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LATE PLEISTOCENE-EARLY HOLOCENE COLONIZATION AND REGIONALIZATION IN NORTHERN PERÚ: FISHTAIL AND PAIJÁN COMPLEXES OF THE LOWER JEQUETEPEQUE VALLEY

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ABSTRACT OF DISSERTATION

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ABSTRACT OF DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Arts and Sciences
at the University of Kentucky

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Until relatively recently, the view of Late Pleistocene hunter-gatherers in the Americas was dominated by the "Clovis-first" paradigm. However, recent discoveries have challenged traditional views and forced reconsiderations of the timing, processes, and scales used in modeling the settlement of the Americas. Chief among these discoveries has been the recognition of a wide range of early cultural diversity throughout the Americas that is inconsistent with previously held notions of cultural homogeneity. During the Late Pleistocene-Early Holocene, the development of widely varying economic, technological and mobility strategies in distinct environments is suggestive of a range of different adaptations and traditions.

It is argued that colonization was a disjointed process involving alternative, perhaps competing strategies at local and regional levels. Individual groups likely employed distinct strategies for settling new landscapes. These different strategies are reflected in the cultural variability that has been documented in the Late Pleistocene-Early Holocene archaeological records of South and North America. A scalar framework for conceptualizing and modeling this variability on local, regional, and continental scales is introduced. Although primarily focused on local and regional reconstructions, the results can be integrated with other regional studies to generate more comprehensive, continental-scale models of the peopling of the New World.

This research provides insight into the local and regional variability—in terms of settlement patterns and economic and technological strategies—present in the archaeological record of at least two formally recognized Late Pleistocene-Early Holocene complexes (Fishtail and Paiján complexes) in the Quebradas del Batán and Talambo of the lower Jequetepeque Valley, northern Perú. Results of extensive survey, excavation, and materials analyses are used to characterize mobility strategies and settlement organization. This research indicates that two distinct patterns of site types, settlement, subsistence, and technology existed at the local level between the Fishtail (ca. 11,200-10,200 B.P.) and Paiján (ca. 10,800-9,000 B.P.); these patterns are indicative of differing regional strategies of colonization. Lastly, it is suggested that the adaptations and behaviors pursued during regional settlement, particularly by Paiján groups, set in motion an increasing reliance on plant foods and an early trend toward sedentism that carried forward into the Holocene period.

KEYWORDS: Colonization, Andean South America, Late Pleistocene-Early Holocene, Early Preceramic, Settlement Patterns

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RULES FOR THE USE OF DISSERTATIONS

DISSERTATION

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For Kary and Finn

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CHAPTER ONE

PROJECT AREA AND RESEARCH STATEMENT

Introduction

Until relatively recently, the view of Late Pleistocene hunter-gatherers in the Americas was dominated by the "Clovis-first" paradigm. The theoretical perspective that lay at the heart of this hypothesis held that the New World was peopled by hunter-gatherers migrating from Northeast Asia across the Bering Land Bridge around 11,500 years ago (Haynes 1966, 1964; Kelly 2003; Martin 1984, 1973). The Clovis culture was thought to represent a specialized hunting economy based on the exploitation of large terrestrial mammals and megafauna (Haynes 1966; Martin 1973, 1967; Mossiman and Martin 1975). Upon entering the New World, Clovis peoples were believed to have rapidly colonized much of continental North America, followed quickly by large parts of northern and Andean South America. This rapid colonization is thought to have resulted in a relatively homogeneous Late Pleistocene "founder" culture for the entirety of the New World (Fiedel 2000; Haynes 1980, 1969; Kelly and Todd 1988; Lynch 1983, 1974).

Within the past two decades, however, new discoveries have resulted in the identification of a substantial amount of data that cannot be explained under the Clovis-first hypothesis (Bonnichsen and Schneider 1999; Borrero 2006; Dillehay 2000; Dillehay et al. 2004a; Goebel et al. 2008; Grayson and Meltzer 2002; Madsen 2004). These discoveries challenged the traditional understanding and forced a reconsideration of the timing, processes, and scale used in modeling the settlement of the Americas. Two of the primary developments responsible for the challenges leveled at the Clovis-first hypothesis include: 1) the discovery of sites in both North and South America, most notably the Monte Verde site in southern Chile, that pre-date the posited entry of Clovis into the New World (Adovasio et al. 1990; Adovasio et al. 1999; Bryan et al. 1978; Dillehay 2000, 1997, 1989; Dillehay et al. 2008; Goodyear 1999; McAvoy and McAvoy 1997; Meltzer et al. 1997); and 2) the recognition of greater than before acknowledged cultural variability in the Late Pleistocene archaeological record, including the existence of several lithic assemblages in both North and South America that are technologically distinct from Clovis (Adovasio and Pedler 2004; Borrero 2006; Bryan 1991, 1973;

Dillehay 2000, 1999; Dillehay et al. 2004a; Goebel et al. 2008; Lavallée 2000; Meltzer 2002, 1993).

Perhaps the most interesting result of these recent developments has been an expanded discussion of the potential time frame in which colonization initiated (Bryan and Gruhn 2003; Dillehay 1997a; Madsen 2004). It is clear that humans were in the Americas by at least 12,500 years ago, based on the intensively dated occupation of the Monte Verde site (Dillehay 1997a; 1989; Meltzer et al. 1997), which clearly demonstrates a human presence in the Americas that predates Clovis (ca. 11,500-10,800 [Fiedel 2000; Haynes, G. 2002]). Assuming the colonization of the New World initiated through North America—which seems most likely route (at present) given its proximity to the Asian landmass and the results of recent genetic data (cf. Meltzer 2004; Merriwether 2002)—then the early date from Monte Verde correspondingly implies that humans must have been in North America by at least that time, and probably earlier.

Expanding the timeframe for the colonization of the Americas does not mean we must reject the possibility of a Clovis migration, only the presumed primacy of that migration (Dillehay 2000; Madsen 2004). Clearly, the Clovis phenomenon still represents a rapid and unique spread of a people, technology, and/or economy across a relatively open North American landscape (Anderson 1996; Anderson and Gillam 2000; Meltzer 2002). However, recent conceptualizations acknowledge that several migrations into the New World likely occurred at different times during the Late Pleistocene (Borrero 2006; Dillehay 2000; Dillehay et al. 2008; Madsen 2004; Meltzer 2002). These migrations may have involved different cultural groups, originated in different geographic locations, traveled to North and/or South America by different routes, and pursued different strategies for exploring and settling new landscapes (Bonnichsen and Turnmire 1999; Bryan 1991; Dixon 1999; Gruhn 2004, 1987; Merriwether 2002; Schurr 2004). The challenge before us is to better understand the social, economic, and technological variability present in local and regional archaeological records that may provide insight into the increasingly complex conceptualizations of the peopling of the Americas.

The Clovis-first hypothesis held that a homogeneous "founder" culture was responsible for the relatively rapid colonization of North and South America—a situation that should result in similar archaeological expressions and human physiology throughout the New World during the Late Pleistocene. However, biological, linguistic, skeletal, and genetic studies point toward a range of diversity that does not fit well with the notion of a founding lineage or culture (Greenberg et al. 1986; Horai et al. 1996; Merriwether 2002; Merriwether et al. 1995; Neves et al. 1996; Nichols 2002, 1990; Schurr 2004; Steele and Powell 2002, 1994; Szathmary 1994, 1993; Torroni et al. 1992). In addition to the genetic and linguistic diversity that appears to have been present during the Late Pleistocene, it has become increasingly clear that a wide variety of cultural expressions also existed. The Nenana complex of Alaska (Goebel 2004; Goebel et al. 1991; Hamilton and Goebel 1999; Powers and Hoffecker 1989), the Western Stemmed Tradition of the Great Basin and Columbia Plateau (Ames 1988; Bryan and Tuohy 1999; Beck and Jones 1997), and maritime-focused coastal California sites (Erlandson 1994; Erlandson and Moss 1996; Jones et al. 2002; Rick et al. 2005) evidence varied economic practices and technological traditions that are distinct from the traditional characterizations of Clovis.

In South America this cultural diversity is even more apparent—widely varying economic and technological traditions have been documented across the continent during the Late Pleistocene (Bryan 1991, 1973; Dillehay 2000; Dillehay et al. 2004a; Dillehay et al. 1992; Lavallée 2000). Sites such as Monte Verde in Chile (Dillehay 1997a, 1989), Taima-Taima in Venezuela (Gruhn 1979; Ochsenius and Gruhn 1979), Amotape complex sites in northern Peru (Richardson 1983, 1981), coastal sites in southern Perú and northern Chile (Lavallée 2003; Keefer et al. 1998; Sandweiss et al. 1998), Fishtail complex sites of southern and Andean South America (Briceño 1999; Borrero 2006, 1996; Miotti 2003; Miotti and Salemme 1999; Nuñez 1992, 1983; Politis 1991), Itaparica Tradition sites in eastern Brazil (Kipnis 1998), and early unifacial sites in Colombia (Correal 1986, 1981), illustrate a range of cultural adaptations and traditions in distinct environments that are inconsistent with the previously held notions of widespread cultural homogeneity.

At present, however, we possess only a limited understanding of what this observable diversity represents in terms of when and how the colonization of the Americas unfolded. What do the various known Late Pleistocene complexes suggest about the process or processes involved in the peopling of the New World? Did different strategies of colonization exist? What are the different mobility, economic, and technological strategies that define these early complexes? Are there economic, technological and social linkages between any of the contemporary/overlapping early complexes—and if not, why?

The recognition of a wider range of early cultural diversity forces us to reevaluate long-standing ideas on how and when the Americas were colonized. The failure of the traditional 'bow-wave' model of rapid migration (e.g., Martin 1973; Mossiman and Martin 1975) to account for or explain early diversity has fostered a renewed interest in understanding (and modeling) the process of colonization itself. As a result of the renewed interest in colonization, several models have been generated that focus more specifically on the behavioral and strategic choices humans make in open landscapes (e.g., Anderson and Gillam 2000; Beaton 1991; Bettinger and Young 2004; Dillehay 1997a; Dixon 1999; Kelly and Todd 1988; Meltzer 2002), with relatively less emphasis on the timing of initial entry (although this remains an important question [see Fiedel 1999, 2002, 2006; Madsen 2004]).

One of the important features of several of the newer models is an explicit recognition that variable rates of exploration, expansion, and settlement may have operated coterminously and at different scales (Beaton 1991; Dillehay 2000, 1997a; Dixon 1999). Rather than viewing colonization as an event, these models conceptualize the peopling of a landscape as a process in which exploration and migration may only be the first steps. Generally speaking, *colonization* has been defined as the process through which viable human groups enter, explore, and settle a given landscape or region (Beaton 1991; Dillehay 2000; Dixon 1999; Madsen 2004; Meltzer 2002).

This conceptualization is necessarily broad, and encompasses a wide range of potential human behaviors. Adapting to new climatic and ecological conditions, transforming technologies to new requirements, and maintaining group viability and social ties are all equally important components of the *process* of colonization (Golledge 1999; Mandryk 1993; Meltzer 2002; Rockman 2003). Differential strategies pursued by coterminous, overlapping, or sequential colonizing populations could produce profound cultural variability in the archaeological record. The possibility of linking that variability to different strategies of colonization shows promise for increasing our understanding of how and when humans settled the New World.

Conceptualizing colonization as a process allows us to begin to integrate seemingly disparate local and regional data and patterns into larger interpretive frameworks (on supra-regional scales). The strength of this is that we no longer assume that colonization was the same everywhere (Beaton 1991; Dillehay 1997a; Meltzer 2002). Rather, it seems likely that different groups probably approached the exploration and settlement of new landscapes with distinct strategies. Identifying and documenting this strategic variability may provide explanations—which have largely eluded us—for the cultural variability that is known to have existed during the Late Pleistocene-Early Holocene period.

Another important feature of some more recent models is the recognition that intensity of settlement in individual landscapes and/or regions varied widely (Anderson 1996; Anderson and Gillam 2000; Bonnichsen and Turnmire 1999; Dillehay 2000; Goebel et al. 2008). One avenue for examining disparities in settlement intensity is the process of regionalization, which is interrelated with colonization. *Regionalization* can be defined as the process in which colonizing groups and their offspring, within a broadly delimited geographic region (such as the Amazon basin or the Intermontane West in North America), begin to develop more intensive and/or specialized subsistence and technological practices tailored to specific ecologies or environments (Dixon 1999; Tankersley 1998).

Like colonization, regionalization must also be viewed as a process that involves the strategic choices of individual groups that may lead to increased territoriality, development of formal social networks, changes in mobility and subsistence strategies, economic intensification, and technological changes (Bamforth 1991; Bar-Yosef 1998; Bar-Yosef and Valla 1992; Dillehay 2000; Henry 1989a, 1985; Rocek and Bar-Yosef 1998; Stanford 1999; Tankersley 1998). The process of regionalization provides us with a significant conceptual tool for understanding the diversity of regional cultural expressions that appear in many areas during Late Pleistocene-Early Holocene period. Regionalization is inter-related with colonization in that it initiates out of the exploration and settlement of new landscapes, but is a slower, more temporally and spatially confined process.

The widespread cultural diversity that appears in South America during the Late Pleistocene-Early Holocene may be best understood as regional outgrowths of an on-going process emphasizing increasingly intensified knowledge and use of local environments and resources. However, significant deficiencies in our understanding of the social, economic, and technological practices and organization of these early complexes limit our ability to model regional processes. More detailed local and regional studies providing insight into the development and organization of these distinct complexes are needed to better understand the relationships between them and the distinct adaptational strategies that may be represented in a broad, continental-scale process. Each of these different scales of movement from colonization to localization may be organized according to different principles or conditioning factors.

The primary goal of the research presented in this dissertation is an attempt to document, define, and interpret the variability present in the archaeological record of the Late Pleistocene to Early Holocene period in one small region of Andean South America—the lower Jequetepeque Valley of northern Perú. This research is designed to provide a more thorough insight into the local and regional variability—in terms of settlement patterns and economic and technological strategies—present in the archaeological record of at least two formally recognized Late Pleistocene-Early Holocene complexes (Fishtail and Paiján complexes) in the Quebradas del Batán and Talambo (QBT) of the lower Jequetepeque Valley. Detailed local and regional studies, such as the one presented here, provide the comparative baseline data for interpreting and modeling continental-scale patterns and processes.

On the local level (such as individual sites, complexes of sites, or archaeological project areas—like the QBT study area in this project) the broad processes of colonization and regionalization are often represented by highly variable, sometimes contradictory, archaeological data. Different behaviors and strategies are often expressed by marked variability at the local level. *Localization* represents the process of regionalization at an even more spatially and temporally confined scale. Like regionalization, groups develop more intensive and/or specialized economic practices focused on local resource exploitation. Local economic intensification/specialization may be coupled with changes or innovations in technology, experimentation with or adoption of new resources, changes in domestic architecture and features (possibly including site furniture, storage, and human burials), and/or increased numbers of associated sites and site types (Aldenderfer 1998; Anderson 1996; Bar-Yosef 1998; Bar-Yosef and Valla 1992; Binford 1980; Borrero 1996; Dillehay et al. 2009; Dillehay et al. 2003; Erlandson and Moss 1996; Henry 1989a, 1985; Kelly 1995; Sandweiss et al. 1998). Localized adaptations are often indicated by changes or alternations in the mobility patterns of individual groups (Binford 2001, 1980; Kelly 1992).

The research presented in this dissertation argues that two distinct patterns of site types, settlement, subsistence, and technology existed at the local level between the Fishtail (ca. 11,200-10,200 B.P.) and Paiján (ca. 10,800-9,000 B.P.) complexes. It is further argued that this patterned variability is indicative of different regional strategies or logics pursued by these groups during the settlement of northern Perú. The central thesis of this research is that colonization was a disjointed process that involved alternative, perhaps competing, strategies at local and regional levels. Individual groups likely employed distinct strategies for settling new landscapes. These different strategies are reflected in the wide range cultural variability that has been documented in the Late Pleistocene-Early Holocene archaeological records of South and North America. This research introduces a scalar framework for conceptualizing and modeling this variability on the local, regional, and continental scales. Although primarily focused on local and regional reconstructions, the results of this research can be integrated with other regional studies generate more comprehensive, continental-scale models of the peopling process.

Introduction to the Project Area

The project area for this study is located in the lower Jequetepeque Valley of northern coastal Perú (Figure 1.1). The lower Jequetepeque Valley has been the focus of an on-going, long-term archaeological project (Proyecto Pacasmayo) directed by Tom Dillehay and Alan Kolata (Dillehay and Kolata 2000, 1999; Dillehay et al. 2009; Dillehay et al. 2004b). The Proyecto Pacasmayo—to date—has resulted in the identification of more than 1000 Preceramic and Ceramic period archaeological sites

Figure 1.1. Location of the lower Jequetepeque Valley (adapted from Keatinge 1988).

spanning from the earliest hunter-gatherers to imperial Chimú/Inca urban centers. The project that forms the basis of this dissertation was one of several subprojects that were undertaken within the framework of the larger Proyecto Pacasmayo (see Stackelbeck 2008; Swenson 2004; Warner n.p.).

One of the important results of the Proyecto Pacasmayo has been to document the changing nature of the prehistoric and Hispanic occupation of the lower Jequetepeque Valley over time (Dillehay and Kolata 2000, 1999; Dillehay et al. 2009). Although the lower valley has been continually occupied since the Late Pleistocene (ca. 11,500 B.P.) specific settings, landforms, and locations within the lower valley, such as the valley floor, coastline, low hillslopes, pampas, and *quebradas*, appear to have been favored at different times by different populations. With respect to the vast Preceramic period (ca. 11,500-4,000 B.P.), this large database of sites has allowed for the investigation of changing patterns of settlement and site location, socio-economic and technological organization, and long-term trends of increasing regionalization throughout the Early (ca. 11,500-9,000 B.P.), Middle (ca. 8,500-4,500 B.P.), and Late Preceramic (ca. 4,500-4,000 B.P.) periods. The age periods have been defined by a number of previous studies within the Jequetepeque Valley and across the north and central coasts of Perú (Chauchat et al. 2006; Dillehay et al. 2009; Gálvez 1999; Haas and Creamer 2004; Malpass 1983; Richardson 1981; Rossen 1991; Stackelbeck 2008). The particular focus of this research are the patterns associated with the Early Preceramic Fishtail and Paiján complex sites identified and recorded in the Quebradas del Batán and Talambo of the lower Jequetepeque Valley.

The Quebrada del Batán and Quebrada Talambo are two large *quebrada* systems consisting of several smaller, side *quebradas* that penetrate the western flanks of the Andes at the northeastern margin of the lower valley (Figure 1.2). The Batán and Talambo systems are situated, respectively, on the northern and southern margins of a dry river course (Río Loco de Chamán—or, Río Chamán) that once flowed along the northern edge of the lower Jequetepeque Valley. The initial survey of portions of these two *quebrada* systems was conducted in 1999 and 2000 by the Proyecto Pacasmayo. As a result of the 1999-2000 survey 28 Early Preceramic sites were identified in the QBT. Because survey in only a limited portion of these two *quebradas* yielded a relatively high

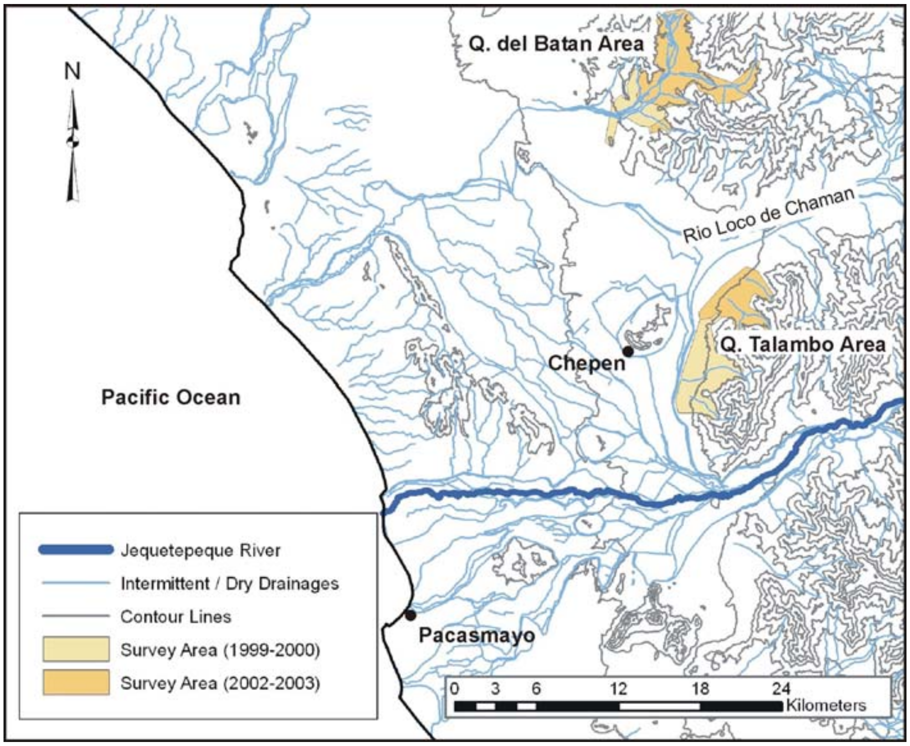

Figure 1.2. Location of the Quebradas del Batán and Talambo project areas in the lower Jequetepeque Valley (plotted on the Chepén Topographic Quadrangle, 1:100,000 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcMap 9.2 GIS program).

density of Early Preceramic sites, it was believed that additional survey within the QBT would result in large number of early sites within a geographically restricted area that could be used to investigate Late Pleistocene technological, economic and settlement strategies.

Another important reason for suggesting that the QBT could potentially be profitable locations for gathering data on Early Preceramic occupations was the fact that previously conducted surveys in the nearby Zaña Valley and Cupisnique/Chicama Valley had identified large numbers of Early, Transitional/Late Early (ca. 9,000-8,500 B.P.), and Middle Preceramic sites (Chauchat 1998; Dillehay et al. 1989; Rossen 1991). In each of these areas, clusters of Preceramic sites had been identified on the margins of the coastal plain (Cupisnique/Chicama—Early Preceramic) and in higher elevation *quebrada* systems (Zaña—Late Early and Middle Preceramic). These surveys, combined with other previous surveys along the Peruvian north coast (e.g., Briceño 1995; Gálvez 1992; Malpass 1983; Ossa and Moseley 1972; Richardson 1978, 1973), seemed to indicate a locational preference for Early Preceramic sites within the *quebrada* systems of the western Andean flanks. It has been argued that *quebrada* systems likely offered reliable access to water sources (i.e., springs and drainages) and other resources that may have been relatively scarce on the coastal plain (Briceño 1997, 1995). However, no systematic identification of site types of regional settlement pattern reconstruction has been conducted for Early Preceramic sites in the Peruvian north coast (Dillehay 2000; Dillehay et al. 2004a; Lavallée 2000).

The reason for the perceived clustering of early sites within the *quebradas* was not known, but the *quebrada* systems appeared to represent focal locations for Early Preceramic settlement. This study will argue that the Early Preceramic Fishtail and Paiján groups explicitly emphasized settlement within the *quebrada* systems of the lower, western flanks of the Andes because of their unique environmental possibilities.

In general, the north coast region of Perú is a complex ecological setting consisting of a desert plain wedged between the varied environments of the Andes Mountains to the east and the Pacific Ocean to the west, which contains the most productive marine environments in the world (Richardson 1983; Sandweiss et al. 1998). Within northern and central Perú, multiple highly diverse environmental settings exist within these three broad macrozones (Pacific Ocean, coastal plain, Andes Mountains). These settings include river valleys, estuaries, coast, springs, *quebradas* (canyons that penetrate the western flanks of the Andes), *pampas* (inter-valley desert plains), *lomas* (fog oases on low hills with diverse plant and animal regimes) subtropical and montane forests, and other subtropical and low- and high-montane zones (Craig 1985; Chauchat 1998; Dillehay 2000; Dillehay and Netherly 1983; Lanning 1963; Moseley 1992; ONERN 1976; Pulgar Vidal 1996; Tosi 1960). The net result is a highly varied landscape containing mixed and juxtaposed micro-environmental zones. This ecological mixing is most pronounced within the *quebrada* systems that drain the western Andean flanks, where as many as 8-10 different zones can be encountered within less than a 25 km radius (Pulgar Vidal 1996; Tosi 1960). Thus, the *quebrada* systems were unique locations that offered access to a potentially wide range of diverse resources from multiple environmental zones.

The QBT study area and the broader north coast region provide an ideal locale to examine variability in the peopling process from the local to continental scale. Local-level site data includes a large site inventory representing at least two distinct Early Preceramic complexes (Fishtail and Paiján). In addition, several technological and economic studies of Early Preceramic occupations in nearby regions (e.g., Zaña, Cupisnique/Chicama, and Moche Valleys) provide the necessary comparative datasets to allow regional patterns and strategies to be discussed and modeled (Briceño 1999; Chauchat et al. 2006; Dillehay 2000; Dillehay et al. 1989; Ossa 1978). Lastly, the lower Jequetepeque, Cupisnique/Chicama, and Zaña Valleys contain some of the earliest dated archaeological complexes known in the Central Andes, such as the Fishtail and early unifacial sites, which are often used in models of continental movement (Borrero 2006; Dillehay 2000; Dillehay and Rossen 2002).

Intensive pedestrian survey of the QBT was conducted by the author and Kary Stackelbeck during 2002-2003. This survey resulted in the identification of 98 additional Early Preceramic sites. Transitional/Late Early and Middle Preceramic sites were also discovered—which are discussed by Stackelbeck (2008). Upon completion of the survey, limited excavations were conducted at 10 Early Preceramic sites that indicated a potential for containing intact deposits based on surface erosional cuts and exposed profiles. The results of the survey, excavation, and corresponding material analyses (including lithics, floral, faunal, and AMS dating) comprise the data that is used to better understand the local and regional organizational variability between the Early Preceramic Fishtail and Paiján complexes.

Organization of This Study

The overall methodological focus of this study centers on a reconstruction of the Early Preceramic period mobility strategies and regional settlement patterns (both Fishtail and Paiján) within the QBT. It is suggested that the reconstruction of Early Preceramic settlement patterns will not only address a significant gap in the prehistory of the region, but will also provide insight into how the processes of regionalization and localization unfolded in the lower Jequetepeque Valley through an increased understanding of potentially different and changing use/occupation of the north coast between approximately 11,500 and 9,000 years ago.

In order to understand how different strategies of settlement may have produced the variability known to exist in the Early Preceramic archaeological record of the Central Andes, it is imperative to increase our understanding of the range of variability present in site types and to understand the functional roles that different types of sites likely played within a system of settlement organization. For example, if we are able to discriminate between residential locations and resource extraction locations, or between relatively short and longer term durations of use/occupation, then we may be able to make specific statements regarding the timing of regional settlement and how use of the landscape evolved over time. To date, this has not been attempted with local and regional data for Early Preceramic complexes of the north coast of Perú. Thus, the primary research questions of this study are: 1) are different types of sites present in the Early Preceramic archaeological record?; 2) if different types of sites exist, what were the functional distinctions between the types?; 3) how were the sites spatially and temporally organized into a regional settlement system?; 4) do the settlement patterns of the Fishtail and Paiján occupations of the region indicate similar organizational strategies?; and 5) what do the Early Preceramic Fishtail and Paiján settlement patterns suggest about differences in regional behaviors or strategies within the lower Jequetepeque?

Several, specific methods were used in this study to facilitate a reconstruction of the Fishtail and Paiján settlement patterns in the QBT. These methods used in this study are detailed in Chapter Two, but include: 1) intensive pedestrian survey for archaeological sites; 2) limited excavation of selected sites; 3) analysis of cultural materials collected during survey and excavation; 4) analysis of floral and faunal materials collected during survey, excavation, and from flotation sampling; and 5) accelerator mass spectrometry (AMS) dating of carbon samples from excavation and flotation contexts. The results of these methods and analyses are discussed in the following chapters. Each generates related lines of evidence (such as economic and technological patterns and chronological relationships) for potentially discriminating the different types of sites that may have existed in the region, and for understanding how the different types of sites may have been spatially, functionally, and temporally organized into regional settlement systems.

The climatic and environmental changes that occurred during the Late Pleistocene-Early Holocene transition were worldwide events (Denton et al. 1999; Soffer and Gamble 1990; Strauss 1996). However, the effects and/or intensity of these changes varied regionally (Gamble 1986; Denton et. al. 1999; Markgraf 1989). Chapter Three of this volume presents a reconstruction of the paleoenvironmental conditions that likely existed in the north coast region during the end of the Pleistocene and into the Early Holocene. This period was witness to the initial colonization and subsequent regionalization that is believed to have taken place in many areas of South America, and evidences environmental and climatic conditions that were very different from modern regimes. It is recognized that paleoenvironmental reconstructions often do not fully account for local topographic, hydrologic, or other factors that may be important in influencing local environmental conditions and human decision making. However, a general paleoenvironmental reconstruction is necessary to provide a baseline context for later discussions of human subsistence, mobility, and settlement during the Pleistocene-Holocene transition. In addition, Chapter Two discusses the effects of the Late Pleistocene-Early Holocene paleoenvironment on landform development, as well as large-scale Holocene geomorphological processes that may have impacted the archaeological record of the Early Preceramic period.

Chapter Four presents a review of the archaeological record of the Late Pleistocene-Early Holocene occupations of Andean South America. Late Pleistocene-Early Holocene occupations in Andean South America have been documented from northern Colombia to Tierra del Fuego. These occupations are known to have inhabited a wide range of paleoenvironments, maintained distinct technological and economic traditions, practiced different patterns of settlement and mobility, and express different intensities of landscape knowledge and use. Although this wide range of variability has been recognized and documented, we do not understand the relationships between early groups (some of which were contemporary and/or overlapping) with markedly different patterns and practices—or what these differences suggest about the process of colonization. The variability present in the archaeological record of the Late Pleistocene-

Early Holocene period of Andean South America is discussed in detail and an attempt is made to relate broad observable patterns to the process of continental colonization.

It is suggested that colonization must be viewed as a long-term, disjointed process that may have operated differently on local, regional, and continental scales. The following chapter (Chapter Five) argues that colonization, regionalization, and localization are inter-related components of the broad peopling process and not mutually exclusive directional trends. Virtually all Late Pleistocene-Early Holocene archaeological data comes in the form of individual cases (sites) with local or (less often) regional interpretations. Because of this, the ability to link local data with regional and continental processes requires a framework with intervening analytical units that can be used to conceptualize lower-scale data and contextualize those interpretations within higher-scale patterns and models. A scalar framework of changes in patterns of movement from the local to continental levels is put forth. Different concepts and models are employed for interpreting data or patterns at distinct scales. Previous models of continental colonization are reviewed (Anderson and Gillam 2000; Bettinger and Young 2004; Gruhn 1994; Haynes 2002; Kelly and Todd 1988; Martin 1973). In general, these models, which often subsume variability, are rejected in favor of an emphasis on modeling local- and regional-scale data—which can then be comparatively used to generate higher-scale interpretations.

Regional data are interpreted according a transient explore-estate settler continuum that is derived from several regional models (Beaton 1991; Dillehay 2000, 1997a; Dixon 1999). These models recognize that different groups may have pursued different strategies, or that individual groups may have alternated between different strategies depending on social and environmental circumstances in different regions or through time. Similarly, local data are used to reconstruct the mobility strategy and settlement organization of individual groups along the familiar residential-logistical mobility continuum (Anderson 1996; Anderson and Hanson 1988; Binford 1990, 1983, 1980; Grove 2009; Kelly 1995, 1992; Kent 1992; Morgan 2008; Surovell 2000). Localized behaviors or adaptations are often reflected in the archaeological record by changes or alternations in the mobility patterns of individual groups (Binford 2001, 1980; Kelly 1992). In general, the residential-logistical model attempts to characterize variability in the organization of movement of foraging groups using the spatial pattern, internal structure, and types of sites present within a defined area or region (Binford 1980).

Chapter Six presents the results of the pedestrian survey conducted in the QBT and compares these results with previously conducted surveys in nearby regions, such as the Zaña and Cupisnique/Chicama regions. Systematic regional survey of the QBT was conducted by the author as a subproject of the larger Proyecto Pacasmayo. As a result of this survey, an additional 98 Early Preceramic sites were documented. These 98 sites are combined with 28 early sites identified during earlier Proyecto Pacasmayo surveys and provide a total dataset of 126 Early Preceramic sites within the QBT.

In addition to presenting the results of the QBT survey, Chapter Six also discusses: 1) Early Preceramic sites previously recorded in the North Coast region; 2) the observed range of variability in Early Preceramic sites, with a special emphasis on identifying characteristics that can be used to distinguish different site types; and 3) the range of variability present in the Early Preceramic sites documented in the QBT region. Each of these discussions aid the primary goal of Chapter Six—which is to identify the different *types* of Early Preceramic sites that existed in the QBT. Five criteria, including size, location, frequency of tools, amount of activities, and the presence of domestic structures are used to define different site types. The identification of distinct site types forms the basis (along with the excavation, lithic analysis, and intra-site spatial data) of later discussions of the nature and character of Early Preceramic mobility patterns and settlement organization.

Chapter Seven presents the results of the test and block excavations conducted at Early Preceramic sites in the QBT. A total of 10 Early Preceramic sites (7 in Quebrada del Batán; 3 in Quebrada Talambo) were selected for test excavations. Test excavations were conducted at selected Early Preceramic sites in order to determine: 1) the extent of intact subsurface deposits present; and 2) provide context-specific samples of artifacts (lithics, floral, and faunal) and features (e.g., hearths and pits) that could augment and/or refine the assessments of site types and function based solely on surface collected materials (presented in Chapter Six).

Chapter Eight continues the presentation of the data from the QBT project with a discussion and classification of the lithic tools recovered from survey and excavation contexts. Lithic artifacts, specifically chipped stone tools and debitage (n=9950), comprise the largest single dataset within the QBT cultural material assemblage. An opportunistic sample of surface lithics (primarily tools and distinctive flakes) were collected from each site identified during the QBT survey (n=3762). However, the majority of the lithic artifacts were collected during the test and block excavations (n=6188).

The overarching hypothesis guiding the lithic analysis in this study is that technological variability present in the Early Preceramic period is likely related to different organizational systems on the local level and reflective of distinct regional settlement strategies. The analysis of the lithic artifacts from the QBT provide insight into the different strategies (i.e., site functions, subsistence focus, technological organization, and settlement patterns) that were pursued by the Fishtail and Paiján complexes that occupied this region of the north coast of Perú. Chapter Five argues that different early groups migrating into a region likely followed distinct strategies that exist along a continuum between the polar extremes of transient explorer-estate settler (Beaton 1991; Dillehay 2000, 1997a; Dixon 1999). It is suggested that the organization of technology for each of these continuum poles is distinct and can be discerned, at least in part, through the analysis of chipped stone tools and debitage, using the organizational concepts of curated and expedient technologies (Binford 1979; Nash 1996; Odell 2001, 1996a).

In order to characterize the variability that may be present in Early Preceramic technological organization, a multidimensional approach to the analysis of the QBT assemblages was employed. This approach combines the analysis of formal and informal tools, and raw materials with limited use-wear analysis and intra-site contextual and spatial data to generate a characterization of each site assemblage and the activities that were likely pursued at that location. The individual site assemblages can then be compared to ascertain organizational similarities and differences between sites and to refine previous characterizations of Early Preceramic lithic technology.

Chapters Nine (Early Preceramic Site Types and Settlement Patterns) and Ten (Conclusions) of this volume present the final reconstruction of the Early Preceramic regional settlement patterns. The independent data from the survey, excavation, and lithic analysis are considered together in order to provide a comprehensive view of the functional distinctions among different types of early sites. The recognition of different types of contemporaneous sites allows for a detailed discussion and spatial reconstruction of the organization of the settlement system for both the Fishtail and Paiján complexes. The organizational features of each of these two early complexes allows for a characterization of the specific local strategies pursued by each group within the residential-logistical organization model.

It is argued that Fishtail mobility was residentially-organized, while Paiján mobility is more characteristic of logistical organization. Settlement models are presented for both complexes. These interpretations are used, along with data from other local studies to characterize the regional settlement strategies of these two early complexes and how the organizational features of these groups may have conditioned later cultural developments in the Early and Middle Holocene. It is further argued that the Fishtail pursued only limited colonization of the region and likely practiced a *transient explorer*-oriented strategy that resulted in a homogenous and redundant use of the landscape, with little site differentiation. The Paiján, in contrast, are argued to have practiced a more *estate settler*-oriented strategy that involved relatively low mobility, intensive landscape knowledge and use, and a range of site types that were widely spread across virtually all available landforms. The patterns described in this study have broad comparative implications for informing our understanding of continental-scale processes and for shaping future research questions.

Five appendices are included at the end the document. These appendices include a list of all the Early Preceramic sites identified in the study (Appendix I) and tables of the AMS dates from the QBT excavations (Appendix II), identifications of faunal materials from Early Preceramic sites in the QBT (Appendix III), activities represented on Early Preceramic sites in the QBT (Appendix IV), and an inventory of lithic tools on Early Preceramic sites in the QBT (Appendix V).

CHAPTER TWO

RESEARCH METHODS

Introduction

This chapter provides a detailed description of the specific methods used in documenting and interpreting the variability present in the archaeological record of the Late Pleistocene to Early Holocene period in the lower Jequetepeque valley, and describes how this variability may be related to the scalar processes of colonization, regionalization, and localization. The overall methodological focus of this study centers on an attempt to document the Early Preceramic regional settlement pattern within the Quebradas del Batán and Talambo. The reconstruction of Early Preceramic settlement patterns is based on data from intensive regional survey, excavation of selected sites, and interdisciplinary analyses (including lithic tools and raw materials, floral and faunal remains, and accelerator mass spectrometry [AMS] dating). The data from these separate techniques—when considered together—provide information regarding subsistence practices, activities, duration of occupation, and site contemporaneity, which can be used to characterize settlement organization. These characterizations provide much needed insight into how the settlement of the lower Jequetepeque Valley may have unfolded through an increased understanding of potentially different and changing use/occupation of the region between approximately 11,500 and 9,000 years ago.

Regional settlement pattern studies are attempts to identify all of the archaeological sites present within a geographically defined region and elucidate the organizational features that linked coterminous sites into functioning systems that reflect social group(s) adaptation to a specific, defined environment over time (Dillehay et al. 2009; Dillehay et al. 1989; Dillehay et al. 1997; Parsons 1972; Willey 1953). Implicit to a regional settlement pattern study is the assumption that individual archaeological sites represent locations where aspects of larger-scale organizational systems were enacted (i.e., the function of sites may vary spatially and/or through time). Given this, a regional settlement pattern study must include: 1) the identification of all extant sites within a geographically defined region; 2) a method for identifying contemporaneous sites; and 3) a method for discriminating between sites with different functions.

Several, specific methods are used in this study to meet these requirements and reconstruct Early Preceramic settlement patterns in the lower Jequetepeque valley. These methods include: 1) intensive pedestrian survey for archaeological sites; 2) limited excavation of selected sites; 3) functional (use-wear), typological, and metric analysis of cultural materials collected during survey and excavation; 4) analysis of floral and faunal materials collected during survey, excavation, and from flotation sampling; and 5) AMS dating of carbon samples from excavation and flotation contexts. Each of these methods generates lines of evidence for identifying potential differences between Early Preceramic sites in the QBT, including the different types of sites that are represented, and understanding what these different types may represent in terms of spatial, functional, and/or temporal organization.

In order to understand how higher-scale processes (like continental colonization) may be reflected in the variability known to exist in the Early Preceramic archaeological record of the Central Andes (Dillehay 2000; Dillehay et al. 2004a; Lavallée 2000), it is imperative to increase our understanding of the range of variability present in site types, the functional roles that different types within a socio-economic system, and how these sites may have been functionally and/or temporally related (Bettinger 1991; Bamforth 1986; Binford 1983, 1980; Kelly 1995; Kent 1991; Tankersley 1998). For example, if we are able to discriminate between residential locations and resource extraction locations, or between relatively short and longer term durations of use/occupation, then we may be able to make specific statements regarding the timing of regional colonization and how use of the landscape may have evolved over time. Regional survey can identify the broad range of site variability that is present in the archaeological record of the QBT. This range of variability, when considered in conjunction with the results of previous studies of Early Preceramic sites in the north coast (Becerra 1999; Briceño 1999, 1997; Chauchat 1988, 1975; Chauchat et al. 2006; Chauchat et al. 2004; Chauchat et al. 1998; Dillehay 2000; Dillehay et al. 2009; Dillehay et al. 2004a; Dillehay et al. 1997; Dillehay et al. 1989; Dillehay and Netherly 1983; Gálvez 2004, 1999, 1992; Malpass 1983; Ossa 1978; Ossa and Moseley 1972; Richardson 1983, 1978, 1973; Rossen 1998, 1991; Uceda 1992), allows for the construction of a general model of potential site types that may be expected within Early Preceramic site assemblages. Not all of the potential site types will likely be present within a given region, but provide a framework of documented variability to which the QBT sites can be compared.

Additional data from the excavation of individual sites, identification of features, various materials analyses, and AMS dating are used to distinguish the different activities represented at individual sites and understand the temporal relationships between sites. This information, combined with variability in site size, location, lithic tool frequency, and presence of domestic structures, are used to identify and characterize the different types of sites present within the Early Preceramic QBT assemblage. The identification of specific site types is used to reconstruct the organization of settlement within the QBT region and understand how settlement patterns changed over time.

Regional Survey

Previous Survey in the Jequetepeque Valley

Prior to the initiation of the QBT subprojects in 2002, 81 Preceramic sites had been identified in the lower Jequetepeque Valley by Dillehay and Kolata between 1997 and 2000, during the larger Proyecto Pacasmayo surveys (Dillehay and Kolata 2000, 1999; Dillehay et al. 2009). These sites were located in Quebrada del Batán (n=28), Quebrada Talambo (n=35), and around margins of coastal hills in both the northern and southern margins of the lower valley (n=18). Although the majority of these sites were temporally unassignable, several (n=28) contained artifacts diagnostic to the Early Preceramic period, specifically Paiján projectile points, *limaces*, and bifaces (Figure 2.1).

In order to broadly establish contemporaneity among all of the QBT sites, only those that contain clear evidence of occupation/use during the Early Preceramic will be considered for this study. Identification of Early Preceramic occupation/use is based on the presence of lithic artifact forms that have been demonstrated by previous studies in the region to be strictly diagnostic of the Early Preceramic period (Briceño 1999, 1995; Chauchat 1998; Chauchat et al. 2006; Chauchat et al. 2004; Dillehay 2000; Dillehay et al. 1997; Lavallée 2000; Malpass 1983; Ossa 1973; Ossa and Moseley 1972; Rossen 1991). These artifact forms include: 1) diagnostic projectile points, specifically Fishtail and/or Paiján points; 2) bifaces and biface blanks (commonly referred to *Chivateros* bifaces, which are diagnostic of the Paiján lithic technology [Bonavia 1982; Chauchat et al.

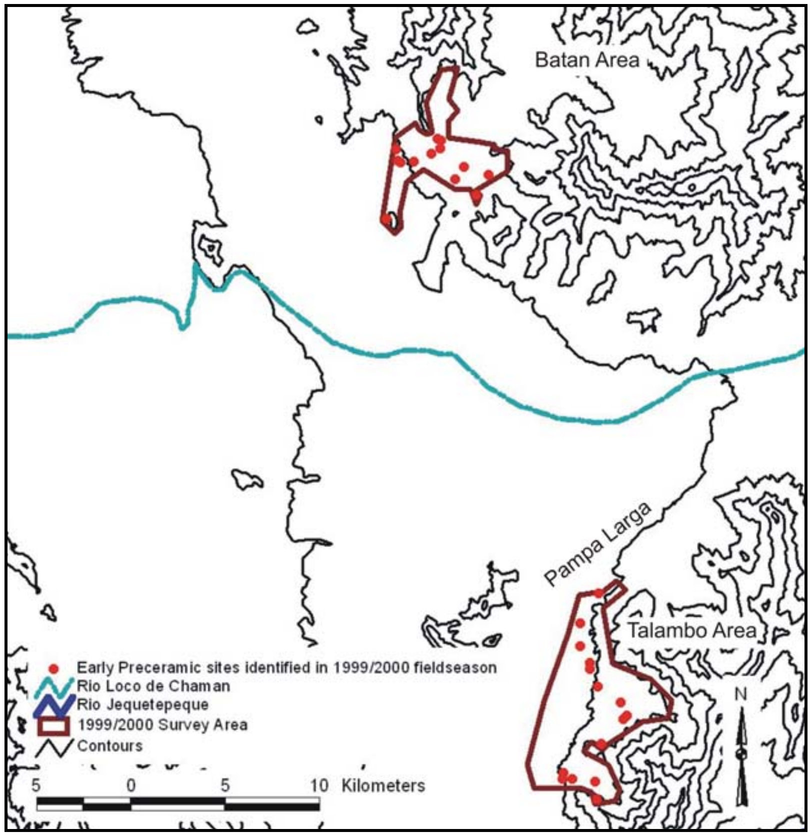

Figure 2.1. Distribution of Early Preceramic sites identified during the 1999 and 2000 fieldseasons (n=28).

2004]); and 3) *limaces* (which are elongated unifaces characteristic of Paiján lithic assemblages [Chauchat 1988]). The presence of one or any of these artifact forms within the lithic assemblage of a site is considered to signify the presence of an Early Preceramic occupation or use at that site.

It is recognized that limiting the sample of sites to only those that contain these diagnostic tool forms will likely exclude those Early Preceramic sites that do not contain formal tools (i.e., expedient or flake-based assemblages) (Dillehay et al. 2004a; Dillehay et al. 1997; Richardson 1983, 1978; Sievert and Wise 2001). The reason for this exclusion is, simply, that sites comprised entirely of surface scatters of flakes and lithic debris (i.e., lacking formal tools) are impossible to temporally assign without excavation data or other associated features (such as domestic structures) that can be used as temporal indicators (Chauchat 1998; Rossen 1998, 1991; Stackelbeck 2008). In the absence of other methods for assigning temporality, lithic scatters that lack diagnostic tools can appear highly similar for the Early, Middle, and Late Preceramic periods and may have been deposited at any point during the entire Preceramic period (Chauchat 1998: 156).

Even specific types of flakes, such as biface thinning flakes, cannot be considered a completely reliable temporal indicator (Sievert and Wise 2001; Stackelbeck 2008). This is due to the fact that unifacial thinning flakes often express similar to nearly exact morphological attributes (including faceted platforms) once removed from formal unifacial tools. Since unifacial traditions exist during the Early Preceramic and continue throughout the prehistory of Central Andean coast (Dillehay 2000; Dillehay et al. 1997; Dillehay et al. 1989; Malpass 1983; Richardson 1983, 1978; Rossen 1998, 1991; Stackelbeck 2008), the use of specific flake types to temporally assign sites can be potentially problematic. In this study, the exclusion of sites that do not contain the identified diagnostic tool forms is necessary to avoid potentially conflating sites from later time periods with those that are clearly Early Preceramic. It is believed that this measure will ensure that later discussions of site types, activities, and settlement patterns are limited to data derived strictly from broadly contemporaneous Early Preceramic sites. This broad contemporaneity will be further refined with the later discussions of the lithic typology and AMS dates generated from samples collected in Early Preceramic excavation contexts within the QBT.

<u>Summary of the Early Preceramic Data from the Proyecto Pacasmayo Survey</u>

In general, the majority of the Early Preceramic sites identified by the Proyecto Pacasmayo in 1999 and 2000 were small, light density, surface lithic scatters located on low terraces extending away from *cerros* (low foothills) that overlooked the broad *pampas* (non-valley coastal plains) outside of the main valley floor (Dillehay et al. 2009). However, a few of these sites (Je-431, Je-439, Je-484) were much larger, contained very large numbers of artifacts, and indicated the presence of multiple, distinct activities that were pursued at those sites. Specific activities or artifact concentrations that were identified at these sites included, lithic knapping stations, land snail middens, and grinding slabs (*batanes*). In addition, stone-lined foundations of simple domestic structures were recorded at examples of both small (Je-449) and large sites (Je-431).

Based on the Proyecto Pacasmayo survey and the results of previously conducted surveys in the nearby regions (Briceño 1999; Chauchat 1998; Dillehay et al. 2009; Dillehay et al. 1989; Gálvez 2004; Rossen 1991), the pattern that began to emerge for the Early Preceramic in the lower Jequetepeque valley was one of relatively concentrated settlement along the margins of the Andean foothills and in the *quebradas* that dissect the foothills where springs and other water sources were available. Although only a small portion of the QBT had been surveyed at this point (approximately 10%), the emerging pattern was highly similar to other Early Preceramic site distributions reported by Chauchat and others (Becerra 1999; Briceño 1999; Chauchat 1998, 1988; Chauchat et al. 2006; Gálvez 2004) in the nearby Cupisnique/Chicama region, in the Zaña Valley (Dillehay and Netherly 1983; Dillehay et al. 1997; Dillehay et al. 1989; Rossen 1998, 1991), by Ossa and Moseley (1972) in the Moche Valley, and in the Casma Valley (Malpass 1983; Uceda 1992). The density of the Early Preceramic occupations in the *quebrada* systems identified in these previous studies suggested that further survey of the QBT would yield additional Early Preceramic sites, and provide a large dataset that could be used to assess regional settlement patterns and make comparisons with the previous studies.

In addition, it also seemed clear that distinct types of sites likely existed within the overall population of Early Preceramic sites. Not unlike the patterns from the Cupisnique/Chicama, Zaña, Moche, and Casma regions, sites with different size, location, frequency of lithic materials, and amount/kinds of activities pursued were identified during the 1999 and 2000 Proyecto Pacasmayo surveys (Briceño 1999; Chauchat 1998; Dillehay et al. 2009; Malpass 1983; Ossa and Moseley 1972). The variability present in these sites offered an opportunity to evaluate and better characterize the types of sites that may have existed during the Early Preceramic and contextualize these sites within a regional settlement pattern—something that had not been done in any of the previous Early Preceramic surveys conducted in the north coast region.

Survey of the Quebradas del Batán and Talambo

Intensive pedestrian survey of the QBT was conducted in 2002-2003, by the author and Kary Stackelbeck, as separate subprojects within the overarching Proyecto

Pacasmayo (Dillehay et al. 2009; Stackelbeck 2008). The Quebrada del Batán and Quebrada Talambo are both large *quebrada* systems that are comprised of a primary *quebrada* drainage and several smaller, intersecting side drainages (Figure 2.2). With respect to this study, the goals of the survey of the QBT were to: 1) provide complete regional coverage of all habitable areas within the *quebrada* systems; 2) identify and record Early Preceramic sites; 3) collect representative samples of artifacts from identified sites; and 4) identify and test sites that had potential to yield intact, subsurface deposits for excavation; and 5) document surface features on Early Preceramic sites.

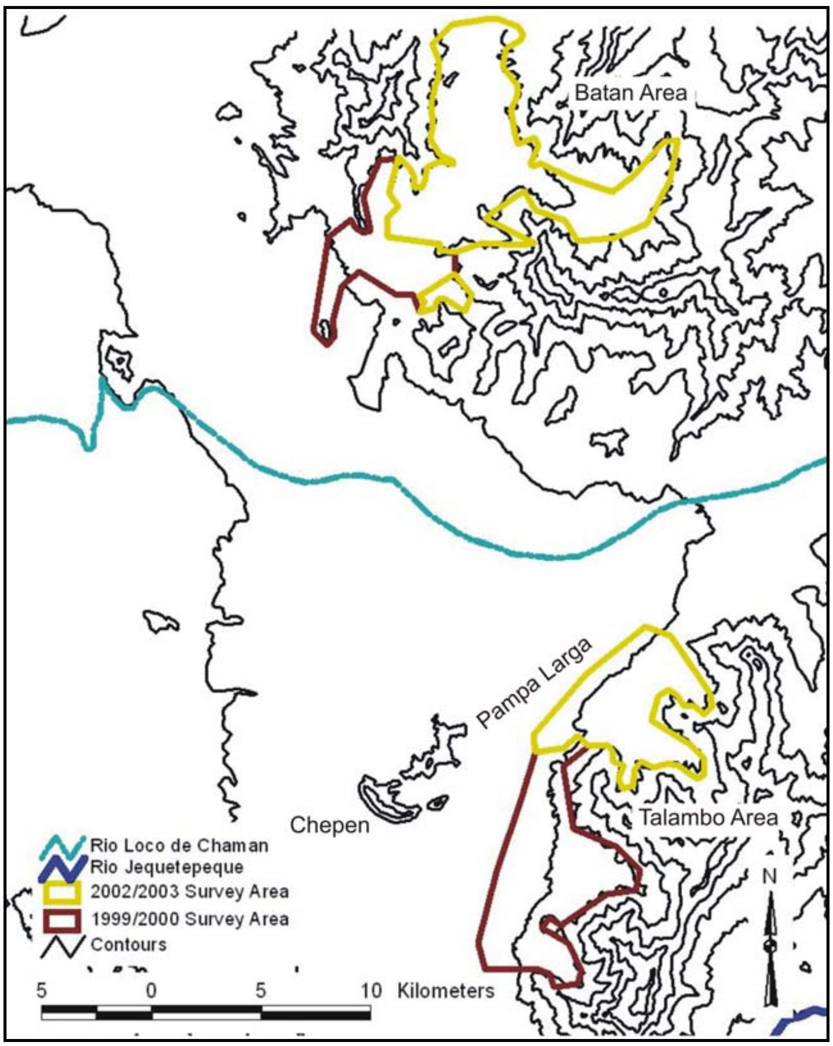

Figure 2.2. Map showing the location of the areas surveyed during the 1999 through 2003 fieldseasons.

As a result of the 2002-2003 survey of the QBT, 98 new Early Preceramic sites were identified and recorded (67 in Quebrada del Batán, 31 in Quebrada Talambo)(Figure 2.3). These 98 sites, combined with the 28 sites that were identified during the Proyecto Pacasmayo surveys, result in the total dataset of 126 Early Preceramic sites within the lower Jequetepeque Valley region. General descriptions for each of these sites are provided in Appendix I (Site Descriptions), and the survey results, including preliminary patterns and materials recovered, are presented and discussed in greater detail in Chapter Six.

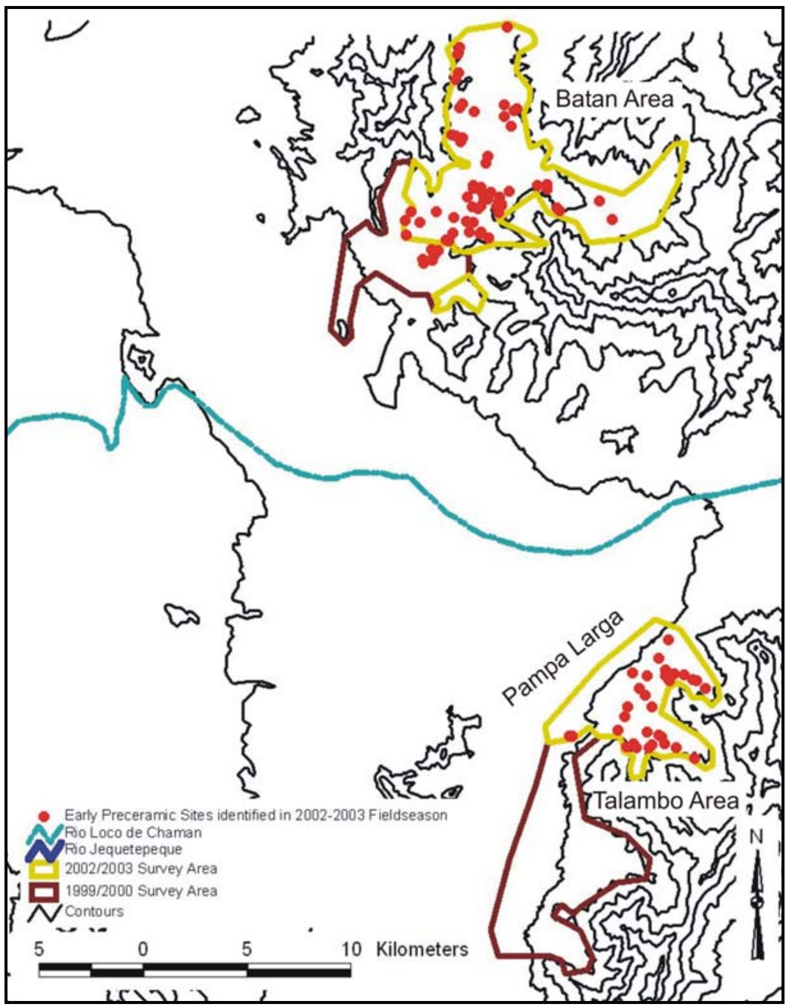

Figure 2.3. Distribution of Early Preceramic sites identified during the 2002-2003 fieldseason (n=98).

<u>Survey Methods</u>

Survey of the QBT region consisted of pedestrian reconnaissance of all habitable landforms and slopes to identify sites. Locations not surveyed included steep slopes unsuitable for human habitation and the rocky floors of the *quebrada* drainage channels. Individual sites were identified based on the presence of surface artifact scatters or features visible on landform surfaces (i.e., stone-lined hearths, domestic architecture, and rock piles). Upon encountering a site, site boundaries were defined based on the limit of the artifact scatter. Once the site boundaries were determined, site dimensions were measured (by pacing) and each site was given an individual identification number.[1] The specific site location was recorded on the appropriate topographic quadrangle map and each site location was also recorded with a handheld Garmin® Global Positioning System (GPS) unit. Site size, physical location, UTM coordinates, and landform descriptions were recorded on a standardized survey site form. Opportunistic artifact samples were collected from the surface of each identified site. Artifact collections were recorded and described on the individual site forms. Upon completion of the artifact collection, sketch maps were drawn of each site and photographs were taken (both color slide and digital). All surface features, identifiable activity areas, diagnostic tools, and any other significant materials or surface patterns were recorded on the site sketch map and site form, and were photographed. In select cases, planview maps of specific features (e.g., domestic structures and stone-lined hearths) were drawn.

Lastly, the probability for containing intact, subsurface deposits was noted on the site form. This probability was ascertained in three ways: 1) by observing exposed erosional cuts on terrace margins for depth of deposits and the presence of subsurface artifacts; 2) by noting the presence of artifacts eroding out of small drainages (*riachuelos*) on the surface of individual sites; or 3) by excavating small probes to test the depth of cultural deposits. These opportunistic test probes typically consisted of the excavation (by trowel) of a 10 cm x 10 cm area (25 cm x 25 cm, in a few cases) simply to determine if subsurface cultural deposits were present and the extent of their depth. In general, the

[1] In an effort to maintain project continuity and eliminate potential duplication, the site numbering system used in the QBT continued that of the Proyecto Pacasmayo, which uses 'Je' to signify the Jequetepeque Valley and sequentially numbers all recorded sites. This is slightly different from the "Rowe System" for enumerating sites, which provides a set numeric identification for each coastal valley (e.g., PV-21 is the Jequetepeque Valley) (Rowe 1971).

vast majority of sites consisted of deflated, surface lithic scatters and very few provided evidence of intact, subsurface deposits. Sites that indicated the presence of intact, subsurface deposits were selected for test excavations, and in some cases, larger block excavation.

Excavation of Early Preceramic Sites

A total of 24 sites (15 in the Quebrada del Batán; 9 in the Quebrada Talambo) were selected for test excavations by the joint subprojects directed by the author and Kary Stackelbeck (Stackelbeck 2008). Test excavations were conducted at sites in order to determine: 1) the extent of intact subsurface deposits present at a given site; 2) provide context-specific samples of artifacts (lithics, floral, and faunal) and features (e.g., hearths and pits) that would aid in assessments of site type and function; and 3) collect carbon samples for AMS dating. The 24 sites that received test excavations were selected according to the following criteria: 1) surface inspection of erosion cuts and/or small probes indicated the possibility of intact deposits; 2) the site contained surface evidence (i.e., artifacts, features, structures) which indicated that a variety of different activities appeared to have occurred at that location; and 3) the site contained structures or distinctive artifact types and distributions (i.e., Fishtail and Paiján projectile points, groundstone implements, extensive lithic workshops), that could provide specific information regarding Early Preceramic economic and/or technological organization. For example, among the 126 Early Preceramic sites only four contained Fishtail projectile points. Test excavations were conducted at all four of these sites.

The criteria used in this study to evaluate and select sites for test excavations, like the survey methodology, were largely drawn from the results of previously conducted investigations in the north coast, such as the excavation of Early Preceramic Paiján sites by Chauchat and others in the Cupisnique region (Becerra 1999; Briceño 1999, 1997; Chauchat 1998, 1975; Chauchat et al. 2006; Gálvez 1999, 1992) and the late Early and Middle Preceramic sites excavated by Dillehay, Netherly and Rossen in the Zaña Valley (Dillehay and Netherly 1983; Dillehay et al. 1997; Dillehay et al. 1989; Dillehay and Rossen 2002; Rossen 1998, 1991). The results of these investigations suggested that larger sites with a wide diversity of surface artifact materials, including variety of tools, surface features, and structures, would likely provide the most opportune locations for encountering subsurface features and intact midden deposits. Additionally, sites with these characteristics tend to provide the most information, in terms of floral and faunal materials and intra-site spatial organization that can be potentially useful for reconstructing subsistence and economic organization and characterizing duration of site occupation and site function (Chauchat 1998; Chauchat et al. 2006; Dillehay et al. 1989; Dillehay and Rossen 2002; Rossen 1991). These kinds of information are necessary for identifying the range of site types that existed within the QBT assemblage, understanding the relationships between different sites, and for reconstructing regional settlement patterns.

However, test excavations conducted in the QBT did not always result in the identification of intact subsurface deposits containing Early Preceramic cultural materials. Nine sites revealed limited subsurface deposits that contained no cultural materials or contained materials that clearly dated (through AMS or with temporally diagnostic artifacts) to periods after the Early Preceramic. Several of the sites containing deposits that dated to later time periods (Je-393, 463, 772, 780, 890, 901, 936, 937, 971) were of Middle Preceramic age and are discussed in detail by Stackelbeck (2008). In addition, of the 24 total sites selected for test excavation six revealed multicomponent subsurface occupations (two or more subsurface occupational episodes that dated [through AMS or temporally diagnostic artifacts] to clearly separated time periods)(sites Je-393, 431, 484, 790, 983, 1002). For example, site Je-1002 yielded subsurface evidence for Early Preceramic, transitional late Early/Middle Preceramic, and a limited Moche/Chimú occupation.

In the case of multicomponent sites where both Early Preceramic and later occupations were identified, the Early Preceramic component will be the focus of the discussions in this study. This information is presented and discussed in Chapter Seven (Excavation Results). Most of the later components identified in the multicomponent sites were transitional late Early/Middle Preceramic and Middle Preceramic in age (for example, sites Je-431, 790, and 1002) and have been discussed in detail by Stackelbeck (2008). In cases where information from these later components is relevant to this study, a brief synopsis of Stackelbeck's (2008) findings is presented.

In sum, test excavations in the QBT resulted in the identification of 10 sites that contained subsurface Early Preceramic period deposits. Of these 10 Early Preceramic sites, seven are located in the Quebrada del Batán (n=7) (Je-439, 919, 979, 993, 996, 1002, 1010) and three are located in the Quebrada Talambo (n=3) (Je-431, 790, 804) (Figure. 2.4). Sites Je-484 and Je-780 were determined, based on associated radiocarbon dates to represent transitional late Early/Middle Preceramic occupations (Stackelbeck 2008). As such, they are not discussed in detail in this study. Results of the excavations at each of the 10 Early Preceramic sites included in this study are discussed in greater detail in Chapter Seven.

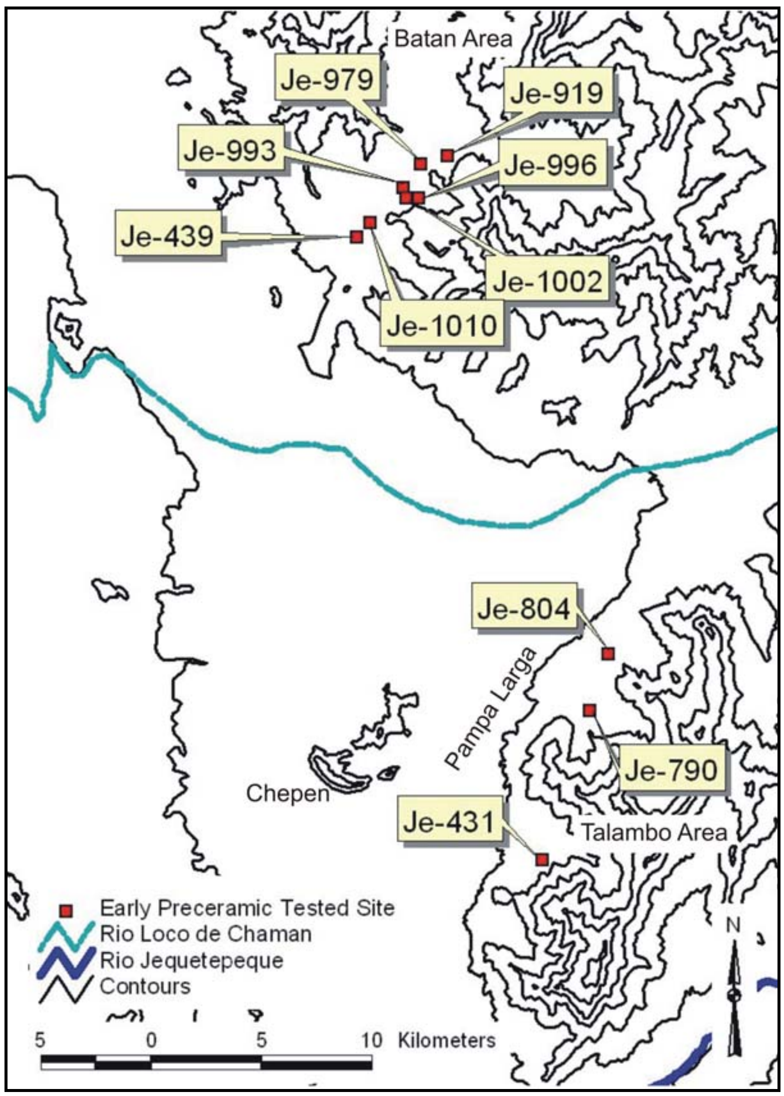

Figure 2.4. Distribution of Early Preceramic sites where test excavations were conducted (n=10).

Test and Block Excavation

As noted above, test excavations were conducted in order to determine: 1) the extent of intact subsurface deposits present at a given site; and 2) provide context-specific samples of artifacts (lithics, floral, and faunal) and features (e.g., hearths and pits) that would aid in assessments of site type and function; and 3) collect carbon samples for AMS dating. Within the framework of these overarching goals, excavation of the 10 Early Preceramic sites in the QBT was conducted according to a two-phased strategy. The first phase was comprised of test units to document subsurface deposits at each of the 10 Early Preceramic sites. The second phase of excavation was consisted of larger, block excavations at selected sites that contained intact, subsurface deposits and could potentially provide the artifact, feature, and contextual data necessary to characterize occupational history and identify site function.

The presence of subsurface deposits was determined by excavating one or two 1x1 m units (Phase 1 test units) in an area of a site that had been previously identified as meeting one or more of the three criteria outlined above. These limited test excavations were designed to be simple soundings to assess the potential of the subsurface deposits (e.g., depth of deposits/stratigraphic integrity, artifact content, and/or presence of features) to provide information that may be useful for assessing site function (i.e., subsistence and technological information, duration of occupation, and chronology). Among the 10 Early Preceramic sites with limited test excavation, four contained relatively shallow deposits—deposits of less than 10-15 cm in depth (sites Je 804, 919, 993, and 1010). The remaining six sites, however, yielded deeper deposits that extended 20-50 cm in depth (sites Je 431, 439, 790, 979, 996, and 1002). Larger and more aerially expansive block excavations were conducted at five of the six sites that contained deeper deposits.

The five sites selected for block excavations (Phase 2 excavations) included Je-431, 439, 790, 996, and 1002 (see Figure 2.4). These sites were selected in part because of the depth of their deposits, but also because they appeared to have the highest potential to provide the artifact, feature, stratigraphic, and contextual data that could potentially inform the assessment of site function and reconstruction of settlement organization.

Block excavations consisted of 2x2 m or 4x4 m blocks that were excavated as a conjoining series of 1x1 m units in order to provide contiguous subsurface spatial data from individual sites. Each 1x1 m unit within a block was excavated, collected, and recorded separately.

All 1x1 m test units (during both Phase 1 and 2 excavations) were excavated by trowel in 5 cm arbitrary levels and generally followed the excavation methodology of the overarching Proyecto Pacasmayo (Dillehay et al. 2009). Each unit was excavated to sterile subsoil or bedrock. Excavation level forms were completed for each level and a unit form for each test unit once completed. In general, the forms described the depth of excavation, soil changes, materials recovered, features encountered, and any other pertinent information. A soil sample for flotation analysis (25x25 cm) was collected from each 5 cm level and provided a flotation column for each unit. Typically, the soil samples were collected from the southwest corner of a unit, unless some form of sediment disturbance necessitated collection from an alternate corner—which was noted. All remaining fill from each level was screened through ¼'' wire mesh. Materials recovered during excavation and screening of each level were collected in separate plastic bags according to material type (i.e., lithics, bone, shell), labeled with provenience information, and placed together in a general level bag. All tools and selected carbon samples were piece-plotted on a level planview map and collected and bagged separately from other materials. Piece-plotted carbon samples were placed in aluminum foil packets inside plastic bags labeled with the provenience information. Once a unit was excavated to sterile subsoil or bedrock, a minimum of one wall was profiled and photographed to document site stratigraphy, soil zones, and the presence of features.

During the excavations several subsurface features (hearths, pits, areas of burned soil) were identified. Once encountered, the boundaries of the feature were identified, mapped, and photographed in planview. After mapping, the feature was bisected and one half was excavated. The exposed feature section was then profiled and photographed. A minimum of one flotation sample was collected from each feature and the remaining feature fill was screened separately. In the case of some very small features, such as small hearths or burned areas, the entire remaining one half of the feature (after bisection) was collected as a flotation sample. All materials collected from features were recorded and bagged separately from non-feature materials. At the end of feature excavation a feature form recording the dimensions and depth, shape, stratigraphy and soil characteristics, and any materials recovered was completed.

All cultural materials recovered during excavations in the QBT were housed and analyzed in the Proyecto Pacasmayo field laboratory. Classes of recovered materials included lithic tools and debitage, ceramics, carbon samples, flotation and soil samples, faunal and floral remains, human remains, and land snail and marine shell. All lithic and ceramic artifacts were washed, labeled, and cataloged according to their respective provenience. Floral, faunal, shell, and carbon samples were analyzed by individual specialists in Perú and the United States. Flotation samples were also processed at the Proyecto Pacasmayo field laboratory. Each of these separate analytical procedures will be discussed in more detail below. Once the field analyses were complete, all artifacts (with the exception of those transported to the U.S. for further specialized analyses) were curated in the Huaca Arco Iris repository in Trujíllo that is managed by the Institúto Naciónal de Cultura de Perú (Peruvian National Institute of Culture).

Each of these separate lines of data is used to assess site function and characterize sites within the general typology that has been identified based on the results of previous studies (Becerra 1999; Briceño 1999, 1997; Chauchat 1998, 1975; Chauchat et al. 2006; Gálvez 1999, 1992) and Zaña Valley (Dillehay and Netherly 1983; Dillehay et al. 1997; Dillehay et al. 1989; Dillehay and Rossen 2002; Rossen 1998, 1991). The characterization of sites by type will, in turn, comprise the base information for reconstructing Early Preceramic mobility patterns and settlement organization. As noted at the outset of this chapter, increased understanding of the organization of Early Preceramic settlement within the lower Jequetepeque Valley during the Early Preceramic—and how settlement may have potentially varied or changed over time—will provide direct information regarding how the processes of localization and regionalization unfolded for the contemporary/overlapping early complexes that occupied the study area and region.

Materials Analyses

The assessment of site type is based on data derived from survey, excavation, and a variety of independent material analyses. Typological, metric, and limited functional lithic analyses, AMS and radiocarbon dating, floral analysis, and faunal analysis were conducted on the materials collected during survey and excavation in the QBT. Each of these separate analyses provides an avenue for characterizing the activities pursued at individual sites, temporal and technological relationships between artifact types, and determining site function (Bamforth 1986; Bettinger 1991; Binford 1983; Dillehay 1997a; Kelly 1995, 1992, 1983; Kent 1991). The results of these analyses provide new insights regarding Early Preceramic technological and economic organization, resource exploitation and mobility patterns, spatial arrangement of sites, comparability between long- and short-term site occupations and assemblages, and refine the regional chronology.

Lithic Analysis

Lithic artifacts, specifically chipped stone tools and debitage (n=9950), comprise the largest single dataset within the QBT assemblage. As mentioned in the previous discussion of survey methods, an opportunistic sample of surface lithics (primarily tools and flakes) (n=3762) was collected from each Early Preceramic site identified in the QBT. However, the majority of the lithic artifacts in the QBT assemblage are represented by flakes and other debitage collected during the test and block excavations (n=6188). Although debitage comprises the majority of lithic material recovered from the Early Preceramic sites in the QBT, the focus of this study involves the lithic tools (n=1035) collected during survey (n=975) and excavation (n=60).

The focus on tools in the lithic analysis conducted in this study represents a specific attempt to understand/characterize the specific technological strategies that may have been employed at different Early Preceramic sites (i.e., manufacturing processes, range of functional types, raw material selection and use, and chronology of different types). This is particularly important for Early Preceramic studies in the north coast where contemporary/overlapping early complexes (such as the Fishtail, Paiján, and unifacial complexes) expressing a range of bifacial, unifacial, and flake-based technological strategies have been identified (these different complexes are discussed in greater detail in Chapters Three and Eight) (Briceño 1999; Chauchat 1998; Chauchat et al. 2004; Dillehay 2000; Dillehay et al. 1992; Dillehay et al. 1989; Gálvez 1999; Malpass 1983; Ossa 1978; Richardson 1978; Rossen 1998; Stackelbeck 2008). Lithic tools, whether bifacial, formal unifaces, or expedient flake tools, represent the end products of these technological strategies. Understanding the different technological strategies employed by distinct early complexes can provide broader insight into the overall organization of technology that can be used (along with temporal, subsistence, and spatial data) to better characterize mobility strategies and settlement organization.

Large, multi-site lithic analyses have been conducted in both the Zaña Valley to the immediate north of the project area (Dillehay et al. 1989; Rossen 1998, 1991; Rossen and Dillehay 1999) and in the Quebrada Cupisinique/Chicama Valley to the south of the project area (Becerra 1999; Briceño 1999, 1997; Chauchat, 1998, 1988, 1975; Chauchat et al. 2006; Gálvez 1999, 1992). Each of these separate analyses focused on large collections of Early (Cupisnique and Zaña) and Middle (Zaña) Preceramic lithic assemblages. The results of these studies form the baseline understanding of lithic variability present within the region, and their general approaches and methods informed the specific methods employed in this study.

The overarching hypothesis guiding the lithic analysis in this study is that the disjointed nature of the colonization process is best understood through the cultural variability present in local and regional datasets, like the Early Preceramic period of Andean South America (discussed in Chapter Five). More specifically, it is suggested that different early groups migrating into and/or settling a region likely followed distinct strategies. These strategies are conceptualized as a continuum between the polar extremes of transient explorer and estate settler (Beaton 1991; Dillehay 2000, 1997a; Dixon 1999). The organization of technology for each of these continuum poles is distinct (ranging from formal to informal technologies) and can be discerned, at least in part, through the analysis of chipped stone tools. The analysis of the lithic artifacts from the QBT can provide insight into the technological strategies employed by the early groups that occupied this region of the north coast of Perú (notably the Fishtail and

Paiján, and possibly others) (presented in Chapter Eight) and provide insight into subsistence, mobility, and regional settlement patterns.

In order to characterize the variability that may be present in Early Preceramic technological organization, a multidimensional approach to the analysis of the QBT lithic assemblage was employed. This approach combines the analysis of formal and informal tools, raw material identifications, and limited use-wear analysis to generate a characterization of each site assemblage and the activities that were likely pursued at that location. The individual site assemblages can then be compared to ascertain organizational similarities and differences and to refine previous characterizations of Early Preceramic lithic technology. The specific methods used in the formal and informal tool analysis, debitage analysis, and raw material characterizations will be discussed below.

Tool Analysis

The previously conducted analyses in the Cupisnique region by Chauchat (Chauchat 1998; Chauchat et al. 2006; Chauchat et al. 2004) and others documented a variety of both formal bifacial and unifacial tools within Paiján assemblages. In contrast, the slightly later (ca. 8,000-5,500 B.P.) lithic assemblages in the Zaña Valley, which were manufactured within a semi- to fully sedentary plant-oriented economy, consisted entirely of unifacial flake tools (both retouched and unretouched) (Dillehay and Netherly 1983; Dillehay et al. 1997; Dillehay et al. 1989; Rossen 1998, 1991; Rossen and Dillehay 1999). Given these previous results from nearby regions, it is apparent that documenting the variety (in both form and function) of lithic tools present within the QBT assemblages may be key to understanding organizational differences related to increasing regionalization.

Like the tool analyses conducted in the Zaña and Cupisnique, the specific methods of tool analysis in this study contained two primary components: 1) visual typological identification; and 2) measurement of metric variables to record variation in tool size (Chauchat et al. 2004; Rossen 1991; Rossen and Dillehay 1999). Each individual tool (both formal and informal) was visually classified into a specific typological category (see Table 2.1). Some of these broad categories have been further

Table 2.1. Chipped stone tool typological classification and descriptions.[2]

Tool Type	Code	Description
Primary Biface	9	Flakes removed on both faces of the object, mainly through primary flaking (i.e., hard-hammer) such that the two sides meet to form the single edge that circumscribes the object; the flaking may reflect a random or systematic pattern; cortex may be present; cross-section of the artifact is thick and irregular; edge of the artifact is typically sinuous; may have been used as a functional tool, but usually represents an early stage in the production of a more refined tool form (i.e., aborted bifacial blank or production failure)
Secondary Biface	10	Shaping consists of flake removal on both faces of the object, mainly through secondary flaking (i.e., soft-hammer) with some primary flaking, and possibly tertiary flaking (i.e., pressure); the flaking reflects a more systematic pattern; cortex is generally not present; cross-section of the artifact is thinner and lenticular; biface edge may be slightly sinuous to straight; may have been used as a functional tool, but usually represents a later stage in the production of a more refined tool form (i.e., aborted preform or production failure)
Projectile Point	11	Shaping is achieved through primary, secondary, and tertiary flaking (hard- and soft-hammer percussion and pressure) on both faces; flake removal is systematic, resulting in a longitudinally asymmetrical form with a pointed distal end and a haft element at the proximal end; latitudinally, the form is generally symmetrical; the cross-section is generally thin, and the artifact edge is straight or only slightly sinuous; these tools may be classified by known stylistic or chronological types (e.g., Fishtail, Paiján) or other as yet unnamed forms
Unidentified Biface Fragment	12	A portion of an object that has been shaped by removing flakes on both faces; likely resulting from a fracture during the course of manufacture, or possibly through use or post-depositional activity; there is not enough of the original form remaining to assign it as either a primary, secondary, or other biface
Limace	13	Form produced by systematic primary, secondary, and tertiary flake removal on one face; generally thick to nearly triangular in cross section, with one flat (unworked) side; longitudinally, may be symmetrical or may be rounded on one end and fine-pointed on the other; latitudinally, generally symmetrical and slightly tear-drop shaped
Limace Fragment	14	Incomplete unifacial form, but recognizable as a portion of a limace (see description above); broken during manufacture, use, or post-depositional process
Uniface	15	Form produced by systematic or unsystematic primary, secondary, and/or tertiary flake removal on one face, usually the dorsal surface of a large flake blank; secondary and/or tertiary flaking may be present on one or both lateral edges, and/or on one or both ends; may have cortex present; may be thick or thin in cross section; generally asymmetrical longitudinally; may be symmetrical or asymmetrical latitudinally; may be wide or relatively narrow; forms include: ovate, tear-drop shaped, sub-rectangular, lanceolate-like, crescent, waisted, or irregular; depending on the form, there may be evidence of provisioning for a haft element on one end
Unidentified Uniface Fragment	16	Incomplete unifacial form, and *not* recognizable as a portion of a limace; broken during manufacture, use, or post-depositional process
Retouched Flake	17	A flake of any class with evidence of tertiary flaking (i.e., pressure) along any or all lateral edges; generally thin in cross-section; may or may not be symmetrical along the latitudinal and longitudinal axes
Utilized Flake	18	A flake of any class with evidence of small flake removal consistent with use-wear; no evidence of intentional shaping; evidence of use may be found on any or all lateral edges

[2] These categories and descriptions are drawn from studies in the Zaña, Jequetepeque, and Cupisnique/Chicama and from generalized lithic typologies (Andrefsky 1998; Chauchat 1998; Chauchat et al. 2006; Chauchat et al. 2004; Dillehay et al. 1989; Odell 2003; Ray and Lopinot 1998; Rossen 1998, 1991; Rossen and Dillehay 1999; Stackelbeck 2008).

refined into sub-types when patterned variability existed among the tools attributed to a typological category (types and sub-types are discussed in detail in Chapter Eight). These categories are not designed to represent perceived functional differences between tool classes (although this may be true in some cases). Rather, each typological category is meant to represent a morphological characterization of individual tools based on defined sets of attributes.

The typological categories used in this study draw from the results of both the Zaña and Cupisnique analyses. However, neither is directly applicable given the emphasis in this study on attempting to distinguish between contemporary/overlapping Early Preceramic groups that may have organized their technologies and economies in different ways. In the Quebrada de las Pircas (Zaña Valley) sites analyzed by Dillehay (Dillehay and Netherly 1983; Dillehay et al. 1989) and Rossen (1998, 1991), most sites were considered to be single component (Middle Preceramic) based on relatively thin, limited deposits and patterns of domestic architecture. The Zaña sites are suggestive of single component households and refuse areas that differ substantially from the expansive, often multi-component, lithic scatters documented in the QBT. In the Cupisnique region, the emphasis in the lithic analysis was to recreate the *chaîne opératoire* through typological classification and replicative experiments, and more fully document the technological processes associated with the production of Paiján lithic tools—especially Paiján projectile points (Chauchat 1998; Chauchat et al. 2006; Chauchat et al. 2004). The goal of this study is not to document the technological process of the Paiján culture (which has already been done), but rather to attempt to discriminate between separate Early Preceramic organizational systems.

Upon completion of the typological classification, specifically defined metric attributes were measured. These attributes included length, width, thickness, weight and for some tools (projectile points with intact haft elements) length and width of stem. Length was measured in millimeters as the longest dimension of a particular tool. Width was measured at the widest point perpendicular to the dimension of length. Thickness was measured at the thickest point on a tool that was perpendicular to both length and width, resulting in a three dimensional picture of an individual tool. The weight of each tool was measured in grams on an electronic scale.

Each of these metric attributes, along with the typological classification, was recorded on a separate tool form for each tool. In addition to the metrics and typology, the location and direction of any retouch, reworking, or tool breakage was recorded on each tool form. Raw material of manufacture was also recorded. Numerous distinctive and/or diagnostic tools were also drawn on individual tool forms, although not all tools were drawn.

Lastly, functional analyses of a limited number of selected tools were performed. These analyses included use-wear analysis on 15 tools (conducted by Dr. Tom Dillehay, Vanderbilt University) and blood-residue analysis on 6 tools (performed by Dr. John Fagan, Archaeological Investigations Northwest). The rather small number of tools that could be exported from Perú for these specialized analyses limits the broad applicability of the functional interpretations. However, the tools that were selected for the analyses were chosen because they were diagnostic to specific time periods (Fishtail and Paiján projectile points) or were representative examples of different tool types (projectile points, bifaces, unifaces, retouched flakes, utilized flakes). The results of the use-wear analysis are presented in Chapter 8 (Lithic Analysis). The blood-residue analysis failed to identify any extant proteins or residue and is not discussed further.

Debitage Analysis

Like the tool analysis, each piece of debitage was typologically identified to a specific category based on a defined set of attributes (see Table 2.2). The primary goal of the debitage analysis was an attempt to discriminate the stage of lithic reduction (primary reduction, tool preparation/manufacture, tool resharpening/rejuvenation) that was occurring at individual sites in order to inform the overall site typology. In addition, the debitage analysis attempts to discriminate between distinct lithic reduction strategies (i.e., bifacial and unifacial) that may have been occurring at particular sites or within individual assemblages.

Upon completion of the debitage typological classification, four specifically defined metric attributes were measured. These attributes consist of the maximum dimensions of an individual piece of debitage along three axes. The first axis measured is the longest dimension of a specimen regardless of flake orientation or direction (although

Table 2.2. Chipped stone debitage typological classifications and descriptions.[3]

Debitage Type	Code	Description
Core/Core Fragment	1	Non-tool nodules or chunks of raw material from which a flake or series of flakes has been detached, as evidenced by the presence of one or more intentional flake removals from the surface of the core.
Cortical Flake	2	Whole flake (feather, hinge, or step termination present) that evidences: 1) identifiable platform, 2) bulb of force on the ventral surface, and 3) more than 50% coverage of the dorsal surface by the original raw material cortex.
Partial Cortical Flake	3	Whole flake (feather, hinge, or step termination present) that evidences: 1) identifiable platform, 2) bulb of force on the ventral surface, and 3) less than 50% coverage of the dorsal surface by the original raw material cortex.
Interior Flake	4	Whole flake (feather, hinge, or step termination present) that evidences: 1) identifiable platform, 2) bulb of force on the ventral surface, and 3) an absence of cortex on the dorsal surface of the flake.
Lipped Interior Flake	5	Whole flake (feather, hinge, or step termination present) that evidences: 1) identifiable platform, 2) bulb of force on the ventral surface, 3) absence of cortex on the dorsal surface, and 4) a lip, or "hook-like" protrusion, on the ventral edge of the platform.
Broken Flake	6	Flake that contains 1) an identifiable platform, and 2) a bulb of force on the ventral surface, but do not contain any evidence of termination (i.e., they are broken and consist only of the proximal to medial portion of the flake).
Flake Fragment	7	A portion of a flake that lacks either an identifiable platform or a bulb of force. However, the specimen is still identifiable as a flake by the presence of either a platform or bulb.
Shatter	8	A lithic artifact that does not evidence: 1) an identifiable platform or, 2) a bulb of force. Because both of these two diagnostic features are absent these lithics cannot be assigned to any other debitage category.

[3] These categories and descriptions are drawn from studies in the Zaña, Jequetepeque, and Cupisnique/Chicama and from generalized chipped stone debitage typologies (Andrefsky 1998; Bradbury and Carr 1999; Chauchat et al. 2006; Chauchat et al. 2004; Cowan 1999; Dillehay et al. 1989; Morrow, C. 1984; Morrow, T. 1997; Odell 2003; Prentiss 1998; Ray and Lopinot 1998; Rossen 1998, 1991; Rossen and Dillehay 1999; Shott 1994; Sullivan and Rozen 1985; Stackelbeck 2008; Tomka 1989).

usually it is parallel or roughly parallel with the flake length). The second measurement taken is the maximum dimension of the specimen perpendicular to the first axis. The third axis of measure is the taken perpendicular to the second axis and records the maximum dimension in this direction. These three measures, combined, provide a good picture of the maximum dimensions of any piece of debitage.

It is important to note that these three axes, at times, can mirror flake length, width, and thickness. However, these terms have been purposefully avoided in favor of a focus on maximum piece dimensions. The primary reason for this is in order to measure length, width, or thickness, one must first identify pertinent characteristics of the flake (such as the bulb of force, platform, and flake termination) that will allow them to orient the flake. Only after orienting the flake can they then take the measures of length, width, and thickness. The problem with this method is that it requires the analyst to make identifications on the debitage in order to generate metric data, thus introducing a level of observer bias and limits replicability of the measures (Fish 1978; Odell 2003; Rozen and Sullivan 1989; Sullivan and Rozen 1985). At the same time, it is difficult to measure length, width, and thickness on pieces that do not exhibit the characteristics necessary to orient the flake (such as broken flakes, flake fragments, or shatter). By using the three measures of maximum dimension perpendicular to each other, this study addresses the introduction of bias and error, while generating a useful picture of the gross size of any given piece of debitage.

In addition to recording the three maximum dimensions, the weight of each piece was recorded using an electronic scale (in grams). Weight has been shown to be one of the most useful indicators of gross size and variation within an assemblage (Andrefsky 1998; Bradbury and Carr 1999, 1995; Odell 1989a; Shott 1994). Thus, in total, four metric values are generated for each piece of debitage. As mentioned above, the purpose of the metric values is to provide an indication of the size of debitage within an assemblage. Variation in overall debitage size can be a useful indicator of changes or variability in technological strategies related to the production of bifaces and/or unifaces (Carr and Bradbury 2001; Odell 1989a).

The results of the debitage analysis (i.e., typological, metric, and raw material identifications) are included in Appendix VII but are not discussed in detail in this study.

Rather, the focus of this study is an attempt to discern the functional roles of individual sites through a characterization of the occupational history and activities pursued. In this regard, lithic debitage did not provide a meaningful avenue for discriminating different activities. In contrast, the lithic tool analysis provided greater insight into functional differences between sites and comprises the focus of this study. The information gathered from the debitage analysis is provided, however, for potential comparison and future use.

Raw Material Analysis

The raw material was identified for each chipped stone tool and piece of debitage in the assemblage. Raw material type and texture (Table 2.3) was assessed visually for each lithic artifact, along with specific variety of material (Table 2.4). The raw material types and many of the specific varieties used in this study were drawn from previously published material identifications for lithic assemblages in the Zaña and Cupisnique regions (Becerra 1999; Chauchat 1998; Chauchat et al. 2004; Gálvez 1999; Rossen 1998, 1991; Rossen and Dillehay 1999; Stackelbeck 2008). Exploitation of different raw materials can provide insight into the degree of mobility and pattern of movement pursued by hunter-gatherer groups (Andrefsky 1991; Bamforth 1991; Dillehay 1997a; Henry 1989b; Ingbar 1994; Kelly 1992; Odell 2003, 1989b).

Additionally, different strategies of lithic production (bifacial and unifacial) may be reflected in the differential use of distinct raw material types and/or sources (Andrefsky 1994; Becerra 1999; Ingbar 1994; Odell 1989b). Each of these potential lines

Table 2.3. Lithic raw material types and textures.

Raw Material Type	**Code**	**Raw Material Texture**	**Code**
Quartz	1	Very fine-grained (VFG)	1
Quartzite	2	Fine grained (FG)	2
Rhyolite	3	Coarse grained (CG)	3
Basalt	4		
Chalcedony	5		
Silex	6		
Andesite	7		
Hematite	8		
Unidentified	9		

Table 2.4. Lithic raw material varieties (based on descriptions of color and degree of translucence).

Raw Material Variety	Code	Raw Material Variety (con't.)	Code
Toba (T)	1	Mottled white (MW)	12
Toba-Green Variety/Dacite (G)	2	Mottled brown/black (MBB)	13
Opaque (O)	3	Mottled brown (MB)	14
Semi-opaque (SO)	4	Mottled caramel (MCa)	15
Crystal (C)	5	Mottled red/black (MRB)	16
Mottled red/pink (MR)	6	Mottled red/caramel (MRC)	17
Caramel (Ca)	7	Tiger stripe (MC)	18
Mottled blue/white/red (MBWR)	8	White (W)	19
Semi-translucent brown (STB)	9	Mottled pink/white (MPW)	20
Mottled white/tan (MWT)	10	Red (R)	21
Mottled gray/blue (MGB)	11	Mottled black/grey (MBG)	22

of insight will be useful in characterizing and understanding variability present in the organization of technology within individual site assemblages and within the overall settlement/mobility patterns of the Quebrada del Batán and Talambo region. These patterns can then be compared with the results from the other nearby regions such as the Zaña and Cupisnique to gain insight into the long-term trends in raw material resource acquisition and lithic production patterns from the Late Pleistocene into the Early Holocene across the north coast of Perú.

Other Material Analyses

Although chipped stone artifacts comprise the bulk of the materials recovered from the survey and excavation of Early Preceramic sites in the QBT, other material classes were also recorded and collected. Faunal materials recovered from both surface and excavation contexts (n=711) were analyzed by Dr. Barnet Pavao-Zuckerman (Arizona State Museum) to genus and species, when possible. Several malacological samples, including both marine (n=36) and terrestrial (land snail) (*Scutalus* sp. and *Bostryx* sp.) (n=337) species were also recovered from survey and excavation contexts. Land snail samples from excavation contexts were collected in bulk lots from each level in which they were present. Each of these samples was individually weighed. Land snail samples were collected in lots from excavation levels due to their persistent and occasionally very dense presence within the deposits of many of the Early Preceramic sites excavated in the QBT.

Malacological samples were identified by biologist María Margarita Mora Costilla (Guadalupe Laboratory of the Universidad Nacional de Trujillo). Representative samples of different marine shells were selected for analysis in order to identify species and home range/distribution. Given the relatively few marine shells recovered, the samples submitted for analysis were opportunistically selected from both surface and excavation contexts in order to provide species identifications and insight into any potential changes in environmental conditions and/or exploitation patterns over time. Representative samples of the different varieties of land snails were also submitted for species identification.

As mentioned in the previous discussion of the excavation methods, a soil sample for flotation was collected from each excavation level, and from features identified during excavation. This resulted in the collection of more than 400 soil samples that were processed with water flotation to recover micro- and macrobotanics. Each excavated soil sample ranged between 2.5-6.0 liters in volume. The intent of the flotation analysis and soil sampling was to identify patterns of plant exploitation by Early Preceramic peoples—such as native grasses, fruits, and legumes—that may indicate increasingly localized subsistence and economic regionalization.

Prior to the flotation of a soil sample, approximately 100-150 grams of soil were separated from the original sample (separately bagged) for use in analyzing soil chemistry to identify potential activity areas (performed by the University of Kentucky Soil Laboratory) and limited phytolith analysis (performed by Dr. Jose Iriarte, Smithsonian Institute Tropical Research Station). The soil samples submitted for phytolith analysis were selected from excavation contexts (specific levels and features) that contained associated, secure AMS dates. The intent of this analysis was, as with the flotation analysis, to identify any plant exploitation that could be clearly related to Early Preceramic subsistence. However, none of the submitted samples yielded any evidence of phytoliths. The complete absence of phytoliths in the submitted soil samples is unusual and may relate to: 1) the strategy for selecting specific samples used in the analysis; or, 2) some post-depositional process that has resulted in extremely poor

Figure 2.5. Photo of the flotation method used to process soil samples collected during excavation in the QBT.

preservation and/or retention of phytoliths in individual site deposits (Iriarte 2005, personal communication).

After the small amounts of soil were separated for chemical and phytolith analyses, the remaining bulk of each flotation sample were processed to extract the light fraction botanic materials. The flotation technique used in this study was based on that of the Proyecto Pacasmayo (Dillehay et al. 2009) and involved pouring each soil sample (individually) into a large plastic tub (Figure 2.5). The tub was filled with water and the soil sample was agitated in order to bring botanic materials to the surface. The water was then poured through a spout with an attached nylon stocking (to catch the light fraction materials). Once the tub was emptied of water, the heavy fraction sludge in the bottom of the tub was inspected for small artifacts and faunal materials, which (if encountered) were collected and bagged according to the excavation provenience.

The light fraction materials that were collected in the nylon stockings—after drying—were poured into aluminum envelopes and labeled as to excavation provenience. A selection of these samples from 15 Early Preceramic sites was submitted to Dr. Jack

Rossen (Ithaca College) for botanical analysis. Samples selected for analysis were chosen because they were from particular features, were found in association with distinctive features or artifacts, or were from excavation contexts that contained secure Early Preceramic AMS dates and were intended to provide insight into potential plant use and/or the range of plant exploitation that may have been practiced within the QBT region.

The results of the flotation samples analysis, along with the faunal and malacological identifications, are presented and discussed by the excavation context and site from which they were recovered (Chapter Seven). The primary goal of these discussions is to identify the range of exploited species, patterns of resource use, and mobility and duration of site occupation when possible (Binford 2001, 1983, 1977; Bettinger 1991; Dillehay 1997a; Kelly 1992; Kent 1991, 1987). Data regarding subsistence practices and duration of occupation will be useful in understanding the functional role(s) different sites may have occupied within the regional settlement system.

Radiocarbon and AMS Assays

A total of 325 carbon samples were collected during the excavations conducted in the QBT. Of this total, 31 samples were submitted for both conventional radiocarbon (n=5) (Beta Analytic Laboratory) and accelerator mass spectrometry dating (n=26) (University of Arizona Radiocarbon Laboratory). The dates that were garnered from these samples are presented in Appendix II. The majority carbon samples collected during excavation were very small, single fragments of piece-plotted wood charcoal. However, some samples (n=7) were aggregates of several small wood charcoal fragments that were collected from the same 5 cm excavation level or feature. All samples submitted for radiocarbon assay (conventional or AMS) consisted of wood charcoal.

The central goal of the radiocarbon analyses is to provide a chronological framework for interpreting the age of deposits within sites and to better document (in absolute terms) the age of specific diagnostic artifact forms and feature use. The specific samples selected for assaying were chosen according to the following criteria: 1) the sample was associated with specific artifact forms (specifically diagnostic lithic tools and characteristic expedient lithic forms); 2) the sample was associated or collected from a feature that was believed (based on stratigraphic position) to relate to the Early, Late Early, or Middle Preceramic periods; 3) the sample was collected from a stratigraphic zone and/or excavation level that believed (based on superposition and associated artifacts) to relate to the Early, Late Early, or Middle Preceramic periods. Samples were primarily collected from excavated midden deposits. However, six samples were collected from within feature contexts (hearths and pits) and two were collected in association with structures.

Several of the samples (n=12) yielded dates for periods that post-date (some substantially) the Early Preceramic period. Some of these later dates come from multicomponent sites that also contained evidence for Early Preceramic occupations. For example, site Je-1002 has substantial Early Preceramic-aged deposits, but also contains a later Moche period occupation that overlays and intrudes into the earlier deposits. Many of these later dates, and the contexts they were collected within (specifically those relating to the Late Early/Middle Preceramic transition [ca. 9000-8500 B.P.] and Middle [8500-5500 B.P.] and Late Preceramic [5500-3500 B.P.] periods), have been previously discussed by Stackelbeck (2008). The focus of the contexts and dates discussed in this study involve only those that relate to the Early Preceramic period (ca. 11,500-9000 B.P.).

However, because the end of the Early Preceramic period and beginning of the Middle Preceramic period on the north coast of Perú is characterized by an unclear and poorly defined transitional period (9000-8500 B.P.) (Dillehay 2000; Dillehay et al. 1989; Lavallée 2000; Rossen 1991; Stackelbeck 2008) the six samples that yielded dates falling within this transitional period are discussed in both this document and Stackelbeck (2008). The dates generated by this study are also compared with previously published dates from other projects, particularly those from the long-term Zaña (Dillehay and Netherly 1983; Dillehay et al. 1997; Dillehay et al. 1989; Rossen 1998, 1991) and Cupisnique/Chicama studies (Briceño 1999; Chauchat 1998; Chauchat et al. 2006; Chauchat et al. 2004).

Spatial Analyses

One of the principle goals of the limited excavations conducted at 10 Early Preceramic sites in the Quebradas del Batán and Talambo was to provide context-specific samples of artifacts (lithics, floral, and faunal) and features (e.g., hearths and pits). Like the lithic and other materials analyses, the analysis of the features that were identified during excavation can be useful in refining the understanding of the types and amounts of activities that were pursued at a given site. In this study, all identified features are discussed in terms of type (hearth, pit, structure, land snail midden, lithic knapping station, burial, etc.), context and chronology (in terms of stratigraphic position and AMS dates), and associated cultural materials (artifacts, floral and faunal materials).

The intent of the discussion of the features is to provide some sense of the internal organization of activities that occurred at different Early Preceramic sites. The identification of activity areas related to lithic production (lithic knapping stations), economic activities (plant and animal processing/preparation), and domestic activities (cooking, domestic structures, storage and/or dumping) have implications for understanding the functional roles of individual sites within the regional settlement system (Binford 2001, 1983, 1980; Brooks and Yellen 1987; Kent and Vierich 1989; Testart 1982; Yellen 1977). As early colonists become more regionalized we can expect to see changes in the internal organization of the activities (both in type and amount) being performed at sites and the functional role of those sites within the regional settlement system (Bar-Yosef and Valla 1992; Beaton 1991; Binford 1990; Dillehay 2000, 1997a; Dixon 1999; Henry 1989a, 1985; Meltzer 2002).

In addition to investigating the internal spatial organization of individual sites (discussed in Chapter Seven), the relationships of different types of sites (as defined by the site typology used in this study) will be instrumental in reconstructing the Early Preceramic regional settlement pattern or patterns that existed. These spatial relationships are graphically presented with the aid of GIS- (Global Information System) based programs (ArcView v. 3.2 and ArcMap v. 9.2) to examine the physical distribution of domestic structures, diagnostic artifacts, different site types, and identify any potential clustering or patterning of distinct types of sites or combinations of site types (discussed in Chapter Nine). Spatial patterns or clusters of distinct types of sites provide one avenue for evaluating mobility patterns, how these patterns may differ or change over time, and characterizing the organization of Early Preceramic settlement.

Summary of the Methods

This study attempts to interpret the variability (social, technological and economic) present in the archaeological record of the Late Pleistocene-Early Holocene period in the lower Jequetepeque valley. It is suggested that this variability can be used to better characterize higher-scale (e.g., regional and continental) processes associated with the settlement of South America. Specifically, it is argued that the Fishtail, Paiján, and possibly other groups that occupied the north coast of Perú pursued distinct strategies of migration and regional settlement that produced the variability in mobility strategies, subsistence, and technological organization that can be observed in the archaeological record. Interpreting this variability necessitates increased understanding of the different strategic choices made by these early groups.

The methodological focus of this study centers on a reconstruction of the Early Preceramic period regional mobility patterns and settlement organization within the QBT. This reconstruction provides new insights into how the processes of localization and regionalization unfolded in the lower Jequetepeque Valley and provides some insights into broader, continental-scale patterns of movement. Several, specific methods are used in this study to generate data that provide information regarding Early Preceramic settlement organization in the QBT region. These methods include: 1) intensive regional survey for archaeological sites; 2) excavation of selected sites; 3) analysis of cultural materials collected during survey and excavation; 4) analysis of floral and faunal materials collected during survey, excavation, and from flotation sampling; and 5) accelerator mass spectrometry (AMS) dating of carbon samples from excavation and flotation contexts. Each of these methods generates independent and related lines of evidence for assessing the functional roles of sites, identifying site types that existed within the region, and for understanding how contemporaneous sites may have been spatially and functionally organized into settlement systems.

In order to understand how different settlement strategies may be reflected in the variability that exists in the Early Preceramic archaeological record of the Central Andes, it is imperative to increase our understanding the range of site types and the functional roles that different types of sites likely played within regional settlement systems. The general site typology used to characterize sites this study (discussed in Chapter Six) provides a method for linking local and regional processes to actual variability in the archaeological record (see Chapter Five). This is accomplished through several specific analyses on the materials collected and recorded during survey and excavation of Early Preceramic sites. The data from these analyses are then used to characterize the different Early Preceramic complexes (specifically the Fishtail and Paiján) within a scalar framework that emphasizes changes in patterns of movement, using distinct concepts and models, from the local to the continental level.

CHAPTER THREE

PALEOENVIRONMENT AND SITE CONTEXTS IN THE LOWER JEQUETEPEQUE VALLEY

Introduction

This purpose of this chapter is to discuss physical and environmental factors that may have influenced Early Preceramic human occupation of the lower Jequetepeque Valley and reconstruct the likely paleoenvironmental conditions that existed during the end of the Pleistocene and into the Early Holocene. This period was witness to the initial migration into and settlement of much of South America (Dillehay 2000; Dillehay et al. 2004a; Lavallée 2000), and evidences regional environmental and climatic conditions that were very different from modern regimes. In addition, this chapter will discuss the effects of the Late Pleistocene-Early Holocene paleoenvironment on landform development, as well as large-scale Holocene geomorphological processes that may have impacted the archaeological record of the Early Preceramic period.

The climatic and environmental changes that occurred during the Late Pleistocene-Early Holocene transition were worldwide events (Markgraf 1989; Strauss 1996). However, the effects and/or intensity of these changes varied regionally (Denton et. al. 1999; Markgraf 1989). For this reason, the following discussions will be limited to data derived from Andean South America, with the intention of reconstructing the general climatic and environmental conditions that may have existed. It is acknowledged at the outset that general paleoenvironmental reconstructions do not fully account for local topographic, hydrologic, or other factors that can influence local environmental conditions. However, a general paleoenvironmental reconstruction is necessary to provide a baseline context for later discussions of human subsistence, mobility, and settlement during the Pleistocene-Holocene transition.

Physical Geography of the Central Andes and Lower Jequetepeque Valley

The landscape of Andean South America is dominated by two major and interrelated geologic/tectonic features: 1) the Andean orogeny; and 2) the South American subduction zone (Clappterton 1993a; Jenks 1956). The South American continental plate has been moving westward since at least the late Cenozoic (ca. 8-15 m.y.a.), creating a subduction zone along the length of the western continental margin where the continental crust is overriding the denser oceanic crust of the South Pacific (Clapperton 1993a). The result of the subduction process has been the formation of multiple chains of folded and thrust rock known as the Andes Mountains and a deep oceanic trench that parallels the continental margin. The topographic relief of the region is among the steepest in the world, with over 14,000 meters separating the trench floor and the Andean summit in a distance of approximately 300 kilometers (Jenks 1956).

The Andes Mountains are subdivided into the Northern, Central, and Southern Andes, based on the directional trends within the broader chain. Boundaries are located where large aseismic ridges bisect the uplifted areas (Clapperton 1993a). The individual Andean chains are comprised of thrust sheets of exposed Precambrian basement rocks and the overlying sedimentary sequence, which results in a wide range of rock types and potential deposition formations (landforms) throughout the chain.

Lithic Raw Material Availability

In general, the western Andes are comprised of a large, uplifted batholith formation (Wilson 1985: 63). In the lower Jequetepeque Valley, this formation is comprised of localized upper Cretaceous and Tertiary volcanic formations (KTi-gd, Ti-vll, T-pc) that intrude into lower Cretaceous sedimentary formations. The intrusive volcanic formations are primarily composed of granodiorite, andesite (including andesitic toba), rhyolite, quartz porphyry (both basalt and andesite), and dacite. (Wilson 1985) (Figure 3.1).

Three principle lower Cretaceous sedimentary formations have been uplifted and exposed in the lower Jequetepeque by the intrusive volcanic formations. These formations include the Goyllarisquizga (Ki-g), Inca Chulec (Km-ich), and the Pariatambo (Km-pa) (Wilson 1985) (Figure 3.1). Constituent rocks found in these formations include sandstone, quartzite (with lutite inclusions), lutites, limestone, and “tobas” (Wilson 1985). Intrusive quartz veins are also present within some formations. In addition, fluvial and alluvial deposits containing conglomerates and stream-rolled boulders, cobbles, and gravels are present in Jequetepeque, Chamán, main *quebrada* drainages.

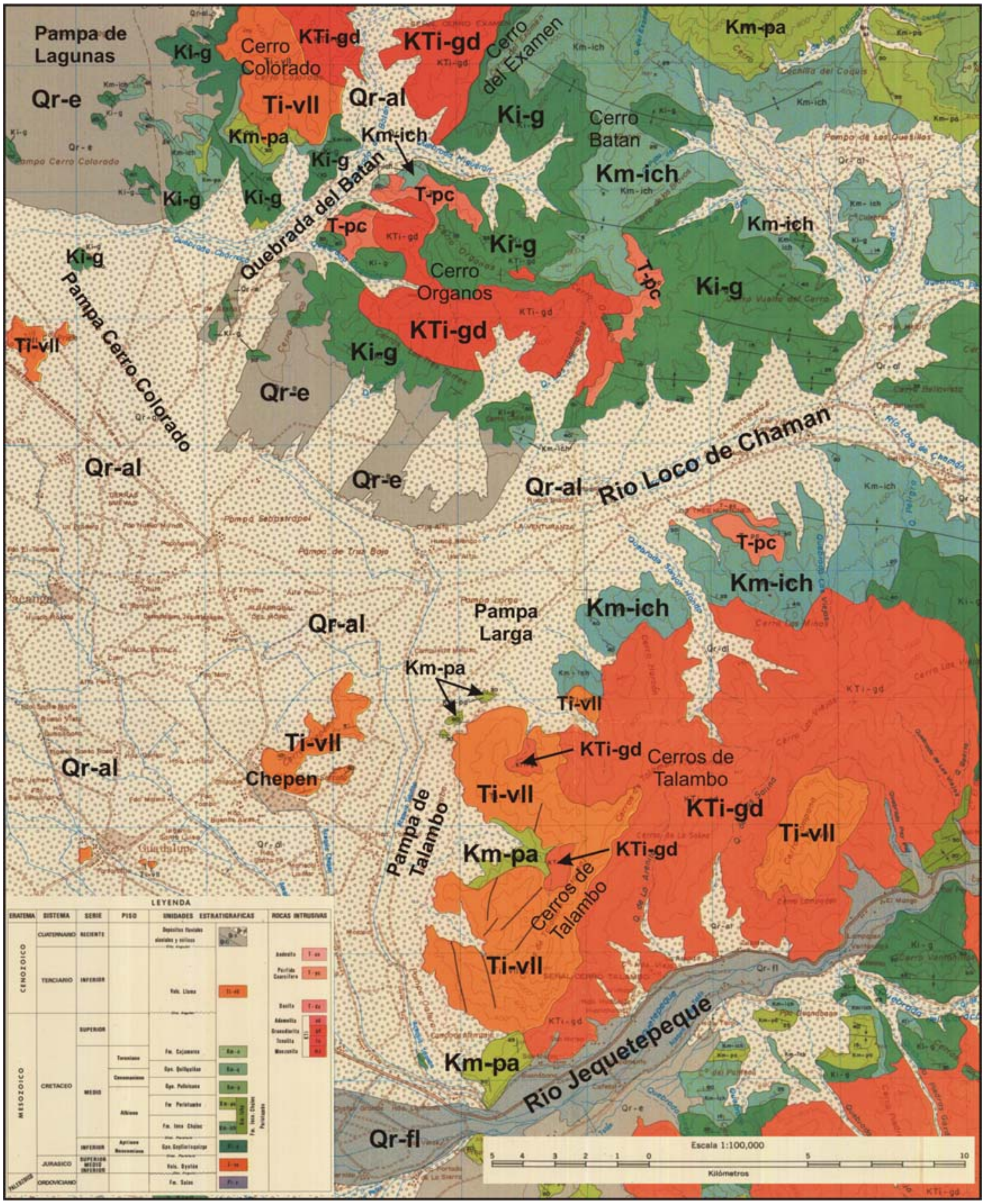

Figure 3.1. Geological map of the Quebradas del Batán and Talambo (Chepén Quadrangle, 1:100,000 scale; Instituto Geologico Minero y Metalurgico de la Republica del Perú, 1985). Principle formations and constituent rocks are discussed in the text of Chapter Three.

In general, the geology of the lower Jequetepeque, and QBT region in particular, offers access to a wide range of potential lithic raw materials from both the sedimentary and intrusive volcanic formations. Many of these potential raw material types are generally considered low-quality resources in terms of controlled fracture properties (Becerra 1999; Chauchat et al. 2004; Rossen 1991; Stackelbeck 2008), but are abundant within the *quebrada* systems. Previous studies in nearby regions (Becerra 1999; Chauchat et al. 2006; Dillehay et al. 1997; Dillehay et al. 1989; Rossen 1991) have noted the frequent to near-exclusive use of varieties of toba, rhyolite, quartz, quartzite, andesite, basalt, and dacite in Early and Middle Preceramic lithic assemblages that is suggestive of a highly localized pattern of raw material exploitation.

Relatively few non-local (or 'exotic') raw materials have been noted by previous studies (Becerra 1999; Chauchat et al. 2004; Rossen 1991). Among the Early Preceramic lithics in the QBT assemblage, clearly non-local materials included varieties of silex, chalcedony, and very fine-grained basalt. Most of these materials are believed to outcrop at higher elevations to east of the project area (Gálvez, personal communication, 2003). It is possible that limited quantities of these materials could have been transported into the QBT region by fluvial processes. However, it seems more likely that most non-local materials probably were acquired directly from source outcrops or via exchange.

Modern Environment

A second major effect of the Andean uplift within the Central Andes (which extend from southern Ecuador to Bolivia and northern Argentina and Chile) has been to create a rain-shadow along the extreme western margin of the continent (ONERN 1976). The mountains impede the westerly wind circulations, which has resulted in the formation of hyper-arid deserts along the coast. This dry, desert plain is bisected by a series of entrenched rivers (like the Jequetepeque River) that drain the Andean highlands and empty into the Pacific Ocean. Annual rainfall totals along the desert coast typically do not exceed 50 mm, except during El Niño-Southern Oscillation (ENSO) events which can result in much higher than average rainfall and heavy flooding (ONERN 1976; Wust and Coronado 2003).

The modern environment varies with elevation, in terms of vegetation and annual rainfall (ONERN 1976), and has been classified into broad environmental zones that are distributed in a roughly linear pattern by elevation. Slightly different terminologies and descriptions have been applied to these broad zones (see discussion in ONERN 1976; Pulgar Vidal 1996; Tosi 1960). The present discussion, however, focuses on the patterns and similarities from these studies that are important for understanding the modern environment and paleoenvironments of the lower Jequetepeque Valley, and specifically the QBT study area.

The QBT region sits on the border of the Premontane superarid tropical desert (ds-PT) and the premontane tropical desert scrub (Md-PT) ecological life zones identified by ONERN (1976: 39-54) (Peruvian National Office of Evaluation of Natural Resource), and provides widespread access to both zones. Vegetation common to these two zones is characterized by xerophytic grasses, cacti, shrubs, and trees, including *algarrobo* trees (*Prosopis juliflora*), *sapote* shrubs (*Capparis angulata*), columnar cactus (*Cereus macrostibas*), and wild cane (*Gynerium sagitatum*) (ONERN 1976: 40-54). Animal species known to inhabit the deep *quebradas* that cross-cut these zones include *cañan* and *tejo* lizards (*Dicrodon* sp.), *iguana* (*Callopistes* sp.), desert fox (*Lycalopex sechurae*), doves (*Columbina* sp.), various raptorial birds, *vizcacha* (*Lagidium peruanum*), white-tailed deer (*Odocoileus virginianus*), and invertebrates like terrestrial land snails (*Scutalus* sp., *Bostrix* sp.). Animals that have been reported at higher elevations within the *quebrada* systems include puma (*Puma concolor*) and spectacled bear (*Tremarctos ornatus*) (Briceño 1999, 1997; Dillehay 2000; Gálvez 2004, 1999).

In general the plant and animal species that inhabit these two ecological life zones reflect the hyper-arid conditions that are present. However, the species lists do not incorporate the marine coastal and littoral resources that are present and were important components of early hunter-gatherer subsistence. The modern marine coast is 25-35 km from the QBT study area. The Late Pleistocene-Early Holocene shoreline would have been an additional 10-15 km away (35-50 km distant) (Chauchat et al. 2006; Richardson 1983, 1978).

In addition to coastal and littoral resource zones, the location of springs is important for understanding potential resources. Annual, seasonally-active, and ENSO-driven springs also occur within the normally dry, coastal *quebradas* (Briceño 1999, 1997; Gálvez 1999). Today, these springs are important water sources for wildlife and can create isolated (often temporary), wet micro-ecological zones (like oases) within the dry *quebrada* systems. Typically, the active and extinct springs are located at the head of small, side drainages between 400-600 masl that empty into the main *quebradas*.

During the Late Pleistocene-Early Holocene, when paleoenvironmental conditions were wetter (discussed in following sections), these spring locations (and others) may have been active more frequently and/or for longer periods of time. Ancient spring locations were identified during the QBT survey based on the presence of travertine and other mineral precipitates that have accumulated and discolored rocks where the spring was active. Some of these springs may have been very large, as is suggested by the remnant traces of an apparent waterfall that once existed at the intersection of the Quebradas del Batán and Higuerón (Figure 3.2).

Figure 3.2. Large, ancient, inactive waterfall located near the intersection of the Quebrada del Batán and Quebrada Higuerón (note the individual in the lower right corner for scale).

Previous studies in the Cupisnique/Chicama region (Briceño 1999, 1997; Chauchat 1998; Gálvez 1999), which is similar in elevation to the QBT region, identified a relatively wide range of floral and faunal species found at or near the modern springs that typically do not occur in the premontane superarid tropical desert and premontane tropical desert scrub zones. Plant species include *pájaro bobo* (*Tessaria integrifolia*), *chilco* (*Baccharis* sp.), cattail (*Typha angustifolia*), wild tobacco (*Tabacum* sp.), and goldenrod fern (*Pityrogramma trifoliata*), among other small plant species (Briceño 1999, 1997; Gálvez 1999). Animal species that are attracted to the modern springs include the normal species found in these ecological zones (see above), but also include reptiles (*Boa constrictor*) and mountain parakeet (*Bolbordynchus aurifrons*) (Briceño 1999: 23-26).

The plant and animal species that occur within the *quebrada* systems that cross-cut the premontane superarid tropical desert and premontane tropical desert scrub zones offer a potentially wide range of subsistence and economic resources. However, the *quebrada* systems—because they penetrate the Andean foothills—also provide access to a wide range of other ecological zones. Tosi (1960) identified six other zones that lie within 20 km of the QBT region; roughly 2-4 hours walking (Figure 3.3). In elevational order, these zones include: 1) dry, subtropical thorn forest; 2) subtropical dry forest; 3) dry, low montane forest; 4) humid, low montane forest; 5) very humid montane forest; and 6) humid montane forest. Thus, the deep *quebrada* systems have the potential to cross-cut multiple zones and provide access to zones at higher elevations.

When considered together, the varied zones identified by Tosi (1960), the nearby coastal and littoral zones, and the resources available in the premontane superarid tropical desert and premontane tropical desert scrub zones are indicative of a potentially abundant environment. There is evidence that the Late Pleistocene-Early Holocene paleoenvironment of the lower Jequetepeque and Central Andes offered an equally, if not more, varied and abundant landscape (discussed in the following sections). It cannot be assumed that early hunter-gatherers had open or equal access to all ecological zones. However, the close proximity of multiple, distinct zones may have played an important role in the organization of Early Preceramic settlement and site location, given the documented density of sites found within the coastal *quebrada* systems (Chauchat et al.

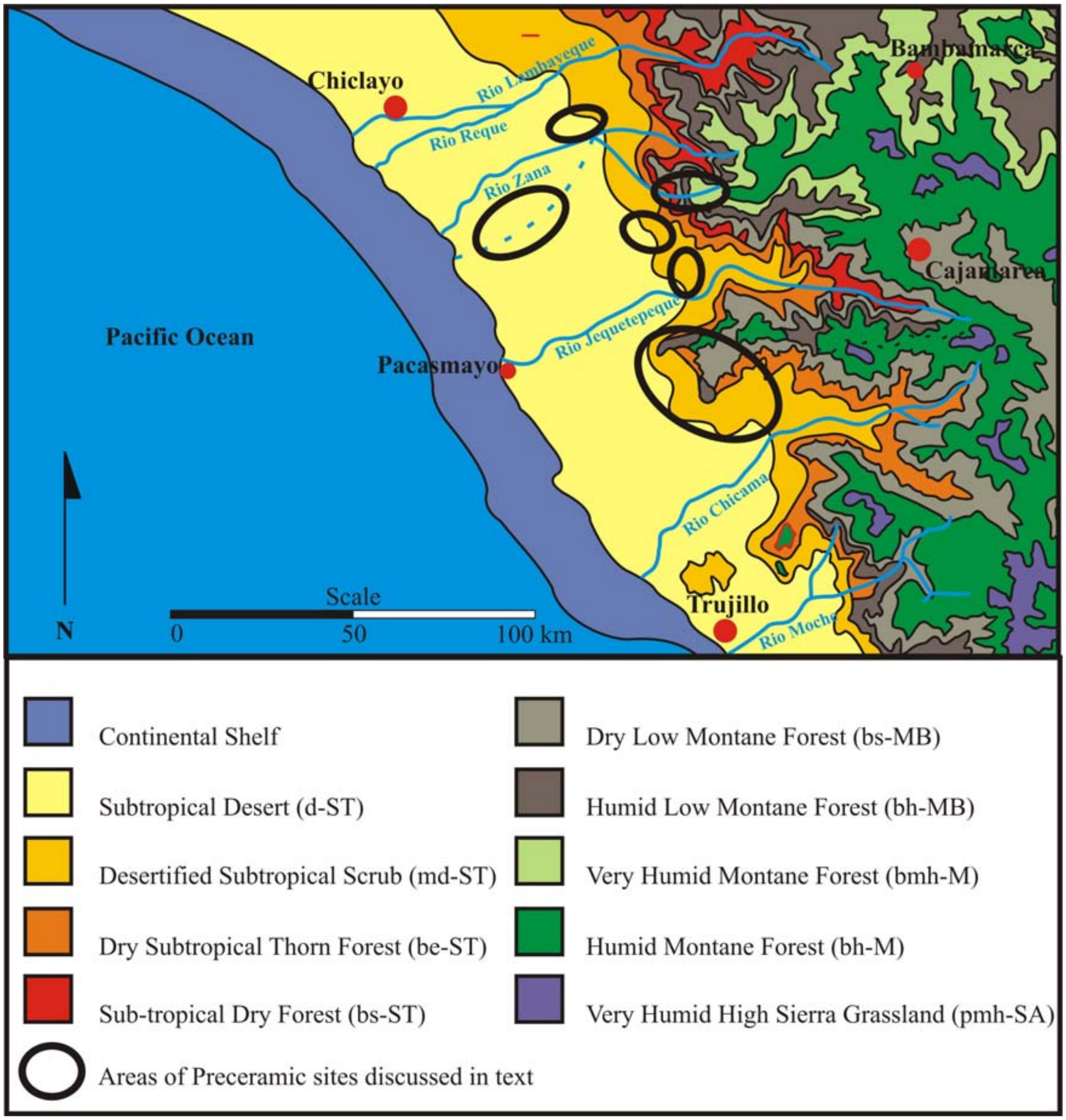

Figure 3.3. Life zones present along the western flanks of the Andes in northern Perú (adapted from Tosi 1960; Dillehay et al. 1997; Stackelbeck 2008).

2006; Chauchat 1998; Dillehay 2000; Dillehay et al. 1997; Gálvez 2004, 1999; Uceda 1992).

Late-Glacial Paleoenvironment of Andean South America

Over the past decade new data on the paleoenvironments of Andean South America have altered our understanding of the Late Pleistocene climate. Until recently, the climate of Andean South America during the Late Pleistocene period, particularly within the Andean region, was generally seen as mirroring late-glacial North America (Lynch 1983). However, the results of recent studies clearly indicate distinct differences in climate and vegetation, amount of glaciation, and the timing of stade/interstade cycles between North and South America (Clapperton et al. 1997; Coronato et al. 1999; Denton et al. 1999; Hajdas et al. 2003; Seltzer et al. 2002; Thouret et al. 1996; Wang et al. 2006). Several of these studies reflect attempts (at least in part) to document the presence or absence of a Late Pleistocene cold reversal between ca. 11,000-10,000 B.P., which correlates with the Younger Dryas stade recorded in the Northern Hemisphere (Ashworth and Hoganson 1993; Clapperton 1993a, 1993b; Clapperton et al. 1997; Coronato et al. 1999; Denton et al. 1999; Hajdas et al. 2003; Thompson et al. 1998; Thouret et al. 1996; Van der Hammen 1974; Wang et al. 2006). The result of these and other studies has been an increased understanding of the environmental conditions that existed across Andean South America during the Late Pleistocene from a number of different proxy indicators. The following discussion presents paleoenvironmental data from across Andean South America in order to characterize the general environmental conditions that prevailed during the Late Pleistocene and Early Holocene, with a special emphasis on the paleoenvironment of the northern coastal region of Perú.

Although the last ice age was a worldwide phenomenon, the specific effects of glaciation during the Late Pleistocene varied markedly between regions (Denton et al. 1999; Markgraf 1989). The large continental glaciers, extreme cooling, and peri-glacial forest and tundra environments that characterized much of the northern hemisphere during the Last Glacial Maximum (LGM) (ca. 26,000-18,000 B.P.)[1] were not similarly expressed in the southern hemisphere (Clapperton 1993b). This is particularly true in South America, where glaciers were restricted to high-elevation, alpine formations and the extreme southern Andes (Clapperton 1993b; Markgraf 1989). In Andean South America the predominant effect of alpine glaciation was tree-line depression of up to 2000 m and the creation of tundra-like environments on the open, high altitude plateaus within the Andean chain (Clapperton 1993a; Clapperton et al. 1997; Coronato et al. 1999; Thouret et al. 1996).

[1] Date ranges used in the paleoenvironmental discussion are presented as uncalibrated ranges before present.

Full glacial conditions also appear to have terminated earlier in South America than in North America (Clapperton 1993a; Dillehay 2000). Based on moraine sequences, pollen cores, and radiocarbon dating from around the continent, Clapperton (1993a: 671-673) has suggested that full glacial climatic conditions ended between 14,000-13,000 B.P. with the onset of more variable late-glacial conditions. Pollen and isotope studies on lake cores from the upper Jequetepeque Valley indicate an end of glacial conditions around 16,000 B.P., with the onset of Holocene warming after ca. 11,000 cal B.P. (Wang et al. 2006). Pollen cores from multiple locations in Colombia also suggest variable late-glacial conditions with a warming trend from 14,000-11,000 B.P., followed by a cooler and drier period from 11,000-10,000 B.P. (Van der Hammen 1974).

Ashworth and Hoganson (1993) have offered a slightly different perspective on the glacial to late-glacial transition based on fossil beetle evidence. They suggest that the climate change from glacial to late-glacial was a single step that occurred around 14,000 B.P. as the glaciers began retreating and the climate began to become warmer and wetter. They further suggest that this change was relatively rapid, with the environment approximating modern conditions by around 12,500 years ago.

However, it appears that the late-glacial period in Andean South America, in general, may be better characterized as a series of warming and cooling trends, coupled with alpine glacial advances and retreats, that served to mix plant and animal regimes along the flanks of the Andes as temperatures, tree-lines, and precipitation levels alternated between lower and higher levels (Denton et al. 1999; Hajdas et al. 2003; Thouret et al. 1996). Some of the clearest evidence for a series of advances and retreats (i.e., warming and cooling trends) within the late-glacial period comes from Pleistocene moraine sequences in Colombia, Ecuador, and Peru. These sequences argue directly against a single-step model of climate change and indicate a more regionally and temporally variable transition to modern environmental conditions.

In Colombia, Thouret and others (Thouret et al. 1996) have identified a series of warming and cooling trends during the late-glacial period. These distinct warming and cooling trends, which are illustrated in Table 3.1, provide insight into the highly variable nature of climatic conditions within the late-glacial period. The alternating sequence of

Table 3.1. Warming and cooling cycles in Colombia based on moraine evidence.[2]

Trend	Age (B.P.)	Climate
Cooling	16,000-14,000	cold and dry, low precipitation levels
Warming	14,000-13,000	warmer with slightly increased precipitation
Cooling	13,000-12,400	cold and wet, lower temperatures but no drop in precipitation
Warming	12,400-11,000	warm and humid, increased temperatures and precipitation
Cooling	11,000-10,000	colder and drier, reduced temperatures and precipitation
Warming	ca. 10,000	onset of Holocene warming

warmer and cooler climatic conditions would have vertically moved plant and animals communities in a 'push-pull' fashion up and down the flanks of the Andes (Bush 2002).

Moraines and pollen cores that have been AMS dated in central and southern Ecuador and also suggest a pattern of warming and cooling trends. Clapperton et al. (1997) suggest that the final main glacial advance culminated prior to 13, 220 B.P. This advance was followed by a glacial retreat, so that by 11,850 B.P. warm enough conditions prevailed to encourage plant growth within previously glaciated areas. However, by 10,885 B.P. the climate was cooling again and witnessed a corresponding glacial advance that lasted until the onset of Holocene warming at 10,000 B.P. Clapperton (1993a) also has suggested that there is clear evidence for at least one late-glacial advance in northeastern Peru based on the moraine evidence from the highland Manachaque Valley.

Evidence from ice cores taken in Perú and Bolivia also indicate a series of warming and cooling trends (Ramirez et al. 2003; Thompson et al. 1995; Thompson et al. 1998; Wang et al. 2006). Coring of the Huascaran glacier in central Peru indicates a cooling trend that initiated around 12,250 B.P. in which continental temperatures were reduced by 5-8° C (Thompson et al. 1995). Ice cores from Nevado Illimani in Bolivia appear to correspond with the Huascaran cores and suggest a cooling trend underway by around 12,250 B.P. (Ramirez et al. 2003). However, ice cores from Sajama in Bolivia indicates a cooling trend that begins around 14,000 B.P. and lasts until the onset of a sudden warming trend at 11,500 B.P. (Thompson et al. 1998). These ice cores illustrate

[2] Based on Thouret et al. 1996

the difficulty in correlating regional sequences, but all suggest that the late-glacial climate was variable and changing.

Additional evidence for fluctuating climatic conditions during the late-glacial period comes from several recent lake core studies that have been undertaken in Ecuador, Peru, Chile, and Argentina (Hajdas et al. 2003; Rodbell et al. 1999; Seltzer et al. 2002). In southern Peru, highland lake cores at Lago Junin and Lago Titicaca suggest cold and wet climatic conditions after deglaciation, ca. 19,500 B.P. (Seltzer et al. 2002). This cold and wet post-glacial climate was interrupted by minor glacial readvances between 16,000-13,000 B.P. Hajdas et al. (2003) compare the results of lake cores in Chile and Argentina and suggest in more detail that the late-glacial climate approximated near modern conditions by 13,000-12,400 B.P. This warm period was followed by a cold reversal that started circa 12,400 B.P. and continued until 10,200 B.P., with the period of maximum cooling occurring between 11,400-10,200 B.P. (Hajdas et al. 2003).

The paleoenvironmental reconstruction put forth by Hadjas et al. (2003) supports an earlier reconstruction by Denton et al. (1999) based on pollen cores from Chile and Argentina, which suggests that a decisive warming trend began around 14,600 B.P. A second warming trend began between 13,000-12,700 B.P. and reached its maximum period of warming between 12,500-12,200 B.P. This warm period was followed by a cold reversal that started around 12,200 B.P. and continued until the onset of Holocene warming (Denton et al. 1999)

Discussion of Paleoenvironmental Data

As these various studies illustrate, there is an abundance of evidence to suggest that the late-glacial climate of Andean South America was regionally variable and fluctuated over time. It is likely that ecological zones at different elevations responded differently to these fluctuations over time. There is clear evidence for one, if not several, warming and cooling trends during the late-glacial across the Andean region, however the timing of these trends can be difficult to directly correlate within the same general region, much less across regions or with worldwide phenomena like the Younger Dryas (Clapperton 1993b; Coronato et al. 1999). The above examples do provide us with a broad framework for modeling the paleoenvironmental conditions and changes that occurred as the Pleistocene came to end and there appear to be distinct climatic conditions during this time in the northern and southern ends of the Andes.

In the northern Andes, specifically Colombia and Ecuador, a series of warm and cool trends appears to be fairly well supported across the region (Clapperton 1997; Thouret 1996; Van der Hammen 1974). Generally speaking, from 14,000-13,000 B.P. the climate appears to have been relatively warm, followed by a cool period between 13,000-12,400 B.P. This cool period is followed in turn by a second warm period between 12,400-11,000 B.P. A final cool period started around 11,000 B.P. and continued until the onset of Holocene warming at ca.10,000 B.P.

In the southern Andes, specifically Argentina and Chile, the picture is slightly less clear but also indicates a warm period from ca. 14,700-12,400 that followed deglaciation. This warm period is followed by a cold reversal that starts around 12,400 B.P. and continues until 10,200-10,000 B.P. (Coronato et al. 1999; Denton et al. 1999; Hajdas et al. 2003). This pattern is essentially the same for the Perú and Bolivia, although the final cooling trend is suggested to have occurred 200-300 years later, between 12,250-12,100 B.P. (Clapperton 1993b; Thompson et al. 1995; Wang et al. 2006).

Although imprecise, there are two important arguments that can be made concerning the late-glacial paleoenvironment of the Andes and western flanks. First, it seems clear that at least one late-glacial cooling event occurred throughout the Andes after the Last Glacial Maximum. In the central and southern Andes this event began sometime around 12,400-12,100 B.P., while in the north it remained warm until approximately 11,000 B.P. This cold reversal, once initiated, continues throughout the Andes until the onset of Holocene warming (ca. 10,000 B.P.) and appears to correlate with (or encompass) the Younger Dryas stade as it is defined in the northern hemisphere (Clapperton 1993a; Coronato et al. 1999; Wang et al. 2006). As such, this cooling trend represents the local signatures of a larger, global phenomenon that occurred at the end of the Pleistocene period. However, because the timing and intensity of the Younger Dryas appears to have varied regionally, we may reasonably suppose that the impact and effects of this cold reversal also varied regionally throughout western Andean flanks.

A second important point is that the warm and cool climate cycles that occurred during the late-glacial period likely had profound effects on local environments and plant and animal communities. Cooling and warming trends would have alternatively lowered and raised local temperatures and tree-lines, affecting habitats and the distribution of individual species (Bush 2002; Dillon 1994; Dillon et al. 1995; Wang et al. 2006). The intensity of glacial readvances during cooling trends may also have impacted the available moisture and precipitation levels within a region (Clapperton 1993a; Denton et al. 1999). As the climate warmed or cooled, there likely would have been alternating pressures on the distributions of plants and animals within a local environment. Bush (2002) has suggested that the Andes, specifically ecotones along the flanks, would have been the locations most sensitive to climate change. He has also suggested that species migrations along the flanks, due to alternating climate changes, produced a mosaic of habitat and species mixtures that have no modern correlates (ibid.). How these changes are related to the Early Preceramic period in lower Jequetepeque Valley is discussed in the following section.

Paleoenvironment of the lower Jequetepeque Valley

As the preceding discussions have illustrated, environmental conditions during the Late Pleistocene-Early Holocene transition were highly variable and dependent on local and regional topographies. There appears to have been at least one glacial readvance in the North Coast region (Seltzer et al. 2002; Wang et al. 2006), although the exact dates and intensity of this event are unclear. Despite our lack of a precise understanding, a generalized picture of the paleoenvironmental conditions that likely existed within the lower Jequetepeque Valley region during this transitional period can be constructed. The following general description is based on the various proxy indicators from across the Andes that have been presented and discussed (Ashworth and Hoganson 1993; Bush 2002; Clapperton 1993a, 1993b; Clapperton et al. 1997; Coronato et al. 1999; Denton et al. 1999; Dillehay et al. 2004b; Hajdas et al. 2003; Ramirez et al. 2003; Rodbell et al. 1999; Seltzer et al. 2002; Thompson et al. 1998; Thompson et al 1995; Thouret et al. 1996; Van der Hammen 1974; Wang et al. 2006).

Following the termination of the Last Glacial Maximum (ca. 16,000 B.P.), the environment was cold and dry. Temperatures were likely depressed by as much as 6-8° C and precipitation levels were still low. These conditions persisted until the onset of a warming period around 14,000 B.P. During this time the environment may have started to approximate near-modern conditions—trending warmer and having slightly increased annual precipitation levels. It is also during this warm period that on-going glacial meltwater, which was channeling through the *quebrada* systems of the western flanks of the Andes, may have begun downcutting and terrace formation within the *quebradas* and along the Jequetepeque and Chamán river drainages. The large alluvial fan systems that drain the western flanks were likely active as well and may have begun to coalesce along the bases of the mountains. Water was probably more available throughout the region, as both springs and drainages in the upper reaches of *quebradas* likely contained water. The river valleys would also likely contained greater amounts of water and were becoming entrenched in their modern valleys. The open *pampas* were probably much wetter (from increased rainfalls), and may have been comprised of expansive grasslands and/or partially-forested parklands that supported a wide range of Pleistocene fauna. As the snowline receded during this warm period, the mountain flanks would have likely have been covered in a mixed forest (of high and low altitude species) and shrubs.

It appears that the environment began to cool again around 12,250-12,100 B.P., although initially this cooling was likely quite gradual. Temperatures and precipitation levels probably dropped slowly over the next 1000 years, or until about 11,000 B.P. By 11,000 B.P. the temperature may have been 4-5° C lower than it had been prior to 12,250 B.P. It is likely that precipitation levels were also reduced and, in general, the region became much drier. The Jequetepeque and Chamán rivers probably still contained relatively high amounts of water, but the smaller *quebrada* drainages and alluvial fan systems may have become much drier. It is likely, however, that springs located along the western flanks (that drain the highlands) remained active and may have become the most stable water sources within the *quebrada* systems.

As a result of the cooling, treelines were probably depressed again and the distribution of species along the western flanks likely became increasingly more mixed and varied. Animal and smaller plant communities probably also became increasingly mixed in terms of range and associated species. *Quebrada* systems also may have witnessed this mixing of species. The *pampas*, which were probably a grassland/parkland, also became drier due to decreased rainfall, and may have gradually transformed into more savannah-like conditions. Water may have been somewhat scarce on the *pampa* and may have tethered grazing animals and their predators to Pleistocene lakes, marshes, and river valleys. Although cooler and drier, it is believed that the environment during this period (ca. 11,000-10,000 B.P.) was varied and contained abundant plant and animal resources.

This cooling trend appears to have ended sometime around 10,000 B.P. when the environment began to approximate modern conditions. Temperatures likely rose to modern levels gradually (probably by 8000-9000 B.P.). Precipitation levels, which may have initially increased, probably began to consistently decline after about 9,000 B.P with the onset of the arid conditions that would come to define the modern desert landscape. However, at the beginning of the Holocene (ca. 10,000-9,000 B.P.) the environment of the lower Jequetepeque Valley probably would not have been remarkably distinct from that of the preceding Terminal Pleistocene, perhaps just slightly warmer and wetter. In general, it seems likely that the Early Holocene paleoenvironment would have offered abundant and varied plant and animal resources within the region.

Implications for Human Occupation

It is unclear when the first humans entered the lower Jequetepeque Valley region, although humans had settled in southern Chile by 12,500 B.P. (Dillehay 1997a, 1989). The earliest known occupations in the north coast appear to have occurred around 11,600 B.P. and are represented by the El Palto (11,650±180 RCYBP) and Amotape (11,200±115 RCYBP) sites (Dillehay and Rossen 2002; Richardson 1978) and several sites containing Fishtail points. Radiocarbon dates from Fishtail sites in northern Perú are indicative of an occupation that began around 11,200 B.P. and continued until ca. 10,600 B.P. (Briceño 1999; Dillehay 2000; Ossa 1973; Ossa and Moseley 1972) (also see Appendix II). The Paiján occupation of the region appears to begin around ca. 10,800 B.P. and continues well into the Early Holocene (ca. 9,000 B.P)(Chauchat 1998, 1988; Gálvez 1999).

This time frame (ca. 11,500-8,500 B.P.) of occupation largely corresponds with the last cold cycle of the Late Pleistocene period, and is followed by the Early Holocene warming. During this time, the *quebrada* systems that penetrate the western Andean flanks probably offered a diverse mosaic of plant and animal species (within the region) (Bush 2002; Wang et al. 2006). In addition, active springs within the *quebradas* likely would have provided the primary stable water source. Terraces and alluvial fans that had formed within the *quebradas* during the earlier periods of glacial melt, would likely have provided ideal locations for accessing multiple different kinds of resources and resource zones. Faunal materials recovered from Early Preceramic archaeological assemblages reflect this diversity and include marine and freshwater fish, terrestrial land snails, reptiles, birds, and a variety of terrestrial mammals (Briceño 1999; Chauchat et al. 2006; Dillehay 2000; Gálvez 2004). Floral remains and starch grain analyses from late Early and Middle Preceramic sites, along with grinding stones on Early Preceramic sites, suggest that a variety of plant resources, including cacti, *algarrobo* (*Prosopis juliflora*), and possibly others, may have also been important resources (Dillehay and Rossen 2002; Dillehay et al. 2004b; Piperno and Dillehay 2008; Rossen 1991).

The Jequetepeque and Chamán river valleys and nearby *pampas* would also have provided locations where early groups could have targeted various plant and animal resources. Settlement on terraces within the river valleys was possible, although coastal river systems did not typically become fully entrenched until after 8,000 B.P. when sea levels began to stabilize (Dillehay 2000). The coastal shore would have been approximately 10-15 km farther out and may have provided an attractive location for settlement (Richardson 1983, 1978). However, the modern cold upwelling current was not in place and sea productivity would have been limited compared to later Preceramic and modern times (Moseley 1975; Richardson 1983).

Clearly, the *quebrada* systems seem to have offered the most likely locations for human occupation within the lower Jequetepeque Valley region. Active springs and access to a potentially wide range of closely juxtaposed resource zones may have been the central foci (or anchors) of settlement. This suggested pattern corresponds well with the results of previous studies on the north coast (Briceño 1999; Chauchat et al. 2006; Dillehay 2000; Dillehay et al. 2003). In general, Fishtail sites tend to be located on high terraces deep within *quebrada* systems and near—now dry—ancient springs (Briceño 1999, 1995; Chauchat 1998). Paiján sites are also found on high terraces within the *quebradas* around springs, but are also found on lower terraces and out on the *pampas* (Chauchat et al. 2006; Chauchat 1998; Gálvez 2004).

General Site Contexts and Geomorphological Processes

One of the important trends that can be surmised from the preceding discussion of the paleoenvironmental conditions within the lower Jequetepeque Valley is that Pleistocene-aged terraces and alluvial fans are likely to be the locations where Early Preceramic cultural materials were deposited (Briceño 1999; Chauchat 1998; Chauchat et al. 2006; Dillehay 2000; Dillehay et al. 2003). Since the onset of Holocene warming, these two landform types (and others) have been differentially affected by a variety of long-term geomorphological processes that have been active in the region, and may have impacted archaeological deposits.

Chief among these long-term processes is the ongoing desertification of the western flanks of the Andes (ONERN 1976). The initiation of Holocene warming around 10,000 B.P., and subsequent intensification (between ca. 6,500-5,000 B.P.), has resulted in increasing aridity on the coast (Seltzer et al. 2002; Thompson et al. 1998). One of the main side effects of desertification has been the increased eolian erosion of older landforms. Driven by persistent winds off the Pacific Ocean, eolian erosion has had two primary effects on the coast: 1) sediment deflation; and 2) dunation (Dillehay et al. 2004b; Waters 1996).

During the Late Pleistocene many of the terraces and alluvial fans were likely aggrading, or minimally, periodically experiencing slack-water deposition (e.g., overbank flooding). This is supported by the general paleoenvironmental conditions and by sediment profiles in individual excavation units at archaeological sites within the QBT region (Dr. Mario Pino, personal communication, 2004). As the environment became drier, the sediments on landforms exposed to the wind became increasingly deflated, often to the point of leaving only an exposed stone pavement on the surface. The net result of the deflation has been to potentially mix archaeological assemblages by essentially removing the surrounding sediment matrix (Chauchat et al. 2006; Dillehay et al. 2004b; Waters 1996). Many archaeological sites that are located on exposed landforms contain no intact sediments and are completely deflated surface scatters.

However, some landforms have been protected or shielded from the wind by local topographic features (hills or mountains) (Dillehay et al. 2003). These landforms have not been impacted by deflation to the same degree as those that are more exposed, and can contain intact sediments (see excavation discussions in Chapter Seven). Protected landforms that contain intact archaeological deposits were identified in the QBT region; several of which were the focus of test and block excavations.

An additional byproduct of the ongoing desertification and eolian deflation of landforms has been the development of large sand dunes and dune fields (Dillehay et al. 2004b; ONERN 1976). Within the lower Jequetepeque Valley, major dune fields are located on the southern margin of the valley and smaller isolated dunes are found sporadically in other locations throughout the region (Dillehay et al. 2004b). Although dunation has largely taken place after the deposition of the Late Pleistocene-Early Holocene archaeological assemblages, dunes have the potential to scour landforms as they migrate, or to bury individual landforms and sites.

A second long-term process that has impacted landforms in the region is flooding during periodic, intense El Niño-Southern Oscillation (ENSO) events (Dillehay et al. 2004b; Seltzer et al. 2002; Sandweiss et al. 1998). ENSO events are thought to have probably initiated at least by 6,000-8,000 years ago, and have likely increased in periodicity and intensity over time (Seltzer et al. 2002). Localized flooding on the coast from an ENSO event can have catastrophic effects on individual landforms and has been documented as destroying or burying portions of later archaeological sites (Dillehay et al. 2004b). For the landforms that contain Late Pleistocene-Early Holocene period archaeological sites, mass wasting and pluvial and colluvial runoff produced by these floods have the potential to destroy intact deposits, redeposit archaeological materials into secondary contexts, or bury landform surfaces.

A final long-term process worth noting that may have impacted Late Pleistocene-Early Holocene archaeological sites is eustatic sea level change. Transgressive and regressive cycles can have the effect of destroying or mixing archaeological deposits located along the shoreline (Richardson 1983; Waters 1996). The fact that sea levels did not begin to stabilize until after ca. 8,000 B.P., and did not reach modern levels until ca. 6,000 B.P., indicates a possibility that beach stands containing early archaeological sites along the paleo-shoreline may have become inundated or destroyed (Chauchat 1998; Chauchat et al. 2006; Richardson 1983). Although no Late Pleistocene-Early Holocene sites have been found submerged or on the modern shoreline in northern Perú, early sites have been recorded on the coast in southern Perú and northern Chile (Keefer et al. 1998; Lavallée et al. 1999; Llagostera 1992, 1979; Sandweiss et al. 1998; Sandweiss et al. 1989) and on uplifted beach ridges in far northern Perú (Richardson 1983, 1978). Although Late Pleistocene-Early Holocene sites have been documented in submerged, coastal shelf contexts in other parts of the Americas (Faught 2004), none have been identified to date in South America. No Late Pleistocene-Early Holocene sites were identified near the modern shoreline or on the coastal plain during the comprehensive survey of the lower Jequetepeque Valley (Dillehay et al. 2009).

Conclusion

This chapter has presented a general reconstruction of the paleoenvironmental conditions that likely existed in Andean South America, and specifically in the lower Jequetepeque Valley, during the Late Pleistocene and Early Holocene. In general, climatological conditions and resource availability and distributions were very different than those that define the modern environment. It appears that the earliest known groups to occupy the north coast of Perú likely did so during a period of glacial readvance and cooling that roughly correlates with (and encompasses) the Younger Dryas stade. During this final cooling period the *quebrada* systems that penetrate the western flanks of the Andes Mountains would have been ideal locations for accessing the mosaic of different plant and animal species that had been produced on the low slopes of mountains by preceding warming and cooling cycles. The shifting and mixing of both plant and animal communities as a result of climate variability probably also had important impacts on the location and organization of human settlement along the Andean flanks. Some of these impacts may be reflected in the location of individual sites, types of resources that were exploited, and/or intensity or duration of occupation at specific locations.

Specific types of landforms within *quebrada* systems, namely terraces and alluvial fans, would likely have been the preferred locations of settlement within and around the *quebrada* systems. Terraces and alluvial fans that were located near active springs or watercourses would likely have been most favored due to the lower precipitation levels that characterized the end of the Pleistocene period. However, other types of landforms in the region, such as low terraces on the *pampas* and main river drainages, and possibly on beach stands along the paleo-shoreline, may have become more or less attractive locations for Early Preceramic settlement depending on climatic conditions. Different types of landforms may have provided access to highly localized resources, or sets of specific resources. If this is the case, different landforms may express a potentially wide variety of uses or types of occupation (i.e., different site types). Sites that represent distinct patterns of occupation or use may be identifiable through archaeological subsistence indicators such as faunal and floral materials, as well as the types and quantities of lithic (and other) tools that may be present.

The long-term geomorphological processes that may have impacted early archaeological sites located on different landforms within the lower Jequetepeque Valley have been discussed. Ongoing desertification, eolian deflation, and dunation have impacted many sites. However, there are some sites that are located on landforms that have been protected from detrimental wind erosion and contain intact archaeological deposits. Sites such as these—that contain intact deposits—are key for recovering the subsistence, technological, and temporal data that are necessary to examine how Early Preceramic settlement may have been organized. These topics are the focus of later chapters in this study.

In conclusion, paleoenvironmental conditions that existed during the Late Pleistocene-Early Holocene transition in the lower Jequetepeque Valley were likely important factors in conditioning the settlement and landscape use strategies of the earliest settlers of the region. Understanding the general environmental conditions that existed is essential not only for reconstructing local settlement patterns, but also for understanding what these patterns indicate about the processes of localization and regionalization. It is very likely that each of these processes played out in distinct ways in different regions, depending on group strategies/choices and local climatic and environmental conditions. The wide variability in Late Pleistocene-Early Holocene group strategies and cultural traditions that has been documented in Andean South

America, including the Fishtail and Paiján settlement of the north coast region, is discussed in the following chapter.

CHAPTER FOUR

THE LATE PLEISTOCENE-EARLY HOLOCENE ARCHAEOLOGICAL RECORD OF ANDEAN SOUTH AMERICA

Introduction

Most archaeologists agree that the colonization of the New World likely initiated in the Northern Hemisphere (Adovasio and Pedler 2004; Bonnichsen and Turnmire 1999; Dillehay 2000; Dillehay et al. 2008; Dixon 2001; Fiedel 2000; Goebel et al. 2008; Haynes 2002; Madsen 2004; Meltzer 2002; Nami 2007; Stanford and Bradley 2002). Beyond this simple acceptance, the issue becomes highly contested and somewhat paradoxical. South America, in particular, has confounded attempts to construct broad, continental-scale models of colonization because of the antiquity of the Monte Verde site and the relatively extreme variability in location, technology, and adaptation of Pleistocene-aged archaeological assemblages. In addition to the age and cultural material record, genetic, biological, and linguistic studies suggest that multiple migrations of different groups may have occurred (e.g., Greenberg et al. 1986; Merriwether 2002; Neves et al. 1996; Nichols 2002, 1990; Schurr 2004; Steele and Powell 2002). Often, the age ranges for the migrations proposed by these different studies (e.g., genetic and linguistic) vary widely (from ca. 30,000-15,000 B.P.) and do not correspond well with the existing archaeological data.

The main goal of this chapter is to present the archaeological record of the Late Pleistocene-Early Holocene occupations of Andean South America. Late Pleistocene occupations in the Andes have been documented from northern Colombia to Tierra del Fuego (Figure 4.1). These occupations inhabited a wide range of paleoenvironments, maintained distinct technological and economic traditions, practiced different patterns of settlement and mobility, and express different intensities of landscape knowledge and use. Although this wide range of variability has been recognized and documented, we do not understand how it is derived from or relates to the colonization of the New World. A second goal of this chapter will be to discuss the variability present in the archaeological record of the Late Pleistocene-Early Holocene period of Andean South America and attempt to relate specific, observable patterns to the colonization of the continent.

Figure 4.1. Locations of Late Pleistocene archaeological sites discussed in the text (base map is a non-copyrighted, open-source image produced by NASA available at http://visibleearth.nasa.gov/view_detail.php?id=12553).

Early Discoveries and the Rise of the Traditional View

Data from Late Pleistocene sites in South America has long been used in constructing arguments for the peopling of the New World (Bird 1938; Krieger 1964; Lynch 1967). Early supporting evidence for the Pleistocene antiquity of humans in South America came with the discovery of the fluted Fishtail projectile points by Junius Bird at

Fell's Cave and Palli Aike Cave north of the Straits of Magellan in southern Chile (Bird 1988, 1938). Named 'Fishtail' for the distinctive flaring of the stemmed proximal end, several of these points exhibited flake scars demonstrating the removal of longitudinal thinning flakes from the proximal end. Bird's finds came shortly after the discoveries of fluted Folsom and Clovis points in the Great Plains (Figgins 1927; Howard 1935), and the presence of thinning flutes drew inevitable comparisons of similarity to Clovis points and Clovis variants in North America, which also exhibit fluting (Bird 1969; Lynch 1974; Mayer-Oakes 1963). However, fluting occurs on Fishtail points in comparatively low frequencies and is technologically distinct from that of North American points (Borerro 2006; Politis 1991).

In addition to the *apparent* technological similarity, Fishtail points recovered in Bird's excavations were associated with extinct Pleistocene fauna, including giant ground sloth (*Mylodon listai*) and American horse (*Parahipparion saldiasi*), along with extant guanaco (*Lama gaunicoe*) (Bird 1988, 1938). Although Bird identified five distinct stratigraphic periods for the occupation of southern Patagonia and Tierra del Fuego (Bird 1938), the lithic assemblages alone did not lead him to suggest a great antiquity for the early portions (Period I) of the cultural sequence—in part because a Pleistocene presence in the New World had not yet been confirmed by radiocarbon dating. It was not until stone tools were found in unequivocal association with the extinct fauna in the basal layer of Fell's Cave that Bird began to posit that the Period I assemblages were representative of Late Pleistocene occupations (1938: 268-270). These associations were later confirmed by radiocarbon dates from the Fell's Cave excavation materials that temporally placed the Period I assemblage (which included the Fishtail points) at ca. 11,000 BP (Bird 1988: 187; 1970: 208).

Bird saw this early association of extinct fauna with the Fishtail point as clear evidence of a Late Pleistocene big game hunting tradition (i.e., Paleoindian) in South America (1970: 208-209). The initial discovery of Fishtail points at Fell's and Palli Aike caves were followed by additional finds at the El Inga site in Ecuador (Bell 1960; Mayer-Oakes and Bell 1960a, 1960b) and at Madden Lake in Panama (Bird and Cooke 1977, 1978; Sander 1959). The Fishtail points from each of these new locations were similar in form to the original Fell's Cave, or Magellanes, type identified by Bird. This widespread similarity in projectile point form—which often exhibited basal fluting—led to suggestions a broad cultural homogeneity for Central America and western/southern South America during the Late Pleistocene period (Bird 1965; Bird and Cooke 1978; Lanning and Hammel 1961; Lynch 1974). This cultural homogeneity was believed to be technologically (fluted bifacial points) and economically (big game hunting) derived from the Paleoindian (Clovis) tradition of North America, which shared similar cultural traits. Thus, the Fishtail came to be seen as the southern expansion of the Clovis culture during a rapid migration through the New World that resulted in a widespread and relatively uniform, big game hunting tradition during the Late Pleistocene period. The traditional view of the colonization of South America was born.

There were, of course, early arguments against this hypothesis. Kreiger (1964) advanced the idea of a "Pre-projectile point" stage that represented the earliest inhabitants of the New World. The "Pre-projectile point" cultural stage was thought to be represented by the relatively crude unifacial and flake industries that had been discovered throughout northern and Andean South America (Kreiger 1964). These industries were believed to indicate a broad-based, general foraging tradition that was the forerunner to the more specialized hunting traditions that developed in the late Pleistocene period. Kreiger's hypothesis drew support from several early sites that contained evidence of simple, unifacial or flake technologies in seemingly early contexts (Lanning 1970; Lanning and Patterson 1967; MacNeish 1971, 1976; Hurt 1977). Dates for the "Pre-projectile point" stage ranged from 14,000 BP to 20-40,000 BP (Kreiger 1964; Lanning 1970; MacNeish 1971).

The idea of a "Pre-projectile point" occupation of the New World, in particular of South America, drew immediate criticisms that questioned the authenticity of the artifacts, their contextual associations, the radiocarbon dates, and the abilities of the investigators (Bird 1965; Lynch 1967, 1974, 1990, 1991). The edge-trimmed unifacial and flake tool industries that had been advanced as representing the earliest settlement of South America were predominantly criticized as being components of later preceramic lithic traditions (that post-dated the accepted bifacial sequence) or as intrusive artifacts into earlier geological deposits. As a result of these critiques many of these sites were disregarded by the larger archaeological community, along with the idea of an occupation of South America that predated the Clovis culture.

In spite the entrenchment of the traditional view of South America as being colonized by highly mobile groups of big game hunters migrating from North America, who emphasized a specialized bifacial technology (for big game hunting), this model does not stand up to the archaeological data from the Late Pleistocene period. The fact that the earliest firmly dated site in the New World, Monte Verde (ca. 12,500 BP), lies at the southern end of South America and contains lithic materials that are definitively not technologically related to the fluted-point tradition highlights serious problems with the traditional model (Dillehay 1997a, 1989). The Monte Verde lithic materials consist of a few bifacial projectile points and several unifacial and flake tools (Dillehay 1997a; Dillehay and Collins 1988). The Monte Verde points are bipointed in form and somewhat similar to the El Jobo points recovered from sites and surface finds in Colombia and Venezuela (Ardila 1991; Bryan 1991; Dillehay et al. 1992). The El Jobo points have been dated from 14,000-12,000 B.P. (Cruxent 1979, Bryan 1973; Bryan et al. 1978; Ochsenius and Gruhn 1979), which overlaps temporally with the Monte Verde materials, however the context of these dates have been questioned (Lynch 1974; Gruhn and Bryan 1984).

The Monte Verde and El Jobo lithics illustrate the 'tip of the iceberg' in terms of variability in the Late Pleistocene archaeological record. Proponents of the traditional view of New World colonization (e.g., Fiedel 2000; Haynes, G. 2002; Lynch 1983; Morrow and Morrow 1997) tend to characterize the Late Pleistocene archaeological record as a widespread, relatively monolithic cultural entity derived from the expansion of specialized big game hunters into South America. As noted previously, this is based on the presence of a few, widely separated sites that contain fluted projectile points. However, there is much more and stronger evidence that suggests a wider range of variability in technology, subsistence, and settlement location existed in South America than for which the traditional model accounts (Borrero 2006; Bryan 1991, 1986; Dillehay 2000; Gruhn 2004; Gnecco 2003; Lavallée 2003, 2000; Miotti 2003).

In general, bifacial technological traditions in Central and South America are relatively scarce, compared to Late Pleistocene North America (Bryan 1991; Dillehay

2000). As a result, there is a tendency to elevate the importance of these traditions and extrapolate their existence over wide areas (Bird 1970; Lynch 1990, 1983). The effect of this extrapolation has been to mask the variability in unifacial and flake industries (such as Teqeundama, Tibitó, and Amotape) that are, at minimum, cotemporaneous with the various bifacial industries and evidence very different adaptive modes from the traditional characterization of Paleoindian life (Bryan and Gruhn 2003; Gruhn 2004, 1994).

Variability in the Late Pleistocene of Andean South America

The Monte Verde site paleoenvironment has been characterized as a cool, temperate forest and marsh wetland (Dillehay 1997a; Dillehay and Pino 1997). The open air Monte Verde II site is thought to represent a year round generalized hunting and gathering economy in which the site's residents extracted resources from the surrounding wetlands and forests, along with neighboring river valleys and the distant Pacific coast. The generalized nature of the economy at Monte Verde is exemplified by the diverse resources recovered from the site, which include a wide range of aquatic plants and fruits (including several medicinal plants), wild potatoes, freshwater mollusks, small mammals, paleo-llama, and mastodon (Dillehay 1997a; Dillehay et al. 1997; Dillehay et al. 2008; Rossen and Dillehay 1999; Ugent 1997). The site also yielded relatively simple edge-trimmed pebbles and unifacial flakes and tools, groundstone and pecked/ground *bola* stones, and bifacial tools (Collins 1997; Dillehay 1997a). In addition to the lithic artifacts, several bone (gorges, flaking baton) and wood tools (digging sticks, lance fragments, and mortars) were well preserved by the peat layer that overlay the site deposits (Dillehay 1997a).

A large tent-like structure constructed of wooden stakes, planks, and poles that was presumably covered with animal hides was recorded at the site. This 20 meter long structure contained internal divisions and has been estimated as housing 20-30 individuals (Dillehay 1997a: 180-203). A second wishbone-shaped structure located 40 meters from the large tent structure, has been interpreted as a public, nonresidential area in which butchering, hide preparation, and tool manufacture occurred (Dillehay 1997a:203-214). This is also the location where the remains of 18 different species of medicinal plants were recovered and may have served as a place of healing or shaman's residence (Rossen and Dillehay 1997a:339-342).

Given the early date of the Monte Verde II materials (ca. 12,500 B.P.), the prolonged settlement and economic diversity evidenced at the site are striking. Multi-seasonal occupation by a relatively large group (25-35 individuals) who made use of a diversity of resources from nearby and distant environs forces a reevaluation of the idea that small groups of fast moving big game hunters colonized South America (Dillehay 1997a:1-18, 791-812). In contrast, Monte Verde suggests a much more socially and economically complex pattern that is indicative of slower moving, larger groups that have intensive knowledge of the local landscape and available resources. Dillehay (1997a:806-810) has characterized the Monte Verde II occupation as one of an estate-settler stem group that explored and later occupied a territorially bounded region, but likely maintained social contact with the parent group. Monte Verde provides us with the single most comprehensive picture of the social structure, landscape and resource knowledge, mobility and settlement strategies, and colonizing logic that existed during the Late Pleistocene of South America.

Other regions of Andean South America, like Monte Verde, also offer insight into the cultural diversity that existed during the Late Pleistocene. Tequendama and Tibito rockshelters in highland central Colombia also offer a picture of a generalized foraging economy with a mixed unifacial and bifacial technology. Tequendama and Tibito rockshelters were located within a wet, partially-forested, *páramo* upland setting by 12,500 years ago that became drier and more open around 11,000-10,000 years ago, before the onset of modern wet, highland forest conditions (Ardila 1991; Correal 1986; Correal and Van der Hammen 1977). The earliest materials from Tequendama come from Zone I, which has yielded several unifacial flake scrapers, numerous flakes, and three bifaces fragments in association with two hearths and the faunal remains of deer and several small animal species (including rabbit, mouse, and guinea pig) (Ardila 1991; Correal and Van der Hammen 1977). Many of the Tequendamiense tools are manufactured from exotic raw materials that were imported into the site. Zone I at Tequendama is overlain by a different lithic industry that consists entirely of edge-trimmed flake tools manufactured from locally available stone (Correal and Van der

Hammen 1977). This industry, termed the Abriense tradition, has been interpreted as representing more woodworking and the processing of plant and vegetal materials within a generalized foraging economy (Correal 1986).

Tibitó rockshelter, which is located to the northeast of Tequendama, represents human activities associated with butchering and processing of animals. The site consists of a small area of cultural remains sheltered by the overhang of a large boulder located on the edge of a Pleistocene marsh/wetland that were buried by later deposits (Ardila 1991). The lithic materials from Tibitó include Tequedamiense scrapers, and core and flake tools. Faunal remains recovered from the site include mastodon, American horse, deer, and fox. The lithic and fauna materials occurred within two discrete activity areas and some of the faunal remains evidence cutting and burning. Dillehay (2000: 119-120) has suggested that the absence of bifaces at Tibitó may be a result of hunting practices, in which the animals (particularly the mastodon) were trapped or mired in the marsh in one location and then selectively butchered skeletal elements were brought to Tibitó for additional processing, preparation, and consumption. A single radiocarbon date of 11,740 B.P. has come from Tibitó deposits (Correal 1981).

Together, Tequendama and Tibitó represent other examples of early, generalized foraging economies. The presence of mastodon and native horse clearly place the sites in the Pleistocene period and suggest the importance of hunting in the economy. However, the relative scarcity of bifaces at Tequendama and the prevalence of unifacial scrapers and flake cutting tools indicate a reliance on a wider range of resources than only big game. This is supported by the clear importance of deer and small animals in the faunal record from Tequendama. The date of 11,740 B.P. from Tibitó falls within the date range of Zone I from Tequendama and suggests (along with the associated extinct fauna) that both sites likely date to circa 12,000-11,000 B.P. The overlying Abriense materials from Zone II of Tequendama appear to represent a transitional Pleistocene-Holocene occupation that may date as early as 10,500 B.P. (Dillehay 2000: 119).

In contrast to the generalized economies exhibited at Tequendama and Tibitó, several sites yielding bipointed El Jobo bifaces from Colombia and Venezuela (including Taima-Taima, Cucuruchu, and Muaco) may appear to indicate a more hunting-focused subsistence strategy (Ardila 1991; Dillehay 2000). The best known of these sites is

Taima-Taima (Bryan et al. 1978; Gruhn 1979; Cruxent 1970; Cruxent and Ochsenius 1979; Ochsenius and Gruhn 1979). Taima-Taima was an ancient spring where a mastodon was either killed or scavenged by humans. A medial fragment of an El Jobo point was found inside the pelvic cavity of a mastodon (Bryan et al. 1978; Gruhn 1979; Ardila 1991). The remains of several other species of modern animals were also noted in the site's deposits, but none appear to show exploitation by humans. Radiocarbon dates from the site layers containing the El Jobo point and the mastodon remains spanned from 14,440-11,860 B.P.(Bryan et al. 1978: 1275-1276). The context and age of the Taima-Taima deposits have been questioned as being mixed by water flow from the spring that may have produced false associations (Lynch 1991; Morlan 1988). However, as Bryan and Gruhn (1979) note, the artifact and bone bearing deposits were capped by a series of impermeable clay lenses that effectively sealed the site. Any disturbance or mixing of bones was likely to have occurred prior to the deposition of these clay lenses (ca. 10,000 B.P.), which appears to validate the Late Pleistocene date for the site (Dillehay 2000).

One telling aspect of the El Jobo points in general, other that their apparent Late Pleistocene age, is that fact that they are most commonly recovered individually from surface finds or in small numbers from open air spring sites (Ardila 1991). This pattern is similar to that of Clovis points in the North American west and may suggest that the makers of the El Jobo points were relatively small groups of highly mobile hunters, although this is not meant to imply a genetic relationship between the two distinct lithic traditions. Rather, the meager evidence we possess for the El Jobo tradition still provides us with a possible glimpse of the techno-economic system in which this tool operated. In sum, however, we know relatively little about the social or economic organization of the culture that produced the El Jobo points.

Another Late Pleistocene projectile point style from northwest South America that is poorly understood is the Restrepo point. Restrepo points have been reported from several surface finds and open air sites in Colombia, particularly in the Popayán valley (Ardila 1991; Correal 1983; Dillehay 2000). Restrepo points exhibit fluting or basal thinning on one or both faces, are stemmed, and have pronounced, angular shoulders (Ardila 1991). Bray (1984) has noted a similarity between Restrepo points and both the Paiján points from northern Peru and the El Inga Broad Stemmed point from Ecuador.

Ardila (1991: 270-271) has questioned this apparent similarity and sees too many differences between the Restrepo and Paiján/El Inga Broad Stemmed styles. Llera and Gnecco (1986) also postulate a technological relationship between the Restrepo and El Inga stemmed points, which is supported by Dillehay (2000: 123-124) who notes the paleoenvironmental similarities between the El Inga and Popayán valley. Both of these point types (Restrepo and El Inga Broad Stemmed) come from sites that would have been located in wet, upland forests during the Late Pleistocene and may represent a regional (given their relatively restricted distribution), generalized hunting and gathering adaptation (Ardila 1991; Dillehay 2000; Llera and Gnecco 1986). Few sites containing Restrepo points have been reliably dated and these dates range between 9,000-3500 B.P. However, given the geographic and technological similarity between the Restrepo and the El Inga and Paiján types a Late Pleistocene/Early Holocene date between 10,500 to 9,000 B.P. is more likely (Dillehay 2000: 124-125).

In the Sechura desert of northern coastal Peru Richardson (1981, 1978, 1973) has identified a distinct Late Pleistocene unifacial industry (the Amotape complex). The sites are situated among paleodunes on Pleistocene *tablazos* (uplifted Pleistocene marine floors) near the Talará tar seeps. The paleoenvironment of the region was one of a relatively wet, open savannah-woodland with a wide range of resources available in the surrounding area, including mangrove swamps, estuarine snails, tropical fish, and animals that visited the grasslands surrounding the tar seeps (Richardson 1981). Lithic artifacts from the Amotape complex are entirely unifacial and consist of flakes, flake denticulates, and pebble-cores, with raw materials of local quartzites and chalcedonies (Richardson 1973). The Amotape complex dates to between 11,200-8,125 B.P. and has been interpreted as representing a generalized foraging economy that emphasized the exploitation of nearby mangrove and estuary resources. Richardson (1981) has further suggested that the Amotape sites may represent the coastal component of a wider coast-inland subsistence system in which early foragers cyclically moved between the coast and interior locations.

The Fishtail complex provides another example of variability in Late Pleistocene adaptations. Fishtail sites are found primarily in the southern cone of South America, but a few sites have also been discovered in Panama (Madden Lake), Ecuador (El Inga), and in northern coastal Peru (Moche, Chicama, and Jequetepeque valleys) (Bell 1960; Bird and Cooke 1978; Mayer-Oakes and Bell 1960; Briceño 1999, 1995). This geographically widespread distribution of Fishtail points has been interpreted as evidence of cultural linkages between these widely separated sites and as indications of a relative cultural uniformity during the Late Pleistocene (Bird 1969; Lynch 1983; Schobinger 1973). However, the apparent distribution of Fishtail points masks the fact that the vast majority of known Fishtail sites come from two regions within the southern cone: 1) the Southern Andes and Patagonian region of Chile and Argentina, and 2) the *Pampas* of eastern Argentina, Uruguay, and southern Brazil (Borrero 1996; Politis 1991; Nami 2007; Suarez and Lopez 2003). Outside of these 'core' areas Fishtail sites are very rare, as is exemplified by the few known sites noted previously. The notion of a widespread cultural horizon does not fit well with the relatively tight regional distribution of most of the known Fishtail sites.

Our understanding of the economy and technology of the Fishtail complex within the 'core' regions has been greatly expanded since the pioneering discoveries by Bird (1938) at Fell's and Palli Aike caves. More recent research and additional site discoveries, including the sites of Tagua-Tagua, Cerro La China, Los Toldos (Cave 3), Mylodon Cave, Cueva del Medio, and Piedra Museo (Borerro 1986; Cardich 1987; Cardich and Miotti 1983; Flegenheimer 1987; Mengoni Goñalons 1986; Miotti 2003, 1999, 1992; Miotti and Salemme 1999; Montané 1976; Nami 2007, 1989, 1987; Núñez et al. 1994; Suárez 2001, 2000) among others, have fostered a much clearer understanding of the Fishtail complex. The majority of these sites are located in rockshelters and caves, although a few open-air sites have been documented as well.

The lithics recovered from Fishtail sites in the 'core' regions—which include the distinctive stemmed projectile points and unifacial flakes and scrapers—are remarkably consistent and seem to indicate a fairly uniform technology oriented toward hunting, butchering, and hide processing (Flegenheimer and Bayón 1996; Politis 1991; Nami 2007; Suárez 2003). Bird (1970) has also reported the presence of a few pecked and ground stone objects from three sites in Patagonia. Although there function is unknown, they appear to be relatively flat grinding bases and pestles that may have been used for grinding pigments or plants. Politis (1991) has analyzed morphological attributes of

Fishtail points from across the southern cone and argues that they represent a regionally restricted technological pattern.

The faunal remains from these sites also appear to indicate a regional pattern. Like the original discoveries at Fell's and Palli Aike caves, the faunal remains of more recently investigated sites (e.g., Tagua-Tagua, Mylodon Cave, Cueva del Medio, Paso Otero, and Santa Julia) included extinct Pleistocene species of *mylodon*, mastodon and American horse, along with guanaco, deer, rhea, birds, feline, and fox. Species selection, availability, and frequency vary between individual sites, but the general pattern of exploitation appears similar throughout the southern cone (Mengoni Goñalons 1986; Miotti 2003; Nami 2007; Politis 1991). Variability in the faunal remains from Fishtail sites likely relates to differences in site function within an organized settlement system (Binford 1980). Prey observation sites, kill sites, butchering/processing sites, quarries, and multiple activity sites represent the known spectrum of functional variability within the Fishtail settlement system (Borrero 2006, 1996; Miotti 2003; Nami 2007). Each of these site functions would have differentially impacted the faunal and lithic artifacts present in a site's deposits.

Mengoni G. (1986: 275) has interpreted the overall pattern as representing a "generalized adaptive strategy". Generalization, in this sense, relates to the diversity of animal species exploited within a given environment, as opposed to the specialized focus on one or a few specific species. This characterization seems accurate given the faunal data from Fishtail sites, but is a somewhat misleading label when compared to sites such as Monte Verde or Amotape, that indicate clear generalized Pleistocene foraging adaptations that include a wide range of both faunal *and* floral materials. There exist glaring lacunae of data regarding any possible plant use from Fishtail sites, but the faunal and lithic data together (grinding stones notwithstanding) suggest that it may be more accurate to characterize the Fishtail economy as a semi-specialized hunting strategy, rather than a generalized adaptive strategy.

A few sites containing Fishtail components may also evidence earlier occupations. Earlier unifacial lithic industries that are overlain by Fishtail deposits have been documented at Piedra Museo and Los Toldos (Cardich 1987; Miotti 1992). These earlier occupations, although not well understood, are thought to represent a generalized foraging adaptation (based on the unifacial assemblages) that preceded the Fishtail in the southern cone (Cardich 1987). Miotti (2003), however, considers these earlier unifacial deposits to represent differential use episodes in the occupation of the site and contends that the unifacial lithics are a component of the Fishtail industry. The earliest occupations at Los Toldos and Piedra Museo have been dated to 12,600 and 12,890 B.P. respectively and possibly represent contemporary, although distinct, populations with the Monte Verde site—however these dates are single samples and may be problematic (Cardich et al. 1973; Miotti 1995). Fishtail site components, in general, from the southern cone region tend to date between 11,100-10,500 B.P (Dillehay 2000; Dillehay et al. 1992; Politis 1991).

The relatively tight geographical distribution within the 'core' areas, combined with the technological and subsistence consistency within these areas strongly supports the characterization of the Fishtail as a regional Late Pleistocene cultural phenomenon. If we accept the Fishtail complex as a *regional* cultural expression of semi-specialized hunters then we are left with the question: what do these outlying sites that contain Fishtail points represent? As one moves away from the 'core' regions, Fishtail sites become much less frequent and very widespread. Within the Central Andes, few sites yielding Fishtail projectile points have been documented (Briceño 2004, 1995; Chauchat 1998; Dillehay 2000). The El Inga site in Ecuador (Bell 2000, 1960; Mayer-Oakes 1986a, 1986b; Mayer-Oakes and Bell 1960), La Cumbre in the Moche valley (Ossa 1978; Ossa and Moseley 1972), and two sites identified by Briceño (1999, 1995) in the Q. Santa Maria are the best-known examples of Fishtail sites in the Central Andes.

Each of these different sites occupies distinct environmental zones that offer access to different kinds of resources. The open air, highland site of El Inga (2550 masl) is located on a promontory that overlooks the upland Rio Chiche and Rio Inga valleys near Cerro Ilalo in north central Ecuador (Bell 2000). The El Inga site contains the largest number of Fishtail points (n=21) on a single site outside of the 'core' regions, but is largely a surface scatter with little intact stratigraphy due to repeated historic plowing of the site and the absence of cultural layers (Bell 2000). In addition, several other types of projectile points representing different occupational episodes were found at El Inga. The Fishtail projectile points from El Inga are morphologically similar to the classic

Fell's cave type from the southern cone (Mayer-Oakes 1986a). Most of the El Inga Fishtail points are broken and exhibit fluting and/or basal thinning (Bell 2000; Mayer Oakes 1986a). Fishtail points from the 'core' regions of the southern cone also exhibit fluting, but not with the same frequency as in the El Inga assemblage (Nami 2007; Politis 1991). Little is known about the mobility patterns, duration of occupation, or subsistence practices of the inhabitants of El Inga or the Cerro Ilalo region in general. Radiocarbon dates from the El Inga site range from 9000-4000 B.P. and appear to correspond to later occupations of the site (Bell 2000: 82-90).

The La Cumbre and Santa Maria sites of northern coastal Peru are also open-air, dense lithic scatters that often include other Early Preceramic and later occupations. The two Fishtail sites identified in Q. Santa Maria, which also contained Paiján points, limaces, and unifacial scrapers and flakes, were located in proximity to ancient springs, which Briceño (1995) suggests may have been prime areas for the collection of various plant and animal resources by non-specialized hunters and gatherers. The La Cumbre site in the lower Moche Valley is located on low slopes that overlook the valley floor and neighboring *quebrada* systems (Ossa and Moseley 1972). One broken, fluted Fishtail point was recovered from the site deposits that also included Paiján points, limaces, scrapers, and flakes (Ossa 1978; Ossa and Moseley 1972). Two radiocarbon dates from the lower deposits at La Cumbre are 12,360 B.P. and 10,535 B.P. Given the dates for Fishtail from the better-known 'core' regions the latter date is likely the most accurate (Dillehay 2000:149).

Because very few Fishtail sites have been reported, excavated, radiocarbon dated, and subjected to settlement/subsistence analysis, our understanding of Fishtail economy and technology outside of the 'core' regions is severely limited, but may indicate some distinct differences with the semi-specialized hunting economy of the southern cone. Most notably, is the conspicuous lack of an abundance of faunal remains from the Fishtail sites in the Central Andes. Faunal remains are common in the sites from the better-known 'core' regions of the southern cone, and may speak to important differences in subsistence practices between the two regions. A second contrast is the repeated presence of other Late Pleistocene lithic traditions on each of the Central Andean sites that contain Fishtail deposits. Fishtail deposits on sites in the Southern Cone typically do not contain evidence for other lithic traditions (Flegenheimer and Bayón 1996; Martínez 2001; Nami 2007; Suárez 2003) This is distinct from the Central Andean sites, in which Fishtail points are often found in stratigraphic association with other lithic traditions (e.g., Paiján and El Inga Broad Stemmed) (Bell 2000; Briceño 1999; Mayer-Oakes 1986a; Ossa and Moseley 1972). This repeated association seems to suggest that the Fishtail points were coterminous with other Late Pleistocene lithic forms and may indicate distinct, yet contemporary populations on the north coast during the Late Pleistocene.

The few dates we have for Fishtail sites in the Central Andes are wide ranging and limit any chronological understanding of Fishtail adaptations or their relationships to other early groups (Bell 2000; Chauchat 1988; Dillehay 2000; Ossa 1976). In the Quebrada del Batán region, four new sites containing Fishtail points (Je 979, 996, 1002 and 1010) were recorded and excavated. Each of these sites is located on low terraces that overlook the intersection of the Q. Batan valley floor and a smaller side *quebrada*. During the Late Pleistocene the QBT region was cooler and wetter and these sites would have provided access to a wide range of plant and animal resources. Each of these sites also contained Paiján points. The four Fishtail points recovered from the Q. Batan sites vary in form and exhibit similarities to other examples from both the 'core' regions and the Central Andes. Each of these sites will be discussed in greater detail in later chapters.

As was noted above, sites within the Central Andes that contain Fishtail points also typically contain other Late Pleistocene lithic traditions. On the north coast of Peru all of the known Fishtail sites also contain Paiján materials. The Paiján complex, which dates from 10,800-9,000 years ago (Chauchat 1988: 47-59; Dillehay 2000: 149-150), is known primarily from the lower sections of the Zaña, Jequetepeque, Cupisnique, Chicama, Moche and Casma Valleys of northern coastal Peru (Briceño 1997, 1995; Chauchat 1998, 1988, 1982; Gálvez 1992; Gruhn 2006; Malpass 1983; Ossa 1978, 1976; Ossa and Moseley 1972; Rossen and Dillehay 1999). Although, Paiján or Paiján-like points have also been documented at El Inga in Ecuador (e.g., El Inga Broad Stemmed and Restrepo varieties) and as far south as Ica in Peru and on the north coast of Chile (Chauchat 1988; Núñez et al. 1994; Mayer-Oakes 1986b). The vast majority of Paiján sites on the north coast have been found within the large *quebrada* systems of the low

Andean foothills (200-600 masl and approximately 10-35 km east of the Pacific coast), like the Quebradas Batán and Talambo of this project.

The paleoenvironment of these coastal *quebrada* systems from 11,000 to 9,000 B.P. was wetter and somewhat cooler, and primarily dominated by open savannah grasslands on the coastal plains and open forests on the higher elevation *quebrada* slopes and Andean foothills. The overall character of the Peruvian north coast at the end of the glacial period (ca. 11,000 B.P.) was one of mixed and juxtaposed microenvironmental zones that supported a diversity of plant and animal life. The juxtaposition of these varied microenvironmental zones would have been most pronounced in the coastal *quebrada* systems where gradual to steep elevational changes would have provided access to numerous different kinds of resources. These *quebrada* systems are, not coincidentally, where the vast majority of Paiján sites are located.

Paiján sites are typically small to large, open air, surface lithic scatters that may incorporate different functional roles within a settlement system. Quarries sites that emphasize the procurement and reduction of local raw materials are common (Becerra and Esquerre 1992; Gálvez 1992). Larger Paiján sites also occasionally evidence distinct activity areas within the site (based on surface tool distributions) and multiple occupation episodes as indicated by the palimpsest nature of the site deposits (Briceño et al. 1993; Chauchat 1982; Dillehay et al. 2003; Gálvez 1992). Small, stone-lined, circular structures that have been interpreted as domestic residences are also occasionally present on Paiján sites (particularly Late Paiján sites) and indicate a degree of reduced mobility that is not present in other Late Pleistocene complexes from Andean South America (Monte Verde being the notable exception) (Gálvez 1990; Dillehay et al. 2003). The trend of reduced mobility among the Paiján continues, however, into the Holocene (Late Paiján) and may represent the initiation of the trend toward sedentism that is documented during the later Middle and Late Preceramic periods (Rossen 1991; Stackelbeck 2008).

Paiján lithic technology is characterized by distinctive stemmed, bifacial projectile points that are commonly associated with unifacial flake tools, scrapers, limaces, and occasionally, groundstone implements suggestive of a broad-spectrum economy (Bonavia 1982; Chauchat 1982; Malpass 1983; Mayer-Oakes 1986a, 1986b; Ossa 1978). Faunal materials from Paiján sites typically contain a wide variety of species, including deer, lizards, fox, marine fish, land snails, birds, and rodents (Briceño 1995; Chauchat 1988; Gálvez 1992). Extinct Pleistocene faunas have not been found in Paiján archaeological deposits (Chauchat 1998). There remains a paucity of data concerning floral remains present in Paiján deposits. However, the intensity of Paiján occupation within the coastal and mountainous *quebrada* systems that has been noted in the north coast region (Chauchat 1998; Dillehay et al. 2003), where a mosaic of microenvironmental zones existed (Tosi 1960), combined with the broad-spectrum of plant resources reported from late Paiján sites in the Zaña Valley (ca. 9,000-8,000 B.P.) (Dillehay et al. 1989; Piperno and Dillehay 2008; Rossen 1991; Rossen et al. 1996) and the presence of grounding stones on Paiján sites (Chauchat 1988; Dillehay et al. 2003) appear to indicate—at minimum—a use of local plant resources that has not been detected or reported in Paiján sites.

In general terms, the Paiján are typically characterized as a regionalized Late Pleistocene to Early Holocene cultural expression. Chauchat (1998, 1988) has further characterized the Paiján complex as an early coastal adaptation, primarily to maritime resources, in which groups moved from littoral zones through the coastal plain into the foothills and *quebradas* on a cyclical basis. Although inland sites are recognized, the focus of Chauchat's model is on the exploitation of marine resources. However, no Paiján sites have been found along the coast and very few are located on the coastal plain. The fact that the vast majority of Paiján sites are located in the coastal *quebrada* systems (which would have been 30-50 km from the paleoshoreline) argues against a maritime-focused subsistence pattern. This suggestion does not ignore the common presence of marine fauna in Paiján deposits, rather it argues that the Paiján economy represents more than semi-specialized coastal fishers (Briceño 1999; Dillehay et al. 2003; Gálvez 1992; Malpass 1983). In this dissertation, the Paiján are characterized as a regional Late Pleistocene-Early Holocene generalized foraging adaptation whose settlement pattern emphasized access to a broad range of resources focused on the inland *quebrada* systems of the Andean foothills, but also made repeated use of marine resources in their broad-based subsistence strategy.

Although the Paiján complex dominates the Late Pleistocene archaeological assemblages from the north coast of Peru, the arid coast of southern Peru and northern

Chile provide additional examples of cultural variability in Late Pleistocene of Andean South America. Early evidence for a maritime adaptation comes from the sites of Quebrada Jaguay, Quebrada Tacahuay, Quebrada del los Burros and the Ring (*Anillo*) site (Keefer et al. 1998; Lavallée 2003; Lavallée et al. 1999; Sandweiss et al. 1998; Sandweiss et al. 1989). The Ring site is an open-air shell midden that dates from the Terminal Pleistocene into the Early Holocene (10,500-7,500 B.P.) Faunal remains include an abundance of marine fish species, birds, and mammals. The lithics from the Ring site are dominated by unifacial flakes (Sandweiss et al. 1989). Quebradas Jaguay and Tacahuay and the Quebrada de los Burros are similar to the Ring site in clearly emphasizing an early maritime adaptation. The early occupation of the Quebrada Jaguay site has been dated between 11,105-9,850 B.P. and was located approximately 7-8 km from the paleoshoreline (Sandweiss et al. 1998). Marine fish and small wedge clams dominate the faunal remains from Jaguay. Lithic materials from the site are predominantly unifacial flakes and debris, but a few bifacially retouched tool fragments were also recovered (Sandweiss et al. 1988). The Quebrada Tacahuay site evidences much the same pattern as noted in Quebrada Jaguay, with the notable exception of an emphasis on the exploitation of sea birds (booby, cormorant) (Keefer et al. 1998). Tacahuay is similarly dated between 10,770-9,550 B.P. Lithic materials, like Jaguay, were unifacial with the exception of one bifacially retouched flake (Keefer et al. 1998). The Quebrada de los Burros is a maritime fishing campsite (with multiple occupations) that has been dated between 10,000-6,000 B.P. and contains a wide range of bifacial, unifacial, bone and shell tools related to marine resource exploitation (Lavallée 2003). The Huentelafquen and Quebrada de las Conchas sites in northern and central coastal Chile were occupied as early as 11,000 B.P., but primarily between 10,500-9,500 B.P., and also evidence a clearly developed broad marine subsistence base and a reliance on edge trimmed, unifacial flakes (Llagostera 1989, 1979).

These sites provide an image of a relatively regionalized and specialized Late Pleistocene adaptive strategy focused on near-shore marine resources. There is evidence in the Quebrada Jaguay and Tacahuay sites of repeated contact with interior settings based on the presence of obsidian from the Alca source in the upper end of the Cotahuasi Valley (some 130 km from the coast). Sandweiss et al. (1998) have suggested that this may indicate a seasonally transhumant pattern of movement into the interior uplands from those coastal sites. However, in contrast, Lavallée (2003) does not see any relationship in the exclusively maritime-oriented Quebrada de los Burros site materials with that of conterminous highland hunter-gatherers populations.

Several sites in the Central Andean highlands also provide another example of Late Pleistocene cultural variability. Although the high elevations of the Andes mountains were dominated by alpine glaciation and treeline depression during much of the Pleistocene, as the ice fields began to retreat (ca. 14,000 B.P.) the high intermontane valleys and plateaus (puna and altiplanos) (ca. 2500-4500 masl) became slowly habitable and covered with herbaceous vegetation (Aldenderfer 1998; Lavallée 2000). Human occupation of the Central Andean region is clear after about 10,800-10,500 B.P. This occupation of the highlands from Ecuador to the northernmost portions of Chile and Argentina is broadly referred to as the Central Andean Hunting Tradition and is based on a series of excavated cave sites including: Pachamachay, Lauricocha, Guitarrero, Panaulauca, Pikimachay, and Telarmachay (Cardich 1978, 1964; Kaulicke 1999; Lavallée 2000; Lavallée at al. 1985; Lynch 1980; MacNeish 1971; MacNeish et al. 1980; MacNeish et al. 1981; MacNeish et al. 1983; Rick 1988, 1980).

Very early occupations of the Central Andean highlands have been postulated on the dates from a few important sites. Early dates from Guitarrero (12,040 B.P.), Telarmachay (11,800 B.P.), and Lauricocha (12,560 B.P.) have been reported, but are widely considered to be outliers of more accepted post-10,500 B.P. occupations (Dillehay 2000; Lavallée 2000; Lynch 1990, 1980). The site of Pikimachay in the Ayacucho Basin is more problematic. MacNeish identified two distinct lithic phases (Paccaicasa and Ayacucho phases) in the lower levels of Pikimachay cave, associated with extinct Pleistocene fauna that have been dated to 19,600-16,050 B.P. and 14,700 B.P., respectively (MacNeish 1971; MacNeish et al. 1981). The veracity of the older Paccaicasa phase, which consists of relatively crude flakes and chopping/cutting tools, has been seriously (and rightly) questioned because the artifacts are made of the same raw material (volcanic tuff) as comprises the cave walls (Grayson 1986; Lavallée 2000). Thus, it is very possible that these lithics were naturally produced and their association with extinct fauna is purely fortuitous.

The succeeding Ayacucho phase lithics are more clearly human in manufacture and consist of core tools, flakes, scrapers and a unifacial projectile point (MacNeish 1971; MacNeish et al. 1980). These tools are predominantly manufactured from basalt, chalcedony, chert, and quartzite, which must have been transported into the cave. The Ayacucho lithics were found in association with extinct Native horse and sloth (MacNeish 1971). Difficult to dismiss, the unifacial and flake lithics of the Ayacucho phase at Pikimachay may represent the earliest occupation of the Central Andean region and the highlands of Andean South America in general (MacNeish et al. 1983). However, the age of the radiocarbon date from the Ayacucho phase (14,700 B.P., obtained from a sloth humerus) has been questioned as being aberrantly old (Lynch 1990, 1983). The Ayacucho phase lithics are not remarkably dissimilar from the later Hunata and Puente phases, which date to the Terminal Pleistocene and Early Holocene. The Ayacucho and Huanta phases are, however, separated by a natural rockfall, which MacNeish (1971: 76) speculates had to have occurred prior to 10,000 B.P. It is possible that this rockfall may have artificially separated a single occupation phase, which would put the Ayacucho phase more in line with an 11,000-10,000 B.P. date. In spite of this speculative possibility, the Ayacucho phase from Pikimachay remains important, if poorly understood, early highland site.

The general pattern of the Central Andean Hunting Tradition is thought to have included a seasonal exploitation of cervids and camelids on the high plateaus combined with the exploitation of smaller game and the collection of plants in lower intermontane valleys (Lavallée 2000; Rick 1980; Rick and Moore 1999). The focus of the subsistence system is thought to have been the intensive exploitation of animals, but the early plant remains from Guitarrero—which include wild (and possible early domesticated) forms of tubers, beans, fruits, and chili peppers—speak to a reliance on plants as well (Lynch 1980; Rick 1988). Based on the data from Telarmachay, Lavallée (1997) has postulated an annual cycle of seasonal movements that correspond to animal migrations between summer and winter habitats (at different elevations).

The lithics of the Central Andean Hunting Tradition are characterized as a diversified assemblage of bifacial projectile points (including the leaf-shaped [Ayampitin], diamond-shaped, and triangular forms), flake scrapers, and hammerstones

(Rick 1988, 1980; Lavallée 2000; Lavallée et al. 1999; Lynch 1980; Rick and Moore 1999). Bone points, awls, and scrapers are also commonly found in these sites (Lavallée 2000; Rick 1980). The lithic assemblages, which are clearly oriented toward the processing of animals, appear to support a characterization of these Late Pleistocene occupations as representing a semi-specialized hunting adaptation in the higher elevations of the Central Andes.

Summarizing Late Pleistocene Variability in Andean South America

As the preceding discussions of the Late Pleistocene archaeological record from Andean South America illustrate, there exists a substantial variety of adaptational strategies that cannot be subsumed into or accounted for by the traditional model of specialized big game hunters colonizing South America around 11,000 years ago. Given this model's failure to account for the known data we must discard it and construct a new understanding that is based on observable patterns that are derived from the archaeological record of the Late Pleistocene. From the above review of Late Pleistocene adaptations several important patterns emerge.

- First, the Late Pleistocene sites from Andean South America fall into two relatively distinct groups based on the age of the site deposits. Group 1 consists of those sites or complexes that are earlier than 11,500 B.P. (Monte Verde, Tequendama, Tibitó, Taima-Taima, and perhaps the Ayacucho phase at Pikimachay and the earliest levels at Los Toldos and Piedra Museo [although these dates remain highly speculative]). Group 2 consists of sites or complexes that are dated between 11,500 and 10,000 B.P. (Abriense, Amotape, Fishtail, Paiján, the southern coastal maritime sites [Q. de los Burros, Jaguay, Tacahuay, and Anillo], the early sites of the Central Andean Hunting Tradition, and probably the Restrepo complex).

- Variability in overall economic strategies evidenced in the Late Pleistocene of South America also allows us to segregate these disparate sites and traditions into two groups. Group 1 consists of those sites and complexes that have been interpreted as representing a broad-based, generalized foraging strategy. The Group 1 generalists consist of Monte Verde, Tequendama, Tibitó, El Abra, Restrepo, Amotape, and Paiján. Group 2 consists of those sites and complexes that evidence an early specialized or semi-specialized foraging strategy, which is often focused on hunting or early maritime exploitation. The Group 2 specialists are represented in the archaeological record by sites of Taima-Taima (El Jobo), Jaguay, and Tacahuay, Q. de los Burros, and by the Fishtail complex and the Central Andean Hunting Tradition.

- Bryan (1991, 1986), Dillehay (2000) and Lavallée (2000) have both noted the presence of two distinct lithic traditions in South America: the unifacial and bifacial. Both of these traditions are clearly represented in the Late Pleistocene record, but often overlap or are present within a single site assemblage. Sites and complexes that show a clear tendency toward bifacial technology include the El Jobo, Restrepo, Fishtail, and Central Andean Hunting Traditions, while a clear tendency toward unifacial technology is represented at the El Abra, Amotape, Jaguay/Tacahuay sites. The sites of Monte Verde, Tequendama, Tibitó, and Q. de los Burros, along with the Paiján complex, all evidence heterogeneous lithic assemblages that include both bifacial and unifacial technologies.

- Gross environmental location of these varied sites and complexes can also provide some coarse-grained patterning for characterizing the Late Pleistocene period of Andean South America. If we make a broad distinction between forested and open environments then two groups of sites and complexes emerge. Group 1 consists of those sites that were located in forested, or partially forested, settings and include the sites of Monte Verde, Tequendama, Tibitó, along with the El Jobo and Paiján complexes. Group 2 is comprised of predominantly open settings (savannah grasslands, high *punas*, and coastal plains) and includes the sites of Amotape, Jaguay, Tacahuay, and the Fishtail complex and Central Andean Hunting Tradition.

- Lastly, we can make a distinction in the Late Pleistocene archaeological record between regionalized and widespread adaptations. Regionalized adaptations refer to those that have a geographically restricted distribution with subsistence practices that are tailored to specific local ecologies. Widespread adaptations refer to those that are geographically widely distributed across multiple regions and evidence variability in subsistence practices between different regions. The archaeological record suggests that regionalized adaptations were much more common and are evidenced by the sites of Monte Verde, Tequendama, Tibitó, Amotape, Jaguay, and Tacahuay, along with the El Jobo and Paiján complexes, and the Central Andean Hunting Tradition. It is argued here that the 'core' areas of the Fishtail complex also represent a regionalized adaptation due to its relatively restricted distribution and semi-specialized hunting strategy. Widespread adaptations in the Late Pleistocene archaeological record are presently evidenced only by the Fishtail sites that are located outside of the 'core' areas (including the Madden Lake, El Inga, and the Central

Andean sites). These sites are widely distributed and appear to evidence technological and subsistence variation between the different regions.

Implications for the Colonization of South America

So what do the above patterns tell us about colonization? Most importantly, these generalized patterns clearly indicate that the colonization of Andean South America was not a straightforward, uniform occurrence. The variability present in the archaeological data speaks to a complex and disjointed process that appears to have initiated (and terminated) at different times in different regions. Also, the various early complexes and sites of the Andes are not very similar, in terms of technology, economy, and settlement, to contemporary North American cultures (Borrero 2006; Bryan 1991; Dillehay 2000, 1999; Dillehay et al. 1992; Gruhn 2004; Nami 2007).

Perhaps the most important indicator of temporal variability during initial settlement is the presence of the two distinct temporal groups of sites within the Pleistocene archaeological record. The earliest group (Group 1), which includes Monte Verde, Tequendama, Tibitó, and the El Jobo sites, indicates an early occupation of Andean South America that probably ranges between ca. 13,000 and 11,500 B.P., if not earlier, based on the radiocarbon dates from these sites. The second group (Group 2) includes many more sites and complexes (Abriense, Restrepo, Amotape, Fishtail, Paiján, Jaguay/Tacahuay, Q. de los Burros, and the Central Andean Hunting Tradition) and, based on the age of these sites, generally ranges between ca. 11,500 and 10,000 years ago.

The different sites that comprise both of these temporal groupings often represent the earliest occupants of the regions from which they are known. The presence of regional temporal variability during colonization directly contradicts the notion of a uniform, continental-scale process. Rather, this variability indicates that the colonization of Andean South America was regionally and temporally variable.

The economic strategies of the different early groups also provide some insight into the complexity that characterizes the settlement of Andean South America. As noted previously, a general pattern of semi-specialized to specialized and generalized foraging strategies can be discerned from the Late Pleistocene archaeological record. On the whole, the specialized foraging economies appear within the later temporal group (ca. 11,500-10,000 B.P.), while the generalized foraging economies are found in both the early and later temporal groupings. It is significant that virtually all of the sites within the early group (ca. 13,000-11,500 B.P.) appear to evidence generalized foraging economies. The only exception to this pattern is Taima-Taima (El Jobo), which could be considered a specialized/semi-specialized economy based on the hunting/butchering activities that were pursued at the site. In spite of the fact that Taima-Taima is clearly a mastodon kill/butchering site, it is very likely that this seemingly specialized activity represents only a single facet of the overall subsistence strategy that was much more generalized—like at Monte Verde, which also contained evidence of mastodon butchering (Dillehay 1997a, 1989). Given the dearth of information regarding El Jobo subsistence practices, their characterization as specialized hunters is premature (and likely inaccurate) and requires additional data for clarification.

It is also important to recognize the proliferation of different economic strategies that occurs during the 11,500-10,000 B.P. period (Bryan 1986; Dillehay 2000; Lavallée 2000). Generalized foraging economies persist—like those of the Paiján, Abriense, and Amotape complexes—but are becoming increasingly localized. At the same time, we also see the development of semi-specialized hunting traditions like the Fishtail and Central Andean Hunting Tradition, as well as the appearance of specialized early maritime subsistence at the sites of Jaguay, Tacahuay, and Q. del los Burros. These later economic practices are regionally focused and indicate a more intensive reliance on locally specific resources.

The character of the occupied paleoenvironments also appears to reflect the complex variability present during colonization. The early sites (ca. 13,000-11,500 B.P.) all are found in areas that would have been wet, forested to partially forested environments (Dillehay and Rossen 2002). Some later sites and complexes, such as the Paiján and Restrepo, also occupied similar paleoenvironments. However, the bulk of the later sites and complexes—like the Fishtail, Jaguay, Tacahuay, Amotape, Q. de los Burros, and Central Andean Hunting sites—were typically located in varied, relatively open environments. It seems an unlikely coincidence that the bulk of these sites also represent specialized/semi-specialized economic strategies. It may be that the environmental locations of the earliest sites (wet, forested areas) were carefully selected to provide maximum access to the wide spectrum of resources necessary for a generalized foraging economy. Although some later groups continued to maintain generalized economies, others express more specialized and localized adaptations that did not require the same environmental conditions, or required different conditions, and allowed for the settlement of new, open landscapes and regions.

Sites from the ca. 13,000-11,500 B.P. period, which represent the earliest known colonists of Andean South America, appear to evidence an environmental selectivity that favored wet, forested landscapes. Early migrants may have directed their movement into new landscapes based on similarity in gross physical environments (Beaton 1991; Bettinger and Young 2004; Dixon 1999). This may explain why the earliest sites are found in the extreme north and south of Andean South America and not on the central coasts or in the central highlands. Both the extreme north (Colombia, Venezuela, and parts of Ecuador) and parts of the extreme south (upland Chile and Argentina) were wet and forested during the ca. 13,000-11,500 B.P. period (Coronato et al. 1999; Clapperton 1993a; Dillehay 1997a; Van der Hammen 1977). The central coast of southern Ecuador, Perú, and northern Chile were also wetter during this period but remained primarily open grasslands and savannahs with large, mixed pockets of forestation along the Andean flanks and in river valleys (Clapperton 1993a; Seltzer 2000). Most of these open environments, along with the grasslands of Argentina and Uruguay (Miotti 2003), would not have been the most preferred to earliest migrants and were apparently settled later (ca. 11,500-10,000 B.P.) by groups with more regionalized economic strategies.

Conclusion

This chapter has presented a review of the Late Pleistocene-Early Holocene archaeological record of Andean South America. The preceding discussions have highlighted the wide range of variability that existed in the types of paleoenvironmental locations that were occupied and the technological and economic strategies pursued. Acknowledging the complexity that existed during the Late Pleistocene-Early Holocene of Andean South America also highlights the need for more complex models of the process. The simplistic, traditional view of colonization as a bow-wave expansion of specialized big-game hunters throughout North and South America ca. 11,500-11,000 B.P. is inadequate and outmoded (Adovasio and Pedler 2004; Bryan 1991; Dillehay 2000; Dixon 1999; Gruhn 2004; Meltzer 2004).

What is required is a framework that explains and incorporates the local cultural diversity that characterized the Late Pleistocene-Early Holocene period into successively higher analytical scales. This can be accomplished by conceptualizing temporal, economic, technological, mobility, and environmental variability within a scalar framework that explicitly recognizes colonization as a disjointed process that may have involved a multiplicity of different behaviors and adaptive strategies at the local and regional levels. More specifically, this framework must model and interpret the increasingly regionalized adaptational strategies that developed during the Late Pleistocene-Early Holocene period, and contextualize variability in the process of regionalization within continental-scale models of colonization. These considerations are discussed in the following chapter (Chapter Five).

CHAPTER FIVE

MODELING THE PROCESSES OF COLONIZATION, REGIONALIZATION AND LOCALIZATION

Introduction

As the archaeological data discussed in the previous chapter illustrate, colonization is often a disjointed process best conceived on continental scales. Both regionalization and localization are intricately tied to colonization and can be considered long-term outgrowths of that process. However, colonization is a broad concept that is most useful when modeled at supra-regional scales (Anderson and Gillam 2000; Dillehay et al. 2008; Kelly 2003). Relating regional and local archaeological patterns to continental-scale processes is difficult and necessitates the use of different, intervening concepts for lower-level analytical scales (e.g., regionalization and localization).

The goals of this chapter are: 1) to construct a general framework for understanding the peopling of the study area and the Americas in general; 2) identify the concepts and models useful at different analytical scales (continental, regional, and local) that can inform our understanding of the broad peopling process, particularly at local and regional scales; and 3) discuss the models and archaeological correlates relevant and appropriate for interpreting the peopling process at different analytical scales.

Theorizing Colonization

Old Problems and New Directions

Since the 1930s the view of Late Pleistocene hunter-gatherers in the New World has largely been dominated by the "Clovis first" paradigm. The theoretical perspective that lay at the heart of this paradigm held that the New World was peopled by hunter-gatherers migrating from Northeast Asia across the Bering Land Bridge around 11,500 years ago (Haynes 1966; Kelly 2003; Martin 1984, 1973). The Clovis culture was thought to represent a specialized hunting economy based on the exploitation of large terrestrial mammals and megafauna (Haynes 1966; Martin 1973, 1967; Mossiman and Martin 1975). Upon entering the New World the Clovis culture is believed to have rapidly colonized much of continental North America, followed quickly by large parts of northern and western South America. This rapid colonization is thought to have resulted in a relatively homogeneous Late Pleistocene "founder" culture for the entirety of the New World (Fiedel 2000; Haynes 1980, 1969; Kelly and Todd 1988; Lynch 1983, 1974).

The simplicity of the Clovis-first paradigm perhaps explains the largely unquestioned acceptance it received until the 1970s and 1980s, when key principles of the hypothesis came under serious scrutiny. Three different developments within archaeology were responsible for the challenges leveled at the Clovis-first hypothesis: 1) the discovery of several sites in both North and South America, most notably the Monte Verde site in southern Chile, that predated the posited entry of Clovis into the New World (Adovasio et al. 1990; Adovasio et al. 1999; Bryan et al. 1978; Collins and Dillehay 1986; Correal and Van der Hammen 1977; Dillehay 1997, 1989); 2) a failure to identify clear Clovis or Clovis-progenitor sites in the presumed home ranges of Siberia and Alaska (Hamilton and Goebel 1999; Goebel 2004; Goebel et al. 1991); and 3) the recognition of greater than before acknowledged cultural variability, including many assemblages that were not explained by Clovis, that existed in North and South America during the Late Pleistocene period (Adovasio and Pedler 2004; Bryan 1991, 1973; Dillehay 2000; Dillehay et al. 1992; Lavallée 2000; Meltzer 2002; Tankersley 1998). These three developments resulted in a rejection of the Clovis-first paradigm for a more robust and complex conceptualization of the colonization of the New World.

Current thinking about the colonization of the New World does not reject the possibility of a Clovis migration, only the supposed primacy of that migration. Recent conceptualizations acknowledge that several migrations into the New World likely have occurred at different times during the Late Pleistocene (Dixon 2001; Madsen 2004; Meltzer 2004). These migrations may have involved different cultural groups, originated in different geographic locations, and possibly traveled to North and/or South America by different methods and routes (Bryan 1991; Dillehay et al. 2008; Goebel et al. 2008; Gruhn 2004; Stanford and Bradley 2002). The vagueness of the principle tenets of our current understanding of the colonization of the New World stand in direct contrast to the hyper-simplicity of the Clovis-first hypothesis. However, it is precisely this vague nature and the recognition of multiple possibilities that makes recent conceptualizations more robust.

One interesting result of new conceptualizations has been an expanded discussion of the potential time frame in which colonization may have initiated (Bryan 2004; Dillehay 1997; Dillehay et al. 2008; Madsen 2004). Attempts to define the initial timing of the origin of people in the New World remain an important within archaeological and other studies. However, since the recognition of the deficiencies in the traditional model, numerous independent research projects including biological and linguistic studies—combined with archaeological projects at pre-Clovis sites in South America like Monte Verde, Taima Taima, Tequendama, Tibitó, and potential pre-Clovis sites in North America Meadowcroft, Cactus Hill, Paisley Cave, and Topper—have generated several key propositions for understanding of the Late Pleistocene peopling of the New World (Adovasio and Pedler 2004; Adovasio et al. 1990; Adovasio et al. 1999; Bryan et al. 1978; Correal and Van der Hammen 1977; Dillehay 2000, 1997, 1989; Gilbert et al. 2008; Goodyear 1999; Greenberg et al. 1986; Mandryk 1993; McAvoy and McAvoy 1997; Nichols 1990; Schurr 2004, 2002; Steele and Powell 1994; Torroni et al. 1992; Turner 2002, 1987). These propositions form the basis of recent conceptualizations and are generating increasingly important questions that center both on when the first humans arrived and what those humans did once they were in the New World (Dillehay et al. 2008; Meltzer 2002, 1995).

The first proposition is that humans were in South America by at least 12,500 years ago. This is based on the intensively dated occupation of the Monte Verde site and clearly demonstrates that human presence in the New World predates the earliest dated Clovis site (Aubrey site, Texas) by at least 1000 years (Dillehay 1997a; Dillehay and Collins 1988; Ferring 1990, 1989; Haynes 1987). Assuming the colonization of the New World initiated in North America, which seems most likely given its proximity to the Asian landmass, this early date also implies that humans must have been in North America by at least 14,000-15,000 years ago. This fact is additionally supported by biological studies of skeletal diversity and linguistic divergence studies that place the earliest entry into the New World sometime between 15,000 to 30,000 years ago (Greenberg et al. 1996; Nichols 1990), although these calculations are highly conjectural.

A second proposition is that there likely were multiple early migrations into the New World that resulted in much greater biological and cultural diversity than previously believed to exist (Greenberg et al. 1986; Horai et al. 1996; Merriwether et al. 1995; Schurr 2002; Szathmary 1993; Torroni et al. 1992). The Clovis-first hypothesis held that a homogeneous "founder" culture was responsible for colonizing most of North and South America—a situation that should result in similar archaeological expressions and human physiology throughout the New World during the Late Pleistocene. However, the data from both North and South America indicate just the opposite (Bryan 1991; Dillehay 2000; Dixon 1999; Lavallée 2000; Meltzer 2002, 1989).

Human remains of sufficient antiquity to provide insights into the period of colonization are rare, but the skeletal data that has been collected show striking physical differences between early regional populations and are suggestive of far greater biological diversity than implied by a "founder" culture or population (Munford et al. 1995; Neves et al. 1996; Schurr 2004; Steele and Powell 1994). In addition, mitochondrial DNA studies among living Native American groups are suggestive of a rate of genetic divergence that required a minimum of 15,000 years to achieve (Greenberg et al. 1996; Horai et al. 1996; Schurr 2004; Torroni et al. 1992). Conservative estimates of language diversification among the indigenous New World language families agree with a 15,000 year time frame, while more liberal estimates suggest a time frame of 30,000 years to achieve the modern day level of language diversity (Nichols 1990; Turner 2002).

Aside from the biological and linguistic diversity present during the Late Pleistocene, it has become increasingly apparent that a wide variety of cultural expressions also existed. The Nenana complex of Alaska, the western stemmed tradition of the North American Great Basin, and maritime-focused coastal California sites all evidence varied economic practices and technological traditions that are distinct from patterns associated with Clovis (Erlandson 1994; Erlandson and Moss 1996; Goebel et al. 1991; Hamilton and Goebel 1999; Jones et al. 2002; Powers and Hoffecker 1989; Rick et al. 2005). In South America this cultural diversity is even more apparent with widely varying economic and technological traditions across the continent during the Late Pleistocene (Bryan 1973; Borerro 2006; Dillehay 2000, 1989; Dillehay et al. 2004a; Dillehay et al. 1992; Lavallée 2000; Nami 2007). Sites such as Monte Verde in Chile (Dillehay 1997), Taima-Taima in Venezuela (Gruhn 1979; Ochsenius and Gruhn 1979), Amotape sites in northern Perú (Richardson 1983, 1981), coastal sites in southern Perú and northern Chile (Lavallée 2003; Lavallée et al. 1999; Llagostera 1992; Sandweiss et al. 1998), Fishtail complex sites of southern and western South America (Borrero 2006, 1986; Briceño 1999; Cardich 1987; Chauchat 1988; Miotti 2003; Miotti and Salemme 1999; Nami 2007; Politis 1991; Suarez 2001a), Itaparica Tradition sites in eastern Brazil (Kipnis 1998) and the unifacial Tequendama and Tibíto sites in Colombia (Correal 1986; Correal and Van der Hammen 1977) illustrate a range of cultural adaptations and traditions in widely varying environments that is inconsistent with the notion of a "founder" culture.

A final proposition is that all Late Pleistocene archaeological cultures are not necessarily related (Bryan 1991, 1978; Dillehay 1999; Gruhn 1994; Schurr 2004). This directly contrasts with the Clovis-first hypothesis and may seem obvious given the previous discussion. However, it is important to recognize that the cultural and biological variability observed throughout the New World is not necessarily related to a "founding" Clovis culture, but may instead be related to multiple migrations of distinct populations into the New World (Adovasio and Pedler 2004; Dixon 1999; Gruhn 1987; Schurr 2004; Stanford and Bradley 2002). In addition, this observed diversity might also be a consequence of cultural and/or physical isolation that occurred during colonization (Dixon 1999; Meltzer 2004).

Rather than viewing colonization as an event, it is more productive to conceptualize it as a process in which migration may only be the first step (Dillehay 2000; Dixon 1999; Meltzer 2002). For the purposes of this discussion, *Colonization* is defined as the process through which human groups migrate to, explore, and settle a given landscape or region. This definition is necessarily broad, and encompasses different analytical scales and a wide range of potential human behaviors. Adapting to new climatic and ecological conditions, transforming technologies to new requirements, and maintaining group viability and social ties are all equally important potential components of the process of colonizing a new landscape. Different strategies pursued by colonizing populations may produce profound cultural variability in the archaeological record—variability that may or may not be evident at different analytical scales.

Regionalization follows directly out of the colonization process and represents another potential source of variability within the Late Pleistocene-Early Holocene archaeological record. *Regionalization* is defined here as the process in which colonizing groups and their offspring, within a broadly delimited geographic region (such as the Great Plains in North America or the north coast of Perú in this study), begin to develop more intensive and/or specialized subsistence practices that are tailored to specific ecologies and/or environments. Regionalization is inter-related with colonization in that it initiates out of the exploration and settlement of new landscapes, but is a slower, more temporally and spatially confined process. Like colonization, regionalization may also have been disjointed and must be viewed as a process that involved strategic choices of individual groups. These choices may have involved changes in mobility and subsistence strategies, economic intensification, technological innovation and/or specialization, and perhaps eventually, increased territoriality (Bar-Yosef 1998; Bar-Yosef and Valla 1992; Beck and Jones 1997; Dillehay 2000; Henry 1985; Rocek and Bar-Yosef 1998). The process of regionalization provides a significant conceptual tool for understanding the diversity of cultural expressions that develop after the initial colonization of a new landscape, particularly at local and regional scales.

On the local level (such as individual sites, complexes of sites, or archaeological project areas—like the QBT study area in this project) the broad processes of colonization and localization are often represented by highly variable, sometimes contradictory, archaeological data. The different behaviors and strategies pursued during colonization and regionalization are often expressed by marked variability at the local level. *Localization* represents the process of regionalization at an even more spatially and temporally confined scale. Like regionalization, groups develop more intensive and/or specialized economic practices focused on local resource exploitation. Local economic intensification/specialization may be coupled with changes or innovations in technology—specifically with regard to the development or increased use of tools for local resource needs, experimentation with or adoption of previously unused resources, the construction of more durable domestic structures and features (possibly including site furniture, storage, and human burials), and/or increased numbers of associated sites and site types (Aldenderfer 1998; Anderson 1996; Bar-Yosef 1998; Bar-Yosef and Valla

1992; Binford 1980; Borrero 1996; Dillehay et al. 2009; Dillehay et al. 2003; Erlandson and Moss 1996; Henry 1989a, 1985; Kelly 1995; Sandweiss et al. 1998). Localized behaviors or adaptations such as these are often reflected by changes or alternations in the mobility patterns of individual groups (Binford 2001, 1980; Kelly 1992).

Worldwide, it is clear that the Late Pleistocene-Early Holocene period witnessed a broad diversity of early cultural adaptations. This diversity of adaptations and behaviors developed within the context of the broad peopling process and changing environmental conditions (Bar-Yosef and Valla 1992; Bettinger and Young 2004; Bonnichsen and Schneider 1999; Dillehay 2000; Ikawa-Smith 2004; Straus 1996). These diverse adaptations are reflected by local and regional variability in mobility, settlement, technology and economic strategies. Although the timing of initial peopling remains important, the cultural diversity present in the Late Pleistocene-Early Holocene archaeological record necessitates a conceptual approach that can incorporate local variability into higher scale (i.e., regional and continental) characterizations of the behaviors and adaptive strategies represented in the broad peopling process.

Modeling the Processes of Colonization, Regionalization, and Localization

As discussed above, the primary problem with modeling the broad peopling process is scale. As Beaton (1991) has noted, colonization is a continental process and must be conceptualized at an appropriate scale. Although it is possible to model human behavior on supra-regional scales (see Anderson and Gillam 2000; Bettinger and Young 2004; Surovell 2000), it is difficult to contextualize local and regional archaeological data and patterns (which are often limited and from widely separated sites) within continental-scale models (Beaton 1991; Dillehay 1997, 1989; Dixon 1999; Meltzer 2002). This problem highlights the need for an interpretative framework that conceptualizes and characterizes adaptive strategies and behaviors at different scales (i.e., continental, regional, and local) (Table 5.1).

Table 5.1 presents the general framework used in this study and the broad concepts/models that are employed at different analytical scales. The basic premise is that data from lower scales is interpreted with scale-appropriate models, which can then

Table 5.1. General framework of concepts and models by analytical scale.

Scale	Concept/Models	General Meaning
Continental	Various colonization models	Rapid or slow movement
Regional	Transient explorer-Estate settler model	Regional settlement process
Local	Residential-Logistical mobility model	Local organizational features

be used to inform higher scale modeling. The unifying theme across the different analytical scales is characterizing patterns of human movement. On the local scale, site type, inter-site spatial arrangements, technological, and subsistence data from sites or project areas (like the QBT in this study) can be used within the residential-logistical forager model (Binford 1980; Grove 2009; Kelly 1995, 1992) to characterize general organizational features and mobility patterns.

These patterns, in turn, can be used with (along with other data regarding subsistence, technology, and social organization) to characterize at the regional scale the different strategies that may have been employed by colonizing groups. The different potential regional strategies are drawn from a series of step-wise models of regional settlement and make use of Beaton's (1991) terminology (Beaton 1991; Dillehay 2000, 1997a; Dixon 1999). When compared with other regions, the different strategies identified at the regional-scale can be used to characterize very broad patterns of movement and the relative pace of continental settlement (i.e., continental-scale models).

Continental-scale statements are beyond the aim of this study. However, the data from the QBT study area and lower Jequetepeque Valley region are used to make interpretations of the local and regional scale mobility and organization of early groups that will inform our understanding of the broad peopling process. The models and concepts used in this general framework are discussed in the following sections.

Continental-Scale Models of Colonization

Several models addressing the colonization of the Americas at the continental-scale have been put forth (Anderson and Gillam 2000; Bettinger and Young 2004; Gruhn 1994; Haynes 2002; Kelly and Todd 1988; Martin 1973). In general, these models tend to characterize colonization as either rapid or slow processes and privilege specific entry routes (Bryan and Gruhn 2003; Dillehay 2000; Grayson 2004; Meltzer 2002). The first of these models to gain widespread acceptance was the 'Pleistocene overkill' model (Martin 1973, 1967; Mossiman and Martin 1975). This model combines the Pleistocene megafauna extinctions with the rapid spread of Clovis hunters. The hypothesis is that groups of specialized hunters (Clovis) who migrated into the New World encountered herds of megafauna that were unaccustomed to human predation. This situation is thought to have allowed the specialized Clovis hunters to spread throughout North America extremely rapidly (within 500 years) by focusing on a very limited set of high-yield resources that could be acquired in different ecological zones across the continent (Martin 1973; Mossiman and Martin 1975). Additionally, this wavelike spread is thought to have continued in South America, albeit with some changes in technology, within another 500-1000 years. As a result of this rapid expansion, overpredation is thought to have directly resulted in the Pleistocene extinction of more than 70 species of megafauna (Martin 1973, 1967).

The shortcomings of this model have been well documented (Dillehay 2000; Dixon 2001, 1999; Grayson 2001; Grayson and Meltzer 2002; Kelly and Todd 1988; Meltzer 2002, 1995; Stanford 1991; Whitley and Dorn 1993). Critiques of the 'Pleistocene overkill' model revolve around three general points: 1) the apparent convergence of the Pleistocene extinctions with the arrival of human colonists may not be accurate and other factors were likely involved in the Pleistocene extinctions (Elias 2002; Grayson and Meltzer 2002; Stanford 1991), 2) the earliest accepted evidence for the occupation of the New World comes from South America and not from Alaska, as the model contends (Dillehay 1997, 1989; Dixon 2001; Hamilton and Goebel 1999; Goebel et al. 1991; Meltzer et al. 1997) and 3) how human groups could effectively spread over two continents within 1000 years and maintain viable populations (Beaton 1991; Meltzer 1995; Whitley and Dorn 1993).

Kelly and Todd (1988) have presented an alternative model for rapid colonization of the New World that postulates rapid colonization as the byproduct of a subsistence and technological strategy exclusively focused on hunting. The authors suggest that the apparent similarities of Paleoindian fluted-point assemblages from across North America and a reliance on high quality lithic raw materials—which were often transported long distances from quarry sources—are indicative of a culturally homogeneous and highly mobile population (1988: 235-238). The model argues that Late Pleistocene environments were a complex mix of plant species and that animal populations were denser than modern day equivalents in similar environments (1988: 232-233). These environmental conditions are suggested to have encouraged colonizing groups to focus subsistence on hunting large terrestrial mammals (to the point of specialization) and to cope with resource stress by migrating to a new territory.

The central assumption of the model is that colonists in a new landscape have limited knowledge of available resources and regional geography. As a result it is more cost efficient to focus subsistence on hunting—and develop a specialized technology—than take the time to acquire the localized knowledge to effectively exploit plant resources at a level that will sustain the group. The advantage of becoming specialized hunters is reinforced by the ability to change territories to cope with reduction in game densities or resource depletion because the landscape is 'empty' of other human populations that might restrict movement. Thus, we should expect the initial colonists to have used various landscapes in a short-term and redundant pattern of exploration, hunting (which may produce kill sites), and abandonment (Kelly and Todd 1988: 235-240).

The model does account for the widespread and relatively rapid appearance of Clovis sites across North America and for the *apparent* technological similarities of Clovis and other fluted point lithic assemblages. However, several critiques can be leveled against these interpretations. First, the widespread similarity of fluted point traditions is more apparent than real. Multiple co-traditions with different fluting technologies, including Clovis, Gainey, Cumberland, and Great Basin Fluted, have been identified in North America within what was once though to be a monolithic Late Pleistocene technology (Bonnichsen and Turnmire 1999; Meltzer 2002; Ray 2003). Second, Kelly and Todd (1988: 235) suggest that the presence of fluting on Late Pleistocene projectile points (including both North and South America) is indicative of cultural relationships and continuity in lifestyle (redundancy from region to region). However, Politis (1991) has pointed out that the technological strategy of fluting between

North and South American projectile points (namely Clovis and Fishtail) varies markedly, represent distinct technological and cultural traditions, and argue strongly against inter-regional redundancy in subsistence and technological strategies. Differences in technological strategies related to fluting (direct vs. indirect percussion) have also been suggested between Clovis and other early North American points (e.g., Cumberland and Gainey) (Morrow 1995; Ray 2003), further arguing against technological redundancy.

A third critique of this model comes from the documented use of high-quality lithic raw material sources by Paleoindians. Kelly and Todd (1988: 235) suggest that rapidly moving Paleoindians would not have had time to learn the particular features and resources of a given landscape and would not have needed to do so, given their focus on hunting. Under their model, Paleoindian sites should reflect short-term and redundant use, and the unique features of a region that require more intimate knowledge should be relatively unused (ibid.). How then are we to account for the apparent fact that Paleoindians found and extensively used the highest-quality lithic outcrops in nearly every region they inhabited (Goodyear 1979; Meltzer 1985)? Stone outcrops are typically relatively small features in any given landscape and may have very limited geographic and geologic distributions (Church 1994; Luedtke 1992). It seems unreasonable to assume that highly mobile groups that occupy a territory for a short period of time would virtually always encounter the best available lithic raw materials. In contrast, this may instead suggest that Late Pleistocene groups had: 1) a more thorough knowledge of the landscapes they were occupying; or 2) that they were occupying territories for longer periods of time than accounted for by this model.

A final critique of Kelly and Todd's model is that it does not account for the diversity of Late Pleistocene assemblages and adaptations found in South America. The model suggests a redundant technological and subsistence strategy that is repeated in new territories and produces a "geographic continuity in lifestyle" (Kelly and Todd 1988: 235). Aside from the fact that the fluting technologies of North and South America represent distinct technological approaches (Politis 1991), the widespread presence of unifacial technologies (such as the Amotape and Pre-Vegas complexes) and the presence of projectile points styles unrelated to Clovis (like the Monte Verde, El Jobo, Fishtail, Paiján, and Ayampitin points) suggests that a technological continuity did not exist between North and South American populations. In fact, the technological discontinuity between different South American Late Pleistocene traditions alone speaks to a much more complex cultural diversity than the model proposes. The lack of technological and cultural continuity seriously undermines the applicability of this model for understanding the colonization of South America, let alone the entire New World.

Both Martin's (1973) overkill model and the variant presented by Kelly and Todd (1988) are built largely on attempts to understand what subsistence (and for Kelly and Todd, technological) strategies could have fostered a rapid settlement of North America. As the preceding discussion has illustrated, attempts to model continental colonization along one or two facets of an adaptational system (e.g., subsistence or technology) are rife with conceptual problems and contrary data. More recently, researchers have started to approach the problem of colonization with more complex and generalistic models that incorporate demographic and social factors, along with subsistence and technology, into step-wise characterizations of the specific behavioral choices and strategies that may be associated with migrations into open landscapes, and with somewhat less emphasis on identifying the timing and cultural origin of colonization (Anderson and Gillam 2000; Beaton 1991; Bettinger and Young 2004; Dillehay 2000; Dixon 1999; Young and Bettinger 1995).

Anderson and others (Anderson 1996; Anderson and Gillam 2000) put forth a least-cost pathway model of colonization primarily using the distribution and density of fluted points in North America, which is extrapolated to Central and South America. The model incorporates hypothetical demographic, range size, and migration distances to generate optimal migration corridors and provide estimations of the time frame involved in spreading across both North and South America (Anderson and Gillam 2000: 53-54). Anderson and Gillam (2000: 53-60) argue that early migrants may have followed either a "string of pearls" or "leap-frog" model of colonization. The "string of pearls" model implies relatively low mobility with short-distance movements and large foraging ranges—resulting in slow migrations. The "leap-frog" model, in contrast, implies relatively high mobility with long-distance relocations after social group fissioning and results in a relatively rapid migration (Anderson and Gillam 2000: 59-60).

The primary strength of the least-cost pathway modeling lies in the argument that the initial colonization of different regions could have occurred at different times. The "string of pearls" and "leap-frog" migration strategies could result in a disjointed and temporally variable colonization process. This model also implies that the wide variability in cultural expressions documented in the Late Pleistocene may be related to migrations into previously skipped or ignored regions by groups practicing different strategies. However, one significant problem with this conceptualization is the difficulty of relating local and regional variability (social, economic, mobility, and technological patterns) to the proposed continental-scale movement patterns.

Bettinger and Young (2004) offer a slightly different perspective on the process of colonization that involves a computer simulation of the spread of *Homo sapiens* from Africa (initiating ca. 50,000 years ago) throughout the rest of the world. The model assumes a simple logistic growth in population and random-walk diffusions of groups (Bettinger and Young 2004: 239). Random-walk migrations are assigned high rates of population growth and diffusion in low latitude environments, which results in rapid spread. High latitude environments are assigned low population growth and diffusion rates, with correspondingly slow rates of spread. However, horizontal movements (i.e., along similar latitudes) may be quick regardless of whether it is in a high or low latitude environment, based on *a priori* knowledge of those environmental zones. Under this simulation, modern humans arrive in Beringia by 16,700 B.P., occupy most of North America by 13,000 B.P., and have occupied all of the New World by 12,600 B.P. (2004: 241).

One of the most important features of this model is that it offers an explanation for why early colonizing groups are so difficult to identify archaeologically. The climatic fluctuations of the Pleistocene period are thought to have forced very low population levels and densities. Adaptation to specific environments would have been difficult; a situation that fostered "niche-chasing", very high mobility, and long-distance migrations (Bettinger and Young 2004: 246-247). High mobility, low population densities, and long-migrations result in ephemeral archaeological sites and assemblages, and a very low archaeological visibility. As the Pleistocene climate ameliorates after the LGM, resource abundance in the New World is thought to have increased, resulting in less necessity for high mobility and long-migrations. Population levels and densities begin to grow rapidly and colonizing populations become archaeologically visible, with larger sites and recognizable assemblages in multiple regions (Bettinger and Young 2004: 247-250).

A second important feature of the model is that it provides a potential explanation for different rates of movement and spread during colonization. As groups move across different environments at different latitudes their rate of movement and spread will vary. Higher latitudes will evince slower rates, while lower latitudes will witness much faster rates. In addition to latitudinal variation, movement and spread rates may also vary horizontally (longitudinally). As noted above, as a group adapts to environments at specific latitudes they may be able to move relatively quickly along that latitude, given similar environmental conditions and a lack of geologic barriers to movement. This scenario suggests that the movement and spread of humans throughout the New World will vary in pace and directionality.

However, there are some basic assumptions of this model that limit its general applicability (Meltzer 2004: 370-373). First, the model assumes that a single migration resulted in the populating of the New World, and does not account for the possibility of multiple migrations of different groups. Second, the model postulates that the migrating groups followed terrestrial mammals into the interior of the continents. A coastal migration scenario is discussed, but is discounted by the simulation (Bettinger and Young 2004: 244-245). Multiple migrations may have followed different routes of entry, a possibility that is not addressed by the model. Lastly, the timing of the Pleistocene climatic fluctuations and amelioration varied markedly on local and regional scales and would have resulted in very different rates of population growth and diffusion that may or may not have fostered "niche-chasing" and long-distance migrations.

Although each of these models provides a conceptual framework for the peopling of the New World, none adequately incorporate or explain the wide variability of Late Pleistocene-Early Holocene archaeological complexes that have been documented by local and regional studies throughout the Americas. The principle strength of continental-scale models is that they provide a range of scenarios for the movement into new landscapes. As noted earlier, movement is typically modeled as either relatively rapid or slow processes and is often difficult to apply to data from local and regional scales. In order to more accurately characterize the movement patterns associated with the peopling of the Americas we must use additional scale-specific models to generate lower-level interpretations that can inform our understanding of the continental-scale processes.

Step-wise Regional Models

Evidence for 'rapid' or 'slow' colonization of continents is typically derived from comparisons of regional data. Several models have been put forth that attempt to specifically consider the problems of characterizing different adaptive strategies that may have been employed as groups move into and begin to settle new regions—problems that are not easily considered at continental-scales (Beaton 1991; Dillehay 2000, 1997a; Dixon 1999). These problems include an explicit recognition of the possible presence of distinct adaptive strategies and contemporaneous/overlapping populations within a region. The models recognize that different groups may have pursued different strategies, or that individual groups may have alternated between different strategies depending on social and environmental circumstances in different regions or through time. Three of these 'step-wise' models are discussed below.

Beaton's (1991) model attempts to characterize the logic associated with colonization by characterizing the strategy of groups in new regions with regard to resource selection, patterns of mobility, and social ties. Beaton (1991: 220-222) hypothesizes that colonists likely did not enter a new landscape randomly, but may have ranked gross habitat types (termed megapatches)—like coasts, mountains, plains, forests, riverine valleys, deserts—and that the selection of these megapatches may have consequences for site location and direction of migration within a continent. The central suggestion is that groups entering an unknown landscape will rank and select gross habitats (not unlike the decisions associated with resource-ranking and selection in optimality models of diet breadth and patch choice [Bettinger 1987; Kelly 1995]) based on what they believe will have the greatest yield based on their available knowledge.

Couched within this larger logic of megapatch selection, Beaton (1991: 215-224) postulates two opposing types of colonizing strategies, the transient explorer and the estate settler. The transient explorer strategy implies very high mobility, few social ties, low fecundity, and a relatively high likelihood of extinction of newly fissioned groups. Under this strategy colonizing groups would fission at extremely low numbers (one adult man and woman), producing multiple groups of minimal-number reproductive groups. These new minimal-number groups would migrate long distances to new regions (either within a similar megapatch or into a new unexplored one) and would result in relatively rapid colonization of a continent (1991: 215). Archaeological sites produced by humans pursuing this strategy would be relatively ephemeral, possibly have very low archaeological visibility, and evince curated and redundant technological assemblages that reflect a narrow range of exploited resources.

In contrast to the transient explorer strategy is that of the estate settler where fissioning from the parent group occurs at a level of multiple individuals (multiple reproductively functional pairs). Newly fissioned groups would relocate short distances from the parent group within the same megapatch to maintain environmental familiarity and close social ties (Beaton 1991: 215). This type of strategy would result in a relatively slow rate of continental colonization, relatively high fecundity, low probability of extinction, and high social connectivity compared to the transient explorer strategy. The estate settler strategy could produce relatively visible archaeological signatures within a region. A variety of site types may be present, including basecamps and specialized extraction locations. Assemblages from these sites would likely contain a wide variety of formal and expedient tools that reflects a generalized foraging economy.

These dichotomized colonizing strategies imply markedly different social relationships, demographic dynamics, and behaviors that provide implications for understanding regional archaeological records of colonizing groups. For Beaton, transient explorers are represented by small groups with high mobility and extremely low population densities. Under this strategy we would expect to see a fairly narrow diet breadth emphasizing known (and probably high ranked) resources that are relatively predictable between regions. Estate settlers, in contrast, would have lower mobility and somewhat larger population densities, with higher growth rates (1991: 216-224).

Dixon (1999) has advanced a similar model for the migration into and settlement of new regions that emphasizes and expands Beaton's (1991) concept of the estate settler strategy. This expanded Estate settler model relies on two central conditions: 1) the carrying capacity of a regional environment; and 2) maintaining a viable breeding population through close social connectivity (Dixon 1999: 39-43). In general terms, the model suggests that colonizing populations (estate settlers) rise to a level that exceeds the local carrying capacity. Once the carrying capacity has been exceeded, portions of the population will fission and new groups will relocate in as similar an ecological area as possible near the parent group. Relocation near the parent group in a similar environment maximizes preexisting knowledge of regional resources and geography, and maintains a close social and physical distance for risk aversion and exchange of mates. As this new group grows and again reaches the carrying capacity of the newly settled area, fissioning will occur again and the process is repeated (1999: 39).

This model focuses on the maintenance of close cultural ties to the parent band and is driven by a presumed steady population growth. Because relocation of the splinter groups into nearby unoccupied territories ensures close social connectivity and maximizes environmental knowledge, the model could potentially explain relatively rapid settlement of regions (or even similar *megapatches*), but the overall pace of expansion would generally be relatively slow. However, Dixon (1999) hypothesizes that the colonization of the western coasts of North and South America represent the relatively rapid settlement of a single, large megapatch; followed by a somewhat slower secondary exploration and settlement of the near-coastal and mountainous environments that parallel and surround the western coasts. A tertiary colonization movement is represented by the extension of settlement around the eastern coastlines and penetration into the interior of both North and South America (Dixon 1999: 40-42). Under this model, settlement occurs at different rates within different gross environmental zones: rapidly along the western coasts, but slowly towards the interior and eastern portions of the continents.

Dillehay (2000, 1997a) has also put forth a step-wise model to explain the potential movements of colonizing populations. Dillehay (2000: 254-255) identifies four distinct patterns of movement that that colonizing groups may have followed within any given environment. These patterns include initial entry, opportunistic dispersion, migration, and colonization. Each of these movement patterns is representative of different rates of exploration and expansion. Initial entry and opportunistic dispersion likely will produce relatively ephemeral archaeological signatures, due to low population densities, high mobility, small sites, and a generalized technology. As groups begin to settle more permanently within a region and develop local adaptations different patterns emerge. Migration and colonization result in lower mobility, larger sites with a more varied technology that may indicate some specialization. Sites would also evince internal patterning and reflect a greater amount of activities within a given region, including possible functional differentiation; resulting in a more pronounced archaeological visibility.

Dillehay notes that the archaeological record within a given region "should ideally reflect a chronological sequence from entry to colonizing populations, with the population at each stage employing different types of adaptive mobility"(2000: 255). However, the sequence can (and likely will) vary from region to region given the social, economic, and technological organization of the colonizing groups (2000: 260-261). Three distinct types of group strategies are posited that would have resulted in different patterns of movement and organizing principles. In the first of these types, group organization would have focused more around specific sets of food resources (namely terrestrial mammals) and the relatively specialized technology (curated, bifacial projectile points) used for exploitation, than the type of environment. These groups would have been highly mobile and correlate with Beaton's (1991) transient explorers (Dillehay 2000: 256).

A second type of group is referred to as 'immigrants' (Dillehay 2000: 257). These groups moved from a previously occupied territory to a new destination and may have maintained loose territories (ibid.). Organization of the movement of these groups centered on specific habitat types and technologies, rather than specific sets of food resources, and may have been seasonal between different habitats. Immigrant groups developed fine-grained responses to their environment and likely exploited a wide range of plant and animal resources. Their technology should reflect this economic generalization and probably contained both unifaces and bifaces for use in collecting/processing resources from multiple habitats.

The final group corresponds with Beaton's (1991) estate settler strategy (Dillehay 2000: 258-259). Under this movement strategy, habitat and sets of food resources are more central organizing principles than technology. Estate settlers occupied large territories and have fairly limited mobility. Seasonal scheduling within a region involved the incorporation of a wide variety of resources and habitats into a generalized economy. Their technology is represented primarily by unifacial and expedient technologies, but likely also contains a curated bifacial component for specialized tasks (e.g., hunting, butchering) (ibid.).

Individual groups may have pursued each of these strategies at different times. One of the key points of this model that distinguishes it from other step-wise models is the explicit recognition that colonization likely was a disjointed process expressed through different sequences and rates of expansion in different regions (Dillehay 2000: 260). While some areas were witnessing initial entry and diffusion, other nearby regions may have been fully colonized. Two underlying processes are the elements driving the variable rate of colonization: 1) migrations of new populations into a continent or region; and 2) stem groups that fission from a parent group (Dillehay 2000, 1997a). The arrival of new populations could result in differential patterns because they may be organized differently from groups already exploring or occupying a region.

Fissioning of stem groups may also have produced variability in regional settlement. Stem groups may evince any of the four patterns of movement that were discussed previously and could have employed variable rates of expansion if they migrated into different environmental settings (e.g., open savannahs vs. forested wetlands) (Dillehay 1997a: 809-810). A stem group may also, at various times, reflect each of the three group strategies noted above, depending on the amount of knowledge they possess about a new landscape and the rate of expansion into that landscape. It is important to note, however, that the maintenance of social ties with the parent group is a crucial resource for social viability, regardless of the specific strategy of movement (1997a: 810).

In sum, the models discussed above provide more spatially and temporally restricted conceptualizations of the factors involved in exploring and settling a new landscape (Anderson and Gillam 2000; Beaton 1991; Bettinger and Young 2004; Dillehay 2000; Dixon 1999; Young and Bettinger 1995). They move our consideration of colonization and settlement away from uni-dimensional techno-economic models toward more comprehensive characterizations of the social, demographic, and behavioral choices that may have operated within a given region. Factors such as demography, landscape learning, social connectivity, social and economic viability, and open or closed social networks are considered equally with technological and economic strategies. Less emphasis is laid on the timing and cultural origin of populations and more of the discussion centers on the potentially variable rates and strategies of expansion. Although differing somewhat in definition and emphasis on specific strategies, when considered together these models provide: 1) explanations for variable rates of expansion and settlement; 2) explanations for potentially different cultural patterns at different scales—although specifically focused on regional scales; and 3) archaeological correlates for interpreting regional records of migration and settlement.

Key features from each of the step-wise models can be combined into a general model of regionalization. As colonizing groups migrate into and settle a new region different adaptive strategies and systems of organization may be employed. These strategies can be characterized using patterns of local- and regional-scale technology, subsistence, and mobility data that are interpreted along distinct continua. These continua can include 'formal and informal' technology, 'generalized and specialized' foragers, and 'residential and logistical' mobility, among others—each of which may be dependent upon separate data. The results of these separate continua allow us to characterize the different strategies that may have existed during the process of regionalization, which also is usually conceptualized along a continuum of possibilities (e.g., transient explorer-estate settler) (Beaton 1991; Dillehay 1997a; Dixon 1999).

Transient Explorer-Estate Settler Continuum

The transient explorer and estate settler strategies provide us with the ability to characterize some of the different behavioral choices and organizational features on regional scales. Specific behavioral choices can be interpreted from the settlement, economic, and technological organizational patterns of the local Late Pleistocene-Early Holocene period archaeological record. Individual characteristics of groups may fall anywhere along the continuum. However, the polar extremes of the continuum consist of generalized sets of social, economic, and technological organizational features that provide the archaeological correlates for modeling human behavior. Tables 5.2 and 5.3 present the archaeological correlates of the polar ends of the transient explorer-estate settler continuum.

The transient explorer strategy is characterized by groups with low population levels, residential organization, and long distance migrations (Table 5.2). As Dillehay (2000) suggests, the movement of these small groups is not focused on exploring specific types of environments, but more on acquiring sets of relatively predictable food resources. This may be analogous to Bettinger and Young's (2004) concept of niche-chasing, except that the specific niche is a limited set of resources and not a habitat. The technology associated with this strategy will reflect the focus on specific sets of food types and high mobility, and should consist of a relatively specialized toolkit that can be redundantly used in a variety of settings.

A transient explorer group, because of the constraints of high mobility and long-distance migrations, should maintain low population densities and growth rates as long as the strategy is pursued. The social organization of these groups is likely based on the nuclear family or smaller units that foster rapid dispersion. Beaton (1991) has suggested that these need not be reproductively viable groups. Rapidly dispersing groups like these

Table 5.2. Archaeological correlates of the Transient Explorer Strategy.

Transient Explorer characteristics	Archaeological correlates
High mobility and residential organization	Small sites; Ephemeral, short-term occupations; Site structure and function is redundant across and between regions.
Long-distance migrations	Site structure and function is redundant across and between regions; Prevalent use of non-local raw materials in tool manufacture; No evidence of territoriality.
Curated, formal technology	Formal, specialized tool forms; Evidence for tool maintenance and reworking; Prevalent use of non-local raw materials.
Semi-specialized subsistence	Faunal and/or floral remains will evince a narrow range of exploited resources.
Low social ties	Aggregation sites may be present; Artifact assemblages may contain 'foreign' tool styles.

Table 5.3. Archaeological correlates of the Estate Settler Strategy.

Estate Settler characteristics	**Archaeological correlates**
Low mobility and logistical organization	Large and small sites; Differentiated site types are present within a region; Evidence for longer duration occupations; Sites may contain permanent site furniture (domestic structure foundations, grinding slabs); Sites may contain internal spatial patterning and activity areas.
Short-distance migrations	Sites are located in similar habitats; May be evidence for territoriality (e.g., development of regional artifact styles, possibly rock art).
Informal expedient technology	Assemblages will consist primarily of informal flake tools; May contain some specialized tool forms (projectile points; groundstone implements); Tools are manufactured from locally available raw materials; Limited evidence for tool maintenance and reworking.
Generalized subsistence	Evidence for exploitation of a wide range of resources; Diverse faunal and floral remains; May contain evidence for seasonal exploitation of different species, or resource scheduling.
High social ties	Assemblages will typically not express 'foreign' tool styles, although evidence for inter-regional exchange networks may be present.

can be highly susceptible to failure in terms of social and economic viability, and probably mitigated these potential risks through flexible group membership and periodic back-migrations or occasional aggregations (with parent groups or other explorer groups) to exchange mates and collect information (Anderson and Gillam 2000; Beaton 1991; Dillehay 1997; Surovell 2000). However, social connectivity with other groups is, in general, very low.

The estate settler strategy represents the opposite end of the continuum. This strategy consists of residential organization, low mobility and slow expansion through relatively higher population levels and short distance migrations (Table 5.3). The movement of these groups is directed into familiar landscapes and maximizes pre-existing knowledge of the environment. Horizontal movement along latitudes, as suggested by Bettinger and Young (2004), would be more rapid than across latitudes. However, even rapid horizontal movement implies some pre-existing knowledge of the range of potential landscapes that are available within a given physiographic region; a knowledge that was likely not possessed by the first groups to enter a new continent, but would have been of central importance to regionalizing populations. Dixon (1999) and Beaton (1991) have addressed this problem by suggesting that estate settlers, in an unknown landscape, will choose to settle in environments that are most similar to those that they just left and presumably know best. Early migrants are thought to have directed their movements based on similarities in gross physical environments, termed *megapatches*. Megapatches consist of regions with similar climates, ecological zones, resource types and distributions, and broad physical features.

Under the estate settler strategy, movement is not organized around specific types of food resources, but rather on the slow exploration of regions and broad-based regional resource use. Estate settlers pursue a generalized economic strategy centered on the exploitation of a broad range of resources available within their territory, including terrestrial (and possibly marine or riverine) plants and animals (Beaton 1991; Dillehay 2000; Dixon 1999). Exploitation of individual species will likely vary with seasonal abundance and may result in resource scheduling (Dillehay 1997a).

Logistically organized mobility with short distance migrations should result relatively higher population densities and growth rates. The social organization of these groups is likely based on extended nuclear families, or perhaps several extended families. Extended family organization with relatively higher growth rates (due to low mobility) typically results in social fissioning when the carrying capacity of a territory has been exceeded (Anderson and Gillam 2000; Dixon 1999). Fissioned groups may consist of a single nuclear family or portions of an extended family unit. Once fissioning occurs, the new (bud) group will migrate to a location that mirrors the current habitat, and is as close to the parent group as possible (Dillehay 2000; Dixon 1999). Because of the short-distance migrations, the rate of expansion may be slow, and depends on the rate of population growth. As Dillehay (1997a: 810) notes, the two groups (parent and bud) may have overlapping or imbricated territories. Close social connectivity and physical distance is the hallmark of the estate settler strategy, which results in a relatively slow rate of dispersion of economic and socially viable populations (Beaton 1991).

It should be noted at this point that both transient explorers and estate settler groups form through fissioning of a parent group (Beaton 1991; Dillehay 1997a). The size of the bud group is not necessarily different for either strategy (see discussion of group size in Grove 2009: 228-231), but the amount of social connectivity between the bud and parent groups is markedly different, as may be the number and distance of moves for each group. Transient explorers maintain only the most limited social ties and periodically aggregate only to mitigate random demographic failure. Estate settlers, in contrast, will maintain close social ties with parent groups and/or other nearby bud groups to maximize information sharing and landscape knowledge.

The transient explorer and estate settler strategies are also respectively characterized by semi-specialized economies with curated, formal technologies, and generalized economies with predominantly expedient technologies. Assessments of forager economic organization in the archaeological record are primarily based on the specific kinds and frequencies of floral and faunal remains recovered, and the patterning of these remains at different types of sites (Binford 1990, 1983; Kelly 1995, 1992; Piperno and Pearsall 1998). A semi-specialized foraging economy will be reflected in the archaeological record by a relatively narrow range of floral and/or faunal species that indicates the repeated exploitation of certain kinds of resources (Kelly 1995, 1992; Kelly and Todd 1988). The 'narrowness' in the range of exploited species is produced by the amount of selectivity practiced within the overall range species variety that existed within a given environment.

This is akin to the concepts of diet breadth and resource ranking within forager optimality models (Bettinger 1991; Grove 2009; Kelly 1995; Winterhalder and Smith 1981). However, transient explorer groups—who are not territorially bounded—do not necessarily have to exploit lower ranked resources in the absence of more preferred species. Rather, they would likely seek out new territories. Thus, the narrow range of faunal and floral remains reflects an organizational strategy focused on specific sets of resources, and does not directly relate to local habitat abundance. As such, a similarly narrow range of exploited species (and specific types of species) should be reflected in the archaeological records at contemporaneous sites within and between regions.

In contrast, a generalized foraging economy can be inferred from the archaeological record when a wide range of exploited resources, including a diverse range of floral and faunal materials, is present. Species diversity in the archaeological record resulting from human selection and exploitation should reflect the relative diversity in the surrounding environment; this is because generalized foragers will attempt to exploit a greater range (and perhaps more intensively) of the total of species that are available. As noted above, the estate settler strategy will typically evince distinct site types within a given region (Table 5.3). The different types of sites may contain different patterns of resource exploitation (floral and faunal remains) that reflect specific task groups for the collection and/or processing of resources (Binford 1990, 1983; Morgan 2008). Floral and faunal remains may also show seasonality in exploitation (e.g., a specific species is only exploited during a certain time of year) (Piperno 1989; Piperno and Pearsall 1998). If distinct patterns in seasonal resource exploitation are present at different contemporaneous sites, then we may be able to infer a general pattern of resource scheduling (Flannery 1986; Halperin 1980).

Assessments of technological organization in the archaeological record of early foraging societies are largely drawn from the analysis of lithic materials, which are more durable (in terms of preservation) than other potential tool-making materials (e.g., wood, bone, ivory, shell). The organization of lithic production, the manufacturing process, the range of functional tool types, and discard patterns of different classes of lithic tools and debris, are key themes that are commonly used to characterize lithic technological organization (Andrefsky 1994; Bamforth 1986; Binford 1980, 1968; Bleed 1986; Bradbury and Carr 1999, 1995; Cowan 1999; Dibble 1997; Hayden 1981; Kelly 1988; Gould and Saggers 1985; Torrence 1989, 1983; Nelson 1991; Odell 2003; Prentiss 1998; Shott 1989, 1986; Sullivan and Rozen 1985).

The polar ends of the transient explorer-estate settler continuum are characterized by distinct technological organizations that can be generally divided by curation and expediency. Curation has been defined several ways that emphasize different scales of analysis from the level of the individual tool to the assemblage (Bamforth 1986; Binford

1979, 1973; Nash 1996; Odell 1996a). Here, curation is defined as the practice of manufacturing and maintaining formal tool forms for specific, anticipated future uses (Binford 1979; Odell 1996a). Thus, a technological strategy that emphasizes curation (i.e., transient explorers) will indicate an orientation toward manufacturing formal, long-life tools.

This orientation involves a reduction trajectory characterized by the production of bifacial implements and formal unifacial tools that serve multiple functional roles and should express conservation through maintenance and/or reworking (Bamforth 1986; Bleed 1986; Odell 1996b). The bifacial reduction trajectory will also produce tool blanks, performs, and failed bifaces (broken or discarded during manufacture), and may result in 'caching' or storage of blanks or finished tools (Nash 1996: 92). Because of anticipated long use-lives, and perhaps for reasons relating to ease of manufacture and/or resharpening, formal tools are often manufactured from high-grade raw materials (i.e., raw materials that express desirable flaking properties) (Binford 1979; Goodyear 1979; Meltzer 1985; Odell 2003; Shott 1989). These high-grade raw materials may be transported through exchange, or direct or embedded procurement, over long distances and result in the appearance of non-local "exotic" raw materials in site assemblages (Andrefsky 1994; Binford 1979; Ingbar 1994; Odell 2003).

In contrast, a technological strategy that does not emphasize curation (i.e., estate settlers) will indicate an orientation toward the production of informal, expedient tools. Expedient tool manufacture is typically characterized by the production of informal flake tools for situational and/or immediate use (Gruhn and Bryan 1998; Odell 2003). Distinct patterns of flake manufacture may be present in an expedient assemblage (Rossen 1998, 1991), but the general character of the assemblage should indicate the production of flakes (as the end product of lithic manufacture) for specific individual uses. Informal tools are typically discarded after their intended use is performed and will show virtually no maintenance/reworking and conservation (Rossen 1991; Sievert and Wise 1999; Stackelbeck 2008). Expedient tool assemblages also typically evince greater reliance on locally available raw materials that can be easily accessed, as needed, for tool manufacture. Relatively few to no non-local raw materials may be present in an expediently produced assemblage. Although dominated by flake tools, expedient assemblages may also contain a few specialized tool forms such as grinding stones or projectile points made on flakes that relate to specific subsistence activities.

A last potential correlate for distinguishing between the transient explorer and estate settler strategies in the archaeological record relates to the amount of social connectivity maintained between individual migrating/colonizing groups. Determining social ties from the archaeological record is exceedingly difficult due to the fact that social relations often do not produce direct material correlates (Binford 1990; Brooks and Yellen 1987; Gargett and Hayden 1991; Surovell 2000; Weissner 1983; Whitelaw 1983; Yellen 1977).

Relatively low social connectivity may be indicated on the regional or supra-regional scale by the presence of distinct tool styles. The development of regionally distinct tool styles may represent growing social distance between groups or perhaps the presence of distinct ethnicities (Meltzer 2002; Rick 1996; Tankersley 1998). Different tool styles found in association may indicate direct interaction between different groups, relocation of groups, or participation in some form of informal exchange (Jefferies 1997; Weissner 1983). This exchange may also involve resources that are not available in newly settled locations (e.g., specific plants, marine resources, or kinds of raw materials) (e.g., Dillehay 1997), or perhaps socially significant markers or curiosities that reinforce the close social ties (such as fossils, crystals, shells) (e.g., Chauchat 1998).

In sum, the transient explorer-estate settler continuum reflects distinct, idealized patterns that are indicative of different sets of behavioral choices and types of organization that provide a framework for understanding how the process of regionalization may have operated. The above discussion has provided several specific correlates for identifying and interpreting these distinct patterns within the archaeological record focusing on residential-logistical mobility patterns, subsistence, and technological data derived from local and regional studies. Because regional colonizing strategies represent idealized patterns on opposite ends of a continuum, it is reasonable to assume that no archaeologically identified culture will perfectly correlate with all characteristics of a specific strategy. It is more likely that groups may alternate between different strategies, depending on social or environmental conditions, group size, or random events (Dillehay 2000, 1997a). It is also probable that other strategies exist along this continuum, and may be characterized by aspects from both of the polar endpoints. Dillehay's (2000) 'Immigrant' strategy provides one example, and combines aspects of both transient explorers and estate settlers.

Modeling Localization through Mobility Strategies

Localization represents the process of regionalization at an even more spatially and temporally confined scale. Localized behaviors or adaptations are often reflected in the archaeological record by changes or alternations in the mobility patterns of individual groups (Binford 2001, 1980; Kelly 1992). One way to interpret the results of survey, excavation, materials analyses, and site type data from the local level is to reconstruct patterns of mobility and settlement organization using the well known residential-logistical continuum model originated by Binford (1990, 1983, 1980) and refined or augmented by others (Anderson 1996; Anderson and Hanson 1988; Grove 2009; Kelly 1995, 1992; Kent 1992; Morgan 2008; Surovell 2000).

In general, the residential-logistical model attempts to characterize variability in the organization of movement of foraging groups using the spatial pattern, internal structure, and types of sites present within a defined area or region (Binford 1980). Residential organization involves the movement of consumers to desired resources through the repeated relocation of central place camps (Binford 1980; Kelly 1995). Logistical organization, in contrast, involves the movement of resources to consumers through the task-oriented or special purpose groups originating from and returning to a central place (Binford 1980; Kelly 1995). It is necessary to view these two organizational systems as polar endpoints of a continuum on which individual groups may simultaneously display aspects of both systems.

Residential organization typically involves relatively frequent moves and high mobility. Relocations are often scheduled to coincide with seasonal availability of specific resources during the yearly round (Kelly 1995; Grove 2009; Morgan 2008). Relatively high mobility and frequent moves are represented in the archaeological record by generally small sites with ephemeral, short-term occupations (Binford 1980, 1977; Kelly 1992, 1983; Kent and Vierich 1989) (Table 5.4). Small sites can be produced by activities other than high mobility (Binford 2001, 1987, 1983). However, if the structure (i.e., site size and the spatial arrangement of deposited or constructed cultural materials [*sensu* Binford 1983: 144; Kent 1991: 34-35) and function of contemporaneous sites is broadly redundant throughout a localized area or across a region, we may infer a mobility strategy that entailed frequent moves designed to position the site residents in proximity to desired resources (Binford 1980, 1978; Grove 2009; Kelly 1995, 1992; Kent 1991; Morgan 2008). Table 5.4 describes the archaeological correlates of a residentially organized system.

Logistical organization, in contrast, involves relatively low mobility and fewer central place relocations (Binford 1980; Kelly 1995; Grove 2009) (Table 5.5). Logistical organization may involve relatively large foraging radii and/or territories and will evince distinct types of sites, including central places (or basecamps) and special-purpose or task-oriented activity sites. In the archaeological record, low mobility can be inferred from larger sites containing evidence of longer duration occupation (Binford 1990; 1977; Hitchcock 1987; Kelly 1992; Kent and Vierich 1989). Site size and structure may vary according the activities performed at individual locations within a region (particularly among special purpose or task-oriented sites), and result in the manifestation of distinct site types and patterns of types (Bar-Yosef 2002; Bar-Yosef and Valla 1992; Binford 1980; Gamble 2000, 1986; Kelly 1992; Lourandos 1997).

Table 5.4. Characteristics and correlates of forager residential mobility.

Residential Organization	**Archaeological correlates**
Relatively high mobility	Short-term occupations; limited midden accumulation; general absence of domestic structures and/or site furniture.
More frequent and longer distances between moves	Central place locations are relatively evenly spaced across the landscape (given local conditions); often display palimpsest deposits from reuse of landforms; little formal or regularized intra-site spatial organization; may result in relatively high numbers of sites within a foraging territory.
Limited differentiation in site function	Intersite structure is redundant; sites express similarity in size, location, and functionality (site type).

Table 5.5. Characteristics and correlates of forager logistical mobility.

Logistical Organization	Archaeological correlates
Relatively low mobility	Short- and long-term occupations; sites may contain substantial midden deposits; sites may contain permanent site furniture (domestic structure foundations, grinding slabs; storage features).
Short-distance migrations with fewer moves	Central place locations are often located in similar habitats that provide access to a wide range of resources; generally fewer central place sites, but the overall number of sites (all types) may be relatively high; may be evidence for territoriality (e.g., development of regional artifact styles, possibly rock art).
Functional differentiation between sites	Intersite structure may be highly varied; contemporaneous sites with clear functional differences are present (multiple types); sites may contain internal spatial patterning and activity areas, particularly central place locations.

Within a logistically-organized system, individual sites may display patterned uses of space related to the performance of specific activities (individual activity areas and/or features [such as hearths and pits]), anticipated future uses of those sites (e.g., investment in the construction of more permanent domestic structures and site furniture), and/or differences in the composition of the group who utilized or resided at a given site (e.g., specialized task groups vs. entire group) (Bar-Yosef 2002; Binford 1990, 1980; Brooks and Yellen 1987; Gargett and Hayden 1991; Grove 2009; Hitchcock 1987; Kent 1991; Kent and Vierich 1989; O'Connell 1987; Testart 1992; Whitelaw 1983; Yellen 1977). Low mobility can be correlated with short-distance migrations when similar types of sites (e.g., basecamps) are located in similar habitats, suggesting that key locations across a landscape are serially targeted (Binford 1980; Kelly 1995; Grove 2009). The presence of distinct, yet contemporaneous, site types within a geographically restricted region may indicate some form of tethered mobility or incipient territoriality (Binford 1990, 1980; Kelly 1995).

Residential and logistical mobility represent different strategies for adapting to environmental vagaries and the spatial and temporal variability of resources. Although focused on mobility, both of these organizational systems also are important strategies for maintaining social networks and information gathering, as well as influencing the fluidity of group membership, interaction, and land tenure (Binford 2001, 1980; Dillehay 1997a; Grove 2008; Kelly 1995; Morgan 2009). Different organizational systems may also structure technological organization and stylistic representation (Binford 1980; Wiessner 1983).

One problem with the residential-logistical organization model is the difficulty in characterizing settlement organization from sites or areas in which multiple different groups may have resided. Across the Americas, the Late Pleistocene-Early Holocene period was witness to a proliferation of cultural diversity (Bar-Yosef and Valla 1992; Bonnichsen and Schneider 1999; Dillehay 2000; Ikawa-Smith 2004; Straus 1996) and indicates the frequent presence of different groups in the same regions. This is similarly true for the QBT study area, where the overlapping/contemporary Fishtail and Paiján complexes, and possibly others, occupied the region.

Identifying the mobility patterns and reconstructing the settlement organization for each of these different early groups requires an expanded method for discriminating complex-specific deposits, determining which sites and types of sites were contemporaneous, and characterizing how the mobility strategies of different groups may influence or reflect interaction and/or competition. This can be especially difficult in situations where distinct organizational systems (both residential and logistical) operated in the same region—resulting in a multiplicity of site types that potentially relate to different groups. In this study, contemporaneity is established among groups of sites and site deposits through detailed and comparative analysis of diagnostic artifacts (particularly lithic tools and domestic structures), intra-site spatial patterns, and AMS dating for chronological control.

Conclusion

This chapter has reviewed the major theoretical and archaeological developments that have led to our current understanding of the process of colonization in the New World. The critique and rejection of the traditional model has provided an opportunity to reevaluate the broad diversity of adaptations observable in the Late Pleistocene-Early

Holocene archaeological record, particularly in South America, and begin to consider how this diversity can better inform our understanding of the peopling process on continental, regional, and local scales.

It is argued that colonization, regionalization, and localization are inter-related within the broad peopling process and not mutually exclusive directional trends. It is recognized that each of these separate processes are likely spatially and temporally disjointed and difficult to model even at continental scales. Virtually all Late Pleistocene-Early Holocene archaeological data comes in the form of individual cases (sites) with local or (less often) regional interpretations. Because of this, the ability to link local data with regional and continental processes requires a framework with intervening analytical units that can be used to conceptualize lower-scale data and contextualize those interpretations within higher-scale patterns and models.

The specific framework used in this study is focused on changing patterns of movement from the local to continental level. At the lowest level, localization is characterized by changes in mobility patterns and settlement organization using a modified version of the forager residential-logistical organization continuum. The patterns identified at the local level are used, along with other data, to make inferences about the strategies and behaviors involved the broader process of regionalization. Drawing heavily from several step-wise models, it is proposed that the transient explorer and estate settler strategies occupy polar extremes on a continuum of potential strategic choices. Either end of the continuum is represented by idealized sets of interrelated behaviors that can be characterized only by first assessing the local settlement and technological organizational patterns. The specific archaeological correlates for each of the continuum poles have been discussed and provide a significant tool for better understanding the migration into and settlement of new regions.

The regional transient explorer-estate settler strategies, especially when compared with other regions, can be used to model continental-scale patterns of movement. Several continental-scale models of colonization have been reviewed. In general, these models revolve around a theme of ‘rapid’ or ‘slow’ migration. Because the local (residential-logistical mobility) and regional (transient explorer-estate settler strategies) data utilize concepts designed to elucidate patterns of movement (along with other organizational features), these data are uniquely suited to address continental-scale questions regarding the relative pace of colonization.

The framework used in this study, because of its implicit recognition that the peopling of the Americas was not a uniform process, is specifically aimed at identifying variability on the local and regional levels that may have resulted from the presence of different early groups or complexes. Distinct concept/models are used to interpret data from separate analytical scales in an attempt to discriminate those patterns or behaviors that may represent aspects of colonization, or are more closely related to 'settling in' process (regionalization and localization). It is anticipated that the data from the QBT can be used (along with the results of other regional studies) to better understand the local and regional strategies pursued during the settlement of South America and provide insights into how the peopling of the New World may have unfolded.

CHAPTER SIX

SURVEY RESULTS AND EARLY PRECERAMIC SITE TYPES

Introduction

This chapter presents the results of the systematic regional survey of the Quebradas del Batán and Talambo that was conducted by the author as a subproject of the larger Proyecto Pacasmayo. The Proyecto Pacasmayo, directed by Tom Dillehay and Alan Kolata, has undertaken a multi-year survey and investigation of the entire lower Jequetepeque valley (Dillehay and Kolata 2000, 1999; Dillehay et al. 2009). This project, to date, has resulted in the identification of more than 1000 Preceramic, Ceramic, and Hispanic period archaeological sites that span from the earliest hunter-gatherers through the colonial period.

One of the important results of the Proyecto Pacasmayo has been to document the changing nature of the prehistoric occupation of the lower Jequetepeque Valley over time (Dillehay et al. 2009; Dillehay et al. 2004b). Although the lower valley has been continually occupied since the Late Pleistocene (ca. 11,500 B.P.) specific settings, landforms, and locations within the lower valley, such as the valley floor, coastline, low hillslopes, pampas, and quebradas, have witness changes in settlement and site location, land use patterns, and density of occupation at different times by different populations. With respect to the vast Preceramic period (ca. 11,500-4,000 B.P.), this large database of sites provides a relatively unique opportunity to examine changing patterns of settlement and site location, socio-economic and technological organization, and long-term trends of increasing regionalization throughout the Early, Middle, and Late Preceramic periods. Of particular importance for this study are the patterns associated with the Early Preceramic Fishtail and Paiján and possibly other complexes.

We can gain insight into the variability that may be present among the Early Preceramic sites of the QBT through comparisons with other datasets of early sites in nearby regions, particularly the Zaña Valley and Chicama/Cupisnique region. Previous studies in these nearby areas, along with others, provide an opportunity to examine which characteristics are useful in discriminating between sites of different types. They also allow us to document the known range of early sites types and identify correlates of those types. From these comparisons we can create a broad picture of the *potential* types of sites that may be represented in the Early Preceramic QBT.

Identifying sites to specific types, however, will also require incorporation of subsistence, lithic toolkit, mobility, and temporal data from other analyses and will form the basis of later discussions (Chapter Nine). The identification of distinct site types will allow us to characterize Early Preceramic settlement patterns and how they may have changed over time. If distinct settlement patterns can be discerned for the different early complexes that occupied the QBT we will gain much needed insight regarding the migration into and settlement of the region.

Documenting the Early Preceramic Occupations of Northern Coastal Perú

Large-scale, regional surveys have a long and important history in attempts to understand diachronic change within the Preceramic periods of coastal Perú (Dillehay 2000; Lavallée 2000; Willey 1953). The use of survey data as a building block in regional-scale interpretations of coastal Preceramic populations was first comprehensively articulated by Frédéric Engel and Edward Lanning in the Central and Northern Coasts of Perú (Engel 1957; Lanning 1963, 1965, 1967; Lanning and Hammel 1961). These investigations focused on the Central Coast *lomas* (seasonal fog oasis on the slopes of low hills) and associated ecological zones and led to the first regional-scale interpretations of Preceramic settlement, economic, and technological systems (Lanning 1963; Lanning and Patterson 1967; Patterson 1966; Patterson and Lanning 1964). Although some of the results from these studies have later been criticized or expanded (Chauchat et al. 2006; Fung Pineda et. al. 1972; Lynch 1974; Parsons 1970), they established early chronologies of the Preceramic period and served to set the tone for future research of Preceramic societies in the Central Andes.

Early Preceramic Sites on the North Coast

A detailed review of the various Early Preceramic complexes identified in Perú and in nearby regions was presented in Chapter Four of this document. Rather than presenting this material again, this section focuses on the variability present in the locations and types of Early Preceramic sites that have been reported from previous surveys on the north coast and in the coastal foothills. The aim of this discussion is to more specifically elucidate the range of site types that have been previously identified and to assess common patterns, or lack thereof, in site location or setting. The information drawn from these comparisons can then be used to define the range of different Early Preceramic site types that may exist within the QBT region and provide characteristics for assessing those differences.

Pampa del los Fósiles and the Chicama/Cupisnique Region

The first recorded Early Preceramic sites on the North Coast came from the broad *Pampa de los Fósiles*, which is located on the coastal plain between the Chicama and Jequetepeque Valleys (Bird 1948; Larco Hoyle 1948). This region contains several dry, shallow Pleistocene lakes and fossilized Pleistocene fauna. Although limited specific data was reported for individual sites, they were generally characterized as small campsites that consisted of surface lithic scatters that frequently contained Paiján projectile points and lithic debris (Larco Hoyle 1948: 11-12). These sites and the fossilized Pleistocene fauna were found around the margins of the dry lakes led to speculations that the lithic scatters and the extinct fauna were associated and temporally coeval and represented hunting locations (Bird 1948: 27).

Since these early reports, our understanding of the Early Preceramic sites in the *Pampa de los Fósiles* and Chicama Valley regions has been greatly expanded by the work of Claude Chauchat and others (Becerra 1999; Becerra and Esquerre 1992; Briceño 2004, 1999, 1997, 1995; Chauchat 1998, 1988, 1975; Chauchat et al. 2006; Chauchat et al. 2004; Gálvez 2004, 1999, 1992). Chauchat (1998) has investigated several sites in the *Pampa de los Fósiles* area and conducted a large regional survey of the nearby Quebrada de Cupisnique and parts of the northern margin of the Chicama Valley. These surveys resulted in the identification of 196 sites that have been attributed to Early Preceramic occupations. Both Fishtail (n=2) and Paiján (n=196) deposits have been identified at these sites, although each site containing Fishtail projectile points also contained Paiján materials.

These Early Preceramic sites are located on a variety of landforms that include the paleo-lakeshore margins in the *Pampa de los Fósiles*, low alluvial terraces along the bases of *cerros* (hills) that overlook the *pampas*, alluvial terraces near that overlook the Chicama Valley, hillslopes within quebradas, small rockshelters, and high terraces within quebradas that penetrate the western foothills of the Andes. In general, Paiján sites were found throughout the Cupisnique/Chicama region and are located on all types of landforms noted above. Fishtail sites, in contrast, were far less numerous and were exclusively located on high terraces within the Quebrada Santa Maria (Chauchat 1988; Briceño 1999, 1997, 1995). Briceño (2004, 1997) has suggested that the location of these sites on high terraces is tied to the proximity of ancient springs (now inactive) as water sources.

Aside from the variability in landform settings, Paiján sites identified in the Cupisnique/Chicama region also vary in terms of size and types of activities represented. Although individual site measurements are not available, site sizes range from very small lithic scatters to extremely large palimpsests that contain evidence of multiple activity areas and distinct individual occupations (Chauchat 1998: 21-154). The largest sites appear to be predominantly located on and around terraces at the base of *cerros* that overlook the pampas and coastal plain, or terraces that are situated near the mouths or intersections of side quebradas (Chauchat 1998: 13-20; Gálvez 1999: 44-49). Small sites are noted throughout the region from higher elevation quebradas within the foothills and associated hillslopes to open locations on the coastal plain.

Several types of distinct activities were also recorded for the different Early Preceramic sites in Cupisnique/Chicama region, including individual campsites, multiple campsites, land snail (*Scutalus* sp.) middens, middens that contained a variety of terrestrial and marine fauna, lithic knapping stations (*talleres*), lithic quarries (*canteras*), grinding stones (*manos*) and slabs (*batanes*), concentrations of specific lithic tool forms, stone-lined, circular domestic structures, rock art, and human burials (Becerra 1999; Chauchat 1998; Chauchat et al. 2006; Gálvez 1999; Gálvez et. al. 1993). In general, the largest sites contain the widest amount of variability in activities and are usually associated with domestic structures, although some smaller sites also contain evidence of multiple different activities. Most of the smaller sites, however, contain evidence of only one or two distinct activities (usually lithic knapping stations and/or land snail middens) (Chauchat 1998, 1988; Chauchat et al. 2006).

Specific patterns of settlement for the Early Preceramic Fishtail and Paiján sites have not been discussed in great detail for the Cupisnique/Chicama region. Although Fishtail sites are apparently limited to higher elevation locations deep within *quebradas*, Paiján occupations are primarily focused on lower elevation terraces (below 1000 m.a.s.l.) in *quebradas* and on *pampas* that border the western margin of the Andean foothills (Briceño 1999: 21-26; Chauchat 1998; Chauchat et al. 2006). Although a few Paiján sites at higher elevations (ca. 1500-2000 m.a.s.l.) were noted (Chauchat 1998: 113-115, 127, 156). No Paiján sites were found along the Pacific shoreline or within the immediate coastal plain (5-8 km from the modern shoreline) (Chauchat 1998: 156-157). This pattern has led Chauchat (1998: 157) and Gálvez (1999: 45) to suggest that the density of Paiján sites in the interior indicates the importance of the *quebradas* as locations for accessing varied and abundant plant, animal, and water resources.

Moche Valley

Directly to the south of the Chicama valley, regional survey of parts of the Moche valley also resulted in the identification of Early Preceramic sites (Ossa 1978, 1976, 1973; Ossa and Moseley 1972). Several Paiján sites were located in a side quebrada (Quebrada de Quirihuac) that drains into the larger Moche Valley. The majority of these sites were located in open-air settings situated on alluvial terraces that contained a surface scatters of Paiján points, bifaces, unifacial tools (limaces and scrapers), and lithic debris (Ossa 1973). Most of these sites appear to indicate relatively short-term or limited occupations; however two sites (Quirihuac Shelter and La Cumbre) did suggest repeated visits or longer, seasonal occupations and contained subsurface cultural deposits (Ossa 1978: 290-293). Quirihuac Shelter consists of shallow cultural deposits located around the base of a large boulder that is situated on a low hillslope that overlooks the quebrada floor (ca. 400 m.a.s.l.). La Cumbre, in contrast, is an open-air setting in a side quebrada that drains into the Moche Valley. Cultural materials from Quirihuac consisted of a small lithic assemblage that included Paiján points, biface fragments, lithic debris, and a large quantity of land snails. In addition, two human burials were also found in the shelter deposits. Although they are much more dense, the cultural materials from La Cumbre are similar to those from Quirihuac Shelter, with the exception of the recovery of a fragment of a fluted projectile point (most likely a fragment of a Fishtail point [Chauchat 1988]) (Ossa 1978; Ossa and Moseley 1972).

The Early Preceramic sites from the Moche Valley region correspond well with the patterns observed in the Cupisnique/Chicama region. Site locations are focused on terraces within the low elevation quebradas and range in size from small surface scatters to large, very dense sites. Like the sites in the Cupisnique/Chicama region, the smaller sites in the Moche Valley typically represent one or very few specific activities (predominantly lithic reduction). In contrast, the larger, more dense sites—like La Cumbre—are suggestive of multiple or longer-term occupations and include evidence for several different kinds of activities, such as lithic reduction, land snail collection, and human burial.

Casma Valley

Farther to the south, in the lower Casma Valley, previous research has documented a series of Preceramic sites that include Early Preceramic Paiján sites, Middle Preceramic Mongoncillo sites, and a few Late Preceramic sites (Malpass 1983; Uceda 1992). All of these sites are open-air settings situated on the *pampas* that flank coastal *cerros*, on coastal *lomas*, or around the margins of coastal quebradas. Of particular interest is the Campanario site, which is a large Paiján site located on the coastal plain less than two kilometers south of the Bay of Casma and approximately 300-400 m from the modern Pacific coast (approximately 5-10 km from the Early Holocene shoreline) (Malpass 1983: 16, 139-141). This site consisted of a large, surface lithic scatter that contained more than 60 Paiján projectile points and numerous other tools, including denticulates and utilized flakes (Malpass 1983: 205). Malpass suggests that the Campanario site functioned as a projectile point finishing and rehafting station (Malpass 1983: 140).

Although the location of this site is unusual, its proximity to the modern shoreline is somewhat misleading. During the Early Holocene, the Campanario site would have been situated roughly in the middle of the coastal plain. The site appears to represent a location for hunting modern fauna and, perhaps, collecting shellfish from the not-too-distant coast. It does not appear, however, to represent a coastal- or marine-oriented

Paiján site. Campanario is distinct from other Paiján sites recorded on the north coast in its proximity to the modern shoreline, but appears to be similar in size, activities, and location to the few Paiján sites recorded on the coastal plain by Chauchat (1998) in the Cupisnique/Chicama region and does not clearly represent a deviation from the previously discussed pattern of Paiján site locations.

Zaña Valley and Nanchoc Lithic Tradition Sites

Directly to the north of the Jequetepeque Valley, Dillehay and others (Dillehay and Netherly 1983; Dillehay et al. 1997; Dillehay et al. 1989; Dillehay and Rossen 2002; Rossen 1998, 1991; Rossen and Dillehay 1999) have conducted more than 30 years of research on Preceramic (and later) period sites in the Zaña Valley. The principle focus of this research has centered on more than 50 Late Early and Middle Preceramic sites, including both residential locations and a large, non-residential site (Cementerío de Nanchoc site) (Dillehay et al. 1989: 747), that are located in the Río Nanchoc branch of the upper-middle Zaña Valley. Generally, these sites range in age from ca. 8500-5000 B.P., although a few sites that pre-date 9,000 B.P. have been identified, and are situated on terraces and flat hill spurs within and overlooking large and small quebradas (Dillehay et al. 1997). The location of these sites in the quebradas of the upper valley afford access to a wide range of resource zones, including tropical and thorn forests, valley floors, and semi-arid to arid grasslands (Dillehay et al. 1989; Rossen 1991). The smaller residential sites are typically located 1.5-3.5 km away from and 20-100 m above the Nanchoc Valley floor (Dillehay et al. 1989; Rossen 1991). These sites are generally small (ca. 1200 m^2) and characterized by relatively shallow domestic midden deposits that have yielded the adobe and stone foundations of elliptical and rectangular domestic structures, human burials (primary and secondary), non-local materials (exotic stone and marine shell), and a suite of early cultigens (squash, peanuts, quinoa, and cotton)(Dillehay and Netherly 1983; Dillehay et al. 1997; Dillehay et al. 1989; Dillehay and Rossen 2002, 2001; Piperno and Dillehay 2008; Rossen 1991; Rossen et al. 1996).

The non-residential Cementerío de Nanchoc site consists of two low, earthen mounds that are bounded by a series of aligned stones that mark the edge of the mounds. The site is located on an alluvial fan that overlooks the confluence of the Nanchoc Valley with several smaller quebradas and appears to have been most intensively used between 8000-6000 B.P., with intermittent use after 6000 B.P. that persists until 5000-4000 B.P. (Dillehay et al. 1989: 746). Testing at the Cementerío de Nanchoc site has yielded little to no domestic refuse, features, or structures (outside of those associated with the mounds) and the site has been interpreted as a location of specialized non-domestic production (probably of lime) (Dillehay et al. 1989: 737–746). The Cementerío de Nanchoc site and the associated residential sites appear to represent a dispersed set of interrelated, semi-sedentary to sedentary households that likely were linked through shared communal space, productive activities, and rituals that occurred on or near the mounds (Dillehay et al. 1997; Dillehay et al. 1989; Rossen 1991; Rossen and Dillehay 1999). This pattern of dispersed, yet locally permanent, settlement (which dates at least to 8,000 B.P.) provides us with important comparison of architectural and organizational features from ca. 10,000 B.P. into the Middle Preceramic period. Some of the important features of the Nanchoc settlement pattern—dispersed households, temporal changes in structure form, situating of sites on alluvial terraces in lateral quebradas, access to multiple resource zones, and use of early cultigens—may have originated in the Late Early Preceramic period and could provide insight into the poorly understood Late Early/Middle Preceramic transition (Dillehay et al. 2003; Stackelbeck 2008).

Amotape and Siches Sites

Farther to the north (north of the Sechura Desert), Richardson has identified a series of Early and Middle Preceramic sites in the Talara region of coastal Perú known respectively as the Amotape and Siches complexes (Richardson 1983, 1978, 1973). The Early Preceramic Amotape sites are located on outwash ridges near the Talara tar seeps and on tectonically elevated, Pleistocene coastlines (known as *tablazos*). These *tablazos* are approximately 50 m above modern seal level and are located 8 km from the modern shoreline (Richardson 1983: 146-147). The Amotape complex (ca. 11,200-8125 B.P.) is represented by a series (n=10) of very small campsites (ca. 5 m in diameter average) that overlook the tar seeps (Richardson 1978: 274-276). Mangrove mollusks are present on the surface of these sites and indicate early exploitation of coastal resources and shellfish. These sites would have been located approximately 16 km from the Pleistocene shoreline and they appear to represent brief use by small groups of hunters as part of a larger seasonal round that included the coastal mangrove swamps/estuaries and interior coastal plains (Richardson 1983: 147). Richardson (1978: 285) hypothesized that the small hunting sites may have been deposited by groups originating from larger basecamps located in nearby *quebradas* or river drainages. Although these larger sites have not been documented, it does seem highly unlikely that the ten known small Amotape sites comprise a complete and functional settlement system. This suggests that other sites must have existed farther within the interior or along the Pleistocene coastline, or both.

The Siches sites (ca. 8,000-6,000 B.P.) are larger and contain denser middens of mangrove mollusk than the earlier Amotape sites (Richardson 1983, 1978). The Siches sites are located exclusively on the raised Pleistocene *tablazos* and would have been closer to (approximately 5 km) the Holocene shoreline (Richardson 1983: 147). These sites also indicate more extensive exploitation of both the coastal mangrove and littoral resources. Like the earlier Amotape sites, the lithics from the Siches sites contain no formal tools and are characterized by expedient denticulates and utilized flakes.

The Amotape, Siches, and Nanchoc sites, which are characterized by relatively simple unifacial and expedient flake tools, provide an important reminder that the archaeological record of the Early Preceramic may be more complex than it appears—particularly in those regions where formal bifacial technologies are found (particularly Fishtail and Paiján). The presence of bifaces and other formal tool forms can mask assemblages produced by informal or expedient technologies. There is a tendency in regions with well known bifacial traditions to 'lump' or subsume all lithics within the known categories (Chauchat 1998; Chauchat et al. 2004). We know that many of these early complexes were contemporary, or overlapping, both temporally and geographically (Dillehay 2000; Lavallée 2000) and must consider the possibility that any Early Preceramic site or assemblage may represent the activity of more than one complex. In spite of this fact, examining Early Preceramic sites from across the north coast can provide insight regarding general characteristics (particularly related to patterns of landform use and site size) that may be useful in discriminating between individual site types.

Summary of Early Preceramic Site Variability

The data from the Talara and Casma regions clearly demonstrate that understanding the types of landforms on which specific sites are located is essential for determining changing settlement over time (Malpass 1983; Richardson 1978). However, locational variability may also be important for understanding contemporaneous, yet distinct, activities and uses within a specific region or at individual sites, as is indicated by the wide variability in site locations reported by Chauchat (1998) in the Cupisnique/Chicama region and the different functional roles and locations of sites in the Zaña/Nanchoc (residential vs. public/non-domestic production) (Dillehay et al. 1997; Dillehay et al. 1989; Rossen 1991; Rossen and Dillehay 1999). The Fishtail, and more specifically the Paiján, sites recorded in the Cupisnique/Chicama, Moche, and Casma also suggest that the density of surface artifacts and the types and amounts of activities that were pursued at individual sites can also vary markedly between different sites and may relate to changing or different functions. Domestic structures in both the Cupisnique/Chicama Paiján sites and the Zaña/Nanchoc sites tend to be associated with sites that have higher diversities of artifacts and indicate wider ranges of activities.

These previous projects were located in different areas of the relatively large North Coast region and employed distinct methodologies and terminologies that may or may not be directly comparable. Collectively, however, the preceding discussions of the Early Preceramic sites recorded by these various projects reveal several specific lines of variability that appear to be significant for characterizing different types of Early Preceramic sites that one may expect to encounter and for understanding how those sites may have been organized into functioning settlement systems. These variables include: 1) site location; 2) site size; 3) lithic tool frequencies; 4) the amount and types of activities represented at individual sites; and 5) the presence of domestic structures. Each of these variables will be used in later discussions to assess variability in the Early Preceramic sites recorded in the QBT (see Chapter Nine).

Potential Early Preceramic Site Types

Patterned differences among sites are assumed to represent distinct *types* of sites within a functioning system (Binford 1983, 1980; Brooks and Yellen 1987; Gargett and

Hayden 1991; Hitchcock 1987; Kent 1991; Kent and Vierich 1989; O'Connell 1987; Whitelaw 1983; Yellen 1977). These differences are reflections of the activities that were (or intended to be) pursued at a specific location, which have left behind a correlate material pattern. If we can approximate the activities that were pursued at specific sites from their individual material records, then we can combine these activities with the location, size, tool frequencies, and presence of domestic structures to effectively compare the different functions of individual sites within a given region. Comparisons of this sort become more robust if the sites are contemporaneous, and can allow for the identification of groups of sites that likely functioned together as a system or network (Binford 1980; Kent 1991; Yellen 1977).

Based on previous studies of Early and Middle Preceramic sites from across the north coast (discussed above), a general range of the potential types of sites that may be encountered in a given region can be identified. These sites include long-term basecamps, short-term basecamps, field camps, processing stations, transitory station/workshop, lithic quarry, mortuary locations, and rock art locations. These different site types are primarily drawn from the work of previous studies from across the north coast (Becerra 1999; Briceño 2004, 1999; Chauchat 1998, 1988, 1975; Chauchat et al. 2006; Chauchat et al. 2004; Dillehay and Netherly 1983; Dillehay et al. 1997; Dillehay et al. 1989; Dillehay and Rossen 2002; Dillehay et al. 2003; Gálvez 2004, 1999, 1992; Malpass 1983; Ossa 1978, 1973; Ossa and Moseley 1972; Richardson 1983, 1978, 1973; Rossen 1998, 1991; Rossen and Dillehay 1999; Stackelbeck 2008; Uceda 1992), but also incorporate aspects and terminology of archaeological and ethnographic data from other hunter-gatherer studies (Binford 2001, 1990, 1980; Dillehay 1997a; Kelly 1995, 1992; Kent 1991).

These site types represent a framework for interpreting and classifying the variability present among distributions of Early Preceramic sites. This is not to say that each site type will necessarily exist within any given population of Early Preceramic sites. Rather, each of these types offer a potential to provide distinct explanations of observable patterned variation that may be present within an assemblage of sites. Within any assemblage of sites, specific types may be present or absent and the presence of other, undefined types should not be discounted. Because these types are based on the material traces of human behavior a relatively wide range of intra-type variability should be expected. There is no absolute correlate for what constitutes a long-term basecamp, field camp, or transitory station. Rather, identifying sites to type involves the comparison of sets of characteristics that can include location, size, tool frequency, activities represented, and the presence of domestic structures, among others. Each of these types is discussed below.

Long-term Basecamp

Long-term basecamps are locations of extended (multiseasonal) hunter-gatherer occupations or habitations. Sites of this type in Andean South America that date to the Late Pleistocene-Early Holocene are relatively uncommon (Dillehay 2000; Lavallée 2000). Dillehay (2000: 81) has noted that these sites are often situated on landforms that offer commanding views of the surrounding landscape and provide ready access to water, fuel, and stone resources. Many of the largest sites identified by Chauchat (1998) in the Cupisnique/Chicama reflect this pattern (although they have not been specifically identified as basecamps). Basecamps (both long- and short-term) function as the organizational center of all subsistence-related activities for the group (Binford 1980: 9). As such, they typically contain the widest variety of individual food resource types, including various terrestrial fauna, plant and seed remains (that may indicate multi-seasonality), invertebrates (e.g., land snails), and marine resources (Chauchat et al. 2006; Gálvez 1999; Gálvez et al. 1993; Gálvez et al. 1999; Ossa and Moseley 1972).

Because these sites were occupied for extended periods of time and contain a wide variety of subsistence activities, tool frequencies are generally higher and more varied than other types of hunter-gatherer sites. Relatively high numbers of tools and large amounts of debris from tool making activities are common (Becerra and Esquerre 1992; Chauchat et al. 2004). In addition, the number of individual tool categories should also be more varied and represent a wide variety of processing and manufacturing activities. Lithic raw materials are often acquired near the site, which often results in greater expediency in tool manufacture (i.e., more unifacial tools, retouched and utilized flakes)(Becerra 1999; Becerra and Gálvez 1996; Binford 1979; Dillehay 2000).

However, this does not preclude the likelihood that formal tool maintenance and recycling activities also occurred at these sites (Chauchat et al. 2004; Dillehay 1997a).

Long-term occupation of the same location may produce redundancy in specific activities that are reflected in the spatial organization of the site (Binford 1983; Yellen 1977). In general, intersite patterning should be highly organized and indicate multiple, distinct activity areas or activity locations (Dillehay 1997a: 790). These may include definable refuse accumulations and/or domestic middens, a relatively high number of hearths (and perhaps pits for storage), tool manufacturing locations, specific resource processing/preparation locations, and perhaps human burials (Binford 1979, 1978; Dillehay 1997a; Dillehay et al. 1997; Rossen 1991; Testart 1982). Some features, like hearths and pits, may show multiple use episodes over time.

Long-term basecamps are also the most likely locations to contain multiple domestic structures (Chauchat 1998; Dillehay 2000; Dillehay et al. 1997; Gálvez 1999; Rossen 1991). The presence of domestic structures implies, through the effort invested in their construction, the anticipation of remaining in one location for a long enough time to justify that effort (Kent 1992, 1991). Multiple structures should occur most frequently on long-term basecamps because they are the locus of multiseasonal subsistence and domestic activities, and the effort expended in construction is offset by the length of site occupation.

Short-term Basecamp

Short-term basecamps represent *seasonal* locations of hunter-gatherer occupation/habitation. A short-term basecamp contrasts with the *multiseasonal* long-term basecamp in that the occupations are shorter and the sites are generally smaller (Binford 1980: 8-10; Dillehay 2000: 81). These sites also function as the organizational centers for all the subsistence-related activities of a group, just for more limited periods of time.

Short-term basecamps may contain a wide variety of subsistence-related activities, but will typically not contain the number of tools that long-term basecamps contain (Briceño 1999; Dillehay 1997a; Malpass 1983; Richardson 1978). A wide variety of individual tool categories may be present, but the frequency of specific tool forms will be lower due to the more limited duration of occupation. The overall range of tool categories may also be lower than in long-term basecamps. Debitage from tool making activities will likely be varied (representing the manufacture of different tool categories) and relatively low in density. Formal tool recycling and maintenance may be much less prevalent than at long-term basecamps.

Spatial segregation of distinct activities should be present at short-term basecamps. However, there will likely be little to no overlap of individual features and activity areas and no extensive reuse of hearths and/or other activity areas (Dillehay 1997a: 790). Domestic midden accumulations may be present, but will be limited and spatially-restricted. In general, fewer features will likely be present than on long-term basecamps. Domestic structures may be present. However, these structures should reflect the seasonal nature of the occupation and may not be present in large numbers or evidence extensive, long-term use (Dillehay et al. 1997; Rossen 1998, 1991).

Long-term Field Camp and Short-term Field Camp

Field camps are locations where individual task groups reside while exploiting specific resources. These camps may be occupied for short (up to a few days) or long (several days to a week) durations (Binford 1980; Dillehay 1997a; Kent 1991). The field camp becomes the "temporary operational center" for the specific task group (Binford 1980: 10). In general, field camps contain evidence for a relatively limited range of individual activities. The nature of these activities are predominantly based on the specific resource exploitation strategies pursued by the task group, but may also include food preparation, provisioning, and tool manufacture/maintenance (Binford 1980; Kelly 1995). Given the temporary nature of the occupation at a field camp, the material traces of these activities will not be densely deposited, nor will they be spatially segregated.

The variety of individual tool categories and debris from tool manufacture may be relatively low, and should correspond to the extraction/collection of specific resources (Binford 1980: 10-12). However, individual tool frequencies may be relatively high (depending on the functional requirements of the extraction methods employed by the task group) compared to other materials at these sites. Very few to no hearths and pits will be present at a field camp. The temporary nature of the occupation will also likely preclude midden accumulations and the construction of domestic structures.

Short-term and long-term field camps are distinguished from each other by the amount of food preparation and provisioning activities represented (Binford 1980; Kelly 1995; Kent 1991). Longer occupations at field camps will generate more significant signatures of the daily necessities of the task group members. It is likely that these activities will not be as well represented at field camps of shorter occupation.

Processing Station

A processing station is a specialized type of field camp that involves mass collection or harvesting of a specific resource that generates large amounts of low value (or waste) material during exploitation (Gálvez et al. 1993; Gálvez et al. 1999; Richardson 1978). Processing stations represent the intensive, short-term use of a specific location by a task group to acquire and process a specific resource (Dillehay 2000: 81). The intensive collection or harvesting of a resource by the task group may generate accumulations of the unused or waste byproducts (e.g., fish harvesting/cleaning locations, intensive plant collection, mass collection/preparation of land snails, collection of marine bivalves, mass animal kills/butchering) (Chauchat et al. 2006; Chauchat et al. 2004; Dillehay et al. 1997; Dillehay and Rossen 2002; Gálvez et al. 1993; Gálvez et al. 1999; Richardson 1978; Rossen 1991; Sandweiss et al. 1998; Sandweiss et al. 1989). The processed and collected resources are transported back to the basecamp.

Specific activities represented at processing stations are likely to be few and related to the exploitative activities pursued at those locations. In general, few features (hearths/pits) will be present, unless they are a necessary part of the resource processing (e.g., cooking hearths, roasting pits). Hearths or pits constructed for resource processing may be large in size and contain remains of the specific resource being exploited (Dillehay et al. 1997; Dillehay et al. 1989; Rossen 1991). The range of tool categories will likely be low and reflect the processing activity. A high percentage of the individual tools may be exhausted or broken. Little to no tool manufacturing debitage may be present. The debitage that is present will likely relate to tool maintenance and rejuvenation.

Transitory Station

Transitory stations are locations where hunter-gatherers (singly or in small hunting parties) engage in information gathering, such as observing game or perhaps, other people (Binford 1978; Dillehay 2000). These sites are likely to be small and contain evidence of a limited range of activities. Deposited materials are predominantly related to those activities that can be accomplished while observing the landscape, like tool manufacture/resharpening (Binford 1979). Debris from tool manufacture and even failed tools or performs may be common at transitory stations/workshops. These sites are used only temporarily, but may be frequently re-visited, which can result in accumulations of lithic debris over time (Chauchat 1998; Chauchat et al. 2004; Gálvez 1999). Features, if present, will likely be limited to small hearths and windbreaks.

Quarry/Workshop

Quarries represent locations for the procurement of targeted raw materials for tool manufacture (Dillehay 2000: 82). Typically, these sites are situated at the location of natural outcrops of the targeted raw material. Different kinds of materials like bone, wood, or shell may be quarried for tool manufacture (and likely were), however the only reported for the Early Preceramic of the North Coast region are for stone (Becerra 1999; Becerra and Esquerre 1992; Chauchat 1998; Chauchat et al. 2006; Chauchat et al. 2004). Lithic quarries generally contain large amounts of early stage lithic reduction debris (decortication flakes, primary flakes, and cores). Preforms and crude bifaces may also be frequently present at quarries.

Mortuary Locations

In general, human remains are relatively rare in Late Pleistocene-Early Holocene archaeological contexts (Briceño and Millones 1999; Dillehay 1997b; Lacombe 1994). However, primary interments, secondary burials, and/or disarticulated skeletal elements have been documented on Early and Middle Preceramic sites in the north coast (Chauchat and Lacombe 1984; Chauchat et al. 1992; Dillehay 2000; Dillehay et al. 1997; Dillehay et al. 1989; Lacombe 1994; Ossa and Moseley 1972; Rossen 1991). The majority of human remains are identified on sites that contain evidence for a wide range of activities—often basecamps—and not in specialized, mortuary locations (e.g., mounds, cemeteries, or charnal facilities) (Briceño and Millones 1999; Dillehay 1997b).

As such, mortuary locations may represent a specific site type. However, it is more likely that early mortuary activities will represent one activity (or set of activities) among several that occurred at an individual site (Dillehay et al. 1997; Rossen 1991). Briceño and Millones (1999: 58-59) report that 20 of the 105 Early Preceramic sites recorded in the Chicama Valley contain evidence of human remains. Most of these sites contain isolated primary interments or disarticulated skeletal elements recovered from the site surface or from within general midden. Two sites (PV22-13 and PV23-198) in the Chicama/Cupisnique region, however, contained small groups of associated burials (n=2 and n=5, respectively) that Briceño and Millones (1999: 62-64) suggest may indicate a specialized use of space or the demarcation of ritual space.

The repeated interment of burials in specific locations may also represent territorial claims or boundary markers manifested through direct association of places with ancestors (Buikstra and Charles 1999; Charles and Buikstra 1983; Dillehay 2007; Dillehay et al. 1997). Among foraging societies, the inclusion of multiple burials (or repeated burial) within specific sites may be an indication of reducing mobility and incipient territoriality. However, the small sample of Early Preceramic burials that are known on north coast sites limits our ability to gain insight into the possible significance of these patterns.

Rock Art Locations

Rock art has been recorded by Chauchat and others in the Cupisnique/Chicama region (Chauchat 1998; Gálvez 1999). These images are typically found on large boulders or exposed rock faces of rockshelter sites or overlook nearby Preceramic sites. Image types range from simple painted or pecked (petroglyphs) lines and geometric patterns to relatively complex groups of images that may include anthropomorphic representations (see images in Chauchat 1998). However, the temporal association of most rock art is unknown and may be related to later time periods.

Summary of General Site Types

These potential site types form the basis for characterizing the range of variability present in the Early Preceramic sites recorded in the Quebradas del Batán and Talambo. The general characteristics of each type, along with the representative activities and cultural materials have been discussed and provide insight into the criteria that may be used to classify sites. As mentioned above, not all of the site types will necessarily be represented within the survey data.

Typological classification of the Early Preceramic sites recorded in the QBT will be based on five criteria, which include: 1) site location; 2) site size; 3) lithic tool frequency; 4) amounts and types of activities represented at a site; and 5) the presence or absence of domestic structures. These criteria are drawn from the summary of the broad variability that has been reported from previous surveys for Early Preceramic sites on the north coast of Perú and from the results of the 1999 and 2000 surveys of the lower Jequetepeque Valley conducted by the Proyecto Pacasmayo (Becerra 1999; Briceño 1999, 1997; Chauchat 1998; Chauchat et al. 2006; Chauchat et al. 2004; Dillehay 2000; Dillehay et al. 2009; Dillehay et al. 1997; Dillehay et al. 1989; Dillehay and Netherly 1983; Gálvez 2004, 1999, 1992; Malpass 1983; Ossa 1978; Ossa and Moseley 1972; Richardson 1983, 1978, 1973; Rossen 1998, 1991; Uceda 1992).

Individual sites will be characterized according to each of the five criteria. Classification will be refined with additional data from excavation and analyses of the lithic, floral, and faunal materials, which are presented in later chapters. These additional data will clarify the specific amounts and types of activities that were occurring at individual site and refine our understanding of the functional roles that different site types likely played within the larger settlement system. AMS dates from samples collected during excavation, along with temporally diagnostic artifact types, will refine the contemporaneity and chronology of these sites, and provide the possibility of examining regional settlement and individual site functions. A reconstruction of regional settlement patterns and how they have changed throughout the Early Preceramic period will be presented in Chapter Nine. Results of the QBT survey, followed by discussion of the variability in site location, size, and presence of domestic structures, will comprise the remainder of this chapter.

Results of Survey in the QBT Area

During the 2002-2003 surveys, a total of 69.6 km^2 were surveyed in the Quebradas del Batán (37.5 km^2) and Talambo (32.1 km^2), resulting in the identification and recording of an additional 252 sites (Je-765-Je-1016). Of the 252 new sites identified during the 2002-2003 surveys of the Quebradas del Batán and Talambo, 98 (38.9%) contain clear evidence of Early Preceramic occupation or use (based on the previously outlined criteria involving the presence of diagnostic artifact forms) (see Figure 2.3). The remaining 154 sites from the 2002-2003 surveys that are not identified as Early Preceramic consist of later Preceramic occupations (Middle and Late periods, which are discussed in Stackelbeck [2008]), and temporally unassignable lithic and ceramic scatters.

The 98 Early Preceramic sites from the 2002-2003 surveys, combined with the 28 Early Preceramic sites from the 1999 and 2000 Proyecto Pacasmayo survey (Dillehay and Kolata 2000, 1999), result in a total dataset of 126 sites that contain clear evidence of occupation/use during the Early Preceramic period. This dataset forms the basis for all subsequent discussions of Early Preceramic settlement patterns in the lower Jequetepeque Valley region. A full inventory of the location and description of each of these sites, along with surface-collected artifacts and observed features, is provided in Appendix I.

Like the first 28 Early Preceramic sites recorded in the lower valley during the 1999 and 2000 surveys by the Proyecto Pacasmayo, the 98 sites identified during the 2002-2003 surveys varied markedly in size, amount of cultural materials, and amounts and types of activities represented on the surface. In general, the Early Preceramic sites in the lower valley region are heavily concentrated in the side *quebradas* that drain into the main valley and along the western base of the low Andean foothills (Figure 6.1). It is important to note that both of these areas contain numerous now dry, relict drainages and springs that would have provided ready access to water during Late Pleistocene and Early Holocene when the paleoclimate was wetter and cooler. Although these sites are situated closely together in relatively small regions, there was wide use of different landform types within the quebradas, and included high and low alluvial terraces, paleodunes, rockshelters, saddles, and the open *pampas*.

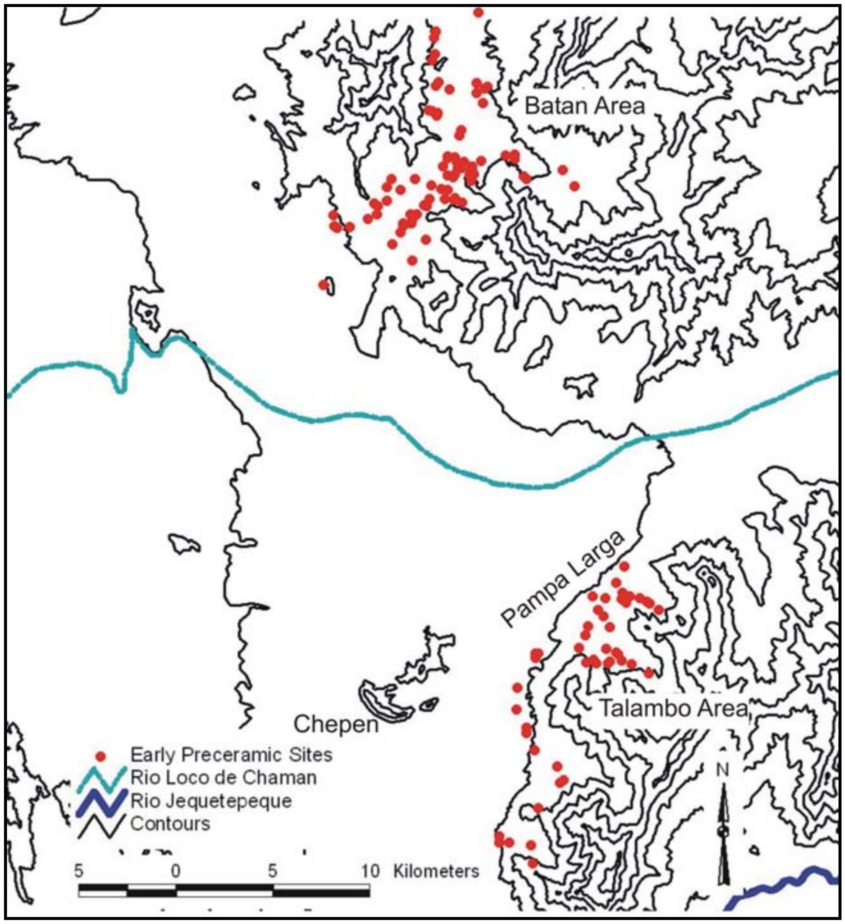

Figure 6.1. Distribution of all Early Preceramic sites in the project area (n=126) (plotted on the Chepén Topographic Quadrangle, 1:100,000 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcView 3.2 GIS program).

Diagnostic cultural materials collected from the surfaces of sites identified during the survey indicate at least two distinct Early Preceramic occupations of the region—the Fishtail and Paiján. Other occupations, with unifacial or flake-based technologies may also have been present, but cannot be discriminated from the surface data alone. Sites that contained Fishtail points (n=4) (Je-979, 996, 1002, and 1010) were identified only in the Quebrada del Batán (Figure 6.2). These four sites are all situated on alluvial terraces (three of which are 5-6 m high with steep shoulders) bordering drainages that provided a commanding view of a large expanse of the main *quebrada* floor (Figure 6.3). Artifacts collected from Fishtail sites included a variety of lithic tools (points, limaces, formal unifaces, bifaces, retouched and utilized flakes) that likely indicate several different kinds of hunting, processing, and/or collecting related activities occurred at those locations. Like the sites in the Cupisnique/Chicama region and La Cumbre in the Moche Valley,

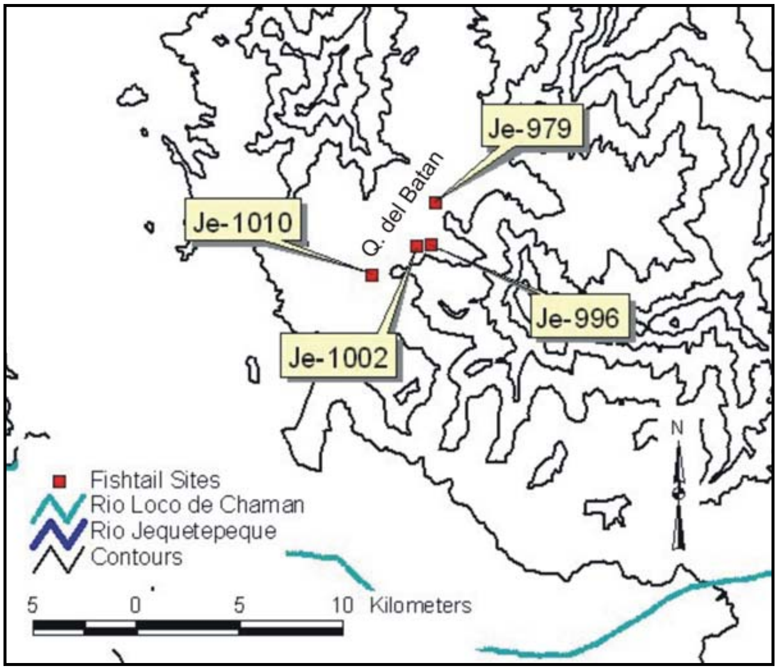

Figure 6.2. Distribution of sites with diagnostic Fishtail projectile points in the project area (n=4) (plotted on the Chepén Topographic Quadrangle, 1:100,000 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcView 3.2 GIS program).

Figure 6.3. Photo of Site Je-996, which is located on a terrace providing expansive views of the Quebrada del Batán.

each of the Fishtail sites recorded in the Quebrada del Batán also contained Paiján points (Briceño 1999; Ossa 1978).

A few important surface features were also recorded at the four sites containing Fishtail points. These included two lithic knapping stations at site Je 1010. Lithic knapping stations are not uncommon on Early Preceramic sites, but these two consisted of quartz flakes—which is the same material the Fishtail point fragment found at this site is manufactured from and may be associated (Figure 6.4). Sites Je 979, 996, and 1002 contained concentrations of land snail shells (*Scutalus* sp.), some of which were dense enough at Je 1002 to be considered middens. A small, circular stone-lined structure and *batan* (grinding slab) were also recorded near the center of Je 1002, as was a disturbed human burial that was eroding out and exposed on the site surface. These three features are considered to be associated with the Paiján occupation of the site because of the close proximity of several Paiján points also found at Je 1002.

Sites that contained lithic artifacts diagnostic of the Paiján complex (Paiján points, limaces, and *Chivateros* bifaces) were identified in both the Quebrada del Batán (n=80)

Figure 6.4. Photo of a lithic knapping station (*taller* 1) at Site Je-1010 in the Quebrada del Batán.

and Quebrada Talambo (n=46) (see Fig 6.1). In addition to occurring more frequently and having a wider distribution than the Fishtail sites, Paiján sites also show greater variability in the types of landforms on which sites were located. Paiján sites were frequently encountered: 1) on low terraces near the confluence of side quebrada drainages with the main quebrada system; and 2) on high terraces or low hillslopes that overlooked the intersection of two quebradas and/or provided commanding views of the *quebrada* floor and nearby *pampas*. Paiján sites were also recorded on paleodunes, rockshelters, terraces, saddles, hillslopes, and *pampas* (Figure 6.5). Sites located on terrace landforms typically cover larger areas and contain greater amounts of lithic artifacts on the surface, often consisting of several tools and a wide variety of flakes and debitage. Paiján sites also often contained evidence that one or a few different types of activities were pursued at that location (e.g., lithic manufacture, land snail collection, and likely hunting/processing of game).

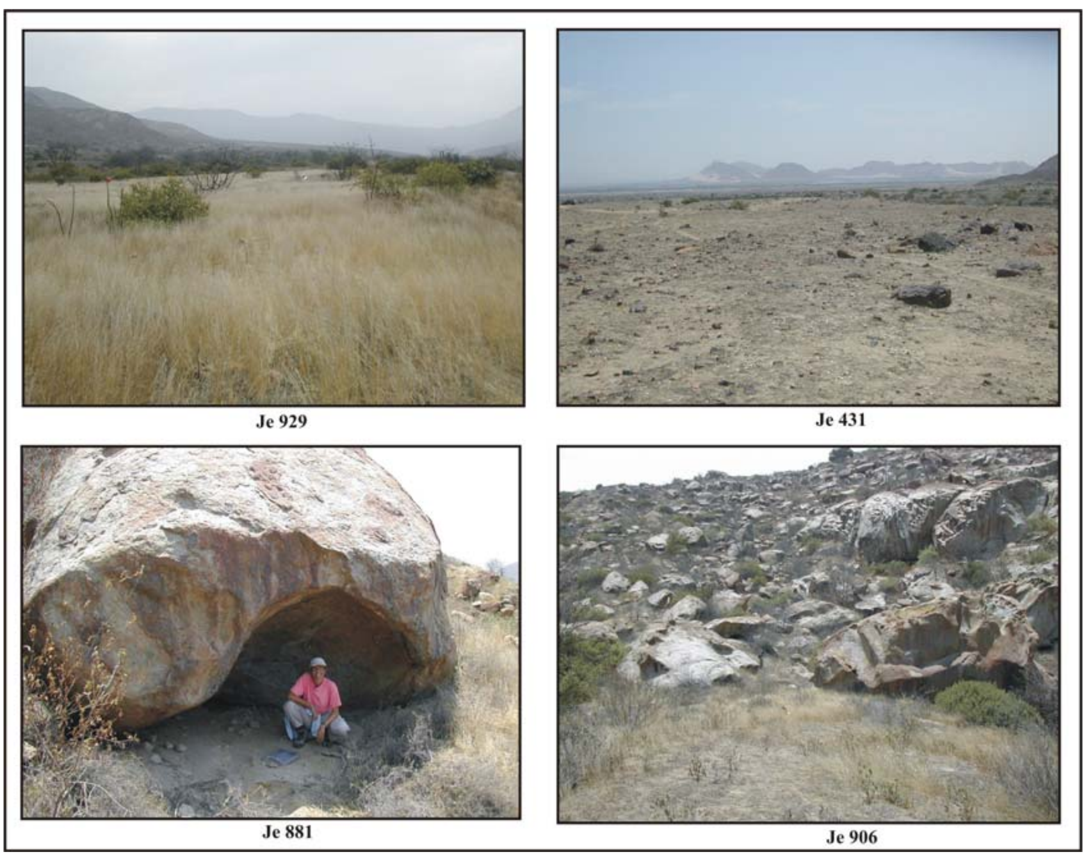

Figure 6.5. Examples of Paiján site locations in the Quebradas del Batán and Talambo.

A few of the Paiján sites were very large and dense (in terms of surface artifact content) and suggested that multiple/repeated or relatively long-term occupations of that location had occurred over time (e.g., Je-431, 439, 780, 790, 971, and 1002). These very large and dense sites also contained evidence of multiple different types of activities that were pursued at those locations in the past. The dense lithic scatters at these sites typically consisted of numerous to dozens of lithic tools of multiple forms (including points, limaces, formal unifaces, retouched and utilized flakes, and groundstone tools) and flakes from all stages of lithic reduction. Evidence for individual activities is indicated by the frequent presence of surface features, including lithic knapping stations, domestic architecture, clusters of artifact forms, faunal remains, and grinding stones and slabs (presumably for plant processing)(e.g., Figure 6.6). As was noted above, a single human burial was found eroding onto the surface of site Je-1002 and is believed to be associated with the Paiján occupation of that site (Figure 6.7).

Figure 6.6. Examples of surface features identified on Paiján sites in the QBT.

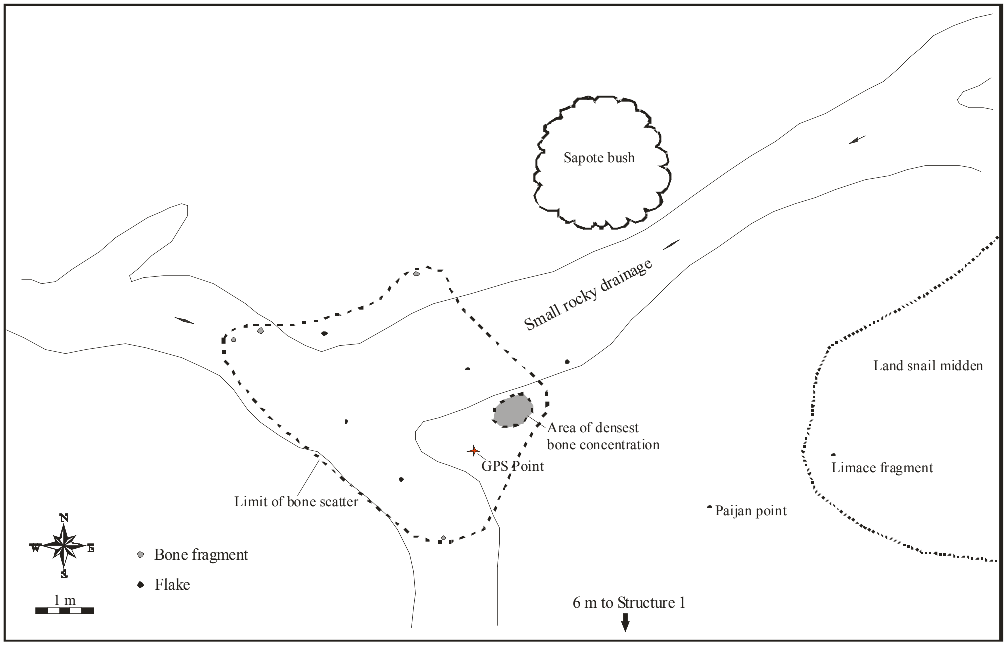

Figure 6.7. Planview of disturbed human burial eroding onto the surface of site Je-1002.

Smaller Paiján sites were also encountered throughout both the Quebradas del Batán and Talambo. The small sites were located on the widest variety of different landforms, and included paleodunes, rockshelters, terraces, saddles, hillslopes, and on the *pampas*. Small Paiján sites typically consisted of light to very light density lithic scatters (usually one or a few bifaces and flakes) and did not evidence the range of activities that larger sites contained.

Many of the Early Preceramic sites identified in the Quebradas Batán and Talambo also indicated reoccupation or reuse of those locations by later peoples. The large Early Preceramic sites, which are typically located on prominent terraces or conspicuous high spots also contained light to extensive scatters of ceramics. The majority of these ceramics date to the Chimú period (ca. 900-530 B.P.), but Early Horizon (Cupisnique, Salinar, and Gallinazo) (ca. 2900-1800 B.P.) and Moche period (ca. 1800-1200 B.P.) ceramic scatters were also noted.[1] Reuse of Early Preceramic site locations by the later Chimú (and others) has also been reported in the

[1] The identification of ceramics collected during the Quebradas del Batán and Talambo survey was conducted by Flor Diaz of the Universidad Nacional de Trujíllo, Perú.

Cupisnique/Chicama region (Becerra and Esquerre 1992; Briceño et. al. 1993; Chauchat 1998; Gálvez 1992, 1990).

Assessing the Variability in Early Preceramic Site Location, Size, and Domestic Structures

The results of the QBT survey, along with the results of previous research conducted on the North Coast, strongly suggest that distinct types of sites—presumably with different functional roles—existed within the Early Preceramic period. The individual characteristics that define differences between specific sites are based on variability in site structure, activities, and locational variability summarized from various previous projects (Becerra and Esquerre 1992; Briceño 1999; Chauchat 1998; Dillehay 2000; Dillehay et al. 1997; Dillehay et al. 1989; Gálvez 2004; Malpass 1983; Ossa and Moseley 1972; Ossa 1978; Richardson 1983; Rossen 1991). Only three criteria are discussed in this chapter—location, size, and presence of domestic structures. The other two criteria used to evaluate site types, tool frequency and activities represented, are dependent on other lines of analysis that are discussed in following chapters. All five criteria will be compared and discussed with relation to settlement patterns in Chapter Nine.

Site Location

Site location records the specific type of landform on which a site is situated and has been recognized as potentially significant understanding regional distributions of different types of sites (Malpass 1983; Richardson 1978). Landform type was recorded for each site during the QBT survey and includes seven categories: 1) high terrace; 2) low terrace; 3) paleodune; 4) rockshelter; 5) *pampa*; 6) hillslope; and 7) saddle. Terraces are considered to be alluvial benches located within quebradas systems. Although some low terraces are located on the *pampas* (adjacent to dry arroyo drainages), any site located on a terrace outside of the quebrada systems are considered to be on the *pampas* and will be identified as such. Sites located on paleodunes, hillslopes, saddles, or in rockshelters will be correspondingly identified irregardless of whether they are in the quebrada systems or on the *pampas*.

For the purposes of this study, a terrace is defined as a 'bench-like' landform that containing sediments deposited through alluvial or fluvial processes. Terraces may be located along the margins of drainages in the quebrada floors (where past fluvial over-bank or terminal alluvial fan deposition occurred), or higher up and away from the quebrada floors (head and mid alluvial fan locations that have been incised by arroyos). *Pampas* are the open plains that extend from the western base of the Andean foothills to the coastal plain and comprise the inter-valley regions of the north coast (see landform discussions in Chapter Three).

Each of the 126 Early Preceramic sites in the QBT assemblage was identified by landform type. This information is presented (along with other site characteristics) in Appendix IV (Early Preceramic Site Characteristics) and is summarized in Figure 6.8. Examining each of the 126 Early Preceramic sites in the QBT by landform type indicates a clear preference for low terrace landforms (Figure 6.8). Sixty-three sites (n=63) are located on low terrace landforms and account for 50% of the total sites. The majority of the remaining sites are concentrated on high terraces (n=36) (28.57%) and the open *pampas* (n=17) (13.49%). However, a few sites are also found on other landform types, including paleodunes (n=2) (1.59%), rockshelters (n=1) (0.79%), hillslopes (n=4) (3.18%), and saddles (n=3) (2.38%).

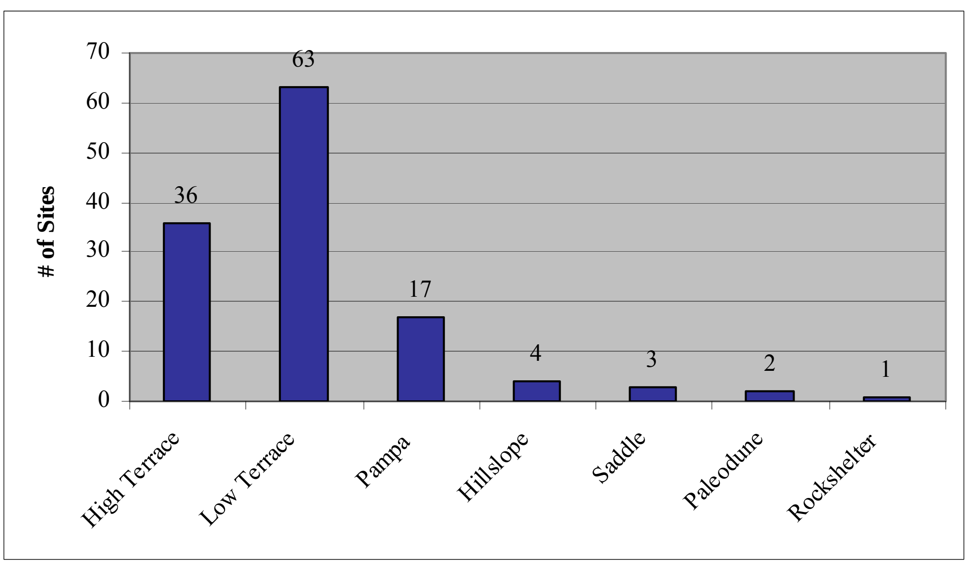

Figure 6.8. Frequency of Early Preceramic sites by landform type in the QBT.

The preference for terraces as site locations (78.57%) reinforces the importance of the *quebrada* systems that has been documented in the Cupisnique and Zaña regions (Chauchat et al.. 2006; Dillehay et al. 1997; Gálvez 1999; Rossen 1991). The importance of *quebradas* as locations for settlement is suggestive of an economic and settlement strategy that emphasized direct access to the resources that would have been available in or near these locations (e.g., water, and various plants and animals) (Dillehay et al. 2003; Gálvez 1999). Sites located on other landforms (*pampas*, hillslopes, saddles, paleodunes, and rockshelters) (21.43% of total sites) may also represent specific resource zones or activities that are distinct from the terrace sites, but were important within the regional settlement pattern. Like the Cupisnique, Moche, Casma[2], and Zaña Valley surveys, no Early Preceramic sites were located along or near the Pacific shoreline.

Minimally, intensive occupation of the *quebradas* during the Early Preceramic is indicated by the density of sites and multiple kinds of different landforms on which they were located. The specific resources that may have been accessed from different landform locations during the Early Preceramic cannot be known for certain. This is due to the mixing and juxtaposition of ecological zones that is thought to have occurred along the western Andean flanks during the Late Pleistocene (see discussion in Chapter Three). Thus, the diversity of the Late Pleistocene-Early Holocene paleoenvironment is likely not fully reflected in the modern equivalent (Bush 2002; Wang et al. 2006).

In spite of this, the distribution of modern ecological zones provides some insight into the potential diversity of resources that may have been available during the Early Preceramic period. As was discussed in Chapter Three, the QBT region sits on the borders of the modern premontane superarid tropical desert and the premontane tropical desert scrub ecological zones, and provides access to a number of nearby zones (see Figure 3.3)(ONERN 1976; Tosi 1960; Pulgar Vidal 1996). During the Late Pleistocene-Early Holocene, this region likely contained a wider and more varied range of micro-ecological zones. The mixing of zones was produced by successive vertical shifts in the location of vegetation bands and treelines as the climate warmed and cooled (Bush 2002; Clapperton et al. 1997; Seltzer et al. 2002; Thouret et al. 1996). Thus, the

[2] See the previous discussion of the Campanario site (Malpass 1983).

paleoenvironment is though to have been characterized by highly localized and mixed microzones that have no modern analogue (Bush 2002).

Annual and seasonally active springs also occur within the normally dry, coastal *quebradas* that are important water sources and create wet micro-ecological zones within the *quebrada* systems (Briceño 1997; Gálvez 1999). During the Late Pleistocene-Early Holocene, when paleoenvironmental conditions were wetter, these spring locations (and others) may have been active more frequently and/or for longer periods of time. Briceño (1999, 1997) and others have argued that the reliable water supply and likely abundance of associated resources near springs were important factors in both Fishtail and Paiján settlement of Cupisnique/Chicama region.

Several ancient and intermittent spring locations were identified during the QBT survey based on the presence of travertine and other mineral precipitates that have accumulated on or discolored rocks where the spring was active (Figure 6.9). It is not clear if all (or any) of these springs were active during the Late Pleistocene-Early Holocene. However, given the suggested importance of spring locations within Early Preceramic settlement (Briceño 1999, 1997), it is likely that many of these springs (and perhaps others) were active. Figure 6.9 shows the distribution of Early Preceramic sites within the QBT region in relation to the identified ancient springs—with arbitrary 1 km buffer zones drawn around each spring location. Only seven (n=7) of the 126 Early Preceramic sites in the QBT are located within one kilometer of an ancient spring (5.6%). This may suggest that factors other than springs—such as the associated plant and/or animal resources—were also important in determining site location. Although not directly beside springs, it is clear that a vast majority of the Early Preceramic QBT sites are located in relatively close proximity to springs (ca. 2-4 km). This distribution supports Briceño's (1999, 1997) argument for the importance of springs in early settlement, but also suggests that other factors associated with or found in the area of springs may also have been important attractors to Early Preceramic peoples.

It is possible that the location of Early Preceramic sites was influenced by the distance to spring locations and that certain landform types provided more ready access. However, the mixed and juxtaposed microzones that present or near the QBT region were likely equally influential factors in Early Preceramic settlement and site location

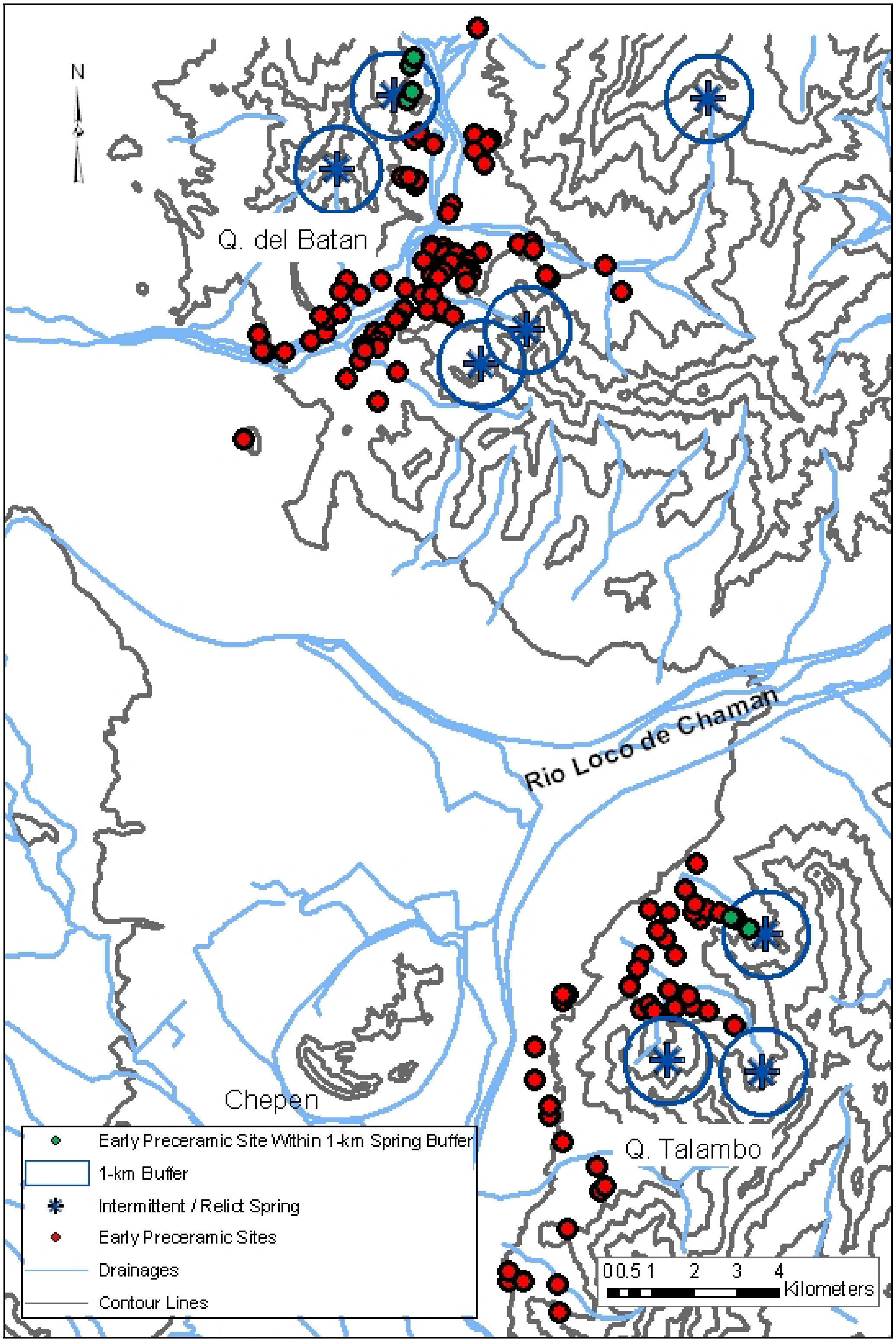

Figure 6.9. Relict and intermittent spring locations in relation to Early Preceramic sites in the QBT project area. Note the seven Early Preceramic sites within a 1-km range of these locations (plotted on the Chepén Topographic Quadrangle, 1:100,000 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcMap 9.2 GIS program).

(discussed in Chapter Three) (Tosi 1960). Based on the site location data presented here for Early Preceramic sites, there is a clear preference for terrace landforms within *quebrada* systems. The relatively dense packing of sites within the *quebrada* systems may be reflective of the importance of both springs and the multiple microzones in structuring early settlement in the region.

Site Size

Site size is an approximate measure of the total area of each individual site. During the survey each site was measured along two perpendicular axes, usually north-south and east-west. These measures are multiplied together to provide an approximate total site area. Individual site size—for the 126 sites used in this study—ranges between 100 square meters and 516,780 square meters, with a mean site size of 20,205 square meters (see Table 6.1). The distribution of site size for all sites is presented in Figure 6.10. As Figure 6.10 illustrates the size distribution is upwardly skewed by a few sites (particularly Je-431) that have very large areas. In spite of the upward skew, it is clear from the size distribution that the vast majority of sites have a size that is less than 10,000 square meters (n=88; 69.8% of sites).

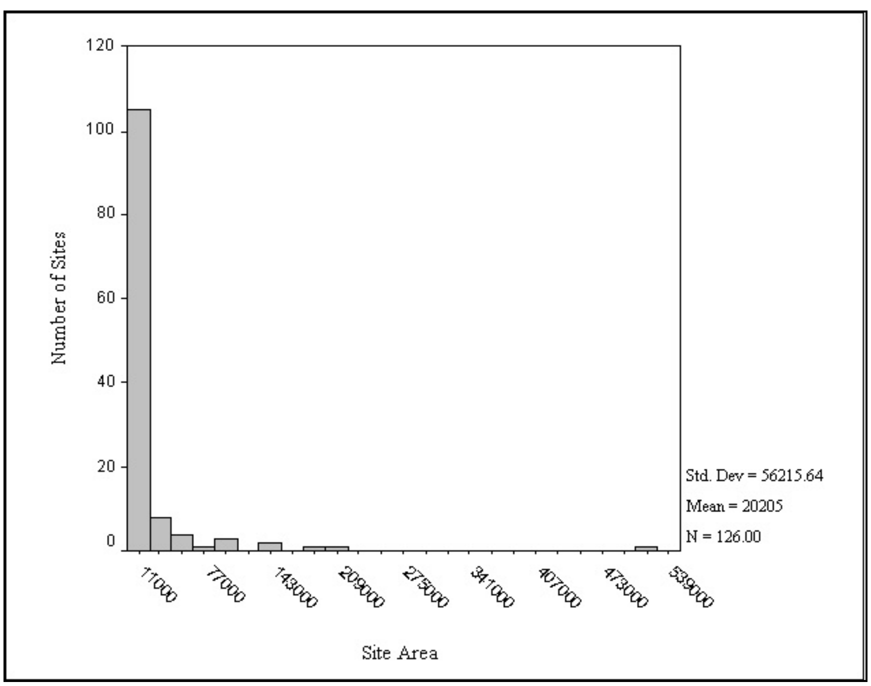

Figure 6.10. Histogram of site areas for Early Preceramic sites in the QBT.

Table 6.1. Site areas for Early Preceramic sites in the QBT.

Site	Area (sq. m)	Site	Area (sq. m)	Site	Area (sq. m)
Je-394	1170	Je-800	1672	Je-925	7440
Je-395	100	Je-803	3648	Je-929	8060
Je-397	150	Je-804	147375	Je-930	966
Je-399	1144	Je-805	29100	Je-936	5460
Je-401	460	Je-812	15200	Je-945	576
Je-425	1100	Je-814	16250	Je-954	3885
Je-430	750	Je-817	7448	Je-955	4026
Je-431	516780	Je-818	9720	Je-960	12400
Je-432	1500	Je-820	154	Je-964	580
Je-433	175	Je-825	3283	Je-969	1189
Je-435	6250	Je-827	5859	Je-970	14378
Je-436	1100	Je-829	7590	Je-971	22736
Je-439	35020	Je-832	4950	Je-972	13206
Je-440	3600	Je-834	319	Je-973	4800
Je-441	800	Je-841	650	Je-976	768
Je-442	16800	Je-843	595	Je-979	31980
Je-443	6600	Je-844	954	Je-980	22140
Je-447	2700	Je-849	5157	Je-981	8106
Je-449	8000	Je-850	15260	Je-982	4455
Je-458	1800	Je-851	5824	Je-983	16500
Je-459	1100	Je-852	936	Je-984	2520
Je-470	104000	Je-853	770	Je-986	1475
Je-471	1400	Je-855	7140	Je-988	17679
Je-474	7600	Je-856	7209	Je-989	94500
Je-475	46200	Je-858	896	Je-990	146400
Je-478	24700	Je-859	9499	Je-991	1254
Je-481	375	Je-866	8370	Je-993	206800
Je-484	8500	Je-868	1485	Je-995	4300
Je-766	1600	Je-870	12852	Je-996	12500
Je-769	750	Je-873	3888	Je-997	9372
Je-770	370	Je-875	5394	Je-998	17430
Je-772	28700	Je-879	1408	Je-1001	64904
Je-777	1400	Je-881	10914	Je-1002	17264
Je-778	1296	Je-888	2016	Je-1003	480
Je-780	52200	Je-897	3379	Je-1004	11800
Je-785	700	Je-899	418	Je-1006	7074
Je-789	480	Je-900	740	Je-1007	7954
Je-790	99360	Je-901	25515	Je-1008	3237
Je-791	2625	Je-906	9500	Je-1010	15484
Je-793	900	Je-914	105	Je-1011	55485
Je-795	3744	Je-915	14694	Je-1012	71100
Je-798	1056	Je-919	187200	Je-1013	2790

Site size can be used as indicator of functional differences between sites (Binford 1980; Dillehay 1997a; Dillehay et al. 1989; Kelly 1995, 1983; Kent 1991). However, the size of individual sites may also reflect other processes that are not related to function. Reuse or re-occupation of sites, in particular, can drastically alter (typically increasing) the size of individual sites. A location that has had frequent or multiple episodes of re-occupation could appear to cover a much larger area of use than the individual occupations actually represent—in effect masking/inflating the actual use area a site represented during a given occupation. Even if size did not change drastically between re-occupations, the function of that site may have—which may or may not be reflected by a change in size. Thus, the uncritical use of size as an attribute for characterizing functional differences between sites can be highly problematic.

One method for addressing these problems is to examine the size of single component sites. Single component sites are considered to generally represent occupation/use of a location by the same cultural group during a relatively limited period of time. This is not to say that re-occupation or reuse did not occur at single component sites. Foraging societies frequently revisit or reuse the same locations on the landscape (Binford 1990, 1983, 1978; Gargett and Hayden 1991; Kelly 1995, 1992; O'Connell 1987; Whitelaw 1983; Yellen 1977). The importance of single component sites rests on the assumption that—based on limited time frame and single cultural group—the activities pursued at an individual site probably did not substantially change.

This approach is useful for single component sites where the issues of re-occupation and reuse are minimized, but it does not address multicomponent sites. Re-occupation and reuse are the principle features of multicomponent sites. Among the Early Preceramic sites in the QBT region both single component (n=25) and multicomponent sites (n=101) were identified.[3] The 25 single component Early Preceramic sites are generally small and have a mean size of 7,250 square meters. If we compare the mean size of the single component sites (7,250 sq. m) with the mean size of all Early Preceramic sites in the QBT (20,205 sq. m), the problems discussed above

[3] Single and multicomponent site identifications are based on the presence of diagnostic projectile points and are discussed in Chapter Eight.

regarding the potential inflation of ‘actual’ site size through re-occupation/reuse become clear.

However, single component sites represent only 19.8% of Early Preceramic sites identified in the QBT. Examining only these sites will exclude most of the variability in size that exists in the QBT assemblage. While it is true that the size of multicomponent Early Preceramic sites can be grossly inflated through re-occupation (as the comparison of the means above indicates), they must be included within the assessment of site sizes in order to understand the range of variability present within the assemblage. It seems apparent that some factor or characteristic of these sites led people to re-occupy and reuse these locations time and again. Single component sites can provide an estimation of the ‘actual’ use area represented at Early Preceramic sites (ca. 7,000 sq. m.). However, examining only these sites may preclude the recognition of potentially important variability within the QBT assemblage. The very fact that multicomponent Early Preceramic sites were reused or re-occupied suggests that some kind of functional difference may have existed between them and single component sites.

The problem for this study is to develop a method by which distinctions in size can be used to examine inter-site variability, while recognizing that larger sizes typically indicate greater reuse and/or re-occupation. It is suggested here, that by re-conceptualizing size as an indicator of the amount or intensity of re-occupation and reuse, rather than a potential indicator of site function, the size of all Early Preceramic sites can be examined. In this sense, site size can be considered a rough, relative measure of how much reuse/re-occupation occurred at individual Early Preceramic sites. Thus, site size would represent one attribute that—when compared with location, density of cultural materials, activities, and presence of domestic structures—can be used to characterize the different types of Early Preceramic sites that may exists within the QBT assemblage.

For the purposes of this study, variability in site size can be divided into three broad, qualitative groups (small, medium, and large sites) representing different amounts of re-occupation and/or reuse. Small sites (n=88; 69.84%) are those that have an area of less than 10,000 square meters and evidence little reuse. Medium sites (n=29; 23.02%) display larger site areas (10,000-70,000 sq. m), and are considered to represent greater amount of re-occupation/reuse. Large sites (n=9; 7.14%) are those sites that express site areas larger than 70,000 square meters and are considered to represent locations where the most frequent and/or intense re-occupation and reuse occurred. The sites that comprise each of these three groups are listed in Table 6.2.

By itself, the assessment of site size (as a single characteristic) tells us very little, other than the fact that small, medium, and large sites exist within the population of Early Preceramic sites. However, these separate groups of sites represent locations that were more or less intensively reused and re-occupied during the Early Preceramic period. Following the descriptions of the potential site types (discussed previously in this chapter)—which were based on the results of previous Early Preceramic studies in the north coast—it is apparent that indications of reuse/re-occupation may be highly characteristic of certain types of sites (particularly between long- and short-term basecamps and long- and short-term field camps). Combining site size ranges into broad groups provides one avenue for assessing these kinds of distinctions.

However, site size alone cannot be used to infer differences in function. In this research, site size is used in conjunction with the four other variables (landform type, lithic tool frequency, amount of activities, and presence of domestic structures) in order to make comprehensive characterizations of the potentially different functional roles that may have existed between Early Preceramic sites. These characterizations are then used to reconstruct Early Preceramic settlement patterns, which are presented and discussed in Chapter Nine.

Presence of Domestic Structures

Domestic structures attributed to early foraging societies are usually relatively simple constructions (often of perishable materials) to provide shelter from the elements (Dillehay 2000, 1997a; Stackelbeck 2008). Although relatively simple when compared to later architectural forms, early structures can provide important insights into hunter-gatherer mobility (and particularly trends toward sedentism), intra-site spatial patterns and organization, regional settlement patterns and site function, and socio-economic organization (Binford 1990; Dillehay 1997a; Flannery 2002; Kent 1991; Malpass and Stothert 1992; Parkington and Mills 1991; Stackelbeck 2008).

Table 6.2. Early Preceramic sites in the QBT by size group.

Site	Area (sq. m)	Site	Area (sq. m)	Site	Area (sq. m)
Je-394	Small	Je-800	Small	Je-925	Small
Je-395	Small	Je-803	Small	Je-929	Small
Je-397	Small	Je-804	Large	Je-930	Small
Je-399	Small	Je-805	Medium	Je-936	Small
Je-401	Small	Je-812	Medium	Je-945	Small
Je-425	Small	Je-814	Medium	Je-954	Small
Je-430	Small	Je-817	Small	Je-955	Small
Je-431	Large	Je-818	Small	Je-960	Medium
Je-432	Small	Je-820	Small	Je-964	Small
Je-433	Small	Je-825	Small	Je-969	Small
Je-435	Small	Je-827	Small	Je-970	Medium
Je-436	Small	Je-829	Small	Je-971	Medium
Je-439	Medium	Je-832	Small	Je-972	Medium
Je-440	Small	Je-834	Small	Je-973	Small
Je-441	Small	Je-841	Small	Je-976	Small
Je-442	Medium	Je-843	Small	Je-979	Medium
Je-443	Small	Je-844	Small	Je-980	Medium
Je-447	Small	Je-849	Small	Je-981	Small
Je-449	Small	Je-850	Medium	Je-982	Small
Je-458	Small	Je-851	Small	Je-983	Medium
Je-459	Small	Je-852	Small	Je-984	Small
Je-470	Large	Je-853	Small	Je-986	Small
Je-471	Small	Je-855	Small	Je-988	Medium
Je-474	Small	Je-856	Small	Je-989	Large
Je-475	Medium	Je-858	Small	Je-990	Large
Je-478	Medium	Je-859	Small	Je-991	Small
Je-481	Small	Je-866	Small	Je-993	Large
Je-484	Small	Je-868	Small	Je-995	Small
Je-766	Small	Je-870	Medium	Je-996	Medium
Je-769	Small	Je-873	Small	Je-997	Small
Je-770	Small	Je-875	Small	Je-998	Medium
Je-772	Medium	Je-879	Small	Je-1001	Medium
Je-777	Small	Je-881	Medium	Je-1002	Medium
Je-778	Small	Je-888	Small	Je-1003	Small
Je-780	Medium	Je-897	Small	Je-1004	Medium
Je-785	Small	Je-899	Small	Je-1006	Small
Je-789	Small	Je-900	Small	Je-1007	Small
Je-790	Large	Je-901	Medium	Je-1008	Small
Je-791	Small	Je-906	Small	Je-1010	Medium
Je-793	Small	Je-914	Small	Je-1011	Medium
Je-795	Small	Je-915	Medium	Je-1012	Large
Je-798	Small	Je-919	Large	Je-1013	Small

A relatively wide range of structure forms has been identified from Preceramic sites in northern Perú (Benfer 1984; Chauchat et al. 2006; Dillehay et al. 2003; Dillehay et al. 1989; Donnan 1964; Gálvez 1999; Malpass and Stothert 1992; Quilter 1989, 1985; Rossen 1991; Stackelbeck 2008). In general, the form of domestic structures changes over time from simple, small circular, stone-lined structures (among other forms) in the Early Preceramic to larger, rectangular and internally segmented structures in the Late Preceramic. However, there is substantial overlap between different forms, and some apparently persisted over relatively long periods of time (Dillehay et al. 2003; Stackelbeck 2008: 180-187).

For the entire Proyecto Pacasmayo (1999 and 2000) and QBT survey (2002-2003), a total of 18 sites were identified that contain the surface remains of Preceramic period domestic structures (n=38) (Dillehay et al. 2009; Dillehay et al. 2003; Stackelbeck 2008). Of the 38 Preceramic period structures that were identified in the lower Jequetepeque Valley, 28 (from 12 different sites) are considered to be Early Preceramic in age (see Table 6.3). These structures range widely in form and include circular (n=17), L-shaped (n=5), V-shaped (n=1), and semi-lunar (n=5) (see Figure 6.11). Each of these forms is represented by the remnants of a stone-lined foundation that likely supported a frame and superstructure constructed of perishable materials (e.g., wood, reed, grasses or hides) (Dillehay et al. 2009; Stackelbeck 2008).

Table 6.3. Early Preceramic domestic structure forms by site.

Site	Circular	L-shaped	Semi-lunar	V-shaped	Total
Je-431	7				7
Je-439				1	1
Je-449	2				2
Je-470	1				1
Je-484	1		1		2
Je-780	2				2
Je-790		4	3		7
Je-804		1			1
Je-897	1				1
Je-954			1		1
Je-970	2				2
Je-1002	1				1
Total	17	5	5	1	28

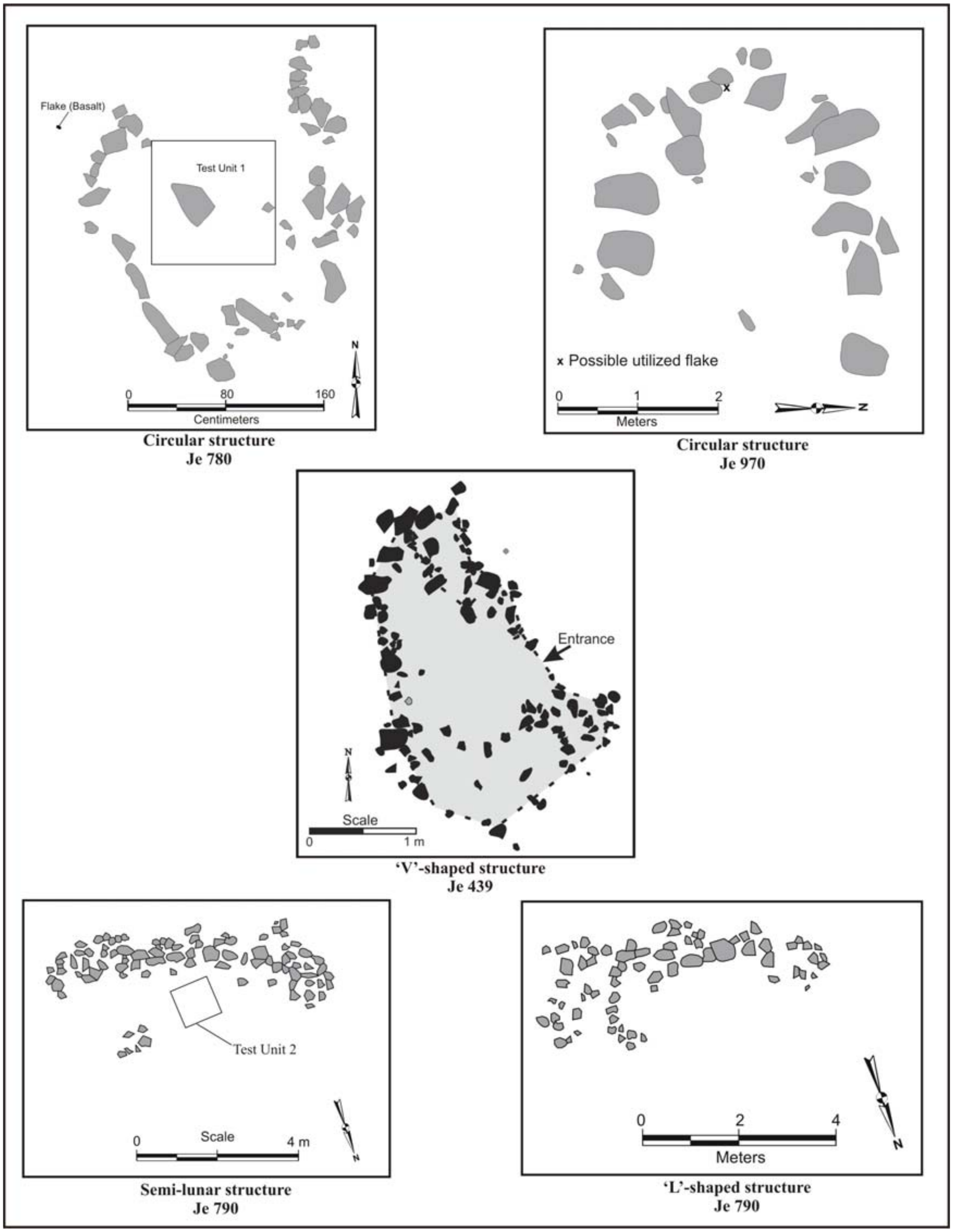

Figure 6.11. Examples of Early Preceramic domestic structures present in the QBT (adapted from Stackelbeck 2008: 182).

The temporal assignment of these 28 structures to the Early Preceramic period is based on a combination of associated diagnostic artifacts, dates from excavation contexts within or associated with structures, and a regional chronology of structure forms developed by Stackelbeck (2008). Diagnostic artifacts (like Paiján points) were occasionally encountered within or (more often) adjacent to individual structures, indicating an Early Preceramic age (Dillehay et al. 2003). In addition, AMS dates from samples collected during the excavation of test units within or near domestic structures were also used to assess the age of individual structures and refine the chronology of separate forms. The lone V-shaped structure from site Je-439 is a good example (Figure 6.11). This structure form was previously unknown in the north coast region and was temporally assigned based on the associated artifacts (numerous Paiján points and limaces) and two AMS dates (10,056±67 and 9851±58 RCYBP) that were collected from nearby midden deposits.

At the few sites where a structure and Early Preceramic diagnostic materials were both found but could not be directly associated, the form of that structure was compared to the regional chronology of structure forms to determine probable age. Stackelbeck's (2008) chronology incorporates Preceramic structure forms identified in the Jequetepeque and Zaña Valleys with others from dated contexts from across Perú and northern Chile to identify long-term architectural patterns and temporal sequences. These patterns form a regional baseline with which individual structures can be compared.

Table 6.3 presents the Early Preceramic sites (n=12) that contain domestic structures, along with the number of structures and specific forms. Circular structures are the most common form (n=17)(60.7%) of Early Preceramic domestic structure and were identified at nine sites. L-shaped (n=5)(17.9%) structures are much less common and were identified at two sites (Je-790 and Je-804). Semi-lunar structures (n=5) (17.9%) were identified at three sites (Je-484, Je-790 and Je-954). As mentioned above, a single V-shaped structure (n=1)(3.5%) was identified during the survey at site Je-439.

Although these structure forms are considered to be roughly contemporaneous (all are Early Preceramic in age), it is unclear what the variability in form might represent. Variability in structure form may relate to different Early Preceramic cultural traditions (i.e., different cultural or ethnic groups) occupying the same region, different intended purpose (function) of the structure, and/or different anticipated duration of occupation at individual sites (Dillehay 1997a; Kent 1991; Kent and Vierich 1989). For the purposes of this study, the indication of anticipated duration of occupation is considered the most relevant for characterizing site types and understanding regional settlement.

While it is likely that all early foragers constructed and used some type of shelter, the common lack of a material signature for these structures indicates that they were probably temporary constructions that required a minimal investment of time, resources, and labor (Binford 1990; Kelly 1992; Kent 1991; Kent and Vierich 1989). However, the presence at some sites of domestic structures with stone-lined foundations suggests a greater investment of time and labor, and implies that these structures were intended (or anticipated) to have longer use lives (i.e., longer duration of occupation). Different anticipated durations of occupation can be an indicator of functional variability between sites (Kent 1991; Kent and Vierich 1989). In this study, the presence of domestic structures is considered to represent longer anticipated stays at individual locations and provide one avenue for characterizing different types of sites.

Although the mere presence of domestic structures may be useful in characterizing functional differences between sites, the number of structures present at individual locations can also provide additional insights. The presence of a single versus multiple structures at a site can be an indicator of the intensity of occupation and/or re-occupation of particular locations and/or possible differences in the size of the population occupying a given site (Binford 1983; Gargett and Hayden 1991; Kent 1991; Whitelaw 1983). Sites that contain single (n=6)(50%) and multiple (n=6)(50%) structures are represented equally in the QBT assemblage (see Table 6.3). However, sites with only one or two structures (n=10; 83.3% of sites with structures) comprise the vast majority of Early Preceramic sites with identified structures. Only two sites (Je-431 and Je-790) contained more than two structures (n=7 structures, respectively). These two sites may represent locations where frequent or intensive re-occupation occurred, resulting in the construction of multiple structures. It is also possible that the presence of multiple structures at these two locations reflects extended stays by larger populations than was typical of sites with domestic structures. These possibilities and the importance of multiple structures are discussed in more detail in Chapter Nine.

Summary and Conclusion

This chapter has presented the results of the survey for Early Preceramic sites within the Quebradas del Batán and Talambo. A total of 126 Early Preceramic sites have been identified in the lower Jequetepeque Valley by the Proyecto Pacasmayo (Dillehay et al. 2009) and the QBT survey. These sites vary widely in terms of size and location and amounts and types of cultural material and features that are represented on the surface. In general, Early Preceramic sites in the lower Jequetepeque region are heavily concentrated in the *quebradas* that drain into the main valley and penetrate western Andean foothills. Two distinct Early Preceramic occupations (based on diagnostic surface artifacts)—the Fishtail and Paiján—are clearly represented, although others may be present as well.

Fishtail points were recovered from four sites within the Quebrada del Batán. These sites are located on alluvial terraces that border dry drainages, and would have provided a commanding view of the *quebrada* floor. However, each of the sites yielding Fishtail points also contained Paiján points. Sites with Paiján cultural materials are far more numerous and widespread. Sites containing diagnostic Paiján artifacts (Paiján points, limaces, and *Chivateros* bifaces) (n=126) were identified throughout the QBT region. These sites occur on a relatively wide range of landforms and express a wider range of variability in size. Paiján sites also often contained surface features related to prehistoric activities and included lithic knapping stations (*talleres*), land snail middens, rock-lined hearths, and stone-lined foundations of domestic structures. A single, disturbed human burial was found eroding onto the surface at site Je 1002.

The results of the QBT survey are discussed within a framework based on previous studies of Early Preceramic sites the Peruvian north coast (Becerra and Esquerre 1992; Briceño 1999; Chauchat 1998; Dillehay 2000; Dillehay et al. 1997; Dillehay et al. 1989; Gálvez 2004; Malpass 1983; Ossa and Moseley 1972; Ossa 1978; Richardson 1983; Rossen 1991). The results of these previous studies suggest that distinct types of sites—with different functional roles—probably existed within the Early Preceramic period. A general model of potential sites types has been presented based on the collective results of previous research in the north coast region and other archaeological and ethnographic studies. These site types include long-term basecamps, short-term basecamps, long- and short-term field camps, processing locations, transitory stations/workshops, quarries, mortuary locations, and rock art locations. Although examples of each of the potential site types can be identified within the broad north coast, it is likely that not all types will be represented in any specific region or assemblage of sites.

Comparison of the various previous Early Preceramic studies also revealed several specific lines of variability that may be useful in characterizing different sites according to the potential types identified in the general model and for understanding how those sites may have been organized into functioning settlement systems. These variables include site location, site size, lithic tool frequency, the amount and types of activities represented at individual sites; and the presence of domestic structures. Only three of these criteria are discussed in this chapter—location, size, and presence of domestic structures. The other two criteria used to evaluate site types—tool frequency and activities represented—are dependent on other lines of analysis that are discussed in following chapters. All five criteria, when considered together, can be used to identify functional differences between sites and determine the range of site types that comprise the QBT assemblage. These characterizations are presented and discussed in Chapter Nine.

The preceding discussions in this chapter have presented the basic data for assessing variability in site location, size, and presence of domestic structures. In general, the data from the Early Preceramic QBT sites indicate a preference for terrace landforms (although a wide range of landform types are represented). Three broad groups of sites by size have been identified and reflect differing amounts and intensity of reuse/re-occupation. Lastly 12 sites have been identified that contain Early Preceramic domestic structures. Most of these sites contain only one or two structures. Two sites were identified that contain multiple domestic structures.

Although these data and general patterns have been presented here, they alone cannot be used to characterize functional differences between sites. These data from these three site attributes must be combined with the tool frequency and activities data in order to more comprehensively examine functional differences and identify site types. The data for assessing these additional attributes is derived from the excavation results (Chapter Seven) and lithic analysis (Chapter Eight). Once presented, the information from these separate analyses can be combined with the survey data presented here to begin identifying Early Preceramic site types and reconstructing regional settlement patterns (Chapter Nine).

CHAPTER SEVEN

EXCAVATION RESULTS

Introduction

The purpose of this chapter is to present the results of the test and block excavations conducted at Early Preceramic sites in the Quebradas del Batán and Talambo. A total of 10 Early Preceramic sites (7 in Quebrada del Batán; 3 in Quebrada Talambo) were selected for test excavations (Figure 7.1). As discussed in Chapter 5 (Methods), test excavations were conducted at sites in order to determine: 1) the extent of intact subsurface deposits present at a given site; and 2) provide context-specific samples of artifacts (lithics, floral, and faunal) and features (e.g., hearths and pits) that would augment and refine the assessments of site types and function based solely on surface collected materials (presented in Chapter 6-Survey Results).

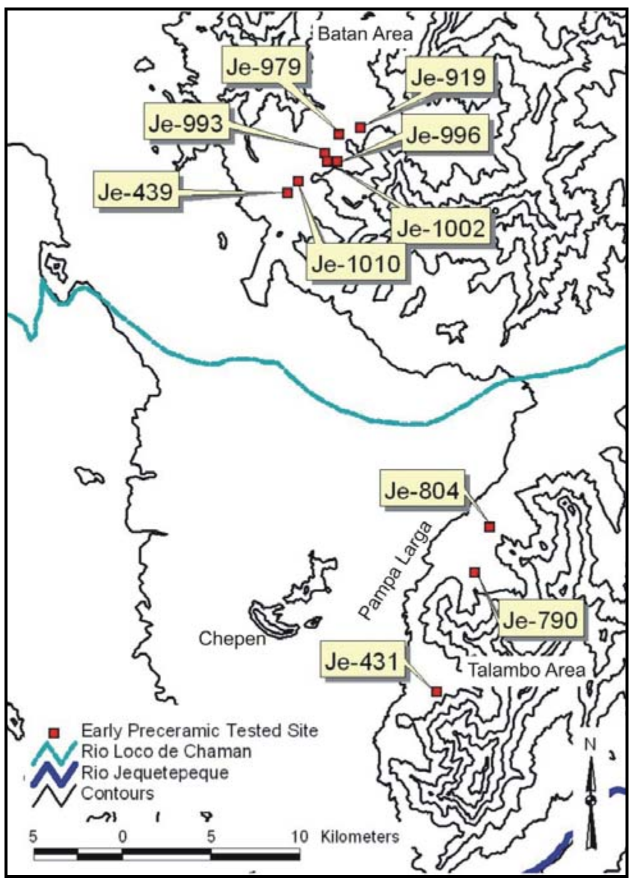

Figure 7.1. Distribution of Early Preceramic sites where test excavations were conducted (n=10) (plotted on the Chepén Topographic Quadrangle, 1:100,00 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcView 3.2 GIS program).

Six sites (Je-804, 919, 979, 993, and 1010) yielded relatively shallow deposits and few data and, as a result, received only limited testing. All of these sites are discussed below, with the exception of Je-1010, which yielded no intact subsurface deposits and is not discussed in detail. Larger, block excavations were conducted at five sites that indicated a greater possibility for providing information on Early Preceramic site function and spatial organization (Je-431, 439, 790, 996, and 1002). The five sites that received block excavations were selected according to one or more of the following criteria: 1) initial test excavations indicated the possibility of relatively deep intact deposits (greater than 15-20 cm below surface); 2) they appeared to have the highest potential to provide artifact, feature, and contextual data that would aid in the refinement of the site typology; and 3) the site contained Early Preceramic structures and/or distinctive artifact types and distributions (i.e., Fishtail and Paiján projectile points, groundstone implements, and floral and/or faunal materials) that could provide specific information regarding Early Preceramic economic and/or technological organization.

The criteria used to evaluate subsurface deposits, inform the excavation methods (discussed in Chapter 5-Methods), and characterize the potential significance of materials encountered were informed largely by the results of previously conducted excavations of Early Preceramic sites in the nearby Cupisnique region (Becerra 1999; Briceño 1999, 1997; Chauchat 1998, 1975; Gálvez 1999, 1992) and Zaña Valley (Dillehay and Netherly 1983; Dillehay et al. 1989; Dillehay et al. 2003; Dillehay and Rossen 2002; Rossen 1998, 1991). Results from the excavation of sites dating to later periods (e.g., Formative, Moche, and Chimú) were also used to inform the excavation methodology and identification of features and artifacts of these periods that were encountered during the QBT excavations (Dillehay et al. 2009; Dillehay et al. 2004b; Swenson 2004)

Previous Investigations

The results generated by the previous investigations in the Zaña, Jequetepeque, and Cupisnique regions highlight the need for specific contextual, feature, and artifact data from excavations for use in examining variability in intra-site spatial organization (Briceño 1999; Dillehay et al. 1989; Rossen 1991), particularly with regard to understanding how the ‘palimpsest effect’ may create an impression of false diversity in the archaeological record (discussed in Chapter Six) (Binford 1979). In addition to the contextual and feature data, the recovery of lithic, floral, faunal, and other materials is necessary to more fully assess the specific activities that occurred at individual sites.

In general, the results of the excavations in the QBT compare well with the results of the investigations conducted in the Zaña and Cupisnique regions. Dillehay, Netherly, and Rossen's excavations at several late Early and Middle Preceramic sites in the Zaña yielded intact, subsurface floors, features (such as hearths, pits, and burials), and a variety of botanical and lithic artifacts (Dillehay et al. 1989; Dillehay and Rossen 2002; Rossen 1991). Excavation of Early Preceramic sites in the Quebrada Cupisnique and Chicama Valley conducted by Chauchat, Briceño, and Gálvez also yielded a variety of faunal, floral, and lithic artifacts that extended at some sites to a depth of 40-50 cm below surface (Briceño 1999; Chauchat 1998; Gálvez 1992). These excavations also encountered several features, including hearths and pits, within dense midden deposits (in particular at sites PV23-130 and PV23-204) that contained both Paiján and Fishtail projectile points (Briceño 1999; Chauchat 1998).

The excavations in the Zaña have provided an excellent chronological framework for the transitional late Early/Middle Preceramic to Middle and Late Preceramic periods in that valley, along with a detailed understanding of the social, technological, and economic organization of the Middle Preceramic occupations in the upper valley (Dillehay et al. 1989; Dillehay and Rossen 2002; Rossen 1998, 1991). The investigations in both the Zaña and Cupisnique/Chicama regions indicated that many sites were multicomponent and contained stratified deposits relating to different periods (Chauchat 1998; Dillehay et al. 1989). This is particularly true for Early Preceramic sites in the Cupisnique and Jequetepeque regions, which are often overlain by ephemeral Moche and Chimú deposits (Briceño et al. 1993).

The excavations in the Cupisnique and Chicama have generated detailed information regarding the technology and economy of Early Preceramic occupations (Becerra 1999; Briceño 1999, 1995; Chauchat 1998, 1988, 1975; Chauchat et al. 2006; Chauchat et al. 2004; Gálvez 2004, 1999, 1992). However, the chronology of the Early Preceramic period remains poorly understood, particularly with regard to the relationship of the Fishtail and Paiján occupations in the north coast region and the different types of sites that may exist. In addition, very little is known of how the various Early Preceramic sites that have been documented and investigated in the Cupisnique/Chicama region may have been organized into a functioning settlement system, or how their function may have changed over time.

The goal of this chapter is to present excavation data recovered in the QBT that will address these persistent questions and build on the results of these previous studies. Specifically, this chapter will present the materials recovered from the excavation of 10 Early Preceramic sites, along with a characterization of the site stratigraphy and a discussion of any features encountered and site chronology. Radiocarbon dates are presented with their associated context and cultural materials. The impact of the excavation data on the site type assessment (Chapter Six) for each site will also be discussed. Each of these separate lines of data will be used to refine the typology of sites that was identified with the survey data by providing additional information about site function and activities, duration of occupation, and chronological relationships within and between sites. The site typology will, in turn, be used as the basis for reconstructing Early Preceramic settlement patterns. If a reconstruction of the settlement patterns that may have existed in the lower Jequetepeque Valley during the Early Preceramic period can be elucidated—and possibly how they may have varied over time—then that information can be used to better document how the processes of localization and regionalization occurred among the coterminous/overlapping early complexes of the lower Jequetepeque region.

Test and Block Excavations in the QBT

Je-431

Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0680613 Northing: 9199107
Site Dimensions: East/West: 1566 m North/South: 330 m
Chronology: Multicomponent (Early Preceramic, Late Early/Middle Preceramic, Cupisnique, Moche, and Chimú periods)

Site Description:

Je-431 is distinctive from all other Early Preceramic sites identified in the QBT (Figure 7.1). It is by far the largest site in terms of area and contained the densest concentrations of surface materials and features (Figure 7.2). The site is extensive and multicomponent, indicating occupation from the Early Preceramic (Paiján) through Chimú times—based on the surface artifacts and features. The Early Preceramic occupation is evidenced by a light to high density scatter of temporally diagnostic lithics that extends across the entirety of the site. Lithic tools identified and collected from the surface include numerous Paiján projectile points and point fragments, bifaces and biface fragments, *limaces*, various unifacial and flake tools, and groundstone (mano-like grinding stone). In addition to the lithic tools and debris, 39 distinct lithic knapping features were also identified (discussed below). The stone-lined foundations of seven circular structures (Structures 2-4 and 6-9) believed to be associated with the Early to Late Early Preceramic period were also recorded.

Later occupations of the site are indicated by the presence of a few Cupisnique, Moche, and Chimú ceramics that were observed and/or collected in various parts of the site, and by three additional structures (Structures 1, 5, and 10) that appear to date to the Formative or later periods. These structures included: a 'B-shaped', stone-lined form (Structure 1); a possible *pirca* (Structure 5); and a partially-disturbed rectangular, stone-lined form with interior partitioning (Structure 10). In addition to these structures, a large and long rock wall that has been heavily disturbed bisects the site on a roughly N/S axis (this wall continues across the entire *quebrada*).

<u>Surface Features:</u> A total of 58 features were recorded at of Je-431, including: 39 lithic knapping features; three large land snail shell middens; three rock piles; ten stone-lined structures of various forms; two rock walls; and one subsurface hearth recorded in Test Unit 5. These features are identified and briefly described in Appendix 1. The knapping features, the seven roughly circular structures (Structure 2-4 and 6-9), and the land snail middens are considered to be Early to Late Early Preceramic based on associated materials (e.g., lithic tools and debitage, carbon samples that yielded AMS dates) and, in the case of the structures, their forms (which compare well with other Preceramic structures documented elsewhere in the Central Andes [Dillehay et al. 2003; Malpass and Stothert 1992; Stackelbeck 2008]). Test Unit 5 was excavated within a land snail midden (Feature 41). A hearth feature (Feature 54) in TU 5 was identified at the base of Level 2; a carbon sample from this level yielded a radiocarbon date from the Early Preceramic

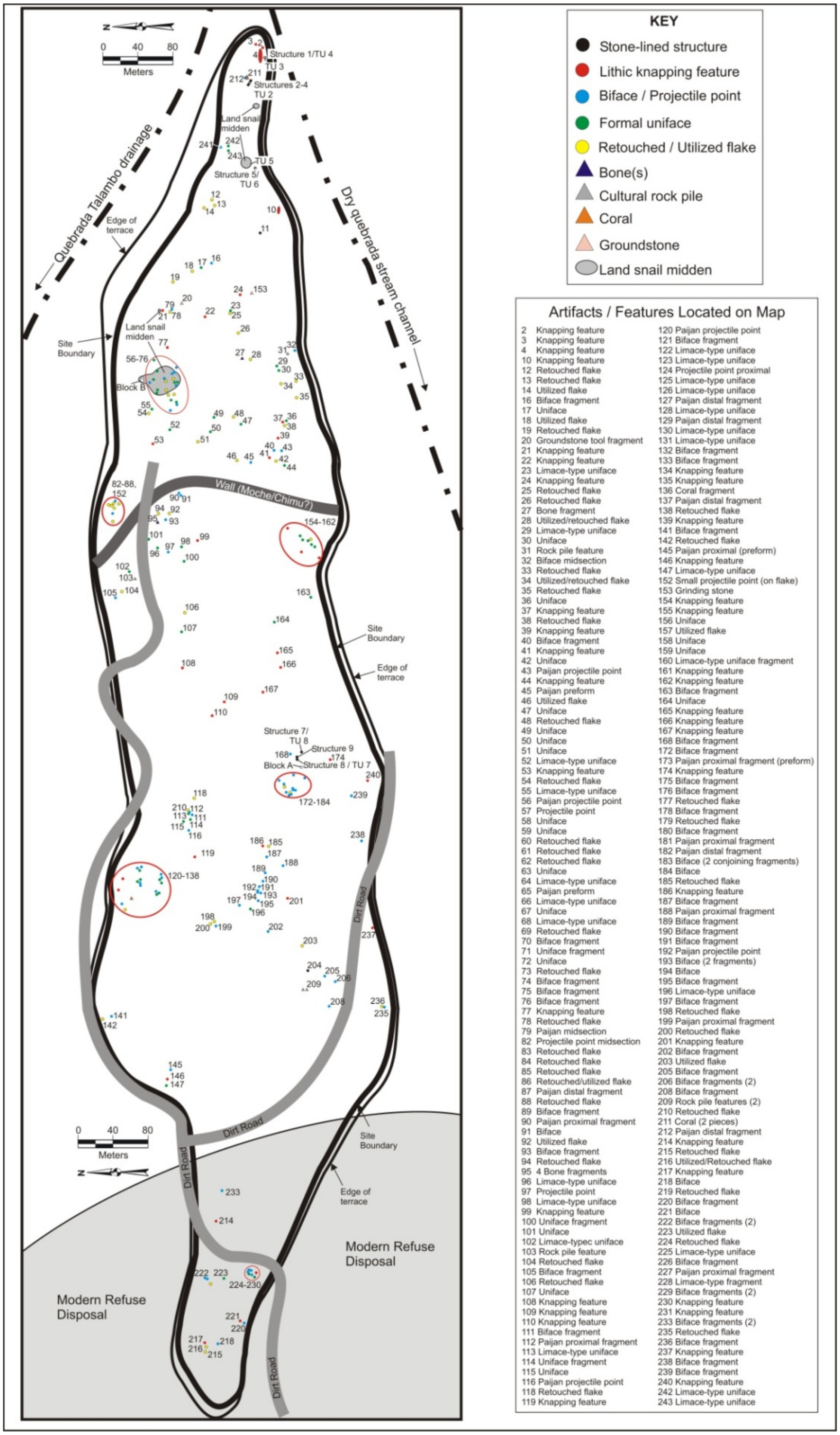

Figure 7.2. Site map of Je-431.

period (9983±93 RCYBP [11,951-11,221 cal BP]). This date and other associated materials support an interpretation of Early Preceramic cultural affiliation for the midden and hearth feature. Excavation Block B, which was excavated within another land snail midden (Feature 42), yielded three AMS dates around 9000 RCYBP, also indicating an Early to Late Early Preceramic age (see discussion below [also see Stackelbeck 2008]).

Excavations in Structure 1 (Feature 46) yielded data suggesting that this structure was occupied during Cupisnique (based on recovered ceramics) or Moche times (based on an AMS date [1521 ± 40 RCYBP; Appendix II]). The cultural affiliation of the rock piles (Features 43-45), Structure 5, Structure 10, and the rock walls (Features 57 and 58) is uncertain, although they are considered to likely relate to the later Ceramic Period occupations of the site (based on similarities with other reported sites [Chauchat 1998]).

Je-431 Excavations:

A total of 16 1 x 1 m test units were excavated at Je-431. Of these units, only Block B (T.U. 1, 13, 14, 15, 16) and T.U. 5 yielded subsurface deposits that can be clearly related to the Early Preceramic period. The result of the excavation of each of these units is discussed in detail by Stackelbeck (2008: 260-267, 313-319). As such, this section will only discuss the Early Preceramic activities and general patterns that are indicated by the cultural materials and stratigraphy that has already been documented.

<u>Block B</u>

Block B at Je-431 consisted of five, adjacent 1 x 1 m test units that were located within a land snail midden that contained diagnostic Early Preceramic artifacts (Paiján projectile point, bifaces, and formal unifaces) (Figure 7.3). Cultural deposits in Block B were relatively deep, extending to a maximum depth of 50 cm below surface. Two sediment zones were identified (Zones I and II) within the deposits. Although artifacts were recovered from both zones, Zone I appears to represent the bulk of the cultural deposition. Stackelbeck (2008) has interpreted the Zone I deposits as representing a transitional Late Early Preceramic/Early Middle Preceramic timeframe, while the lower Zone II deposits are believed to date entirely within the Early Preceramic.

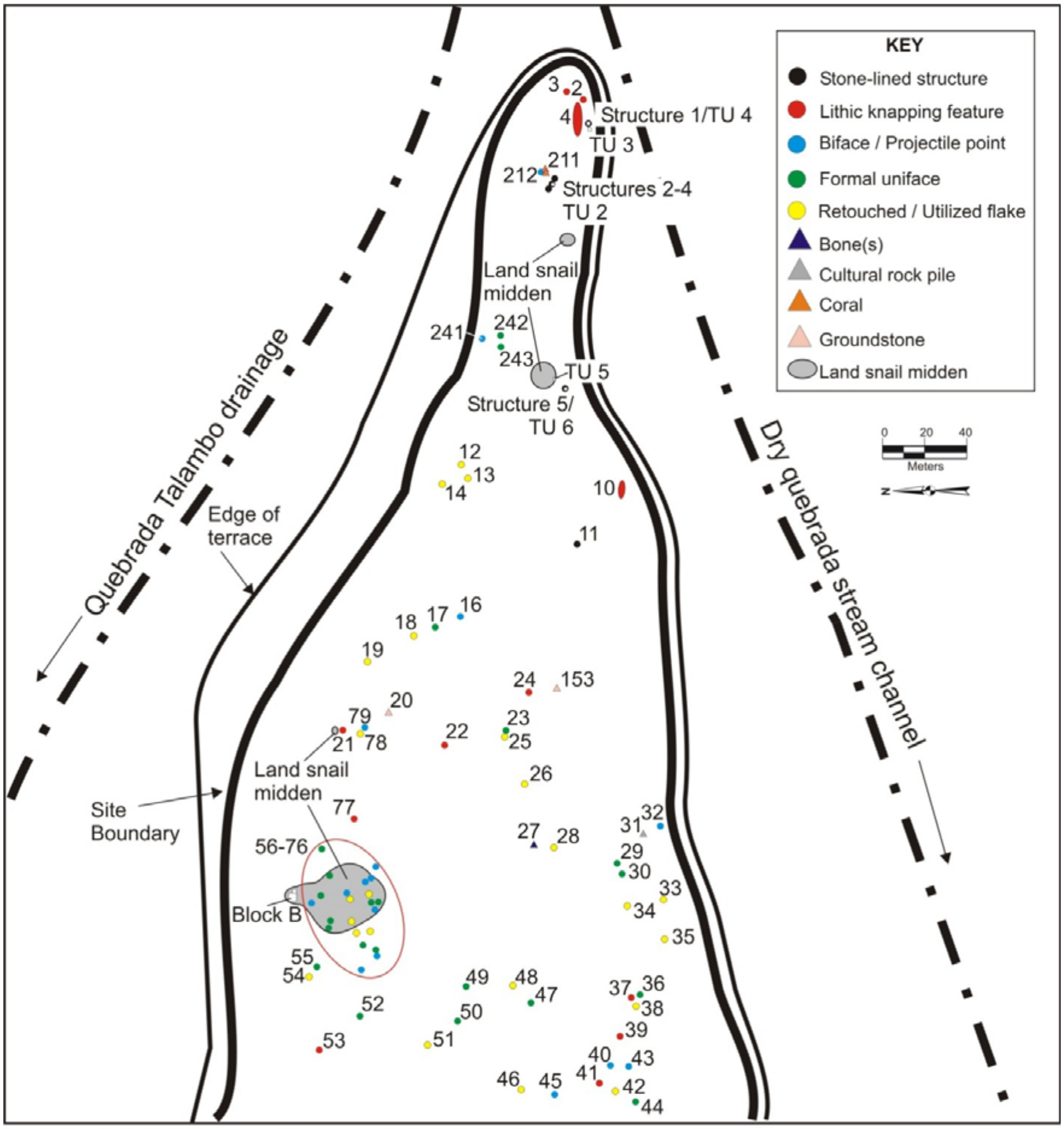

Figure 7.3. Site map of the east end of Je-431.

Three AMS dates were produced on carbon collected from throughout the Zone I deposits (see Table 7.1). Aside from one anomalously old date, the age of the Zone I deposits in Block B clusters around 9,000 RCYBP, which corresponds with the end of the Early Preceramic period. The cultural materials recovered from Block B included numerous pieces of lithic debitage, ten lithic tools (including a Paiján projectile point [Figure 7.4] and a Paiján midsection), and abundant faunal remains (including land snail shells, bone, and columnar cactus seeds) (Stackelbeck 2008).

Table 7.1. AMS dates from Block B, Je-431.

Site	T.U.	Level	cmbd	PP #	Zone	AMS date	Error	Cal BP (2 sigma)	Material
Je-431	1	2	8	3	I	>15,600		uncalibrated	Wood Charcoal
Je-431	1	4	20	9	I	8,983	65	10,244-9,912	Wood Charcoal
Je-431	1	7	30-35	gen	I	9,032	50	10,270-9,939	Wood Charcoal
Je-431	13	2	10	1	I	9,041	48	10,282-10,043	Wood Charcoal

Figure 7.4. Photo of an *in situ* Paiján projectile point in Block B, Je-431.

The faunal remains from Block B indicate the persistent and intensive exploitation of land snail (*Scutalus* sp.), along with a relatively wide range of other terrestrial and aquatic/marine species. Other exploited species identified in the Block B Zone I deposits included: South American fox (*Pseudalopex* sp.), perching birds (Passeriformes), desert tegu lizard (*Dicrodon* sp.), sharks and rays (Chondrichthyes and Rajiformes cf. Dasyatidae), drum/croaker (Sciaenidae and *Micropogonias* sp.), lefteye flounder (Bothidae), mullet (*Mugil* sp. [some burned]), unidentified bony fish (Osteichthyes [some burned]), and unidentified Mammalia (some burned)(Pavao-Zuckerman 2004; Stackelbeck 2008). Faunal remains from the lower Zone II deposits in Block B were much fewer in number and included only desert tegu lizard (Teiidae) and bony fish (Osteichthyes).

It is interesting that the three exploited species represented in the Early Preceramic Zone II deposits (land snail, desert tegu, and bony fish) also are present in the overlying Late Early Preceramic aged deposits (Zone I), perhaps indicating the persistence of similar exploitation strategies. However, by the time of Late Early Preceramic occupations, it is clear that a broad suite of species is being transported to Je-431 (from a variety of ecological zones) for preparation and consumption.

Test Unit 5

Test Unit 5 was a 1 x 1 m unit positioned within a small land snail shell midden thought to be associated with a nearby circular structure (Structure 6) (see Figure 7.3). Cultural materials in T.U. 5 extended to a depth of 20 cm below surface and included lithic debitage, land snail shell, and bone. A small hearth feature (Feature 54) was identified between 13-18 cm below surface that contained a few flakes and land snails and one bone (Osteichthyes) (Stackelbeck 2008). A carbon sample collected from above the hearth feature (Level 2, 8 cmbs) yielded an AMS date of 9,983±93 RCYBP (11,951-11,221 cal B.P.) indicating an Early Preceramic age for the deposits in the portion of Je-431.

Other than land snails (*Scutalus* sp.) faunal remains recovered from T.U. 5 included a deer scapula (Cervidae), desert lizard (Teiidae and *Dicrodon* sp. [some burned]), mullet (*Mugil* sp.), bony fish (Osteichthyes), and unidentified Mammalia (some burned) (Pavao-Zuckerman 2004). All of these resources can clearly be attributed to an Early Preceramic occupation of Je-431. It is more difficult, however, to directly associate these cultural materials with the nearby Structure 6. This is due primarily to the fact that excavations within the structure produced shallow deposits with few cultural materials (lithic debitage). Stackelbeck (2008) has suggested that the large land snail shell midden within which T.U. 5 was positioned, served as the domestic/food preparation area for the occupants of the structure.

If Structure 6 and the nearby midden deposits are associated, then the occupation of Je-431 during this period of the Early Preceramic (Middle Early Preceramic) seems to have been of relatively long duration (to have produced the midden deposits and warranted the construction of the structure) and involved the exploitation of a wide range of resource zones—some of which (i.e., coast) are at some distance from the site (paleoshoreline was 30-35 km distant).

Discussion of Je-431 Excavations

The results from the excavations conducted at Je-431 provide some significant insights into the nature of Early Preceramic occupations of the site over a relatively long span of time. The T.U. 5 deposits are indicative of an Early Preceramic occupation (ca. 10,000 RCYBP) that involved relatively long-term occupation (probably seasonal to multiseasonal) with the presence of a domestic structure and associated midden with a subsurface feature. Faunal remains from the midden and feature indicate a relatively wide range of species was exploited, some of which were apparently acquired at distances up to 30-35 km from the site or exchanged for with other groups. The transportation of a wide range of species from different ecological contexts to the site for consumption, combined with the relatively substantial midden deposits, is suggestive of long-term occupation. Structure construction also typically indicates a low anticipated mobility (Kent and Vierich 1989; Kent 1991) and supports the suggestion of long-term occupation of the site during this period of the Early Preceramic.

A similar pattern of broad resource exploitation and substantial midden development was also documented in the Block B deposits at Je-431. These deposits are tightly dated to the end of the Early Preceramic period (Late Early Preceramic, ca. 9,000 RCYBP) and suggest that the subsistence practices of the site's occupants had not significantly altered over the intervening roughly 1,000 years. Like the T.U. 5 midden, a range of both terrestrial (primarily land snail) and aquatic/marine resources were exploited. Block B also contained diagnostic Paiján lithics (projectile point and point midsection) that clearly associate those deposits with the Paiján complex. The similarity of the Block B deposits (in terms of subsistence strategies and exploited resources) with those of earlier T.U. 5 deposits is suggestive of a relatively long-term Paiján use of the site.

Interestingly, both of these midden deposits appear to indicate relatively long-term occupations (seasonal to multiseasonal), but are temporally distinct and spatially segregated from each other. The temporal and spatial separation of these middens suggests that individual Paiján occupations of the landform over time did not relocate themselves in precisely the same areas of site. The same landform is re-used over time, but the location of campsites shifted to different areas across this large landform. This may partly explain the massive size of Je-431, but more importantly, it suggests that the seven structures identified as Early Preceramic at the site may relate to distinct occupational episodes and were not contemporaneously inhabited.

In sum, the Early Preceramic deposits at Je-431 suggest that the site likely served as a Paiján basecamp from about 10,000-9,000 RCYBP. This occupation does not appear to have been continuous (given the spatial segregation of the two middens), but more likely involved periodic long-term (seasonal to multiseasonal) re-occupations of the site. It does appear that the Paiján occupants of the site employed a generalized foraging strategy that emphasized the exploitation of a relatively wide range of resources. This subsistence strategy appears to have persisted relatively unchanged throughout the length of the Early Preceramic use of the site (roughly 1,000 years).

Je-439

Subarea: Quebrada del Batán   Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0675245   Northing: 9218190
Site Dimensions: East/West: 206 m   North/South: 170 m
Chronology: Multicomponent (Early Preceramic and unknown Ceramic period)

Site Description:

Je-439 is located on a low, flat terrace that extends to the west from the base of Cerro Organos into the lower Quebrada del Batán drainage (Figure 7.1). The terrace is situated directly to the north of the mouth of Quebrada Organos and has a commanding view of the lower Quebrada del Batán drainage and nearby pampa. Je-439 is a large site that is comprised of a generally medium to high density lithic scatter with areas of very high density concentrations. A large number of lithic tools were identified and collected from this site, including numerous Paiján projectile points, an unidentified projectile point, limaces, unifaces, bifaces, and retouched/utilized flakes. Several groundstone tools were also identified and recorded at the site, including several *batanes* and smaller 'mano-like' grinding stones.

At least four large, very dense clusters (Clusters 1-4) of lithic tools and debitage were identified at the site. These large clusters were believed to represent distinct occupations of the site or reoccupations of the same landform over time and were predominantly located along the northern end of the site (Fig 7.5). Several smaller clusters of tools were also observed across the surface of the site, including a cluster of grinding slabs and grinding stones in the northwest portion of the site that represents a distinct activity area, perhaps related to plant processing. Three small, surface bone scatters were also identified on the western end of the site. Two distinct lithic knapping stations were also identified, along with a small, circular rock hearth and a 'V' shaped, rock-lined structure (Structure 1)(see Figure 6.11).

Je-439 Excavations:

A total of ten 1 x 1 m test units (T.U. 1-10) were excavated at Je-439. Each of the units was positioned in areas that appeared to present a strong possibility for containing intact subsurface deposits and had yielded concentrations of lithic tools and debris on the site surface. Test Units 1 and 3-10 were located in the northwestern portion of the site within the large cluster (Cluster 1) of lithic tools and debitage associated with Structure #1 and a concentration of bones (Figure 7.5). Test Unit 2 was positioned in the north-central portion of the site, just to the west of Cluster 2 and will be discussed first since the rest of the units at Je-439 (T.U. 1, 3-10) comprised a large block excavation.

<u>Test Unit 2</u>

A total of three 5-cm levels (Levels 1-3) were excavated in T.U. 2 (1 x 1 m) to a final depth of 15 cm below surface. Eleven flakes and flake fragments were collected on the surface of T.U. 2 prior to excavating Level 1. Level 1 (0-5 cmbs) contained a total of

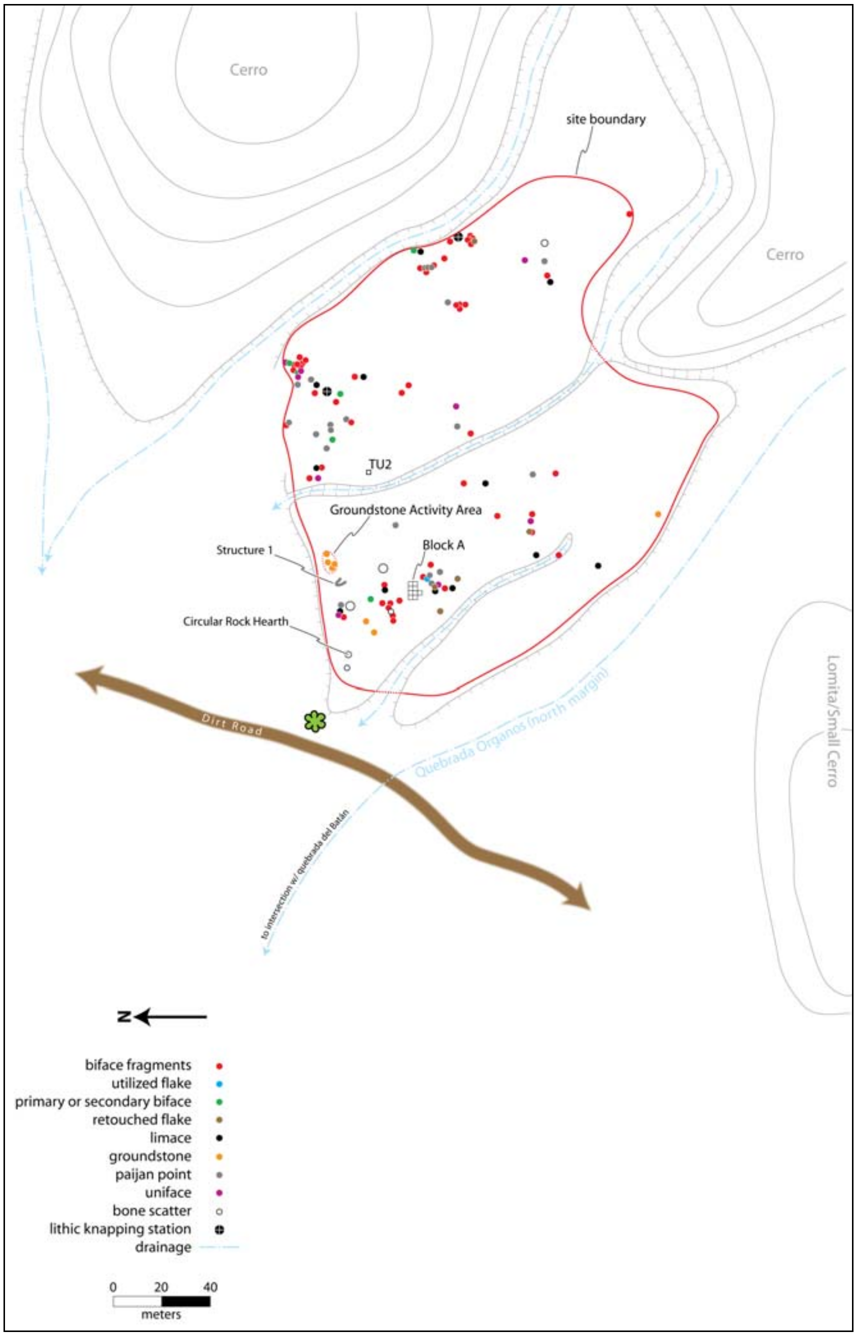

Figure 7.5. Site map of Je-439.

20 flakes and flake fragments of several types of raw materials (basalt, quartzite, *toba volcanica*, quartz, and quartz crystal) (Table 7.2). A change in the sediment structure occurred in Level 1—from a moderately compact fine silty sand to a loose fine silty sand between 1 and 3 cm below surface across the unit. The loose fine silty sand continued into Level 2 (5-10 cmbs) but abruptly contacted compact (hard) fine silty sand with

Table 7.2. Materials recovered by level from TU 2, Je-439.

	Debitage	Bifaces	PPK	Unifaces	Carbon (PP)	Land snail (g)
TU2/Surface	11	0	0	0	0	0
TU2/Level 1	20	0	0	0	0	0
TU2/Level 2	6	0	0	0	0	0
TU2/Level 3	3	0	0	0	0	0
Unit Total:	40	0	0	0	0	0

numerous pebble inclusions. Level 2 contained only six flake/flake fragments (all of quartz and quartzite). Level 3 (10-15 cmbs) was entirely within the compact fine silty sand sediment, which became increasingly compact (with depth) and contained 'nodule-like concretions' of sand and pebbles[1]. A total of three flakes were recovered from Level 3. Each of these flakes was found in the upper 1-2 cm of Level 3 and no artifacts were found in the lower portion of the level. No additional levels were excavated in T.U. 2.

A total of three soil zones (Zones I-III) were identified during the excavation of T.U. 2 (Figure 7.6). Zone I, which was characterized as a pale brown (10YR 6/3) moderately compact fine silty sand, was of uneven thickness across T.U. 2 and ranged from the surface to between 1 to 3 cm below surface. Zone II was also a pale brown (10YR 6/3) fine silty sand, but the structure of the Zone II sediment was much looser than the overlying Zone I. Zone II appeared between 1-3 cm below surface and extended to a maximum depth of 6-10 cm below surface across T.U. 2. The final zone in T.U. 2, Zone III, was a brown (10YR 5/3) compact fine silty sand with numerous pebble inclusions. Much of Zone III consisted of very compact 'nodule-like concretions' of sand and pebbles that could not be broken apart without the aid of a pick.

Zones I and II were similar in all regards, except for structure (moderately compact vs. loose). I believe that the structural distinction between these two soil zones most likely represents a compaction of the near-surface sediments (like a crust) by the light rain that infrequently falls in this area. Zone II, then, would represent the same sediment, but was deep enough below surface to not be affected by surface moisture.

[1] During an inspection of the Je-439, Dr. Mario Pino identified these 'nodule-like concretions' as representing the deposition of the terrace sediments in a wet environment, likely associated with the initial alluvial deposition of the terrace landform.

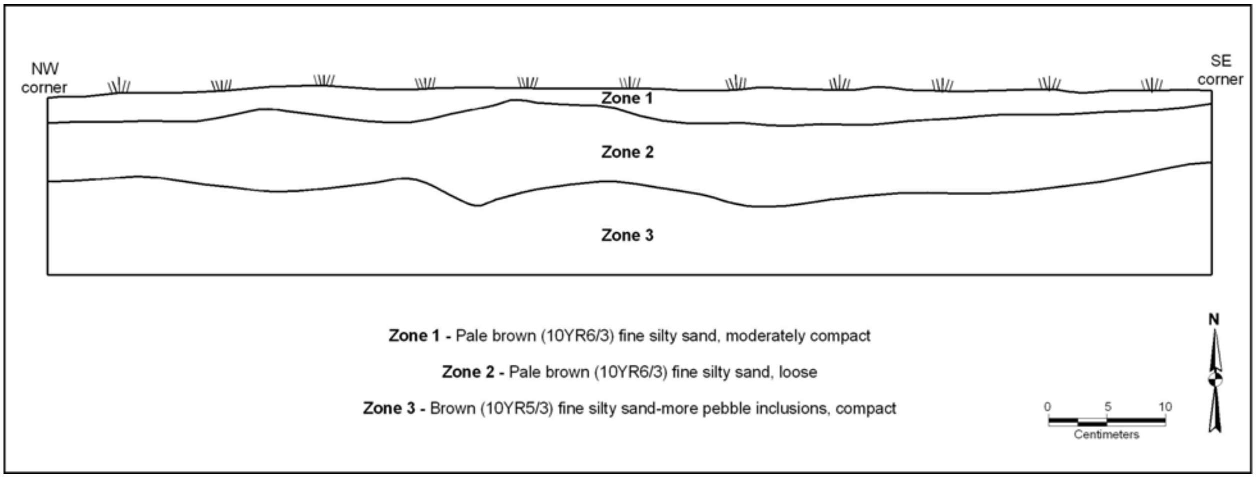

Figure 7.6. North wall profile of TU 2, Je-439.

Because the excavation levels in T.U. 2 overlap the contacts between the different soil zones, assigning cultural materials to specific zones is problematic. However, the density of materials in Levels 1 and 2 (compared to Level 3) suggests that Zones I and II represent the extent of the cultural deposits in this portion of Je-439 (totaling 6-10 cm thick). Zone III represents the sterile, terrace subsoil. Zone III did yield three flakes, but each of these was found in the uppermost portion of Level 3 (10-12 cmbs) and probably represent some downward displacement of artifacts from Zones I and II through relatively recent rodent or root activity.

In sum, the excavation of T.U. 2 at Je-439 resulted in the identification of intact subsurface cultural deposits that overlay sterile subsoil that was deposited as the terrace landform was initially forming. The cultural deposits were relatively shallow (6-10 cm thick) and did not contain a large number of artifacts. No features were encountered in T.U. 2.

Test Units 1, 3-10 (Block A)

Test Unit 1 was located in the northwestern portion of Je-439 in an area (Cluster 1) that contained a high density of surface lithic and faunal materials that was associated with Structure #1 (a V-shaped, rock-lined structure) (Figure 7.5). The excavation of T.U. 1 resulted in the identification of intact subsurface cultural deposits that extended between 10-15 cm below surface and contained a relatively high quantity of cultural materials. As a result of the productivity of T.U. 1, a large block (Block A) (2 x 4 m) consisting of eight 1 x 1 m test units (T.U. 3-10) was excavated directly adjacent (to the north) of T.U. 1 (Figure 7.7).

<u>Block A Paleosurface</u>

One of the more interesting characteristics of the sediment in T.U. 1 was the presence of a thin paleosurface that extended across the unit (Figure 7.8). The paleosurface was represented by a thin (0.5-1 cm thick), brown (10YR 5/3) compact lens of fine silty sand with small pebble inclusions. Cultural materials were encountered above and below the paleosurface, which appeared between 1.5-3.5 cm below surface, suggesting that the terrace landform had stabilized enough at some point during the occupation of the site to have resulted in the formation of this lens. A total of three soil zones (Zone I-III) were identified in T.U. 1 and cultural materials were encountered in all zones. Zones I and II appear, based on the density of cultural materials, to represent the extent of cultural deposits in this portion of Je-439. In contrast, Zone III contained only a single flake and appears to represent the sterile subsoil.

From the northern edge of T.U. 1, the thin paleosurface extended 1.85 cm to the north, covering most of T.U. 3 and 4 (Figure 7.9). Although it covered nearly all of T.U. 1, 3, and 4, the paleosurface extended only ephemerally into Test Units 5, 6, 9, and 10, and was not identified in the profiles of the western, northern, or eastern walls of Block A. It is unclear why the Zone II paleosurface was not present across all of Block A. However, the profile of the west wall of T.U. 3 and 4 provides some insight into this problem.

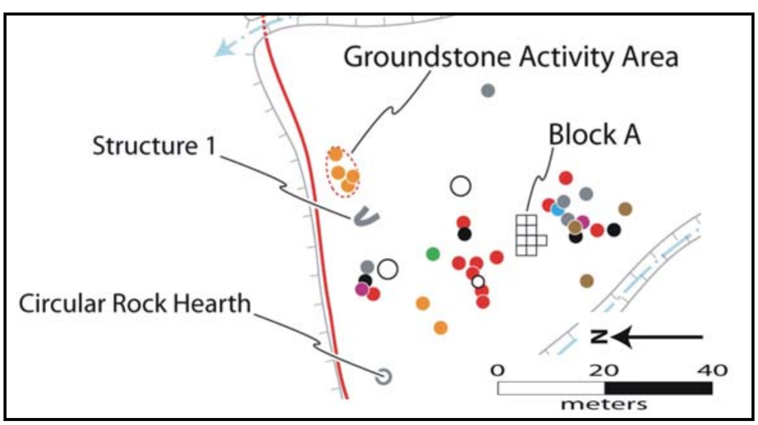

Figure 7.7. Planview of Block A at Je-439 in relation to nearby activity areas and Structure 1 (see Figure 7.5 for Key to artifact types).

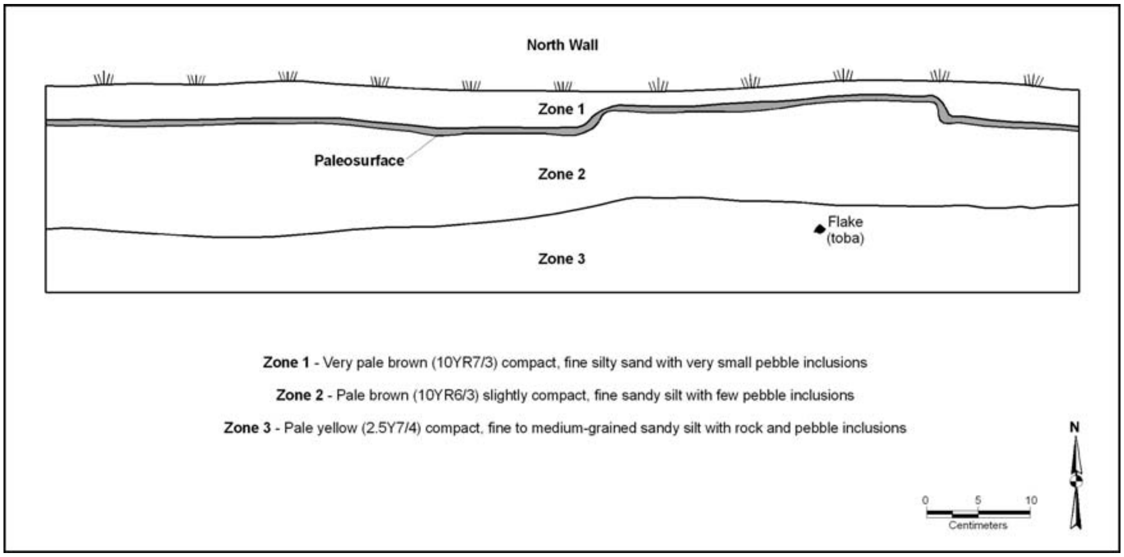

Figure 7.8. North wall profile of TU 1, Je-439.

In the northernmost end of the T.U. 3 and 4 west wall profile, the paleosurface abruptly terminates at the base of Zone I (Figure 7.9). This abrupt contact with Zone I suggests that the paleosurface has been eroded. It is possible that the extant portion of the paleosurface that was identified in Block A is the remnants of a larger paleosurface that has been unevenly eroded in areas that were closest to the surface. If this is the case, the remnant portion of the paleosurface probably represents areas that remained buried after deposition and have not been subjected to eolian erosion operating on the landform surface. This would explain why the paleosurface is not present across the entirety of Block A. The profile of the north wall of Block A (T.U. 10, 4, 5, 8) offers some support for this interpretation (see Figure 7.10). In the north wall of Block A, Zone I is not present across the entirety of the block, resulting in a contact between Zone II and the modern surface. The fact that Zone II contacts the surface suggests that the site has been eroded and that Zone I is comprised of redeposited sediment.

The interpretation of the discontinuous distribution of the paleosurface in Block A as a product of eolian erosion implies that Zone I (across Block A) represents deposits that have been reworked by wind and are not *in situ*. However, the sediment below Zone I (Zones II) is intact and represents *in situ* cultural deposits. What is not known, however, is how much of the Zone II deposits have been eroded. I will return to this question following a discussion of the stratigraphy and materials recovered in Block A.

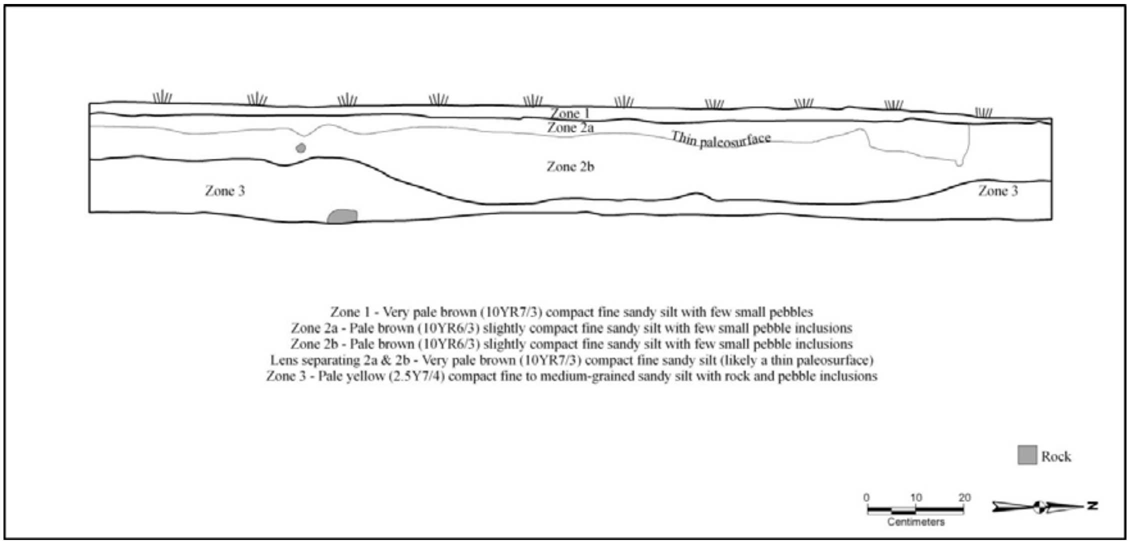

Figure 7.9. West wall profile of TU 3 and TU 4, Je-439.

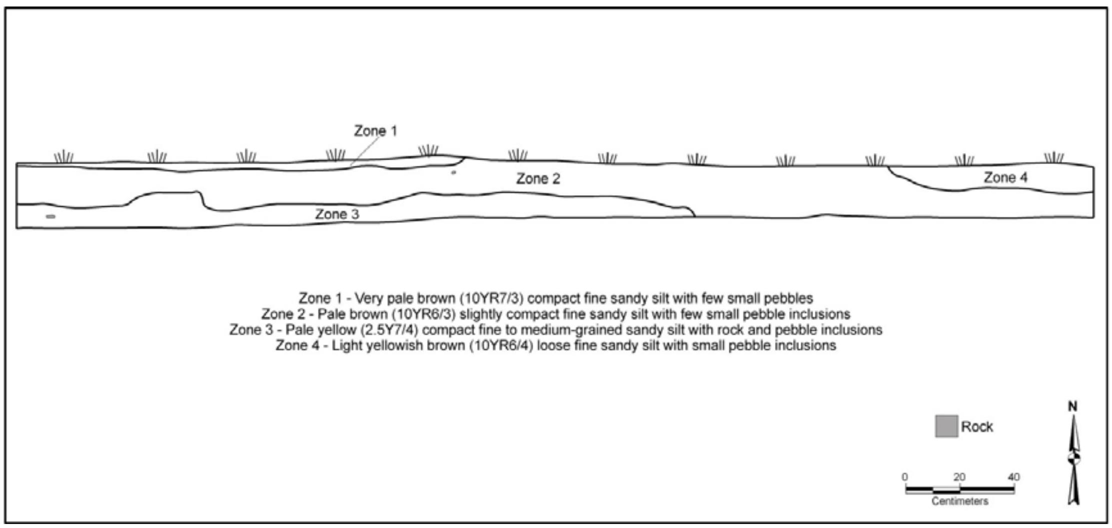

Figure 7.10. North wall profile of Block A, Je-439.

Stratigraphy of Block A, Je-439

A total of four distinct soil zones (Zones I-IV) and the aforementioned paleosurface were identified in the deposits of Block A at Je-439 (Figures 7.10, 7.11, and 7.12). Zone I, which was a very pale brown (10YR 7/3) compact, fine sandy silt with small pebble inclusions, comprised the uppermost soil zone in Test units 1, 3, 4, 9, and

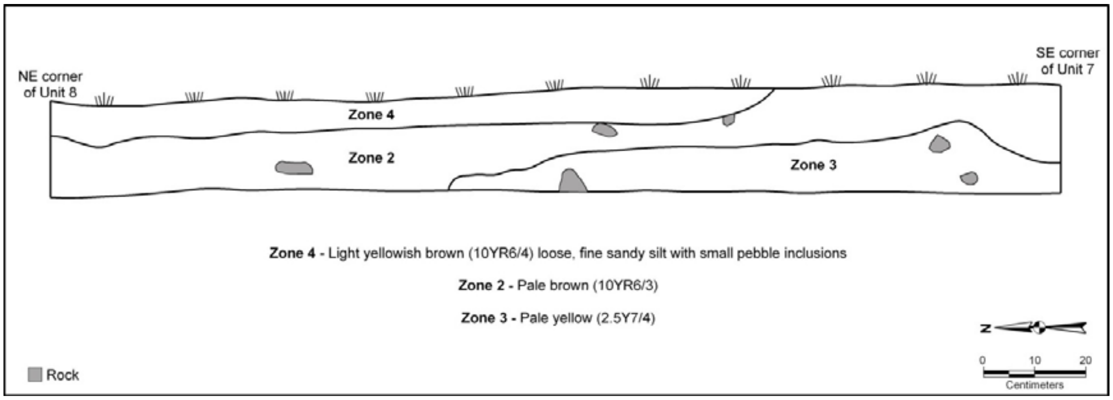

Figure 7.11. East wall profile of TU 7 and TU 8, Block A, Je-439.

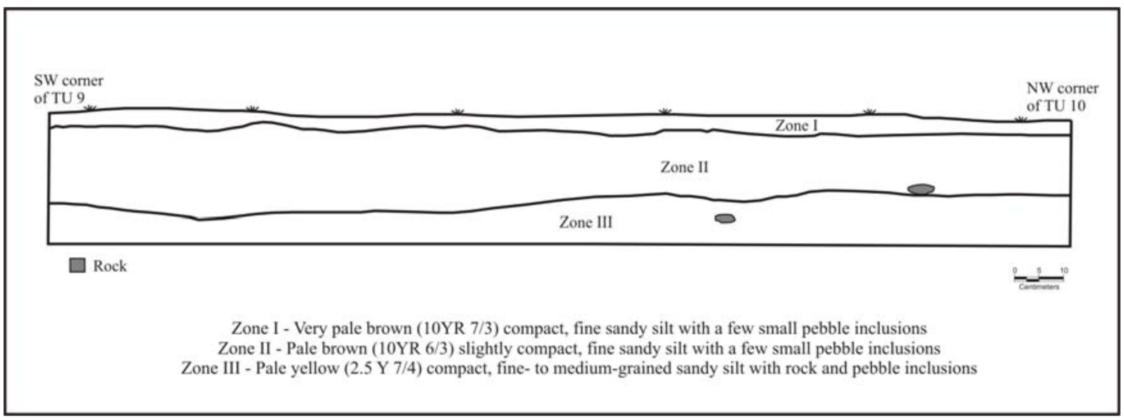

Figure 7.12. West wall profile of TU 9 and TU 10, Block A, Je-439.

10. Zone I was also present on part of the surfaces of Test units 5 and 6. Zone I extended from the surface to a maximum depth of 3-5 cm below surface across Block A (where it was present). In the central and western units of Block A, Zone I overlay a slightly compact, pale brown (10YR 6/3) fine sandy silt with small pebble inclusions (Zone II).

Zone II, in general, appeared between 0-10.5 cm below surface and continued to a maximum depth of 10-21.5 cm below surface. In the eastern end of Block A (T.U. 5, 6, 7, 8), Zone II appears at the surface or is overlain by a localized, loose disturbance or redeposited sediment (Zone IV). In the central units of Block A (T.U. 3 and 4), Zone II is bisected by the thin paleosurface. The paleosurface is also present in T.U. 1, although in this location it separates Zones I and II. In the westernmost units of Block A (T.U. 9 and 10), Zone II is directly overlain by Zone I.

The fact that Zone II contacts the surface in the eastern end of Block A and is completely subsurface in the western and southern units indicates that it is dipping slightly toward the southwest. It appears that Zone II (across Block A) was exposed to the surface at some point and subjected to eolian erosion, which resulted in the destruction of the paleosurface across most of the block. Remnants of the paleosurface remain in areas that were buried deeply enough to not have been post-depositionally exposed to surface processes.

Because the paleosurface bisects or overlays Zone II in Block A (T.U. 1, 3 and 4), it suggests the Zone II sediment is intact and represents *in situ* deposits. Correspondingly, the overlying Zone I sediments appear to be reworked deposits that are not in a primary depositional context. Zone II overlays a pale yellow (2.5 Y 7/4) compact, fine to medium-grained sandy silt with rock, pebble, and 'nodule-like concretions' of sand and pebbles (Zone III). Zone III represents the sterile subsoil in this location and likely correlates with the initial formation of the terrace landform (see previous discussion of T.U. 2, Je-439).

Zone II can be subdivided into Zones IIa and IIb in T.U. 3 and 4 because the paleosurface bisects Zone II. The sediment above (Zone IIa) or below (Zone IIb) the paleosurface is similar in all respects, suggesting that the landform stabilization that resulted in the formation of the paleosurface was likely a brief episode. Zone IIa appears 1-3 cm below surface and continues to the contact with the paleosurface at 4-11 cm below surface. Zone IIb appears directly beneath the paleosurface (4-11 cmbs) and continues to a maximum depth of 11-20.5 cm below surface.

The final soil zone identified in Block A (Zone IV) was a loose, light yellowish brown (10YR 6/4) fine sandy silt. Zone IV is restricted entirely to the surface of the eastern units of Block A (T.U. 7 and 8) and extended to a maximum depth of 5-8 cm below surface. The loose structure of Zone IV and relatively localized occurrence suggests that this zone represents either a recent disturbance or relatively recently redeposited sediment. In either case, Zone IV does not represent *in situ* deposits.

Materials Recovered by Zone from Block A, Je-439

Cultural materials were recovered from all four soil zones identified in Block A (Zones I-IV). Zones I and IV represent the uppermost soil zones and have been interpreted as representing redeposited or deflated sediment. Table 7.3 presents the cultural materials recovered from each test unit and excavation level within Block A. Because the test units were excavated in 5-cm levels, and not in natural layers, some levels overlap the boundaries between separate soil zones. In cases where levels overlap two zones, that level is described as a transition between the two zones.

The excavation levels that comprised the Zone I/II transition contained more cultural materials than other sediment zones in Block A. The Zone I/II transition contained a relatively large amount of lithic debitage and three utilized flakes. Other materials recovered from the Zone I/II transition included bone (n=39), a small amount of land snail shells (22.5g), and a fragment of marine coral. An AMS date of 10,056±67 RCYBP (11,962-11,309 cal B.P.) was generated from a carbon sample collected from within a small hearth/burn feature (Feature 2) that was located within the Zone I/II transition (TU3 Level 1, 4 cmbs). Feature 2 will be discussed in more detail below.

The Zone IV/II transition yielded less cultural material than the Zone I/II transition. Zone IV/II contained lithic debitage (n=76), utilized flakes (n=2), and bone/bone fragments (n=13). No carbon samples were collected in the Zone IV/II transition levels. Although Zone IV/II contained fewer cultural materials, the kinds of materials recovered (debitage, unifacial tools, and bone) are similar to those recovered from Zone I/II. This is not surprising, given that both Zone I and Zone IV have been interpreted as redeposited/deflated sediments that overlay Zone II.

Zone II also contained a relatively large number of cultural materials. The excavation levels that comprised Zone II yielded lithic debitage (n=166), several unifacial tools (n=7)(4 utilized flakes, 2 retouched flakes, 1 unidentified uniface fragment), a large number of bones/bone fragments (n=109), carbon samples (n=5), a few land snail shells (7.5g), and a piece of hematite. The relatively high number of unifacial tools (n=7) and bones (n=109) in Zone II are suggestive of processing/butchering and/or hideworking activities. The exploitation patterns that are suggested by the bones and lithic tools will be discussed below.

Table 7.3. Materials recovered by zone from Block A, Je-439.

	Debitage	Bifaces	Unifaces	Bone	Carbon (PP)	Land snail (g)	Other
Zone I/II Transition							
TU1/Surface	38	0	0	0	0	0	
TU1/Level 1	39	0	0	24	0	0	
TU3/Surface	11	0	0	1	0	0	
TU3/Level 1	23	0	0	4	1	10.3	
TU4/Surface	16	0	0	0	0	0	
TU4/Level 1	34	0	1	5	0	0.8	coral
TU9/Surface	16	0	1	0	0	0	
TU9/Level 1	35	0	1	1	0	2.4	
TU 10/Surface	9	0	0	0	0	0	
TU 10/Level 1	58	0	0	4	0	9	
Zone Total:	279	0	3	39	1	22.5	
Zone IV/II Transition							
TU 7/Surface	6	0	0	0	0	0	
TU 7/Level 1	53	0	1	6	0	0	
TU 8/Level 1	15	0	1	5	0	0	
TU 8/Level 2	2	0	0	2	0	0	
Zone Total:	76	0	2	13	0	0	
Zone II							
TU 1/Level 2	11	0	0	25	2	0.1	
TU 3/Level 2	4	0	0	1	0	0	hematite
TU 4/Level 2	6	0	0	6	1	0	
TU 5/ Surface	5	0	0	0	0	0	
TU 5/Level 1	10	0	1	2	1	3	
TU 5/Level 2	1	0	0	4	0	1.7	
TU 6/Surface	12	0	1	1	0	0	
TU 6/Level 1	43	0	1	21	0	0	
TU 6/Level 2	9	0	2	26	1	0	
TU 8/Level 3	4	0	0	7	0	0	
TU 9/Level 2	25	0	1	3	0	2.7	
TU 9/Level 3	5	0	0	1	0	0	
TU 10/Level 2	31	0	1	12	0	0	
Zone Total:	166	0	7	109	5	7.5	
Zone II/III Transition							
TU 1/Level 3	7	0	0	1	1	0.2	
TU 3/Level 3	2	0	0	1	1	0	
TU 4/Level 3	4	0	0	3	1	0	
TU 4/Level 4	0	0	0	0	0	0	
TU 5/Level 3	6	0	0	8	0	0	
TU 5/Level 4	0	0	0	0	0	0	

Table 7.3. (con't.)

	Debitage	Bifaces	Unifaces	Bone	Carbon (PP)	Land snail (g)	Other
TU 6/Level 3	2	0	0	5	0	0	
TU 6/Level 4	2	0	0	4	0	0	
TU 7/Level 2	4	1	0	12	0	0	hematite
TU 7/Level 3	0	0	0	0	0	0	
TU 8/Level 4	2	0	0	0	0	0	
TU 9/Level 4	2	0	0	0	0	0	
TU 10/Level 3	17	0	0	8	0	0	
TU 10/Level 4	7	0	0	1	0	0	
Zone Total:	55	1	0	43	3	0.2	
Zone III							
TU 1/Level 4	0	0	0	0	1	0	
TU 3/Level 4	0	0	0	0	0	0	
TU 6/Level 5	0	0	0	0	0	0	
TU 7/Level 4	0	0	0	0	0	0	
TU 9/Level 5	0	0	0	0	0	0	
TU 10/Level 5	1	0	0	0	0	0	
Zone Total:	1	0	0	0	1	0	
Block A Total:	577	1	12	204	10	30.2	3

The excavation levels that comprised the Zone II/III transition contained fewer cultural materials that those that were entirely within Zone II. Zone II/III contained lithic debitage (n=55), an unidentified biface fragment (n=1), bones/bone fragments (n=43), carbon samples (n=3), a single land snail shell fragment (0.2 g), and a piece of hematite (n=1). One of the carbon samples collected in Zone II/III (TU3 Level 3, 12 cmbs) yielded an AMS date of 9,851±58 RCYBP (11,587-11,171 cal B.P.).

The final zone that contained cultural materials was Zone III. It was suggested earlier that Zone III represents the sterile subsoil at Je-439. The materials recovered from Zone III, which include a single flake fragment (n=1) and a carbon sample (n=1), do not discount this interpretation. Rather, the presence of the small flake fragment is likely related to downward displacement and not cultural deposition. The carbon sample collected from Zone III also supports the interpretation of this zone as subsoil. This sample (TU1 Level 4, 20 cmbs) yielded an AMS date of 11,380±240 RCYBP (13,714-

12,881 cal B.P.) and is substantially older (more than 1,000 years) than the other two dates yielded by samples from Block A.

Although Zone III represents sterile subsoil, the age of the single AMS date from this zone provides some interesting insight into the development of the terrace landform on which Je-439 is located. As noted in the previous descriptions of the sediment characteristics for each zone, Zone III contained 'nodule-like concretions' of sand and pebbles that were interpreted as representing the initial deposition of the alluvial sediments that formed the terrace (Pino 2003, report on file with the author). The AMS date from Zone III (11,380±240 RCYBP) suggests that this zone was likely deposited just prior to the Younger Dryas interval (ca. 11,000-10,000 RCYBP) (see Chapter 2). During the Younger Dryas interval the western flanks of the Andes became drier and much colder. It is possible that the alluvial deposition of the Je-439 terrace initiated sometime after 14,000 RCYBP when the glacial melt and increased precipitation resulted in active depositional environments along the western Andean flanks. At the onset of the Younger Dryas interval the amount of precipitation, and presumably alluviation, decreased. This decrease in alluviation may have resulted in the formation of the 'nodule-like concretions' that characterize Zone III as the terrace surface and previously-wet sediments dried.

Although inconclusive, this scenario does correlate well with the general paleoclimatic and geomorphological data for the north coast region (presented in Chapter Three) and with the structure of the sediment in Zone III at Je-439. The depositional history of the sediments that comprise Block A at Je-439 suggest that this landform was initially deposited sometime prior to the Younger Dryas (ca. 11,000 RCYBP). Intensive human use of the terrace (intensive enough to result in midden deposition) apparently did not occur until approximately 1000 years later (ca. 10,000 RCYBP).

Feature 2

A single subsurface feature was encountered during the excavation of Block A. Feature 2, a shallow, roughly circular hearth/burn feature, was identified in the northern portion of T.U. 3 and extended into the southern part of T.U. 4 (Figure 7.13). Feature 2 was encountered directly below the Zone I sediment at a depth of 2.5-5 cm below surface

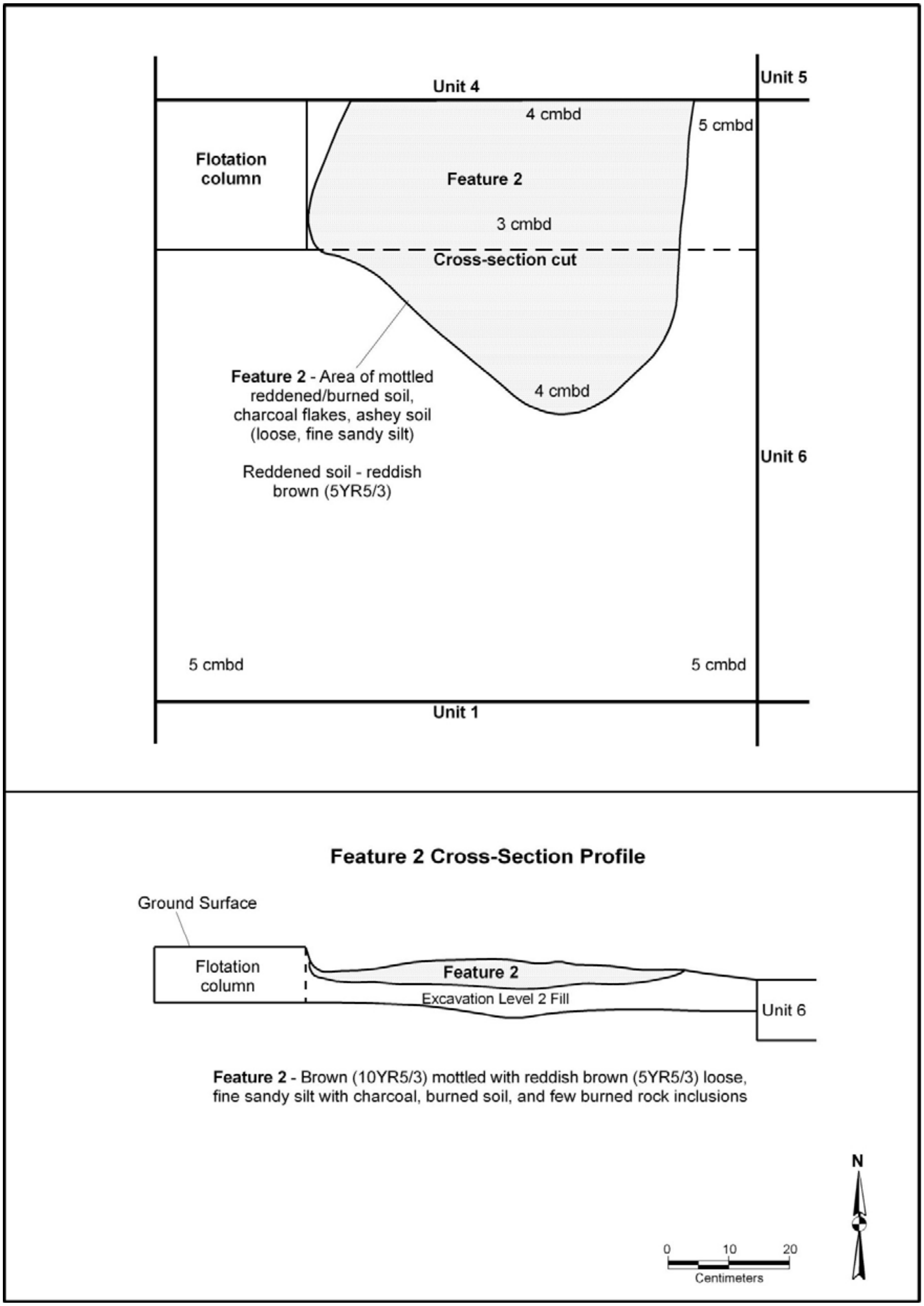

Figure 7.13. Planview and profile of Feature 2 from Block A, Je-439.

and extended to a maximum depth of 8.5-13 cm below surface. The sediment of Feature 2 consisted of a reddish brown (5YR 5/3) fine sandy silt with charcoal inclusions mottled with a brown (10YR 5/3) fine sandy silt. Cultural materials recovered from Feature 2 included two flake fragments, a few land snail shells (3.9 g), bones (n=2)(1 mullet vertebra [*Mugil* sp.] and 1 fragment from an unidentified mammal), and a single carbon sample.

The carbon sample recovered from Feature 2 (PP#2, 4 cmbs), discussed above, yielded an AMS date of 10,056±67 RCYBP (11,962-11,309 cal B.P.). The interpretation of Feature 2 as a hearth/burn area is primarily based on the reddish-colored (oxidized) soil and the presence of numerous flecks of charcoal. In addition, one of the bones recovered from Feature 2 (FS#752.4.1—unidentified mammal) was burned, suggesting that this feature was a location of cooking or processing food. The presence of both mammal and fish (mullet), along with land snail shells, within Feature 2 is similar to Paiján features excavated in the Cupisnique/Chicama valley (Briceño 1999; Chauchat 1998; Gálvez 1999) and at site Je-431 (discussed above), and is suggestive of a relatively wide range of exploited resources.

Interestingly, the paleosurface that was present in Block A and covered most of T.U. 3 and 4 did not cover Feature 2. Stratigraphically, this suggests that Feature 2 was intrusive through the paleosurface. Thus, Feature 2 post-dates the period of landform stabilization that resulted in the formation of the paleosurface, which must have occurred sometime prior to ca. 10,000 RCYBP

Discussion of Je-439 Excavations

The materials recovered, AMS dates, and stratigraphy of Block A are suggestive of a relatively long-term and intensive use of Je-439. Zone II in Block A represents an intensive occupation, in which multiple different activities were likely undertaken. The uppermost portion of Zone II has likely been weathered/eroded, resulting in the mixing of cultural materials in Zones I and IV. It is clear, given the presence of the paleosurface in portions of Block A, that the surface of Je-439 has undergone periods of active alluviation punctuated with episodes of landform stabilization and weathering. It also appears that human use of the landform continued through these periods.

Table 7.4. AMS Dates from Block A, Je-439.

T.U.	Feature	Level	cmbs	Zone	AMS date	Error	Cal BP (2 sigma)	Material
3	2		4	I/II	10056	67	11962-11309	Wood Charcoal
3		3	12	II/III	9851	58	11587-11171	Wood Charcoal
1		4	20	III	11380	240	13714-12881	Wood Charcoal

The AMS dates from Zone III, Feature 2, and Zone II/III suggest that the initial occupation of Je-439 occurred sometime after ca. 11,300 RCYBP (Table 7.4). Early Preceramic activity at the site is contained entirely within Zone II and the reworked upper portions of Zone II (Zones I and IV). The age of the Zone II deposits is somewhat confusing given the slightly younger age of the lower portion of Zone II (9,851±58 RCYBP), compared to the date of 10,056±67 RCYBP from the stratigraphically higher Feature 2. However, the calibrated age ranges for the dates from Zone II (11,587-11,171 cal B.P.) and Feature 2 (11,962-11,309 cal B.P.) overlap (overlap between 11,587-11,309 cal B.P.) and reinforce the integrity of the stratigraphic sequence in Block A.

The overlap of the dates from the upper and lower portions of Zone II (and above and below the paleosurface) suggest that Je-439 was likely utilized by Early Preceramic peoples for a period of only 200-300 years and that the Block A midden was deposited in a relatively short span of time. The calibrated age range of the cultural deposits at Je-439 (11,587-11,309 cal B.P.) compares well with the known age range for the Paiján occupation of the region (Chauchat et al. 2004; Chauchat et al. 2006; Dillehay 2000; Lavallée 2000). Given that Paiján projectile points and limaces were recovered from the surface of the site, it seems reasonable to characterize the subsurface deposits at Je-439 as belonging to the Paiján complex.

The faunal materials recovered from the Je-439 deposits also support this characterization. Block A contained a large number of faunal materials (204 bones (217 after identification and analysis) and 30.2g of land snail shells [*Scutalus* sp.]) indicative of a broad range of terrestrial and aquatic/marine resources. Analysis of the bones revealed a large number of terrestrial species including: South American fox (*Psuedalopex* sp.[n=3; 2 burned]), brocket deer (Cervidae cf. Mazama [n=1]), deer

(Cervidae [n=10; 7 fossilized; 2 fossilized and burned]), doves and pigeons (Columbidae [n=2]), indeterminate and perching birds (Aves [n=3] and Passeriformes [n=2; 1 burned]); desert tegu (*Dicrodon* sp.[n=32]), lizard (Lacertilia [n=4]), carnivore (Carnivora [n=1]), tree squirrel (*Sciurus* sp. [n=2]); weasel/skunk/otter (Mustelidae [n=1]), unidentified mammals (Mammalia [n=42; 2 fossilized, 9 burned]), artiodactyls (Artiodactyla [n=2]), unidentified vertebrates (Vertebrata [n=16]) terrestrial mollusk (Mollusca [n=1]), New World rats and mice (Sigmodontinae [n=34] and Rodentia [n=1]), and 50 unidentified bones. In addition to the terrestrial resources, several aquatic/marine resources also were identified and included mullet (*Mugil* sp. [n=4]), probable Pacific porgy (cf. *Calamus brachysomus* [n=1]), and indeterminate bony fish (Osteichthyes [n=5])(Pavao-Zuckerman 2004).

The Je-439 Block A faunal assemblage is the largest of any Early Preceramic site within the study area and also included the most diverse range of exploited species. These species represent a number of potential environmental settings that minimally include the coast, riverine/estuary, and the Andean foothills (*quebrada* systems). The stratigraphic, artifact, and chronological data from Je-439 indicate a relatively intensive occupation of the site and broad-spectrum resource use by Paiján complex peoples over a period of 200-300 years. If this is the case, then the faunal materials from Block A provide a rather unique and previously undocumented insight into the subsistence strategies of the Paiján during a tightly defined (and short-term) timeframe.

The overall pattern of subsistence for the Paiján occupants of Je-439 around 10,000 RCYBP is best characterized as a generalized, broad-spectrum foraging strategy. Terrestrial animals, including large and small mammals, birds, land snails, and lizards, appear to be the primary resources. Among the terrestrial resources, desert tegu lizard appears to have been a main dietary staple.

> "Desert tegu (*Dicrodon* sp.) are small frugivorous lizards that grow to approximately 20 inches in length (Holmberg 1957, citation original). These lizards hibernate underground between April and November, suggesting that they are more likely to be captured in the intervening austral summer months. The recovery of desert tegu (*Dicrodon* sp.) specimens indicates that the site was occupied between December and March." (Pavao-Zuckerman 2004: 24).

In spite of the abundance of terrestrial resources, the Paiján occupants of Je-439 should not be characterized as semi-specialized hunters. Rather, the Paiján at Je-439 are probably more adequately characterized as broad-ranged foragers who hunted a variety of terrestrial game. The range of smaller species (birds, land snail, squirrel, and others) combined with the presence of a limited amount of aquatic/marine resources indicates the exploitation of a broad diversity of species and ecological settings. Although the marine resources were apparently acquired at some distance, most resources were probably locally available within the *quebrada* or other, nearby systems. Many of the exploited species appear to have been processed/prepared at the site (as indicated by calcining and burning). The relatively high number of unifacial tools (unifaces, utilized flakes, and retouched flakes) that were present within the Block A deposits (n=12) probably reflects a broad range of different activities associated with processing, cooking, and consumption. The number of unifaces contrasts sharply with the lone broken biface that was recovered in Block A (often considered to be indicators of hunting/butchering related activities) (Andrefsky 1998; Binford 1979; Odell 2003).

The seasonality indicators from the desert tegu (quote above) suggest that Je-439 likely was occupied seasonally during the austral summer months (December-March). However, seasonality indicators for the remainder of the exploited species at Je-439 are not available and may indicate several different seasons and/or multiseasonal occupations. It is unlikely that the entire midden in Block A resulted from a single, continuous deposition (i.e., occupation). It seems more likely, given the distinct spatial clusters of artifacts that were documented on the surface of the site, that Je-439 served as the location for a series of basecamp occupations (seasonal to multiseasonal) that shifted location on the landform over the 200-300 years the site was occupied.

Je-790

Subarea: Quebrada del Batán   Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0675245   Northing: 9218190
Site Dimensions: East/West: 206 m   North/South: 170 m
Chronology: Multicomponent (Early Preceramic and unknown Ceramic period)

Site Description:

This very large site consists of areas of light to high density scatters of lithics located on both the paleodune and terrace surfaces (Figures 7.1 and 7.14). A continuous light density scatter of lithics was present across the entirety of the site, but distinct areas with higher densities of surface artifacts were also noted. Lithics from the site included Paiján projectile points, bifaces, a variety of unifacial and flake tools, and groundstone implements. Due to the large size and varying surface densities of artifacts, the site was originally recorded and collected in four zones (Zones I-IV). Zone I was located on a low rise that comprised the northwestern boundary of the site and contained a light to medium density of lithic tools and debris, along with a single "L-shaped" structure (Structure 7) (discussed below). Zone II comprises the surface of the paleodune in the central portion of the site. Zone II contained a medium to high density concentration of lithic tools and debris. In addition, four structures (Structures 1-4) were also recorded in Zone II. Zone III comprises a low rise on the northeastern portion of the site and contained a continuous light density scatter of lithic artifacts. Zone IV comprises the southern portion of the site and contained a light to medium density scatter of lithic artifacts, with restricted areas of high density concentrations. In addition to the lithic tools and debris, two structures were recorded in Zone IV (Structures 5 and 6).

Je-790 Excavations:

A total of 14 1 x 1 m test units were excavated at Je-790 (T.U. 1-14) (Figure 7.14). Test Units 1 and 2 were isolated units intended to provide insight into the nature of the deposits at the sites. Test Unit 1 was located in the northwestern portion of the site (Zone IV) in an area that contained a number of lithic tools on the surface. The results of the T.U. 1 excavation are presented below. Test Unit 2 was positioned within Structure 1 in an attempt to determine identify subsurface deposits or floors related to the use of the structure. Because the results of the T.U. 2 excavation directly relate to the use of Structure 1, they have been discussed by Stackelbeck (2008).

The remaining 12 test units that were excavated at Je-790 comprise two large excavation blocks (Block A and B). Excavation Block A was a 2 x 2 m block comprised

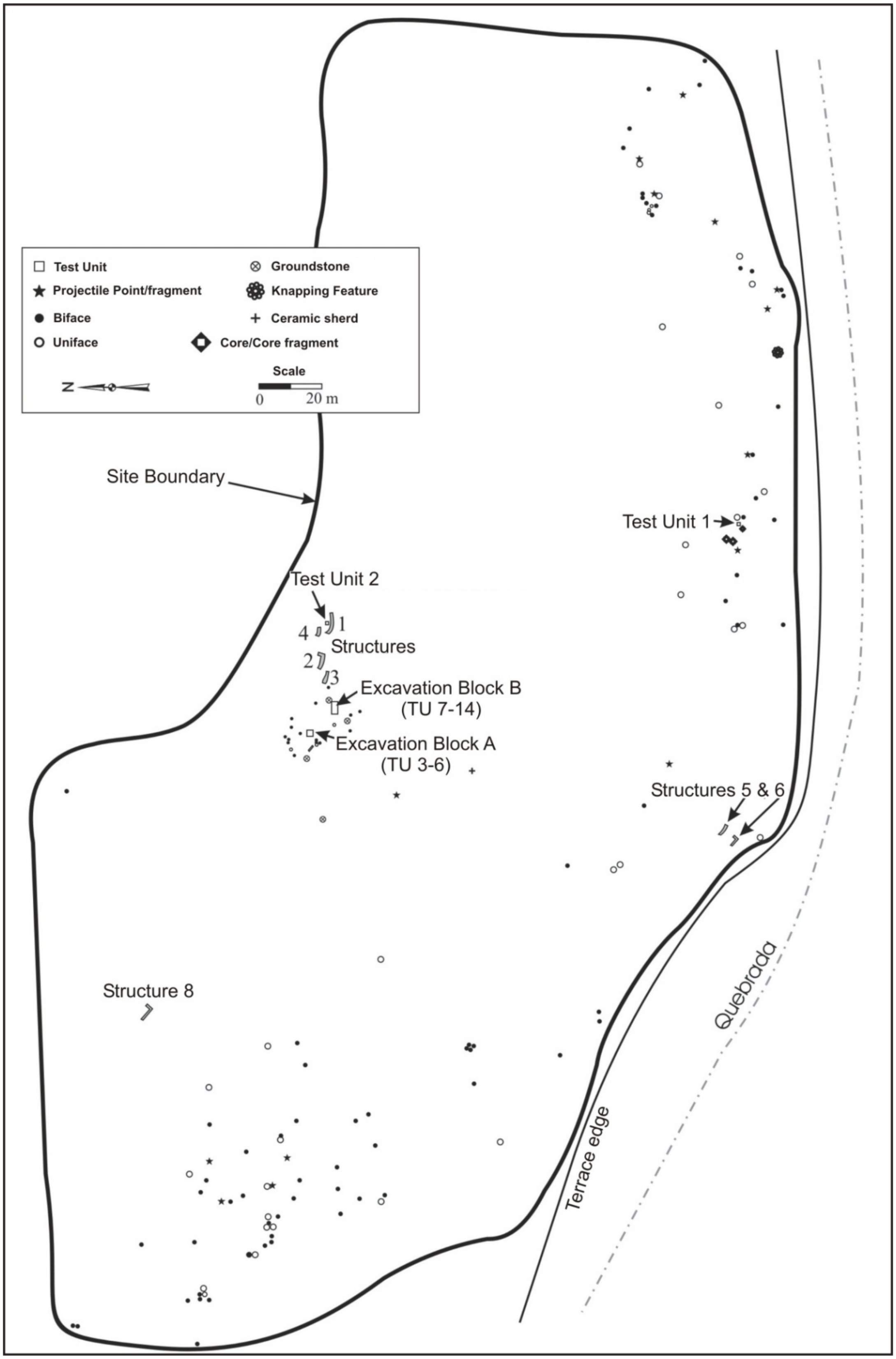

Figure 7.14. Site map of Je-790.

of Test Units 3-6. Block A was excavated on the eastern end of the crest of a low hill (Zone II) that contained a high density of lithic tools and debris on the surface. It was hoped that the excavation of Block A would provide insight into the nature, chronology, and length of the occupations at Je-790. The results of the Block A excavations are discussed below.

Block B was a 2 x 4 m excavation block (T.U. 7-14) that was also located on the crest of the low hill that defined Zone II of the site. However, Block B was positioned closer to Structures 1-4 (approximately 13 m southwest of Structure 3) in an area that appeared to be a domestic midden related to the occupation of the structures (Figure 7.14). The excavation of Block B yielded numerous lithic artifacts, faunal remains, and a small hearth feature (Feature 11) that support the identification of the this area as a domestic midden associated with Structures 1-4. The results of the Block B excavation and recovered materials are discussed in detail by Stackelbeck (2008) and are only referenced here when making comparisons with the Block A materials.

Test Unit 1

As mentioned above Test Unit 1 was located in the northwestern portion of the site in an area that contained numerous surface lithic tools and debitage, and indicated a potential for subsurface deposits. A total of four levels (Levels 1-4) were excavated in T.U. 1 to a maximum depth of 20 cm below surface (Figure 7.15). Two distinct soil zones were identified during the excavation of T.U. 1 (Zone I and II). Zone I consisted of

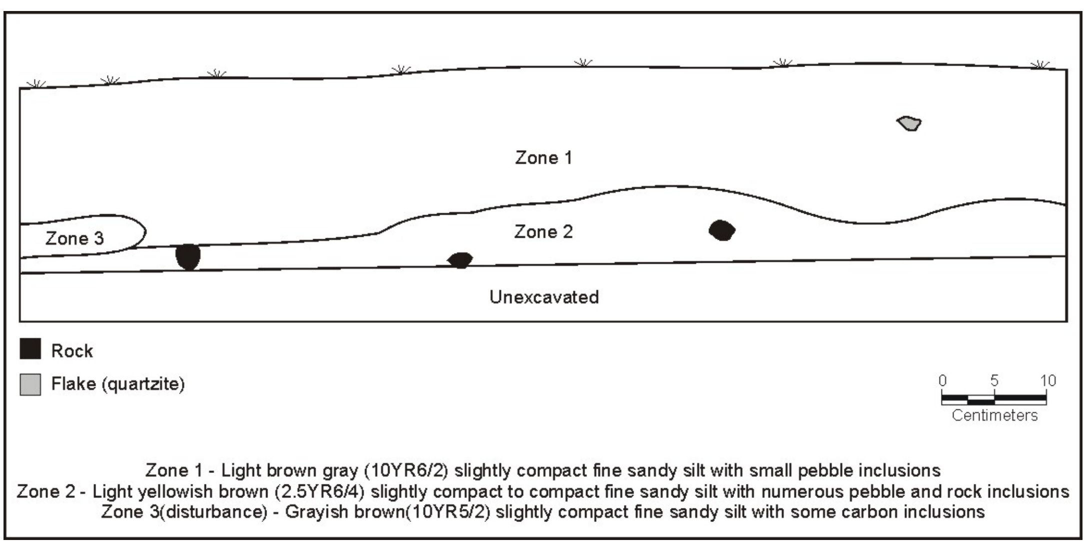

Figure 7.15. North wall profile of TU 1, Je-790.

Table 7.5. Materials recovered from TU 1, Je-790.

	Debitage	Bifaces	PPK	Bone	Carbon (PP)	Land snail (g)
Zone I						
TU1 Surface	4					
TU1 Level 1	102		1	1	1	2.5
TU1 Level 2	94	2		1	2	1.6
Zone Total:	200	2	1	2	3	4.1
Zone I/II						
TU1 Level 3	28				1	0.4
TU1 Level 4	5					0.5
Zone Total:	33	0	0	0	1	0.9
Unit Total:	233	2	1	2	4	5

light brownish grey (10YR 6/2) slightly compact, fine sandy silt with small pebble inclusions. Zone I initiated at the surface of T.U. 1 and continued to a depth of 11.5-16 cm below surface across the unit. Zone II appeared unevenly across T.U. 1 at 11.5-16 cm below surface and continued beyond the limit of excavation (20 cm below surface). Zone II consisted of a light yellowish brown (2.5Y 6/4) slightly compact to compact fine sandy silt with numerous rock and pebble inclusions. In addition to these two zones, a small disturbance was noted in the northwest corner of T.U. 1 at the base of Zone I (Figure 7.15).

Cultural materials were recovered from all four levels in T.U. 1. Materials recovered included a large amount of lithic debitage, two biface fragments (one is a drill fragment), a proximal fragment of a Paiján point, two bone fragments, four carbon samples, and a small quantity of land snail shells (see Table 7.5). Although cultural materials were recovered in all levels, the vast majority were recovered from Levels 1 (0-5 cmbs) and 2 (5-10 cmbs). Levels 3 (10-15 cmbs) and 4 (15-20 cmbs) contained decreasing amounts and varieties of materials.

Levels 1 and 2 are entirely within soil Zone I. Level 3 encompasses the contact between Zones I and II in the eastern half of T.U. 1, but mostly lies within Zone I. Similarly, Level 4 encompasses the Zone I/II contact in the western half of T.U. 1, but is mostly comprised of Zone II sediment. This distribution of artifacts by levels and zones suggests that Zone I represents the extent of cultural deposition in this portion of Je-790.

It is possible that Zone II also represents cultural deposits—based on the few artifacts recovered from Level 4. However, it is equally probable that the artifacts found in Level 4 relate to the Zone I/II contact and are, in fact, associated with Zone I. It is also possible that the small disturbance located at in the northwestern portion of T.U.1 (which straddles the Zone I/II contact) resulted in the displacement of artifacts from Zone I into the deeper Zone II. Based on these possibilities, I believe that Zone II in T.U. 1 represents sterile subsoil in this part of Je-790.

No features were encountered during the excavation of T.U. 1 and none of the recovered carbon samples were submitted for dating. However, the materials that were recovered provide some insight into the nature of the activities that occurred in this portion of the site and the relative age of the deposits. The large amount of lithic debitage from Zone I suggests that the general lithic reduction/manufacture was occurring in this location. The presence of two broken bifaces (one drill fragment and one unidentified medial fragment [probably of a Paiján point]), along with the diagnostic proximal fragment of a Paiján point reinforces the indication that this area was used for lithic reduction. The presence of these tools also suggests that a range of other activities may have occurred as well, including hunting, butchering/processing of game, and perhaps, hideworking. The fact that all three of these tools were broken may indicate that they were discarded either during manufacture or in the location of their use.

The presence of a few bone fragments and land snail shells suggests that general consumptive activities also occurred in the location of T.U. 1. These activities, combined with those indicated by the lithic debitage (general lithic manufacture) and lithic tools recovered (hunting, butchering/processing, hideworking), suggests that the Zone I deposits probably represent a general multi-activity midden. The diagnostic Paiján point recovered from Zone I clearly places these deposits within the Early Preceramic period and relates them specifically to the Paiján complex (ca. 10,800-9,000 B.P.). The activities and relative age range indicated from T.U. 1 compare favorably with the results from the excavations of Blocks A and B at Je-790 (discussed below).

Block A

Block A was located on the crest of a low hill (ancient paleodune) located in the central portion of the site. Block A (2 x 2 m) consisted of four 1 x 1 m test units (TU's 3, 4, 5, and 6) that were individually excavated. Block A was excavated to a maximum depth of 15 cm below surface (Levels 1, 2, and 3) across the block and resulted in the identification of two soil zones (Zones I and II) and one feature (Feature 9—a small pit). Zone I extended from the ground surface to an uneven depth of 4-12 cmbs across the Block A (see Figure 7.16 and 7.17). Zone I was comprised of a light yellowish brown (2.5Y 6/4) slightly compact fine sandy silt with small pebble inclusions. Zone II, in contrast, consisted of a light olive brown (2.5Y 5/4) compact fine to medium grained sandy silt with abundant pebble and rock inclusions. Zone II appeared between 4-12 cmbs and extended beyond the limit of excavations.

Cultural materials recovered from Block A were concentrated within the Zone I deposits and included numerous pieces of lithic debitage (n=55), two unidentified biface fragments, one retouched flake, and one utilized flake (Table 7.6). A small amount of land snail shells were also discontinuously present within the Zone I deposits. Because the contact between soil Zones I and II occurred unevenly over a depth range of 8 cm (4-

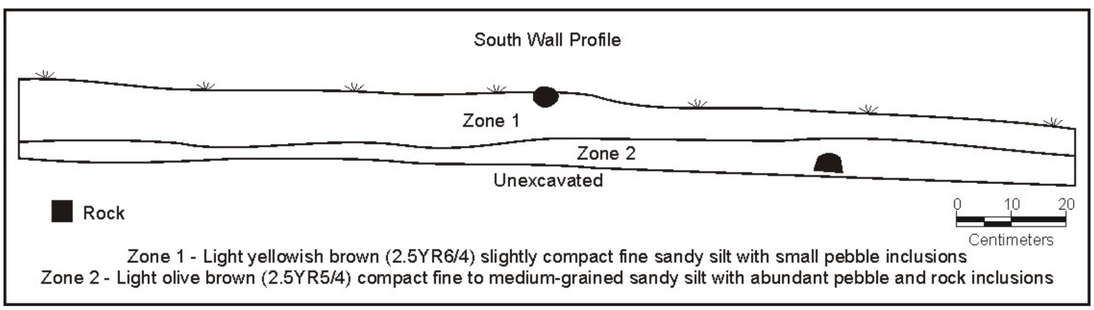

Figure 7.16. South wall profile of Block A, Je-790.

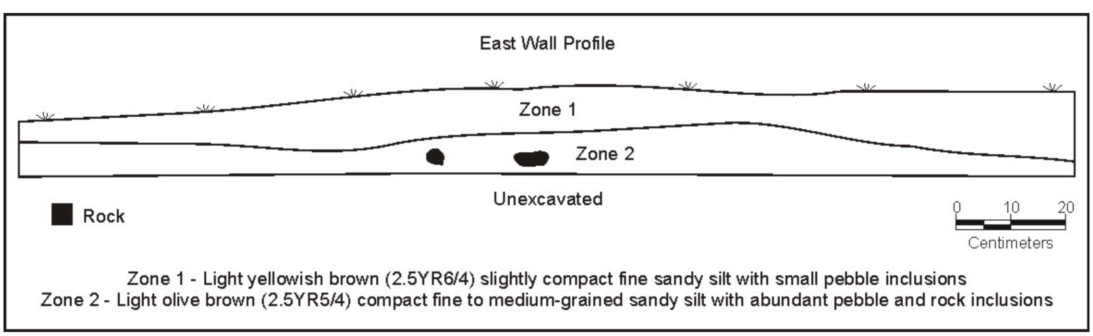

Figure 7.17. East wall profile of Block A, Je-790.

Table 7.6. Materials recovered by zone from Block A, Je-790.

	Debitage	Bifaces	Unifaces	Bone	Carbon (PP)	Land snail (g)
Zone I						
TU 3 Surface	7					
TU 3 Level 1	6		1			3.2
TU 4 Surface	1					
TU 4 Level 1	3					
TU 5 Surface	9					
TU 5 Level 1	7					0.1
TU 6 Surface	13	2	1			
TU 6 Level 1	9					0.2
Zone Total:	55	2	2	0	0	3.5
Zone I/II Transition						
TU 3 Level 2	5				1	1.1
TU 3 Level 3						1.1
TU 4 Level 2	2					
TU 4 Level 3						
TU 5 Level 2	6			1		
TU 5 Level 3	2					0.1
TU 6 Level 2	4	1				
Zone Total:	19	1	0	1	1	2.3
Zone II						
TU 6 Level 3	0	0	0	0	0	0
Zone Total:	0	0	0	0	0	0
Block A Total:	74	3	2	1	1	5.8

12 cmbs), artifacts that were recovered from excavation levels that encompassed this transition have been identified separately. The Zone I/II transition yielded fewer artifacts than the overlying Zone I deposits, and included 19 pieces of lithic debitage, one biface fragment (distal end of a projectile point), a bone fragment (*Dicrodon* sp.), a single carbon sample, and small amount of land snail shells. The only excavation level that was entirely within Zone II (TU 6 Level 3) contained no artifacts.

In addition to the artifacts recovered from Block A, a single feature (Feature 9) was identified just below the surface of TU 6 Level 1 (2 cmbs) and extended to a maximum depth of 8 cm below surface (Figure 7.18). Feature 9 consisted of a roughly circular, and basin-shaped dark sediment (10YR 5/2 grayish brown fine sandy silt) that was looser in texture than the surrounding Zone I sediment. Charcoal flecks were present throughout the feature fill. In addition to the charcoal flecks, a few small possible burned

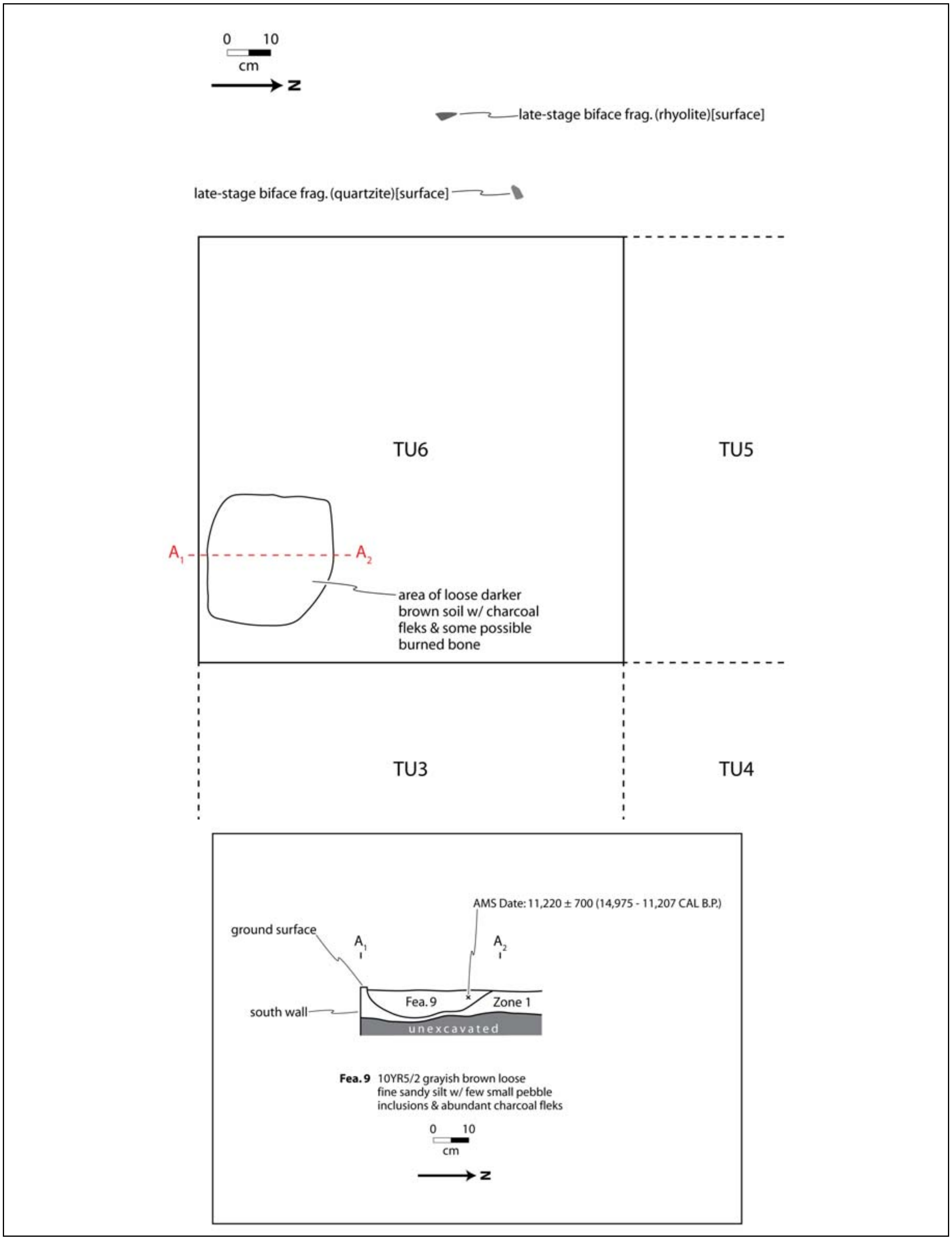

Figure 7.18. Planview and profile of Feature 9 from Block A, Je-790.

bones were noted within the feature fill (most of the possible bones had deteriorated to the point of powder and were not able to be collected or identified). During the excavation of Feature 9, a single quartz flake, one small bone (*Sigmodontinae*[2] femur), and a general carbon sample were collected. The carbon sample yielded an AMS date of 11,220±700 RCYBP (14,975-11,207 cal B.P.).

Given the abundant presence of charcoal flecks, possible small burned bones, and relatively few other artifacts within the fill, it is suggested that Feature 9 represents the base of shallow refuse pit or a shallow hearth. Feature 9 is entirely located within the Zone I deposits and the AMS date of 11,220±700 RCYBP provides an indication of the age of the surrounding Zone I deposits in this area of Je-790. However, I believe that the younger end of the calibrated age range for the date is more accurate than the earlier, given the absence of Fishtail complex materials on the surface of the site.

There is a possibility that Feature 9 has been disturbed, as indicated by the presence of the *Sigmodontinae* femur. However, the clear basin-shaped outline of Feature 9, along with the presence of charcoal and a quartz flake argue against this being a rodent disturbance. Although there is no clear evidence for disturbance of Feature 9, the age range provided by the lone AMS date must be viewed with some skepticism.

<u>Discussion of Block A within the Je-790 deposits</u>

The distribution of artifacts within Zones I, Zone I/II, and Zone II and the presence of Feature 9 within Zone I, suggest that the relatively shallow Zone I deposits represent the extent of cultural deposits in this portion of Je-790. Zone II appears to represent sterile subsoil. Zones I and II in Block A compare well with the stratigraphic sequence of TU 1 (discussed above), although Zone I is shallower in Block A than in TU 1. The stratigraphic sequence of Block A also compares well with the sequence from the nearby Block B excavations at Je-790 (Block A is approximately 17 m northwest of Block B). Like Block A, two soil zones (Zone I and II) are also present in Block B. However, Zone I in Block B was much thicker (9-28 cm thick) than in Block A (4-12 cm thick) and contained a much higher quantity and wider range of artifacts, including lithic debitage, bifaces and flake tools, carbon samples, numerous bones/bone fragments, and

[2] *Sigmodontinae* represents South American rats and mice.

an abundance of land snail shells (Stackelbeck 2008). In addition, Zones I and II in Block B were separated by a thin, compact (1-2 cm thick) paleosurface that was discontinuously present across the excavation block. This paleosurface was not present in the Block A deposits.

Stackelbeck (2008) has interpreted the Zone I deposits in Block B as representing a general domestic midden likely associated with the nearby Structures #1-4. Two AMS dates were collected within Zone I of Block B (FS#736.2.1—9,334±50 RCYBP [10,697-10,306 cal B.P.] and FS#718.2.3—9,530±70 RCYBP [11,131-10,600 cal B.P.]) and indicate an Early Preceramic age for the deposits. When calibrated, the two dates from Block B overlap at approximately 10,600 cal B.P. and suggest a relatively long period of use (or repeated use) of that area of the site during the Early Preceramic period (Stackelbeck 2008). This age range correlates well with the diagnostic tools (Paiján projectile points and fragments) that were recovered in the vicinity of both Blocks A and B, as well as with the relatively large number of Early Preceramic structures (n=7) that are present on the site (suggesting repeated use and/or low anticipated mobility [Dillehay 1997a; Kent and Vierich 1989]).

The cultural materials recovered from Block A, however, were not as numerous (in frequency or different types) as those recovered from Block B. Also, Block B (14,975-11,207 cal B.P.) appears to date a few to several hundred years earlier than the Block A midden (11,131-10,306 cal B.P.). The shallower Zone I deposits, fewer artifacts, and earlier age range suggest that the Block A deposits are not part of the same general midden identified in Block A (and associated with Structures 1-4). Although Block A is located on the same landform (paleodune) as Structures 1-4 and Block B, it is separated from them by a minimum of 17 meters (see Figure 7.14). This spatial separation, when considered along with the differences in Zone I thickness, artifact frequencies, and age ranges suggest that Block A may represent a light density midden associated with an earlier occupation of Je-790.

The faunal and botanical materials recovered from Blocks A and B suggests the possibility that these two areas represent general middens associated with separate occupations of the site over time. The single bone (*Dicrodon* sp.) and few land snail shells recovered from Block A contrast sharply with the denser and more diverse subsistence remains recovered in Block B. Like Block A, Block B contained *Dicrodon* sp., but also included a number of fish bones (Osteichthyes [n=25] and *Mugil* sp.[n=11]), unidentified mammal bones (n=25), and a much greater density of land snail shells (more than 550 g) (Pavao-Zuckerman 2004; Stackelbeck 2008). Feature 11, a small refuse pit/possible hearth within Block B yielded burned *Mugil* sp. (n=4) and unidentified bone fragments (n=13). Flotation samples collected from Feature 11 also yielded minute, unidentified carbonized seed/rind fragments (Rossen 2006; Stackelbeck 2008). A general carbon sample collected from within Feature 11 yielded the previously mentioned Early Preceramic AMS date of 9,334±50 RCYBP (10,697-10,306 cal B.P.).

Discussion of Je-790 Excavations

The data recovered from the excavation of Je-790 are suggestive of a pattern of long-term/repeated use of the site. AMS dates on carbonized materials from both feature and non-feature contexts indicate an occupational history that spans much of the Early Preceramic period (ca. 11,200-10,300 cal B.P.). Diagnostic Paiján materials recovered from T.U. 1 in the northwestern portion of the site correspond well with the occupational timeframe provided by the AMS dates.

Both the T.U. 1 and Block A excavations, along with that of Block B, yielded evidence of multi-activity midden accumulation. This is significant because each of these excavations are spatially segregated across the site landform. The presence of a general Early Preceramic-age midden across different parts of the site suggests either a long-term occupation scattered across most of the site or extensive, repeated use of the landform over time. The latter—repeated use of the site over time—seems most likely given the nature of the materials recovered from the separate midden excavations.

Both Block A and T.U. 1 contained relatively few artifacts, but did indicate the pursuit of a variety of activities based on the types of stone tools and floral and faunal materials present. However, these two areas contrast sharply with Block B, which indicated the exploitation of a wide range of subsistence resources including terrestrial animals, marine fish, land snails, and plants. It is not coincidental that the Block B midden is the closest to the cluster of four domestic structures (Structures 1-4) located in this portion of Je-790. Stackelbeck (2008) has interpreted the Block B deposits as a communal food preparation/domestic midden location associated with the nearby domestic structures.

The association of the Block B midden with Structures 1-4 is suggestive of a relatively long-term occupation, with low anticipated mobility (Kent 1991; Kent and Vierich 1989), that made use of a wide variety of resources that were available in different areas of the foothills and coast. For example, the fish species recovered from Block B would have been acquired in near shore coastal or estuarine locations, while the land snails were likely acquired from trees or rock faces within the *quebrada* foothills. The presence of a wide range of resources from ecological settings implies a broad use of the landscape and perhaps multiseasonal occupation.

When considered together, the Block A, T.U. 1, and Block B excavation data suggest repeated use of this landform beginning early in the Early Preceramic period. The early repeat occupations were of sufficient duration (perhaps seasonal or less) to have resulted in midden deposition and the emplacement of subsurface features for refuse disposal (like Feature 9 in Block A). The later Block B midden—which is thicker and contains a wider range of cultural materials—is suggestive of longer-term and more intensive occupations (multiseasonal). These occupations appear to have been of substantial enough duration to offset the investment involved in the repeated construction of domestic structures, indicating a low anticipated mobility.

Although no diagnostic artifacts indicative of an occupation earlier than the Paiján were encountered at Je-790, the AMS date from Feature 9 (11,220±700 RCYBP [14,975-11,207 cal B.P.], is suggestive of an earlier occupation that pre-dates the Paiján. The lower end of the calibrated age range of the early date from Feature 9 (14,975-11,207 cal B.P.) is still slightly earlier than the known age for the Paiján occupation of the north coast region (ca. 10,800-9,000 B.P.), but fits well with that of the Fishtail (ca. 11,100-10,600 B.P.) (Chauchat 1998; Dillehay 2000; Lavallée 2000). The diagnostic tools recovered from surface and excavation contexts at Je-790 suggest that Paiján groups were responsible for the construction of the structures and deposition of the distinct midden deposits that have been identified at the site except for the shallow Feature 9 pit. At present, an earlier occupation cannot be demonstrated for certain, but it is possible that this feature and date relate to an unrecognized occupation by early unifacial tool using groups or by other early groups that left no diagnostic artifacts at the site (e.g., Fishtail).

In sum, the excavation of site Je-790 yielded evidence suggestive of changing patterns of Paiján occupation of the site over time. Relatively short-term (perhaps seasonal), repeated occupations of the landform are indicated by the Block A and T.U. 1 midden deposits. We do not know the precise age of the T.U. 1 deposits, but the Block A materials likely relate to an early Paiján occupation (based on the calibrated age range of the AMS date from Feature 9). The Block B materials, which clearly date to a much later Paiján occupation (ca 9,500-9,300 RCYBP), contrast sharply with the earlier deposits and speak to a longer-term (perhaps multiseasonal) occupation of the landform, with low anticipated mobility, that utilized a broad variety of subsistence resources.

Je-804

Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682971 Northing: 9205341
Site Dimensions: East/West: 655 m North/South: 225 m
Chronology: Multicomponent (Early Preceramic Paiján and Chimú)

Site Description:

Site Je-804 is located on the northern edge of the hills that separate the first and second large *quebradas* east of the Cerros de Talambo in the Río de Chamán drainage (Figure 7.1). The site is situated on the low, gently sloping *pampas* that extend to the west from the base of a low hill toward Pampa Larga and has a commanding view of Pampa Larga and the Río Chamán drainage. Je-804 is a long, narrow scatter of lithics with generally medium to high density concentrations, although areas with high density concentrations of lithics were observed. An abundance of lithic tools were collected from the surface, including numerous Paiján projectile points, limaces, broken bifaces, and retouched/utilized flakes. The overall distribution of artifacts, although continuous, was denser on the eastern (upslope) end of the site. Seven distinct lithic knapping stations were identified across the surface of the site (Figure 7.19).

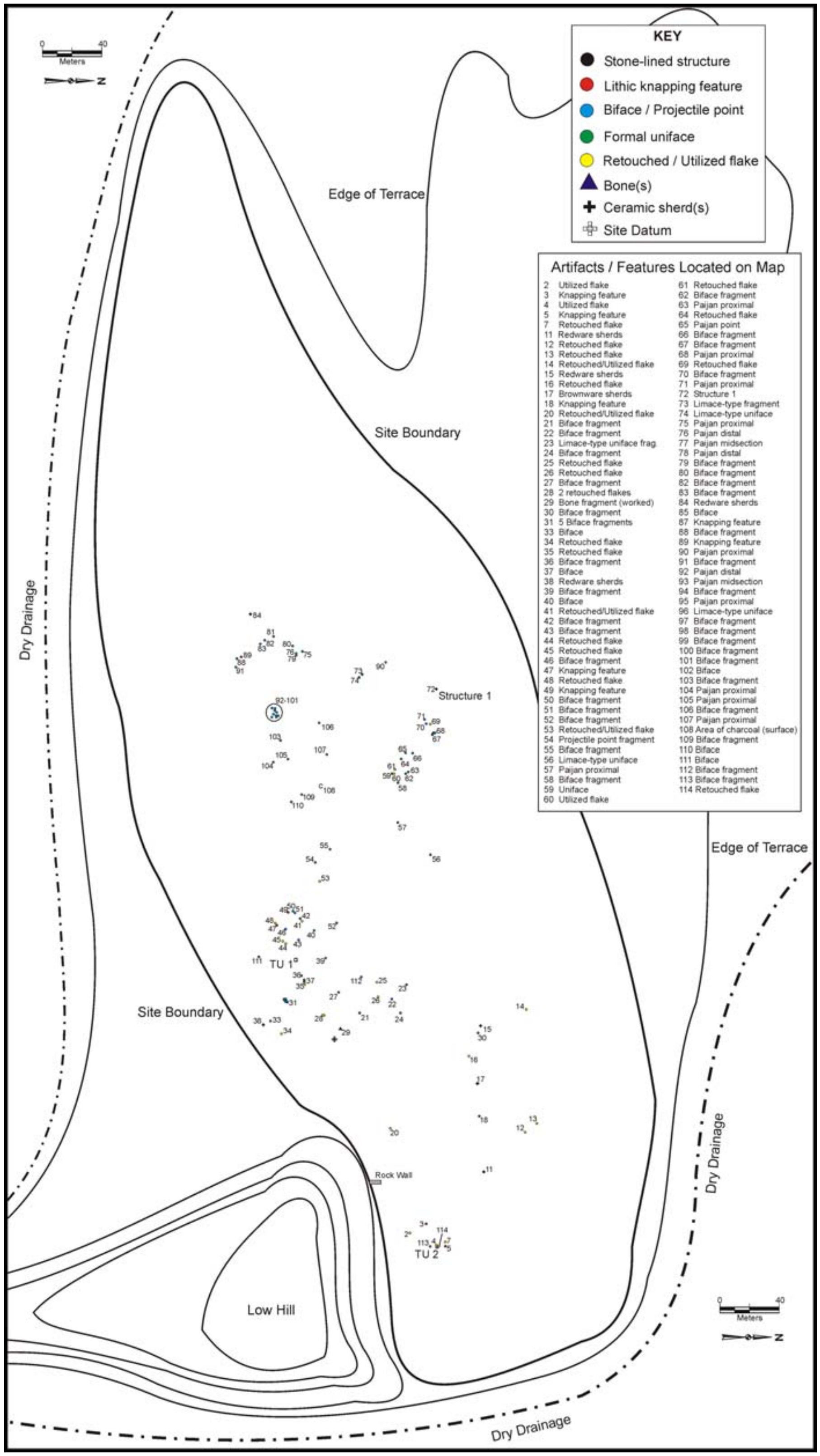

Figure 7.19. Site map of Je-804.

Je-804 Excavations:

Two 1 x 1 m test units (T.U. 1 and 2) were opportunistically located in areas of hummocked sediment that indicated a good possibility of containing intact, subsurface deposits. Test Unit 1 (T.U. 1) was positioned in an area near the center of the site where a limace (PP1) was noted eroding onto the surface. It was hoped that subsurface deposits yielding additional, *in situ* Early Preceramic tools and other cultural materials could be identified in this location. Test Unit 2 (T.U. 2) was positioned on the eastern end of the site in an area that appeared to contain a very limited amount of bifacial debitage/tools.

At the time of excavation, it was believed that the area around T.U. 2 could possibly represent an activity area or occupation distinct from that in the location of T.U.1. The excavation of T.U. 2 resulted in the recovery of very few artifacts (n=6 pieces of lithic debitage) and several carbon samples. A sample of the carbon from T.U. 2 yielded an AMS date of 802±32 RCYBP, indicating that this area of Je-804 was related to Chimú period use of the site. As a result of this late date, no further discussion of the T.U. 2 excavation or materials recovered will be undertaken.

<u>Test Unit 1</u>

Test Unit 1 was excavated to a maximum depth of 15 cm below surface (three 5-cm levels) and, in general, indicated that intact sediments containing cultural materials extended only to a depth of 9-12 cm below surface across the unit. A total of two soil zones (Zones I and II) were identified in T.U. 1 (Figure 7.20). Zone I was comprised of a

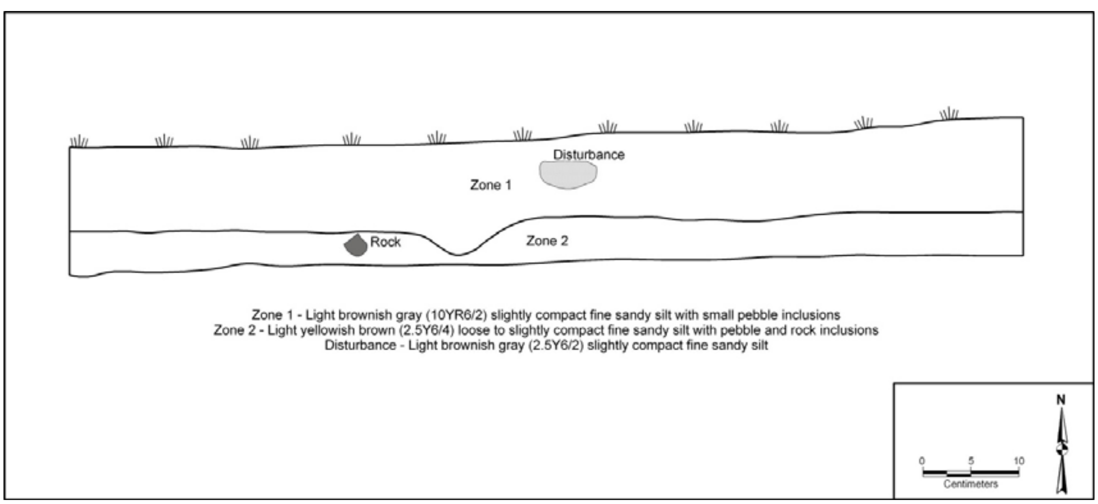

Figure 7.20. North wall profile of TU 1, Je-804.

Table 7.7. Materials Recovered from TU 1, Je-804.

		Debitage	Bifaces	PPK	Unifaces	Bone	Land snail (g)
Zone I							
	TU1/Surface	1			1		
	TU1/Level 1	5	1	1			1.6
	TU1/Level 2	2					0.1
	TU1/Level 3	1				1	
	Zone Total:	9	1	1	1	1	1.7
	Unit Total:	9	1	1	1	1	1.7

light brownish gray slightly (10YR 6/2) compact, fine sandy silt with small pebble inclusions. Zone I originated at the surface ranged in depth across the unit (9-12 cmbs). Zone I comprised the entirety of Levels 1 (0-5 cmbs) and 2 (5-10 cmbs), and extended slightly into Level 3 (10-15 cmbs) in one localized portion of the unit (central portion of the northern edge of T.U. 1—see Figure 7.20). All of the cultural materials from T.U. 1 were recovered within Zone I (Table 7.7). Thus, the Zone I sediment appears to represent the extent of cultural deposits in T.U. 1 at site Je-804.

Zone II consisted of a light yellowish brown (2.5YR 6/4), loose to slightly compact, fine sandy silt with pebble and rock inclusions. Zone II in T.U. 1 was restricted entirely to excavation Level 3 (10-15 cmbs) and did not contain cultural materials. The Zone II sediment appears to represent sterile subsoil deposits at the site. In addition to Zones I and II, a small disturbance (2.5YR 6/2, light brownish gray) that extended from Level 1 into Level 2 was also identified in the northernmost portion of T.U. 1., and probably relates to rodent or lizard tunneling action (Figure 7.20).

Cultural materials recovered from T.U. 1 Zone I consisted of several flakes (n=9) and lithic tools (n=3). As noted previously, a *limace* manufactured from *toba volcanica* was noted eroding onto the surface of T.U. 1. In addition to the *limace*, the midsection of a Paiján point manufactured from rhyolite (5 cmbs) and a late stage biface/bifacial knife manufactured from quartzite (4.5-5 cmbs) were recovered from Level 2. Other materials recovered from T.U. 1 included a single bone (*Sigmodontinae*)[3] and a small amount of land snail shell (1.7 g).

[3] The specimen recovered from T.U. 1 is a femur fragment and in this case, I suspect, is probably intrusive into the Early Preceramic deposits and does not indicate a food resource.

Although artifacts were recovered from all three excavated levels in T.U. 1, the density of cultural materials was greatest in Level 1 (0-5 cmbs). The fact that most of the artifacts were located in the uppermost level, combined with the presence of artifacts eroding onto the surface, suggests that the Early Preceramic deposits at Je-804 have been seriously deflated. No carbon samples were recovered from T.U. 1, so a precise dating of the deposits cannot be ascertained. However, the recovery of diagnostic Paiján materials from the surface and Level 1 indicate at least a Late Pleistocene to Early Holocene age occupation in this area of Je-804.

The presence of multiple tool forms (projectile point fragment, bifacial knife/late stage biface, and a *limace*) in an area as small as T.U. 1 suggests that a relatively wide range of different activities were conducted in this location by the Early Preceramic occupants of the site. Minimally, these tools point to a location for tool manufacture—although the low frequency of debitage does not appear to indicate a specialized workshop or knapping station activity area. Rather, the low number of debitage and relatively high number of tools suggests that a variety of different activities (including lithic manufacture, and possible woodworking [*limace*], animal processing/butchery [projectile point and bifacial knife], and hunting [projectile point]) occurred in this location. In addition to the possible activities indicated by the lithic tools, a limited amount land snail processing and/or consumption also appears to have occurred. Rather than indicating a specialized activity area, the materials recovered from T.U. 1 appear to indicate that a wide range of independent activities likely occurred in this location and were deposited as part of a general midden.

The materials recovered from T.U. 1 appear to represent a range of activities and general midden deposition. Because at least a portion of the site deposits appears to have been eroded or deflated, the length of site occupation or any re-occupation cannot be determined. However, the presence of artifacts throughout the extant portion of Zone I (9-12 cm thick) suggests the occupational history of the site is longer than that which might result from limited use or special purpose sites (e.g., field camps, transitory stations, processing station, or quarry/workshops).

In sum, the limited amount of excavation conducted at Je-804 does not allow for a thorough understanding of this large and complex site. However, the limited amount of cultural materials recovered from T.U. 1 indicates a relatively wide range of activities was undertaken during the Paiján occupation of the site. The amount of subsurface deposits and range of different tool types suggest this site likely served as a short-term basecamp (seasonal or less duration). Lastly, the only clearly identifiable reoccupation of the site was undertaken much later by the Chimú (as indicated in T.U. 2).

Je-919

Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0678012 Northing: 9220741
Site Dimensions: East/West: 720 m North/South: 260 m
Chronology: Multicomponent (Early Preceramic and Moche)

Site Description:

Je-919 is located on a long, flat, low terrace that parallels the northern edge of the mouth of Quebrada Higuerón and extends out toward the intersection with Quebrada del Batán (Figure 7.1). The site is crossed on the southern and western ends by the small dirt road that runs through Quebrada del Batán. Je-919 is large site that is characterized by series of light to high density scatters of lithics across the surface of the terrace. Five distinct lithic knapping features were documented at the site (Figure 7.21). In addition, numerous lithic tools, including several Paiján points, were recovered from the surface of the site. This site is multicomponent, as evidenced by the presence of a four *pirca* structures and an associated pile of stones (Figure 7.21). A few Moche ceramics were in the area around the *pirca* structures and two were collected for identification.

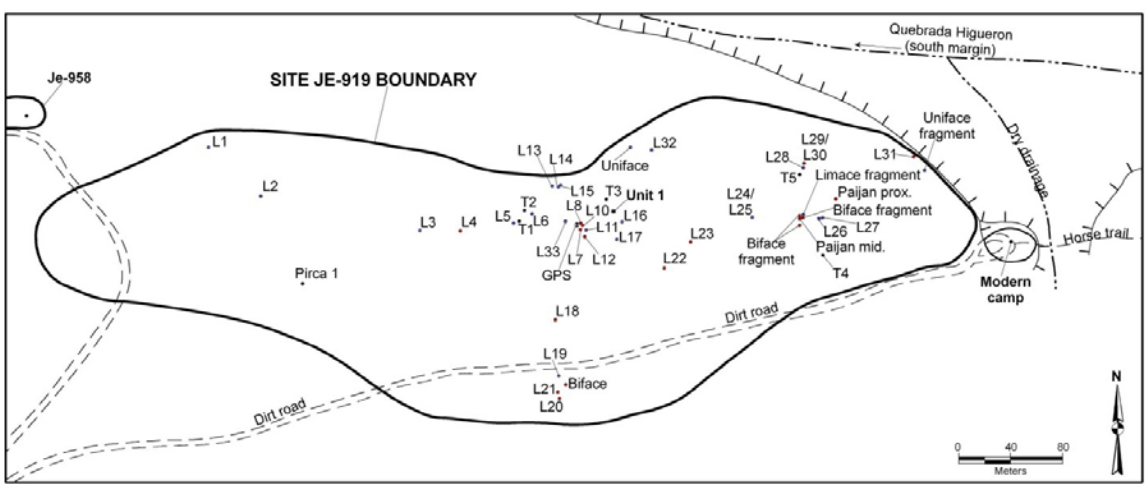

Figure 7.21. Site map of Je-919.

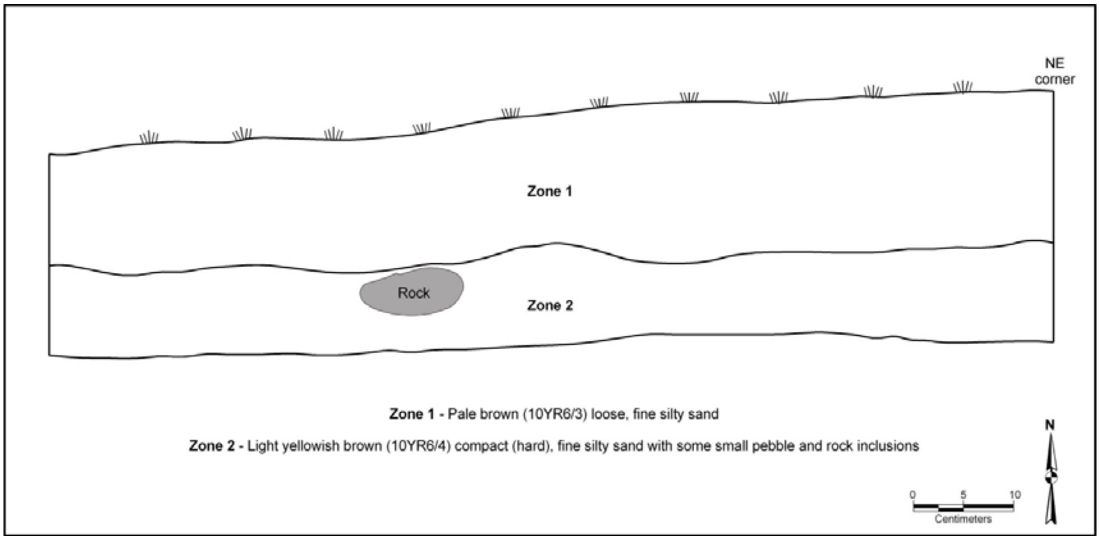

Figure 7.22. North wall profile of TU 1, Je-919.

Je-919 Excavations:

A single 1 x 1 m test unit (T.U. 1) was excavated at Je-919. Test unit 1 was positioned in an area of hummocked soil that appeared to be a good candidate for containing intact subsurface sediments. Three 5-cm levels were excavated in T.U. 1 to a final depth of 15 cm below surface. The ground surface where T.U. 1 was located was uneven and sloped away from the northeast corner of the unit, which resulted in an uneven thickness for Level 1 (5-13.5 cm).

Several flakes (n=11) were collected from the surface of T.U. 1 prior to starting the excavation. Level 1 (0-5 cmbs) contained the highest quantity of artifacts (56 lithics, 2 bone fragments, 1 fragment of carbon [PP#1], and 4.12 grams of land snail shell). The density of artifacts in Level 1 was produced in part by the hummocked ground surface that resulted in an expanded thickness in the eastern portion of the unit. Level 2 (5-10 cmbs) contained substantially fewer artifacts than Level 1 (4 lithics, 1 land snail shell). Level 3 (10-15 cmbs) contained a single small flake near the top of the level and was the final level excavated in T.U. 1.

Overall, the excavation of T.U. 1 indicated that Je-919 contained relatively shallow deposits (Figure 7.22). No evidence for the Moche occupation of the site was encountered during the excavation of T.U. 1, suggesting that the subsurface cultural materials all relate to the Early Preceramic period. Two sediment zones (Zone I and II)

Table 7.8. Materials recovered from TU 1, Je-919.

		Debitage	Bone	Carbon (PP)	Land snail (g)
Zone I					
	TU1/Surface	11			
	TU1/Level 1	56	2	1	4.12
	TU1/Level 2	4			0.1
	TU1/Level 3	1			
	Zone Total:	72	2	1	4.13
	Unit Total:	72	2	1	4.13

were identified in T.U. 1. Zone I, which was a 10YR 6/3 pale brown loose, fine silty sand with small pebble inclusions, comprised the entirety of Levels 1 and 2. Zone I extended from the surface to a depth of 11-14 cm below surface across the unit (depending on the unevenness of the ground surface). Zone I contained all of the cultural materials recovered from the excavation of T.U. 1 (Table 7.8) and represents the extent of intact Early Preceramic cultural deposits at the site.

Zone II was comprised of a 10YR 6/4 light, yellowish brown compact (hard) fine silty sand with small pebble and rock inclusions. Zone II appeared near the top of Level 3 (11 cmbs) and continued beyond the limit of excavation. The Zone II sediment was compact and hard and contained several large rocks. Zone II contained no cultural materials and represents sterile subsoil at site Je-919. No features were encountered during the excavation of T.U.1. Given the relatively shallow deposits at the site and the relatively few artifacts recovered from T.U.1 no further excavations were conducted at Je-919.

In sum, the excavation of T.U. 1 at Je-919 resulted in the recovery of relatively few cultural materials and is indicative of correspondingly few activities. Some amount of lithic manufacture appears to have occurred in this location, although production was not intensive enough to be considered a knapping station. Other possible activities, including consumption and/or processing, are suggested by the presence of the bone/bone fragments and land snail shells. The bones recovered from T.U. 1 were both identifiable only as mammals (unidentified Mammalia) (Pavao-Zuckerman 2004). The limited amount of both bone and land snail shell in the T.U. 1 deposits probably indicates, at most, a single episode of consumption or processing and precludes a more precise characterization of these activities at this location.

The stratigraphic position of most of the lithic (and other) artifacts in Level 1 (Zone I) suggests that Je-919 was likely not occupied for long periods of time and probably represents either a single occupation or sporadic short-term use episodes. Episodic use and re-occupation of this site during the Early Preceramic period appears the most likely scenario, given the relatively shallow deposits, few artifacts, and large size of the site. The Moche occupation that is suggested by the presence of *pirca* structures with associated ceramics was not present in the T.U. 1 deposits. The lack of evidence for the Moche occupation suggests that their activities at the site were limited and/or were confined to another area of the site (most likely around the *pircas*).

Je-979

Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677191 Northing: 9220493
Site Dimensions: East/West: 130 m North/South: 246 m
Chronology: Multicomponent (Early Preceramic [Fishtail and Paiján] and Chimú)

Site Description:

Je-979 is located on the upper (eastern) end of a long, dissected, low terrace that extends west/southwest from Cerro Organos toward the Quebrada del Batán drainage (Figure 7.1). The site is large and consists of a generally light density scatter of lithics with areas of medium to high density concentrations (Figure 7.23). There are concentrations of caracoles scattered across the site as well. Numerous bifacial and unifacial tools were identified and collected from the surface of the site, including the proximal end of a Fishtail projectile point and several retouched flakes. A light scatter of Chimú ceramics, including a jar rimsherd, was present across the southern end of the site. Associated with the ceramics, were ten pirca structures which probably relate to the Chimú use of the site (Figure 7.23).

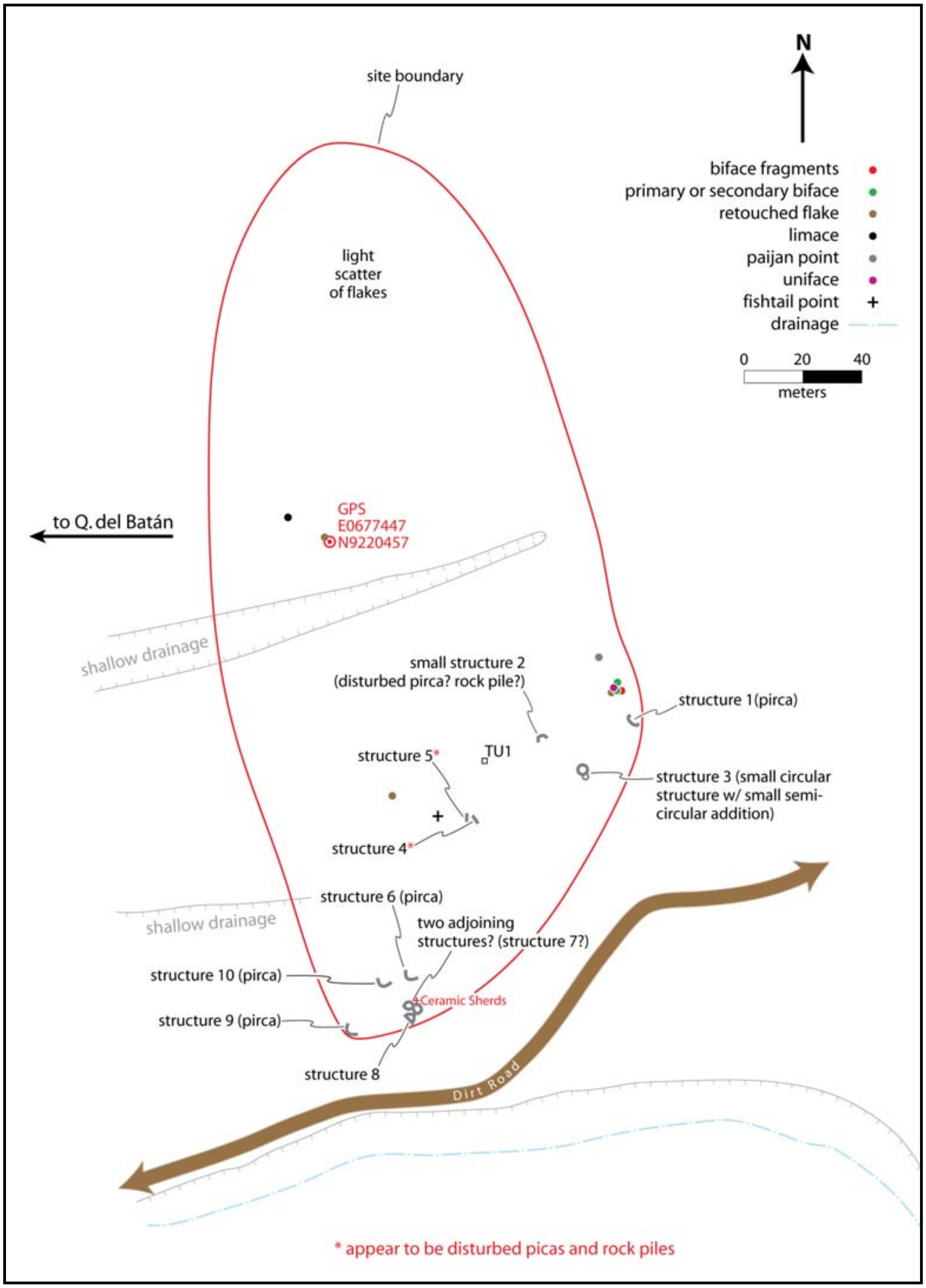

Figure 7.23. Site map of Je-979.

Je-979 Excavations:

A single 1 x 1 m test unit (T.U. 1) was excavated at Je-979. Test Unit 1 was positioned in an area that appeared to be a small land snail midden, near where the proximal end of the Fishtail point was found (see Figure 7.23). Land snail shells were eroding out onto the surface (66.5 g collected from the surface of T.U. 1), suggesting that this location may contain intact subsurface deposits. A total of six 5-cm levels were excavated in T.U. 1 to a final depth of 30 cm below surface.

Level 1 (0-5 cmbs) consisted of a loose, fine silty sand that contained two lithics (1 flake and 1 amorphous core) and numerous land snail shells (548.9 g) (Table 7.9). A few very small charcoal flecks were noted in Level 1, but were not collected. Three small rodent disturbances were noted in the northwest, southwest, and northeast corners of T.U. 1. The loose, fine silty sand continued through Level 2 (5-10 cmbs). Two of the rodent disturbances (northwest and southwest corners) that appeared in Level 1 disappeared in Level 2, while the disturbance in the northeast corner continued into the next level. Like Level 1, Level 2 contained two lithics (both flakes) and a substantial amount of land snail shells (911.8 g).

Level 3 (10-15 cmbs) consisted of a loose, fine silty sand that contained a land snail shells (although fewer than Level 2) and charcoal. A total of 281.5 g of land snail shells were recovered from Level 3, along with 3 lithics (two flakes and a tested cobble) and two carbon samples (PP1 and PP2). The disturbance in the northeast corner of the unit that appeared in Level 1, disappeared near the floor of Level 3 (14 cmbs).

Table 7.9. Materials recovered from TU 1, Je-979.

	Debitage	Bone	Carbon (PP)	Land snail (g)
Zone I				
TU1/Surface	0	0	0	66.5
TU1/Level 1	2	0	0	548.9
Zone Total:	2	0	0	615.4
Transition Zone I/II				
TU1/Level 2	2	0	0	911.8
Zone Total:	2	0	0	911.8
Zone II				
TU1/Level 3	3	0	2	281.5
TU1/Level 4	0	1	3	163.6
TU1/Level 5	2	0	0	50.8
TU1/Level 6	0	0	0	18.9
Zone Total:	5	1	5	514.8
Unit Total:	9	1	5	2042

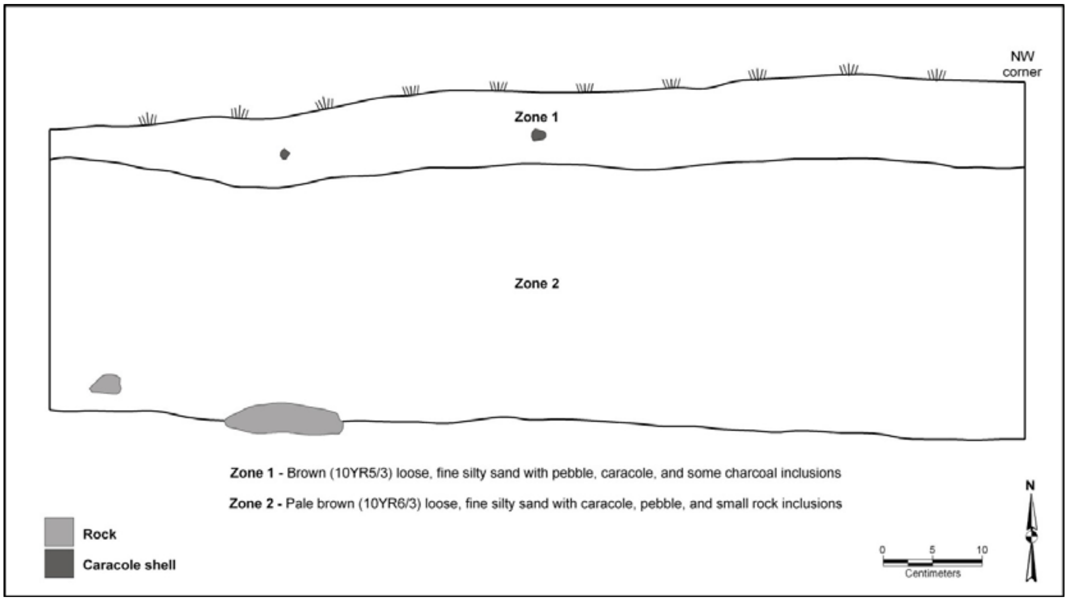

Figure 7.24. East wall profile of TU 1, Je-979.

Level 4 (15-20 cmbs) consisted of a loose, fine silty sand that contained pebble/small rock and charcoal inclusions. Artifacts recovered from Level 4 included three carbon samples (PP3, PP4, and a general sample), 1 small fish bone (Osteichthyes), and land snail shells (163.6 g). Several rocks that extended into Level 5 were encountered at the base of Level 4.

The rocks encountered in Level 4 continued into Level 5 (20-25 cmbs) and more were encountered. A few small charcoal flecks were noted in the loose, fine silty sand that comprised Level 5, along with several land snail shells (although significantly fewer than in previous levels). Artifacts recovered from Level 5 consisted of two flakes and land snail shells (50.8 g).

Level 6 (25-30 cmbs) consisted of a loose, fine silty sand that contained a substantial amount of rocks. The rocks that were initially encountered in Level 4 increased in Level 6 to the point of comprising most of the unit floor and appear to represent the terrace sub-strata. No charcoal or lithics were encountered in Level 6 and very few land snail shells were recovered (18.9 g). Level 6 was the final level excavated in T.U. 1 and represents the end of subsurface cultural deposits at Je-979.

As a result of the excavation of T.U. 1, two subsurface zones (Zone I and II) were identified (Figure 7.24). Zone I was a brown (10YR 5/3) loose, fine silty sand with pebble, land snail, and small charcoal fleck inclusions. Zone I extended from the surface of T.U. 1 to a maximum depth of 9 cm below surface and encompassed all of Level 1 and part of Level 2. The contact between Zone I and II, which occurred in Level 2 (5-10 cmbs) was a subtle transition (primarily a change in color) that was only visible upon completion of the excavation of T.U. 1. As such, the materials recovered from Level 2 cannot be separated into either Zone I or II and have been characterized as representing a transition between the two zones (Table 7.9).

Zone II was a pale brown (10YR 6/3) loose, fine silty sand with land snail, charcoal, and rock inclusions. Zone II appears between 5-9 cm below surface over most of the unit and continued to the limit of excavation (30 cmbs). The majority of the cultural materials recovered from T.U. 1 were encountered in Zone II and it represents most of the intact cultural deposits at Je-979.

In sum, the excavation of T.U. 1 at Je-979 resulted in the documentation of a land snail midden and the recovery of relatively few other artifacts. The vast majority of the land snail shells in T.U. 1 were recovered from Zone I (0-9 cmbs). Most of Level 2, which contained the greatest amount of land snail shells, was located within the lower portion of Zone I. The frequency of land snails decreased substantially throughout the levels in Zone II, culminating with only a slight presence (18.9 g) in Level 6. I believe that the distinction between Zones I and II, which is primarily color and amount of charcoal inclusion, is related to the occupational history of the site. Although the nature of the human use of the site (apparently land snail exploitation/consumption) changes very little over time, the intensity of this activity does increase substantially in the uppermost levels of T.U.1. Thus, the distinction between Zone I and II appears to have been produced by the increased intensity of land snail exploitation.

No evidence for the Chimú occupation of the site was encountered in T.U. 1, and it appears that the site deposits in this location all relate to the Early Preceramic (and possibly Middle and/or Late Preceramic) period. Only a few lithics (n=9) were recovered from T.U. 1. Interestingly, two of the lithic artifacts are a core and a tested cobble, suggesting that early stage lithic reduction may have been occurring in this locality. A single fish bone (Osteichthyes, Level 4) and five carbon samples (Levels 3 and 4) were the only other materials encountered in T.U. 1. As stated previously, the high presence of land snails and low incidence of other cultural materials suggests that the exploitation/consumption of land snails was the primary activity that occurred in this location.

It is unclear when the deposition of the land snail midden initiated, but it is clear that the activity increased in frequency over time (as indicated by the amount of land snails recovered per level). The lack of radiocarbon dates and *in situ* diagnostic artifacts limit an assessment of the chronological relationships between the site's deposits. However, the presence in Level 5 of a flake manufactured from quartz (which was commonly used in the Early Preceramic period), contrasts with the basalt flakes that appear in Levels 2 and 3 (which are more commonly associated with the expedient Middle and Late Preceramic period lithic technologies). The presence of an amorphous core (quartzite) and tested cobble (basalt) may also indicate a more expedient production focused on the use of locally available materials, which is also characteristic of later Preceramic periods. It is also possible that the deposits in T.U.1 are all related to technologically different (unifacial) Early Preceramic period occupations of the site.

These chronological indicators are tentative at best, but are suggestive of two possible scenarios for the occupation of Je-979. *Scenario 1*: The deposition of the land snail midden began during the Early Preceramic period and increased in frequency during later Preceramic (Middle and/or Late) period occupations, as suggested by the relatively meager lithic data. *Scenario 2*: The land snail midden was deposited entirely during the Early Preceramic period and the slight variation in the types of lithic raw materials used over time are related to differences in the technological strategies of the Fishtail, Paiján, or possibly other (unifacial) occupations at the site. At present, there is not enough evidence to conclusively support either of these possibilities.

The information from the T.U. 1 excavation, however, does suggest that Je-979 may have been occupied over a relatively long period of time. Because only a very limited range of activities appears to have occurred in the location of T.U. 1 (no features and low number of artifacts and artifact classes), it appears that the occupation(s) of the site likely consisted of relatively short-term episodes of redundant use that focused on the exploitation/consumption of land snails. No evidence to suggest long-term occupations of the site, such as features, activity areas, diversity of artifact classes and artifacts, or structures, was identified in the T.U. 1 deposits.

Je-993

Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676634 Northing: 9219768
Site Dimensions: East/West: 940 m North/South: 220 m
Chronology: Multicomponent (Early Preceramic and Chimú)

Site Description:

Je-993 is located on a very long, gently sloping high terrace that extends west/southwest from the base of Cerro Organos into the Quebrada del Batán drainage. The terrace is bordered on the northern and southern edges by deep side drainages that run into the Quebrada del Batán drainage (Figure 7.1). The site extends for nearly a kilometer along the terrace and provides a commanding view of the lower Quebrada del Batán and associated *pampa*.

Je-993 is a large site that consists of areas of light, medium, high density lithic scatters. The western end of the site is in general, characterized by a light density lithic scatter with very few lithic tools and was the area that contained the Chimú ceramics (n=6) that were identified on the site surface (Figure 7.25). Artifact distributions are much denser on the eastern (upslope) end of the site, which contains several areas of very high density concentrations of lithic debitage and tools. Several concentrations of caracoles (*basurales*) were identified and recorded on the eastern end of the site. Several small bones (n=21), including one fossilized antler tine, were also collected on the site surface. Numerous lithic tools were identified and collected, including 17 Paiján projectile points, limaces, bifaces, unifaces, and retouched or utilized flakes. Two of the Paiján points were proximal ends that refit with distal fragments also found at the site.

At least three distinct, high density clusters of tools and debitage were recorded on the eastern end of the site. These clusters of tools and debitage likely indicate long-term occupation or reoccupation of the landform over time, based on the excavation results discussed below (Table 7.10). Three lithic knapping stations were also identified and recorded, one of which was a large, very dense cluster of quartz and quartz crystal debitage.

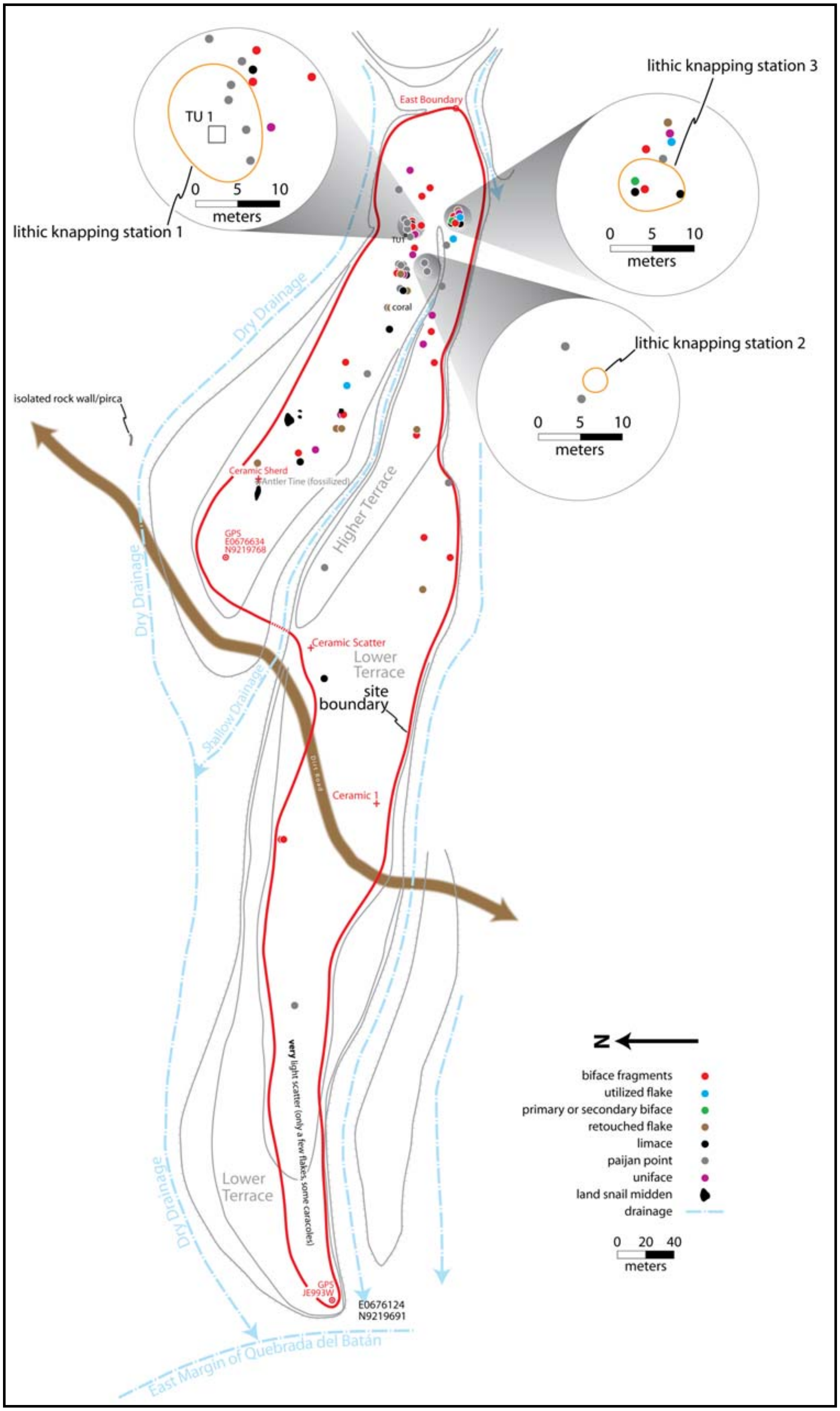

Figure 7.25. Site map of Je-993.

Table 7.10. Materials recovered from TU 1, Je-993.

	Debitage	Bifaces	Bone	Carbon (PP)
TU1/Surface	411		11	
TU1/Level 1	261	1	14	1
TU1/Level 2	34		6	
TU1/Level 3	3			
Unit Total:	709	1	31	1

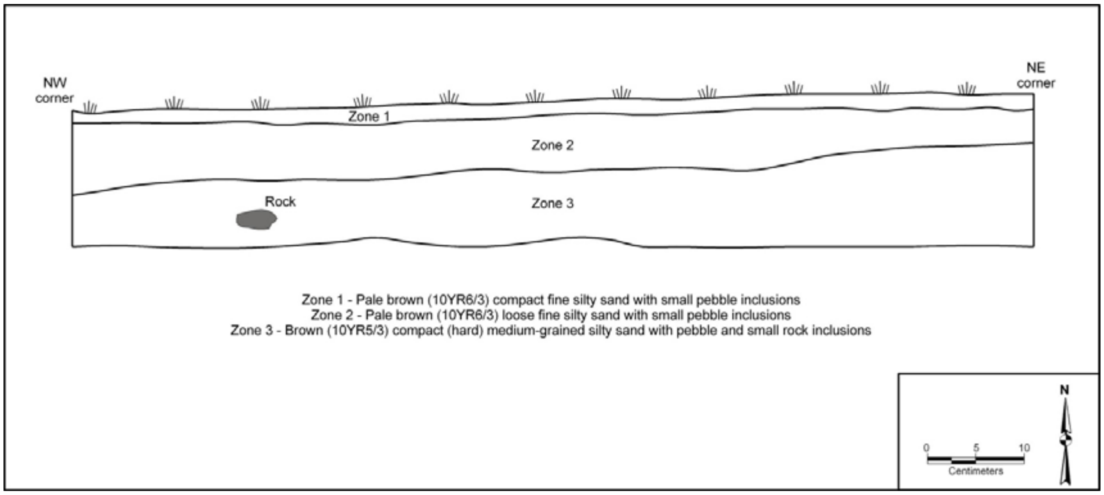

Figure 7.26. North wall profile of TU 1, Je-993.

Je-993 Excavations:

A single 1 x 1 m test unit (T.U. 1) was excavated at Je-993. Test Unit 1 was positioned within a large lithic knapping station (Taller 1) in order to gather any subsurface cultural materials and possibly collect carbon samples for dating. Taller 1 is a dense accumulation of quartz and quartz crystal flakes from numerous episodes of lithic reduction. All lithic debris on the ground surface of T.U. 1 was collected prior to beginning excavation. Surface collected materials included 411 lithics (flakes and shatter) and 11 bones/bone fragments (Table 7.10).

A total of three 5-cm levels were excavated in T.U. 1 and extended to a maximum depth of 15 cm below surface. Level 1 (0-5 cmbs) also contained a large amount of lithic debris, but the quantity decreased in comparison to the surface density. Artifacts recovered from Level 1 included 1 medial section of a primary biface of quartz, 261 flakes and shatter, 14 bones/bone fragments, and a small carbon sample. A distinct soil change was noted in Level 1 (Figure 7.26). The upper two centimeters of Level 1 (0-2 cmbs) were a compact fine silty sand that changed abruptly at 2-3 cm below surface into a loose, fine silty sand. The loose silty sand continued into Level 2 (5-10 cmbs) to a depth of 7-8 cm below surface, where it abruptly contacts coarser grained, compact silty sand. Level 2 contained substantially fewer artifacts than Level 1 and included 34 lithics (flakes and shatter) and 6 bones/bone fragments. The compact silty sand that appeared near the base of Level 2 encompassed all of Level 3 (10-15 cmbs). The sediment became increasingly more compact toward the base of the level, necessitating the use of a hand pick for removal. Three small flakes, recovered in the upper part of Level 3 (10-12 cmbs) were the only artifacts encountered in this level. The few artifacts encountered, combined with the compactness of the sediment matrix, indicated that Level 3 was in subsoil and no further excavation was conducted.

The three levels excavated in T.U. 1 indicated the presence of three distinct soil zones (Zones I, II, and III) within the deposits at Je-993 (Figure 7.26). Zone I (0-2 cmbs) was positioned directly below the surface and existed entirely within Level 1. This zone was comprised of a pale brown (10YR 6/3) compact, fine silty sand with small pebble inclusions. Zone I appears to represent a near-surface 'crust' that is produced by occasional contact with surface moisture that serves to slightly compact the uppermost sediments of the terrace.

Zone II (2-8 cmbs) encompassed most of Levels 1 and 2 and consisted of a pale brown (10YR 6/3) loose, fine silty sand with small pebble inclusions. Zone II is only distinguished from Zone I by texture, which again suggests that Zone I is probably the product of contact with surface moisture. Thus, there is no meaningful distinction between Zone I and II, and together they represent the extent of cultural deposits at Je-993.

In contrast, Zone III, which appears at a depth of 7-8 cm below surface across T.U. 1, appears to represent the appearance of non-cultural deposits at the site. Zone III did contain a few artifacts (as evidenced by the three flakes in Level 3), but I believe that these relatively few artifacts probably filtered down into the upper portion of Zone III from the overlying Zone II. The compactness (hard) of Zone III also suggests a non-cultural origin for this stratum.

In sum, the excavation of T.U. 1 at Je-993 indicated that cultural deposits, although shallow, extended to a depth of 7-8 cm below surface and contained a relatively large amount of lithic debris (n=709) and was a location of intensive lithic manufacture. No evidence of Chimú use of the site was encountered in the T.U. 1 deposits. This is not surprising given that most of the Chimú activity appears to have been located on the western end of the site. Thus, it appears that the cultural deposits in T.U. 1 all related to the Early Preceramic period, which correlates well with the clusters of Early Preceramic artifacts recorded in this area of the site surface.

No subsurface features were encountered in T.U. 1. However, the amount of lithic debris that was present indicates that the lithic knapping station (Taller 1) that was documented on the site surface continued into the subsurface deposits. The very high density of lithic debris that was noted on the surface of T.U. 1 (n=411) was most likely produced by both intensive reduction and the deflation of cultural deposits (thus increasing the density of materials). However, the fact that Taller 1 continued through Zones I and II to a depth of 7-8 cm below surface suggests that this knapping station may have been deposited over a relatively long period of time and may have had multiple or repeated episodes of use.

The presence of several bones/bone fragments within the Taller 1 deposits (n=31) suggests that the manufacture of lithic implements was not the only activity that occurred in this location on a relatively frequent basis. Most of the bones were identifiable only as indeterminate mammal, although several terrestrial species were also identified, including desert tegu lizard (*Dicrodon* sp.), peccary (Tayassuidae) (burned), and deer (Cervidae) (Pavao-Zuckerman 2004). Along with lithic manufacture, Taller 1 appears to represent a location where the processing/butchering of a variety of game was also undertaken. In contrast, it is also possible that the presence of these animal remains indicates simple consumption and discard by the lithic knappers while engaged in other activities (e.g., lithic manufacture, game spotting). The absence of hearth features or evidence of burning in the T.U. 1 deposits would appear to argue against processing or cooking activities in this location (although the peccary bone was burned). However, barring further excavations these possibilities will remain inconclusive.

Je-996
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677098 Northing: 9219454
Site Dimensions: Northwest/Southeast: 250 m Northeast/Southwest: 50 m
Chronology: Early Preceramic (Fishtail and Paiján)

Site Description:

This site is situated on a long, high terrace that is located in a small, side *quebrada* at the western base of Cerro Organos (Figure 7.1). The terrace extends to the west/northwest and is bordered on the southern and eastern ends by a deep side drainage that runs into the Quebrada del Batán.

Je-996 is a long, narrow site that is characterized by a generally light density scatter of lithics with areas of high density concentrations. Several lithic tools were identified and collected from the surface of the site, including a Fishtail projectile point, a Paiján projectile point, a limace, and several retouched flakes. The majority of the tools were located in two clusters of artifacts near the central portion of the site and on the northwestern end of the site (Figure 7.27). These clusters may represent distinct activity areas or different occupations of the site. A light scatter of caracoles was also found across the surface of the site.

Je-996 Excavations:

A total of eight 1 x 1 m test units (T.U. 1-8) were excavated at Je-996. Each of the units was positioned in areas that appeared to contain a good possibility for intact subsurface deposits and had yielded concentrations of lithic tools and debris on the site surface. Test Units 1, 3, and 4 were located near the center of the site, Test Units 2, 5, 6, and 7 (Block A) were located in the northwestern end of the site, and Test Unit 8 was located on the eastern (upslope) end of the Je-996.

Test Units 1, 3, and 4

Test Units 1, 3, and 4 were located near the center of the site in an area that contained a cluster of surface lithic tools (including a Fishtail projectile point) and debitage (Figure 7.27). The surface of this area of the site consisted of hummocked areas of sediment that had been slightly dissected by small runoff channels. Test Units 1, 3,

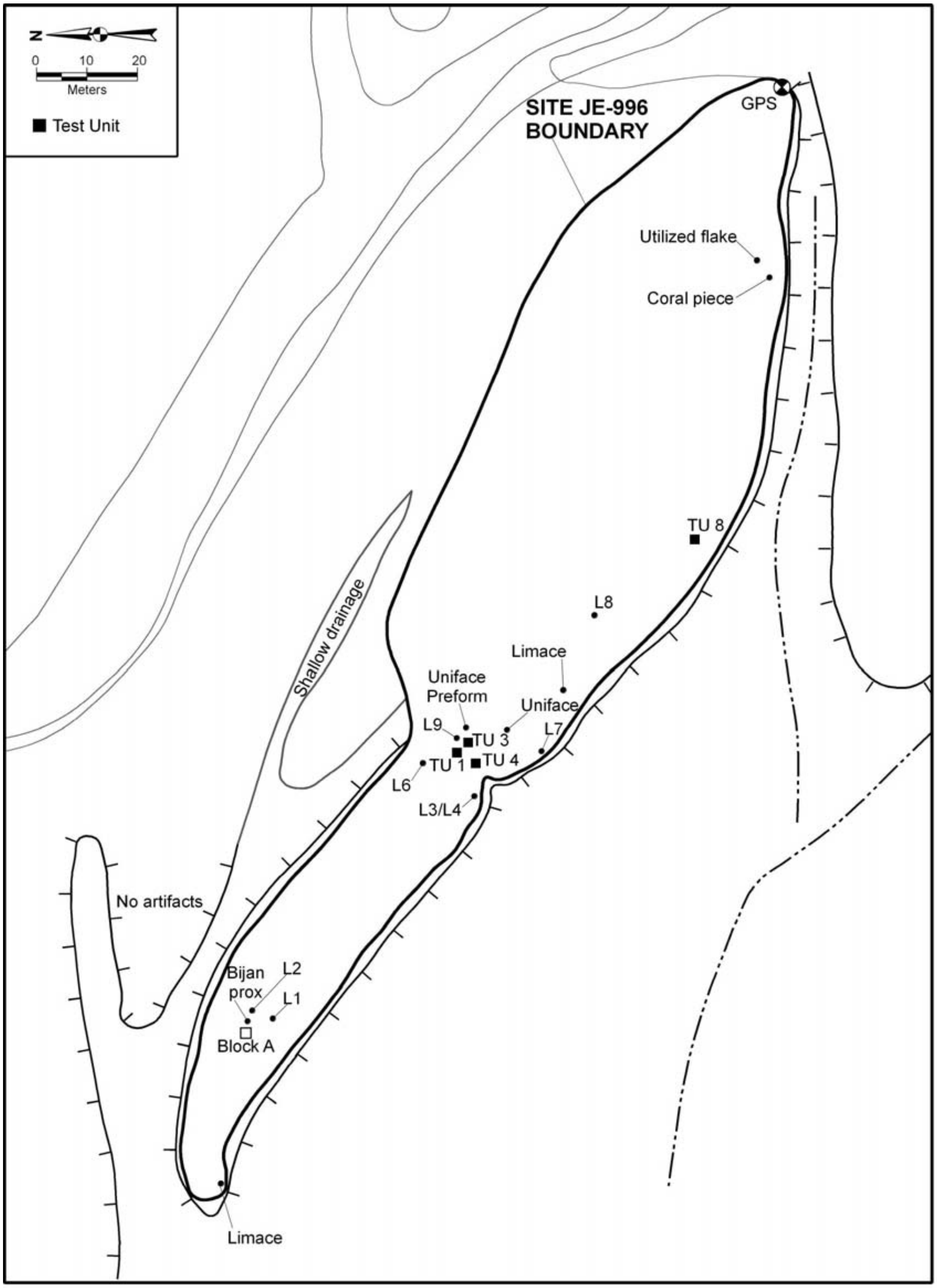

Figure 7.27. Site map of Je-996.

and 4 were located in this area in an attempt to recover any *in situ* materials that may be related to the Fishtail occupation of the site and to collect any potential carbon samples for dating. In general, however, these units revealed relatively shallow deposits in this portion of the site and limited cultural materials.

Two levels (0-10 cmbs) were excavated in both T.U. 1 and 3, while three levels (0-15 cmbs) were excavated in T.U. 4. Two soil zones (Zone I and II) were identified in the shallow subsurface deposits in this area of the site (Figures 7.28, 7.29, and 7.30). Zone I is a loose, brown (10YR 5/3) fine silty sand with a few small pebble and rock inclusions. Zone I is the uppermost zone in all three test units (T.U. 1, 3, 4) and extends from the surface to a depth of 6.5-7.5 cm below surface. Zone I encompasses the entirety of Level 1 and part of Level 2 in each of the test units. Zone II is a very compact, brown (10YR 5/3) medium-grained sand with numerous small pebble and rock inclusions. Zone II appeared at 6.5-7.5 cm below surface in each of the units and continued beyond the limit of excavation (10-15 cmbs). The primary distinction between Zone I and II is structural (Zone II is very compact [hard]) and textural (Zone II sand is more coarse).

Zone II also contains substantially more rock inclusions that the overlying Zone I. The majority of the cultural materials recovered from Test Units 1, 3, and 4 were located in Zone I (Table 7.11). While very few materials were encountered in Zone II (a single flake and a few land snail shell fragments). Most, if not all, of the artifacts that are listed in the Transitional Zone I/II category of Table 7.11 probably should b included

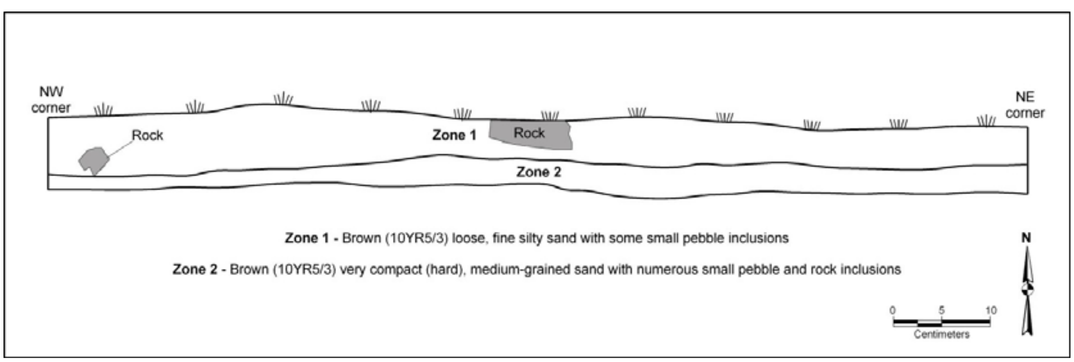

Figure 7.28. North wall profile of TU 1, Je-996.

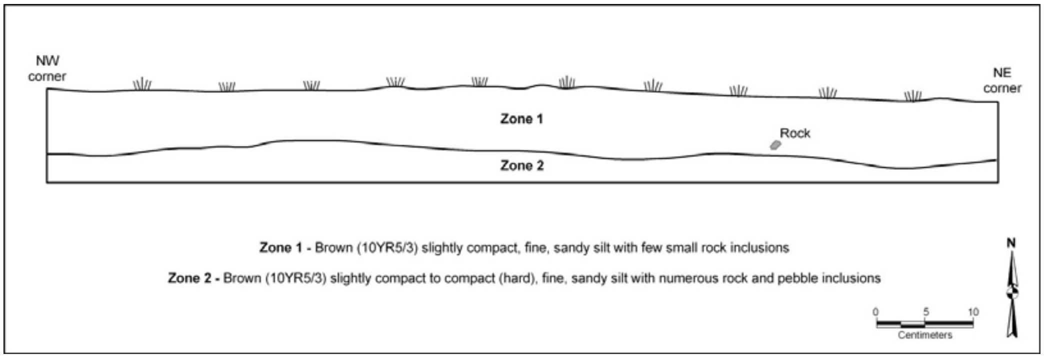

Figure 7.29. North wall profile of TU 3, Je-996.

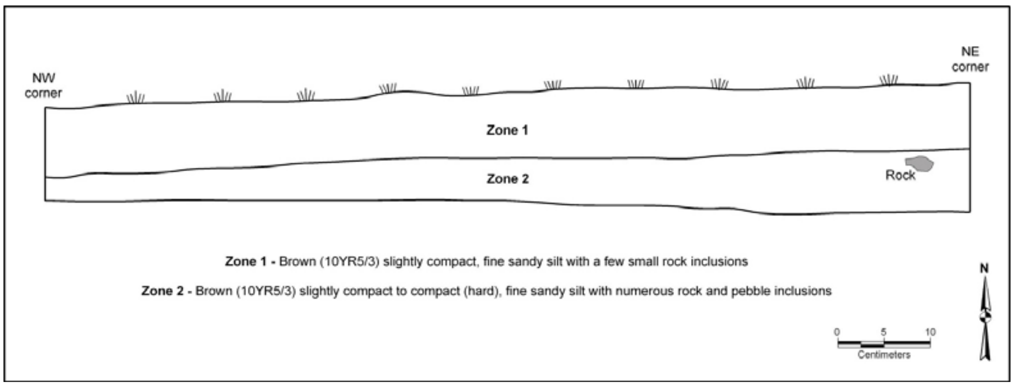

Figure 7.30. North wall profile of TU 4, Je-996.

Table 7.11. Materials Recovered by Zone from TU 1, 3, and 4, Je-996.

	Debitage	Unifaces	Carbon (PP)	Land snail (g)
Zone I				
TU1/Surface	4	0	0	0
TU1/Level 1	9	1	0	0.1
TU3/Surface	2	0	0	0
TU3/Level 1	4	0	1	1.9
TU4/Surface	3	1	0	0
TU4/Level 1	8	0	2	0.8
Zone Total:	30	2	3	2.8
Transition Zone I/II				
TU1/Level 2	0	0	0	0
TU3/Level 2	1	0	0	0
TU4/Level 2	1	0	2	6.1
Zone Total:	2	0	2	6.1
Zone II				
TU4/Level 3	1	0	0	1.8
Zone Total:	1	0	0	1.8
Total for T.U.1, 3, 4:	33	2	5	10.7

with the Zone I. However, because the contact between the two zones falls within Level 2 in all units, these materials cannot be accurately separated out.

It is clear that Zone I contained the bulk of the cultural materials in Test Units 1, 3, and 4. The structure of the Zone II sediments (compact hard), combined with the near absence of artifacts suggests that Zone II in Test Units 1, 3, and 4 represents sterile subsoil. Thus, Zone I appears to represent the extent of deposits containing cultural materials in this portion (center) of the site.

This lithic material recovered from this site will be discussed in more detail in Chapter 8 (Lithic Analysis), but it can be noted that most of the debitage was small and indicated relatively late stage manufacture. A broad range of raw materials was recovered, including two examples of a non-local highland chalcedony (TU 1, Level 1). Two lithic tools were recovered, a retouched flake of chalcedony (TU 1, Level 1, PP1) and an utilized flake of *toba volcanica* (TU4, surface). The presence of these unifacial flake tools, combined with the other tools that were identified on the site surface during survey, suggests that a variety of activities may have occurred in the central portion of the site. The fact that one uniface (a retouch flake) is manufactured from chalcedony (although a different variety), like the Fishtail point that was recorded on the site surface near T.U. 1, suggests that the cultural deposits in Test Units 1, 3, and 4, probably relate to the Fishtail occupation of the site.

The variety of tools that were recovered in the central portion of the site contrasts with the relatively shallow subsurface deposits, suggesting that some post-depositional process may have altered the depositional sequence (discussed below in the summary of Je-996). A variety of tool types is typically related to long-term or repeated occupations. However, the lack of features and shallow deposits appears to argue against long-term or multiple occupations. These questions will be addressed again after presenting the results from the rest of the excavations at Je-996.

<u>Block A (Test Units 2, 5, 6, and 7)</u>

Test Unit 2 was position on the northwestern end of Je-996 in area that contained a concentration of lithic tools on the surface and appeared to be a good candidate for containing intact subsurface deposits (Figure 7.27). The excavation of Test Unit 2 resulted in the identification of deposits that extended to a depth of 20 cm below surface and contained a relatively high amount of cultural materials. As a result of the productive nature of the T.U. 2 deposits, it was decided to open additional test units adjacent to T.U. 2. The result was the excavation of four adjacent 1 x 1 m test units (T.U. 2, 5, 6, 7) that covered a 2 x 2 m area (Block A). The excavation of Block A yielded numerous lithic artifacts, several carbon samples (five of which have been AMS dated) and an intact stratigraphic sequence in this area of Je-996.

Test Unit 2 was excavated to a final depth of 20 cm below surface (four 5-cm levels). Levels 1-3 all contained cultural materials, while Level 4 was sterile (Table 7.12). Test Units 5 and 6 were both excavated to final depth of 25 cm below surface (five 5-cm levels). Levels 1-4 in T.U. 5 and 6 all contained cultural materials, while Level 5 in both units was sterile. Like T.U. 5 and 6, T.U. 7 was also excavated to a final depth of 25 cm below surface (five 5-cm levels). Test Unit 7 contained no artifacts in Level 1, but each of the Levels 2-4 yielded cultural materials. Level 5 in T.U. 7 contained no artifacts, but did yield two carbon samples.

Three distinct soil zones (Zone I, II, III) were identified in Block A (Figures 7.31 and 7.32). In general, the soil zones are highest in T.U. 2 (NE ¼ of Block A) and dip to the southwest across the block. Zone I is a slightly compact, pale brown (10YR 6/3) fine sandy silt with few small pebble inclusions. Zone I continues from the surface to a depth of 5.5-16 cm below surface across Block A. Zone II is a slightly compact reddish brown

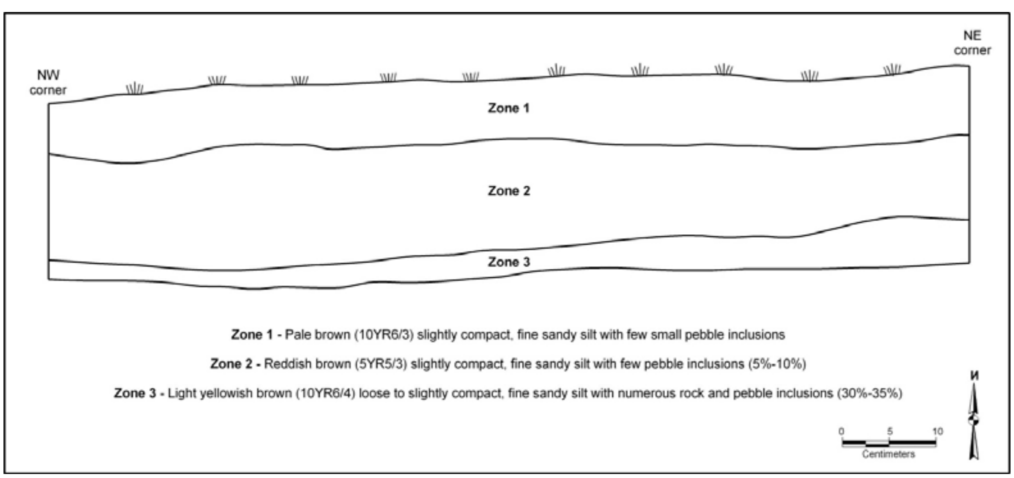

Figure 7.31. North wall profile of TU 7, Block A, Je-996.

Table 7.12. Materials recovered by zone from Block A (TU 2, 5, 6, 7), Je-996.

	Debitage	Bifaces	Unifaces	Bone	Carbon (PP)	Land snail (g)
Zone I						
TU2/Surface	9	0	1	0	0	0
TU2/Level 1	10	0	0	0	0	0.3
TU5/Surface	2	0	0	0	0	0
TU5/Level 1	5	0	0	0	0	0
TU6/Surface	0	0	0	0	0	0
TU6/Level 1	8	0	0	0	0	0
TU7/Surface	0	0	0	0	0	0
TU7/Level 1	0	0	0	0	0	0
Zone Total:	34	0	1	0	0	0.3
Zone I/II Transition						
TU2/Level 2	13	0	0	0	0	0
TU5/Level 2	9	0	0	0	0	0
TU6/Level 2	13	0	0	0	0	0.2
TU6/Level 3	5	0	0	0	0	0.2
TU7/Level 2	11	0	0	0	1	0
Zone Total:	51	0	0	0	1	0.4
Zone II						
TU2/Level 3	7	1	0	0	1	0
TU5/Level 3	16	0	0	0	1	0
TU7/Level 3	6	0	0	1	2	0
Zone Total:	29	1	0	1	3	0
Zone II/III Transition						
TU5/Level 4	12	0	0	0	0	0
TU6/Level 4	1	0	0	0	0	0
TU7/Level 4	1	0	0	1	0	0
Zone Total:	14	0	0	1	0	0
Zone III						
TU2/Level 4	0	0	0	0	0	0
TU5/Level 5	0	0	0	0	0	0
TU6/Level 5	0	0	0	0	0	0
TU7/Level 5	0	0	0	0	1	0
Zone Total:	0	0	0	0	1	0
Block A Total:	128	1	1	2	5	0.7

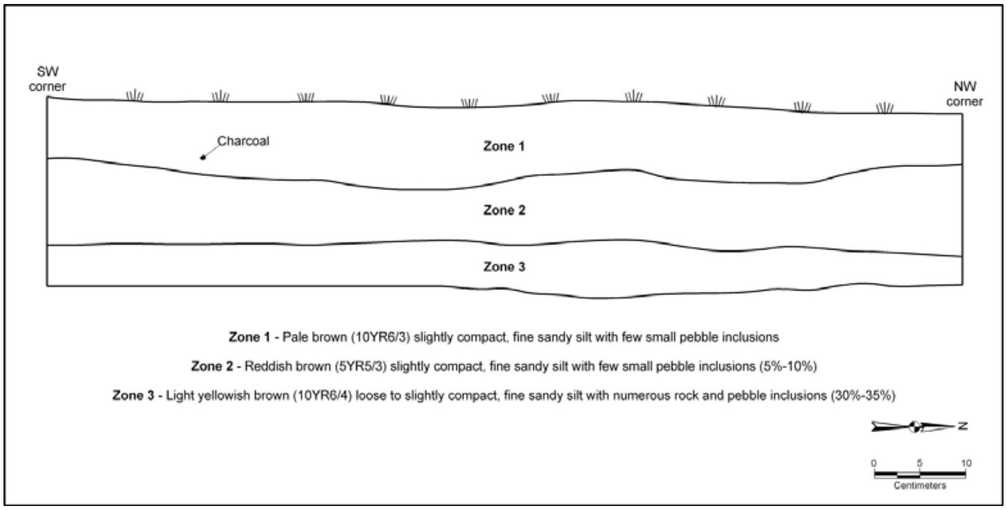

Figure 7.32. West wall profile of TU 7, Block A, Je-996.

(5YR 5/3) fine sandy silt with few pebble inclusions. Zone II appears across Block A between 5.5-16 cm below surface and continues to a maximum depth of 15.5-21 cm below surface. Zone III is a loose to slightly compact light yellowish brown (10YR 6/4) fine sandy silt with numerous rock and pebble inclusions. Zone III appears between 15.5-21 cm below surface and continues to the limit of excavation across Block A.

Both Zone I and II represent cultural deposits in this portion of Je-996. Zone III, which contained no artifacts, represents sterile subsoil. Table 7.12 presents the materials recovered in each zone by test unit and level. It is impossible to separate some levels into a specific zone because the level crossed a contact between zones. As such, the materials recovered from these levels are presented as transitions between zones.

Lithics (debitage and tools) comprise the bulk of the materials recovered in Block A, although a few bones (n=2), several carbon samples (n=5), and few land snail shells were also collected. The presence of land snail shells was limited to fragments of only a few shells and are not an important resource or activity in the Block A deposits. The two bones recovered from Block a have been identified as South American fox (*Psuedalopex* sp.) and unidentified Mammalia (Pavao-Zuckerman 2004). The lithic materials were overwhelming recovered from Zone I (n=34 debitage; 1 uniface) and the Zone I/II transition (n=51). Zone II (n=29 debitage; 1 biface fragment) and the Zone II/III transition (n=14) also contained lithic materials, but in decreasing frequencies. Zone III, the sterile subsoil, contained no lithic artifacts.

Table 7.13. AMS dates from Block A, Je-996.

Test Unit	Level	cmbd	PP #	Zone	AMS date	Error	Cal BP (2 sigma)	Material
7	2	8	1	I/II	10,230	59	12,230-11,653	Wood Charcoal
5	3	13	1	II	12,260	570	15,881-13,082	Wood Charcoal
7	3	14.5	3	II	10,113	76	12,037-11,360	Wood Charcoal
5	4	15-20	general	II/III	10,650	50	12,822-12,413	Wood Charcoal
7	5	21	5	III	10,353	58	12,571-11,986	Wood Charcoal

Piece-plotted carbon samples were collected from the Zone I/II transition, Zone II, and Zone III. Four of these samples, along with one general sample, were submitted for AMS dating. The dates yielded by these samples are presented in Table 7.13., along with their associated soil zone. In general, the dates produced from the samples collected in Block A support the Early Preceramic age of the site deposits and range in age between 12,260-10,113 B.P. The oldest date from the stratigraphic sequence in Block A, 12,260±570, came from Zone II (T.U. 5 Level 3). This date is substantially older than the other four dates from the Block A sequence and appears to be anomalously old. Even if we consider the lower end of the error range (±570), this date (11,690 B.P.) is still earlier than the other four dates by more than one thousand years. However, the lower end of the calibrated age range for this date does compare well with early dates from other sites in the region (e.g., Je-790 and Je-1002). It is possible that this date represents a very early occupation of the site, but seems unlikely given the consistent age ranges on the other samples collected from Block A.

The remaining four dates 10,230±59 (Zone I/II), 10,113±76 (Zone II), 10,650±50 (Zone II/III), and 10,353±58 (Zone III) are close in age and have a maximum separated range (using the error ranges) of 663 years. The closeness of these dates is even more pronounced when we examine the calibrated age ranges, where there is overlap in the ranges of all four dates. The overlapping age ranges for the Block A deposits suggest that the stratigraphic sequence is intact—despite the seemingly juxtaposed stratigraphic position of the dates—and represents a relatively long occupational history (perhaps 400-700 years). The occupation of the site appears to have initiated with the deposition of the Zone II deposits (lowest zone with cultural materials). The Zone III date of 10,353±58 and the Zone II/III date of 10,650±50 probably represent the earliest occupations of the site (ca. 10,400-10,700 B.P.). The remaining two dates from Zone II (10,113±76) and Zone I/II (10,230±59) provide an age range for the end of the site occupation (ca. 10,000-10,300 B.P.).

If we consider the ages of these zones with the materials recovered from the excavations then it appears that the site witnessed slightly more intensive occupations over time. If we compare the lithic materials recovered from Zone II (n=30) and Zone II/III (n=14) (n=44 combined) to those recovered from Zone I (n=35) and Zone I/II (n=51) (n=86 combined) there is a relatively marked increase between the lower and upper portions of the stratigraphic sequence. Interestingly, the types of different activities represented in the materials recovered from Block A do not evidence much change over the span of the site occupation.

Lithic reduction is the primary activity indicated in the Block A deposits (in both the lower and upper portions of the sequence). A biface fragment of quartz (T.U.2 Level 3) and a utilized flake (lipped interior flake) of fine-grained basalt (T.U.2 Surface) were the only tools recovered from the Block A deposits. These tools indicate that bifacial reduction was likely the primary technological strategy pursued in this location. The expedient use of waste flakes for cutting/slicing and/or scraping, combined with the limited number of bones that were recovered (n=2), suggest that activities other than lithic reduction were also occurring. These activities may have included animal processing/consumption, hide processing, and hunting.

In spite of the depth of the deposits in Block A and their relative productivity, no features or artifact concentrations were encountered. The absence of well-developed midden deposits, lack of features, and relatively few activities represented, suggest that Je-996 was not occupied for long periods of time. Although the occupational history of the site is relatively long (ca. 400-700 years), the material evidence is not suggestive of intensive occupations during this span of time. Rather, it appears that the site occupation was more likely characterized by short-term episodes of redundant use (over 400-700 years) focused around relatively few activities.

Because both Fishtail and Paiján points were recovered from the surface of Je-996, this site provides an opportunity to examine the chronological and organizational (technologic and economic) relationships between these two Early Preceramic complexes. The lack of diagnostic artifacts in the site's subsurface deposits hinders this possibility and does not allow us to directly associate either complex with the dated zones. However, the raw materials of lithic debitage do provide some clues. Non-local chalcedony flakes were recovered from Zones I, I/II, and II (T.U. 2 Levels 1 and 2; T.U. 5 Levels 2 and 3; T.U. 6 Level 2). Chalcedony is the raw material that was used in the manufacture of the lone Fishtail point recovered from the site's surface (none of the Paiján points are manufactured from chalcedony) and suggest that the occurrence of this raw material in different zones may relates to the Fishtail complex at this site.

If this is the case, then virtually all of the cultural sequence in the location of Block A was deposited by the Fishtail occupants of the site. However, the dates associated with these deposits are indicative of a range that overlaps both the Fishtail and Paiján (ca. 10,700-10,000 RCYBP). It is difficult to ascertain the initial Paiján occupation of the site due to a lack of diagnostic tools in the excavations. However, because there is no clear change over time in the lithics, raw materials, or activities represented in the Block A sequence (only an increase in intensity in the upper portions of the sequence), we can speculate that the Paiján use of the site probably was limited to similar activities (lithic reduction, animal processing/consumption, hideworking, and hunting). The increased amount of lithics in the upper portions (Zone I and I/II) may be, at least in part, indicative of the Paiján occupation. If the increased frequency of lithic materials is related to the Paiján, then their occupation of the site would overlap with that of the Fishtail and likely fall sometime between 10,300-10,000 B.P.

<u>Test Unit 8</u>

A single 1 x 1 m test unit (T.U. 8) was excavated on the eastern end of Je-996 in an area that yielded Paiján tools on the surface and appeared to be a good candidate for containing subsurface deposits (Figure 7.27). Test Unit 8 was opened on the eastern end of the Je-996 in order to provide additional stratigraphic information and determine the depth and nature of subsurface deposits on this end of the site. Test Unit 8 was excavated to a final depth of 20 cm below surface (four 5-cm levels). Cultural materials were recovered from Levels 1-3 (0-15 cmbs). Level 4 (15-20 cmbs) contained no artifacts.

Overall, the artifact density in T.U. 8 was relatively low and no features or carbon samples were recovered.

Like the excavations on the western end of Je-996 (Block A), T.U. 8 contained three distinct soil zones (Zones I, II, III). Zone I extended from the surface to a maximum depth of 5-9 cm below surface across the unit (Figure 7.33). The sediment in Zone I consists of a slightly compact, light brownish gray (10YR 6/2) fine sandy silt. Zone II, which appears between 5-9 cm below surface, extends to a maximum depth of 11-15 cm below surface across T.U. 8. The sediment in Zone II consisted of a slightly compact, brown (7.5YR 5/4) fine sandy silt with pebble inclusions. Zone III appeared between 11-15 cm below surface and continued beyond the limit of excavation in T.U. 8. The Zone III sediment was characterized as a slightly compact to compact (hard), light yellowish brown (10YR 6/4) fine sandy silt with rock and pebble inclusions.

Zones I and II comprise the extent of the cultural deposits in T.U. 8. Zone III, which contained no artifacts, represents sterile subsoil. Level 1 (0-5 cmbs), which was located entirely within Zone I, contained a single flake and a few small fragments of land snail shell (Table 7.14). The contact between Zone I and Zone II was located within Level 2 (5-10 cmbs). As such, the materials recovered from Level 2 (4 flakes and one small land snail shell fragment) have been classified as transitional Zone I/II. Zone II (maximum depth of 11-15 cmbs) encompasses much of Level 3 (10-15 cmbs). However, the contact between Zone II and Zone III (11-15 cmbs) is also located within Level 3. As

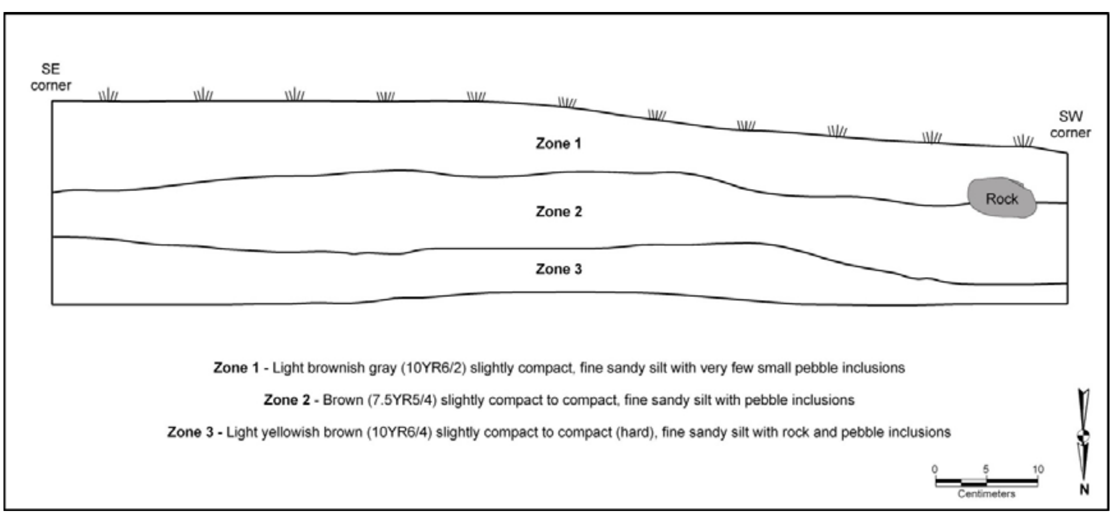

Figure 7.33. South wall profile of TU 8, Je-996.

Table 7.14. Materials recovered by zone from TU 8, Je-996.

		Debitage	Land snail (g)
Zone I			
	TU8/Surface	3	0
	TU8/Level 1	1	2.4
	Zone Total:	4	2.4
Transition Zone I/II			
	TU8/Level 2	4	0.3
	Zone Total:	4	0.3
Transition Zone II/III			
	TU8/Level 3	1	0
	Zone Total:	1	0
Zone III			
	TU8/Level 4	0	0
	Zone Total:	0	0
	Unit Total:	9	2.7

a result, Level 3 has been classified as representing the Zone II/III transition and contained only a single flake. Level 4 (15-20 cmbs) is located entirely within the sterile Zone III and contained no artifacts.

Overall, there is very little differentiation between in the subsurface cultural deposits in T.U. 8. The raw materials of the debitage recovered in T.U. 8, although meager, consists entirely of quartzite, fine-grained basalt, and *toba volcanica*, all of which were also found in T.U.s 1-3 and Block A. Although few in number, the materials recovered from T.U. 8, combined with the near absence of land snail shell, suggest that these deposits are likely contemporary with those in the central and western portions of Je-996.

Summary of Je-996 Excavations

A total of eight 1 x 1 m test units were excavated at Je-996. Four conjoining test units (T.U. 2, 5, 6, 7)(Block A) were excavated on the western end of the site, three test units (T.U. 1, 3, 4) were located in the central portion of the site, and a single unit (T.U. 8) was located on the eastern end of the site (Figure 7.27). The excavation of these units resulted in the identification of dated, intact subsurface cultural deposits and associated materials.

The profiles from the eastern and western ends of the site (T.U. 8 and Block A) are nearly identical in terms of soil zones identified. Both of these areas contained three soil zones (Zones I-III). In general terms, these zones were characterized as light-colored sandy silt (Zone I) that overlay reddish-colored sandy silt (Zone II). The contact between Zones I and II typically occurred between 5-10 cm below surface in both the eastern and western ends of Je-996. Zone II overlays a sterile, light-yellowish subsoil (Zone III) in both the eastern and western portions of the site. The subsoil generally appears at 15-20 cm below surface, although the exact depth varies within the individual test units (see profiles above). In both areas, Zones I and II represented the extent of the cultural deposits. Several carbon samples from Block A provided AMS dates (Table 7.13) that indicated the age of those deposits to range between 10,000-10,700 B.P. Given the similarity of the stratigraphic sequence to Block A, it is reasonable to assume that the T.U. 8 deposits also fall within this age range.

In contrast to the eastern and western ends of the site, the central portion of Je-996 yielded slightly different subsurface deposits. The primary difference is a complete absence of the reddish-colored Zone II that is present in the eastern and western ends of the site. All three of the test units that were excavated in the central portion of Je-996 (T.U. 1, 3, 4) contained shallow deposits (less than 15 cmbs) and only two subsurface soil zones. Zone I in the central portion of the site is similar to the Zone I identified in the eastern and western portions in terms of color and depth, but was much looser in structure. The Zone II subsoil in the central portion of the site is similar to the Zone III subsoil in both the eastern and western ends of Je-996, although it appears much higher in the profile (ca. 6.5-7.5 cmbs).

The absence of the reddish-colored Zone II in the central portion of the site, combined with the relatively shallow deposits, suggest that this area of the site experienced a different depositional history or has undergone different post-depositional weathering than either the eastern or western portions of Je-996. The fact that numerous lithic tools were recovered on the surface in the central portion of the site suggests that it witnessed similar use as either the eastern or western ends, and argues against a different depositional history. Rather, the loose structure of Zone I and shallow appearance of sterile subsoil indicate that the central portion of the site has been more intensively deflated (primarily through eolian processes) than either the eastern or western ends of Je-996.

As discussed in Chapter Three (Paleoenvironment and Site Context), post-depositional deflation through eolian processes is a common feature of many Early Preceramic sites in northern Perú. The intensity of eolian deflation is dictated by both macro- and micro-topographic features (e.g., hills, slope angles, surface undulations) that are specific to individual locales. More intensive deflation by wind in the center portion of Je-996 would explain the absence of the reddish Zone II deposits, the loose structure of Zone I, and the relatively shallow subsoil that characterize the stratigraphy in T.U. 1, 3, and 4.

If the central portion of Je-996 has been wind-scoured—resulting in the erosion of the reddish Zone II stratum—then the overlying Zone I also does not represent intact sediments. Rather, Zone I would represent redeposited sediments that are not culturally derived, but do contain out-of-context cultural materials. The loose structure of the Zone I sediments seems to support this interpretation.

Cultural materials recovered from both the Block A and T.U. 8 excavations are indicative of a fairly limited range of activities. Lithic reduction (primarily bifacial reduction) is the major activity that is suggested by the recovered materials. A total of four lithic tools (1 biface fragment, 1 retouched flake [scraper], and 2 utilized flakes) were recovered from the subsurface deposits at Je-996. This includes the two tools found in the central portion of the site even though they are likely out of their depositional context.

These tools provide more insight into the potential activities that may have occurred at Je-996. The presence of a scraper and two utilized flakes (cutting/slicing) are potentially suggestive of a wider range of activities. The scraper from T.U. 1 was subjected to functional analysis (microwear analysis, discussed in Chapter 8) and indicated heavy polish and wear likely related to hideworking. The two utilized flakes probably represent cutting and slicing related to hunting and animal processing/consumption activities. Faunal materials recovered in T.U. 7 also provide some indication of hunting and animal processing/consumption and represent at least one identifiable species—South American fox (*Pseudalopex sp.*) (Pavao-Zuckerman 2004). Land snail collection or consumption does not appear to have been an activity of any significance at Je-996.

In spite of the depth and relative productivity of the excavations on the eastern and western ends of Je-996, no features or artifact concentrations were encountered. The absence of midden deposits, lack of features, and relatively few activities represented, suggest that occupations at Je-996 were relatively short-term and primarily focused on a fairly limited set of activities related to hunting and animal processing. Although the age range for the site suggests a relatively long occupational history, the material evidence is more indicative of a palimpsest series of short-term, redundant (in terms of activities) residential occupations that occurred over a span of perhaps 400-700 years.

The materials recovered from the surface of Je-996, which included both Fishtail and Paiján points, indicates use of the site by both of these Early Preceramic complexes. Occupation of the site appears to have taken the form of a repeated series of relatively short-term campsites focused on a narrow range of activities. The activities pursued at the site appear to have emphasized hunting, animal processing, and lithic reduction. Cultural materials recovered from the excavations, however, suggest that the Fishtail occupations of the site were likely responsible for the majority of the cultural deposition. Fishtail use of Je-996 appears likely to have initiated sometime around 11,000 B.P. (12,822-11,986 cal BP) and continued until the site was abandoned around 10,600 B.P. (12,230-11,360 cal BP). Paiján use of the site appears to have initiated sometime toward the end of the site's occupation (ca. 10,600-10,000 B.P.) and overlaps with that of the Fishtail.

Je-1002
Subarea: Quebrada del Batán   Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676737   Northing: 9219424
Site Dimensions: East/West: 166 m   North/South: 104 m
Chronology: Multicomponent (Early Preceramic, Late Early/Middle Preceramic, Moche, Chimú)

Site Description:

Je-1002 is located on a high, gently sloping high terrace that extends westward into the Quebrada del Batán drainage (Figure 7.1). The terrace is situated on the southern margin of the mouth of a small, side *quebrada* that is located along the western base of Cerro Organos and is bordered on the northern edge by a deep, side drainage. This location provides a commanding view of the side *quebrada* and the main Quebrada del Batán drainage.

Je-1002 is characterized by a light to medium density scatter of lithics, with areas of high density concentrations. The highest concentrations of artifacts are located on the eastern (upslope) end of the terrace (Figure 7.34). Numerous lithic tools were identified and collected from the surface of the site, including one broken Fishtail projectile point,

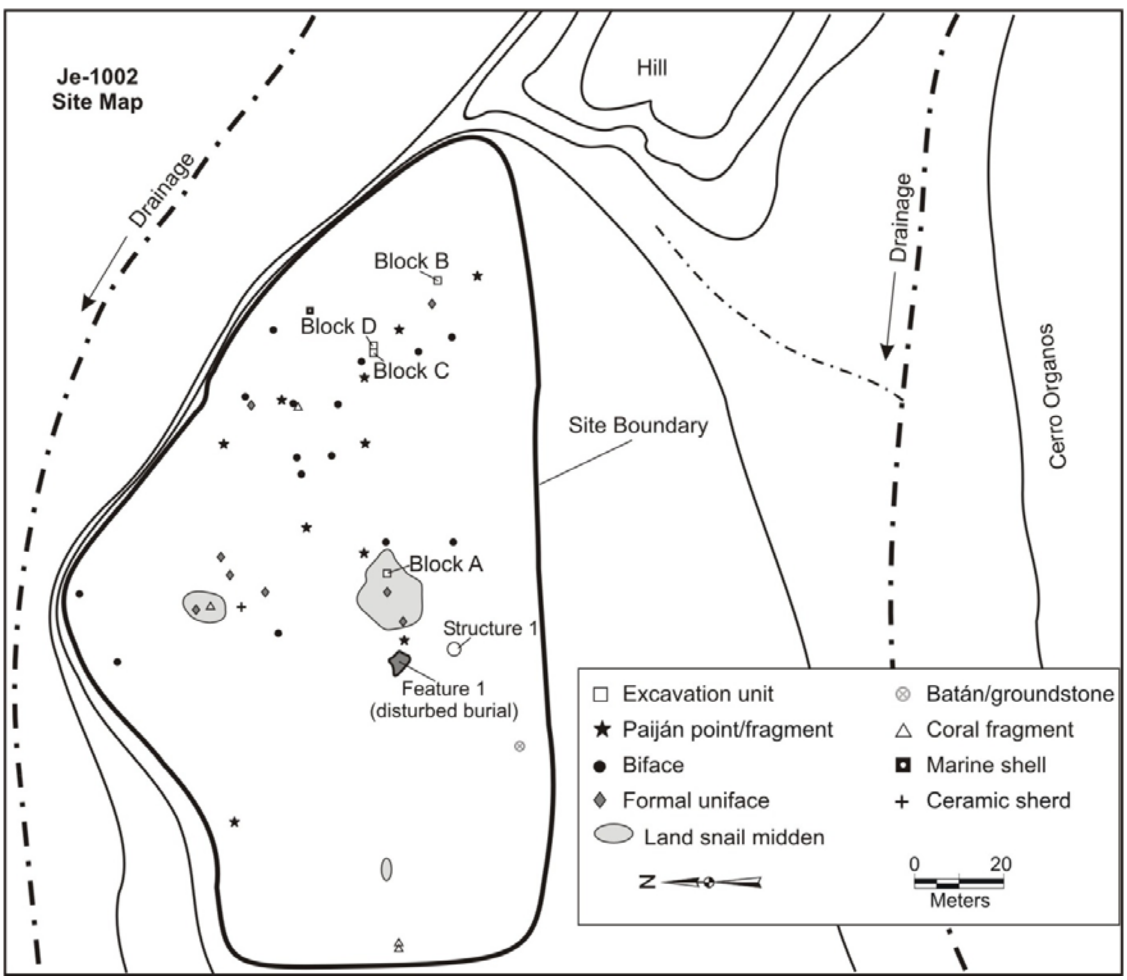

Figure 7.34. Site map of Je-1002.

seven Paiján projectile points, several biface fragments, unifaces, and retouched flakes. There was a relatively continuous medium density scatter of caracoles across the site and three areas of very high density concentrations (*basurales*). The density and concentration of lithic tools at this site appear to indicate that this site may have been a location of long-term or repeated occupations/reoccupations. There was a light scatter of Chimú ceramics across the site. A small circular rock structure (Structure 1) was identified and recorded near the center of the site (Figure 7.34). The remains of a human burial that was eroding onto the surface were also identified and recorded near Structure 1 in the center of the site (see Figure 6.7).

Je-1002 Excavations:

The amount of cultural materials on the surface of Je-1002 suggested that substantial deflation/erosion had taken place. However, there did appear to be areas of the site that contained extant intact deposits—as indicated by the human burial that was eroding out onto the surface near the center of the site. Excavation of Je-1002 began with a single 1 x 1 m test unit (T.U. 1) positioned to examine the depth of any potential subsurface deposits within the large land snail midden located near Structure 1 and Burial 1 (Figure 7.34). The excavation of T.U. 1 revealed relatively deep (ca. 50 cm below surface) deposits that contained a number of potential features and a high density of cultural materials (lithics, faunal materials, carbon). An additional three 1 x 1 m test units were excavated off of T.U. 1 to form a 2 x 2 m block (Block A [T.U. 1-4]). The Block A excavations yielded a complex sequence of deposits that spanned from the Early Preceramic period through the Late Early/Middle Preceramic (LEM), with intrusive Moche period features. Detailed discussion of the Block A cultural sequence and materials recovered are presented in Stackelbeck (2008). As such, only the relative portions and materials from the Block A excavations (Early Preceramic deposits) are discussed here.

Along with Block A, three additional 2 x 2 m blocks (Blocks B, C, and D) were excavated at Je-1002. These three excavation blocks were all located on the eastern (upslope) end of Je-1002 (Figure 7.34) and resulted in the identification of 25-40 cm of intact subsurface deposits across much of the eastern portion of the site. Block C (T.U.

9-12), which was located approximately 54 m east of Block A, yielded a complex stratigraphic sequence dominated by three large, intrusive and overlapping Moche- and Chimú-aged pit/hearth features (Features 6, 7, and 8) (Figure 7.35). Each of these features contained significant evidence for burning and chunks of carbonized wood (identified as algarrobo (*Prososis juliflora*) [Rossen 2006]). A sample of the carbonized wood from Feature 8 yielded an AMS date of 1330±70 RCYBP (1353-1074 cal B.P.) indicating a roughly transitional Moche/Chimú age. Together, these three features comprise the bulk of the Block C deposits. Any Early Preceramic deposits that may have existed in this location are likely mixed and out of context due to the substantial later intrusive features. As a result, the focus of the Je-1002 excavation discussion will involve the sequences and materials identified in Blocks B and D. Block C will not be discussed further.

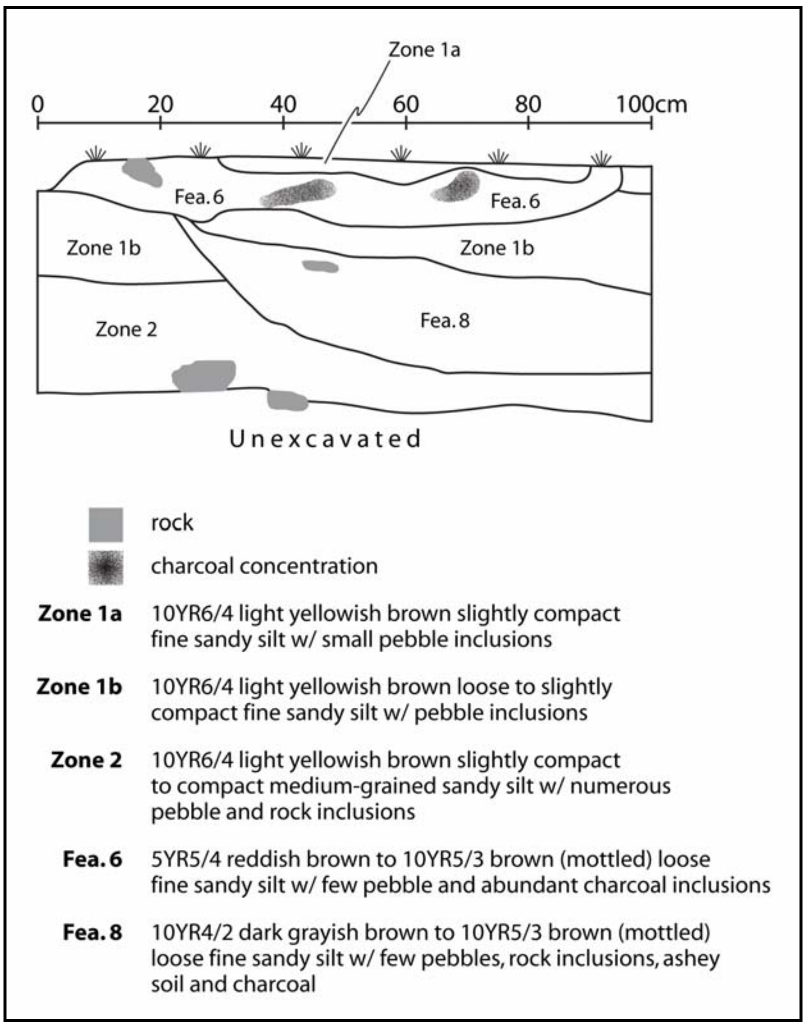

Figure 7.35. South wall profile of Block C, Je-1002.

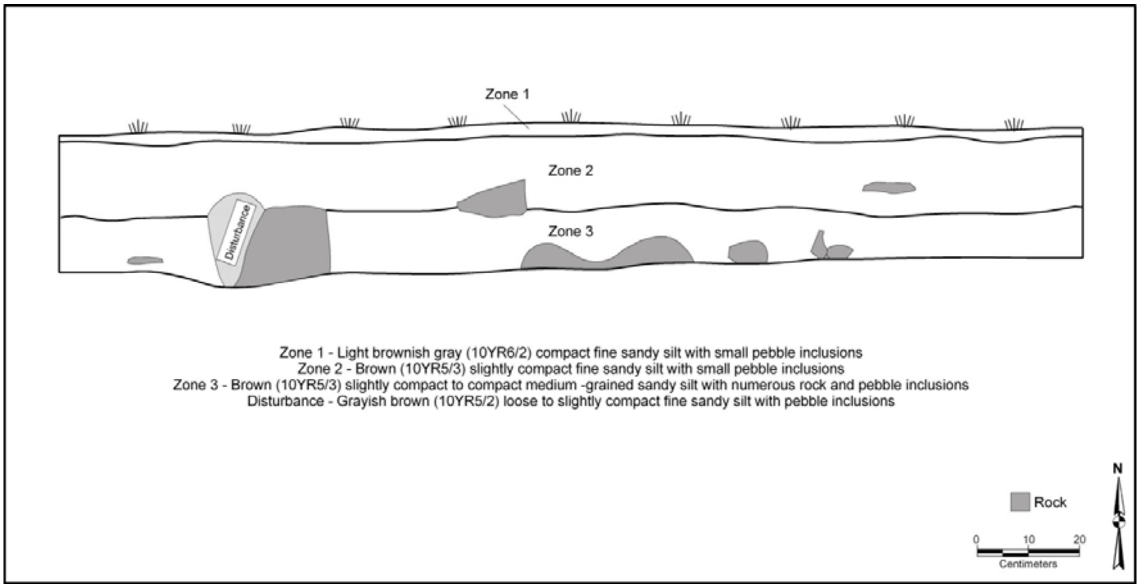

Figure 7.36. North wall profile of Block B, Je-1002.

Block B

Block B is a 2 x 2 m unit that was excavated as four adjacent 1 x 1 m test units (Test Units 5, 6, 7, 8). Block B was excavated to a maximum depth of 25 cm below surface and resulted in the identification of three distinct sediment zones (Zones I, II, and III) (Figure 7.36). Zone I was thin layer of light brownish gray (10YR 6/2) compact, fine sandy silt with small pebble inclusions that extended from the ground surface to a depth of 1-3 cm below surface across Block B. Zone II was a brown (10YR 5/3) slightly compact, fine sandy silt with small pebble and rock inclusions that appeared across Block B between 1-3 cm below surface and extended to a depth of 15-17 cm below surface. The final sediment zone, Zone III, was identified at 15-17 cm below surface and extended beyond the limit of excavation. Zone III consisted of a brown (10YR 5/3) slightly compact to compact, medium-grained sandy silt with numerous rock and pebble inclusions. In addition to these three zones, a disturbed area (probably rodent) in the northern portion of TU 7 that extended from the base of Zone II through Zone III was also identified.

Cultural materials were recovered from all three zones identified in Block B, although the highest frequencies of artifacts were recovered from the Zone I/II transition and Zone II (Table 7.15). No temporally or culturally diagnostic artifacts were recovered from Block B. However, the lithic debitage that was recovered (cores, early and late

Table 7.15. Materials recovered by zone from Block B, Je-1002.

	Debitage	Bone	Carbon (PP)	Land snail (g)
Zone I				
TU5/Surface	6			
TU6/Surface	17			
TU7/Surface	9			
TU8/Surface	2			
Zone Total:	34	0	0	0
Zone I/II Transition				
TU5/Level 1	37			
TU6/Level 1	87	1		
TU7/Level 1	28			
TU8/Level 1	35			0.1
Zone Total:	187	1	0	0.1
Zone II				
TU5/Level 2	21		1	
TU5/Level 3	3		1	
TU6/Level 2	62			
TU6/Level 3	15		1	
TU7/Level 2	1			
TU7/Level 3	9		1	
TU8/Level 2	13			
TU8/Level 3	5			0.9
Zone Total:	129	0	4	0.9
Zone II/III Transition				
TU5/Level 4	2			
TU6/Level 4	8		1	
TU7/Level 4	2			
TU8/Level 4	4			0.7
Zone Total:	16	0	1	0.7
Zone III				
TU5/Level 5	2			
TU6/Level 5	2			4.5
TU7/Level 5	0			
TU8/Level 5	2			
Zone Total:	6	0	0	4.5
Block B Total:	372	1	5	6.2

stage flakes) appears to indicate that the full reduction process occurred in this location. Additionally, the raw materials represented in Block B are dominated by quartz and quartzites, which are typically characteristic of Early Preceramic Fishtail and Paiján lithic reduction in the north coast region (Briceño 1999; Chauchat et al. 2004). A relatively large amount of carbon was present throughout much of the lower portion of the Block B deposits. A few land snail shells were also recovered—again, primarily from the lower levels of the deposits, particularly Zone III. A single bone (unidentified Mammalia) was recovered from the Block B deposits.

Block D

Like Block B, Block D was a 2 x 2 m unit that was excavated as four adjacent 1 x 1 m test units (Test Units 13, 14, 15, 16). Block D was positioned directly adjacent (to the east) to Block C (discussed previously) (see Figure 7.34). Block D did not contain the large amount of intrusive Moche and Chimú features that were present in the adjacent Block C and provided an intact sequence of Early Preceramic deposits in this portion of site Je-1002.

A total of three sediment zones (Zones I, II, and III) were identified in Block D (Figure 7.37). Zone I consisted of a thin layer of brown (10YR 5/3) compact, fine sandy silt with small pebble inclusions that extended from the ground surface to a depth of 2-3 cm below surface across the block. Zone II was a brown (10YR 5/3) slightly compact, fine sandy silt with small pebble and carbon inclusions. Zone II appeared between 2-3 cm below surface across the block and extended to a depth of 18-24 cm below surface. Zone III appeared across the block between 18-24 cm below surface and continued beyond the limit of excavation. Zone III consisted of a light yellowish brown (2.5Y 6/4) slightly compact to compact, medium-grained sandy silt with rock and pebble inclusions.

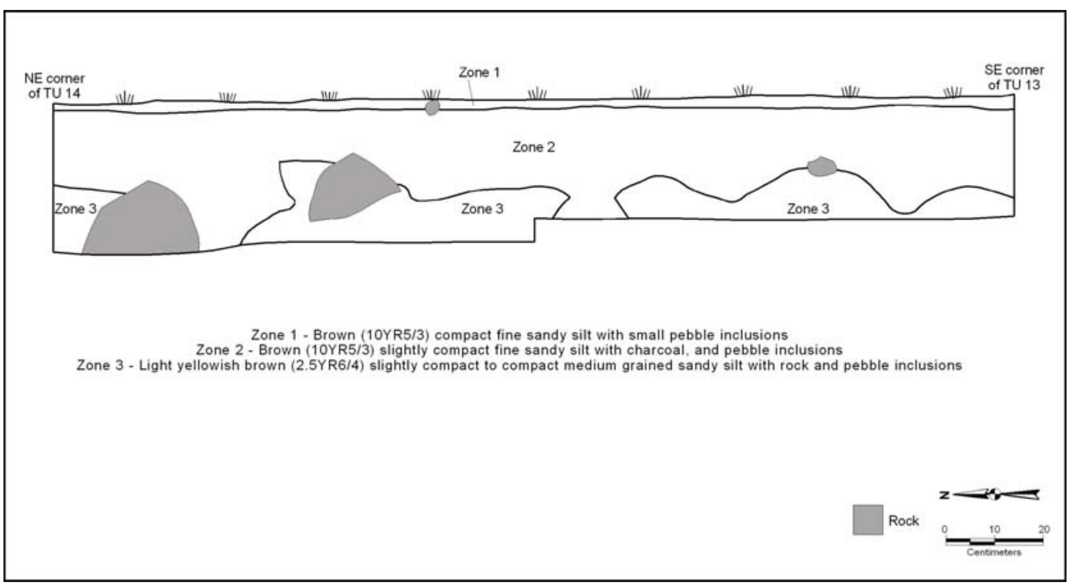

Figure 7.37. East wall profile of Block D (TU 13 and TU 14), Je-1002.

Cultural materials recovered from Block D included lithic debitage, a biface fragment (midsection of a projectile point—probably Paiján based on the shape), two piece-plotted carbon samples (although small flecks of carbon were present throughout much of the Block D deposits), several bones, numerous land snail shells, and two marine shell fragments (Table 7.16). Zone I contained only lithic debitage and Zone III contained only a few land snail shells. The bulk of the cultural materials recovered from Block D came from the Zone I/II transition, Zone II, and the Zone II/III transition.

Each of these zones contained a relatively large amount of land snail shells and bone, particularly Zone II. The Zone I/II transition contained three bones (Indeterminate Mammalia) (Pavao-Zuckerman 2004) and a marine shell (*Nucula agujana*). Zone II faunal materials consisted of several marine species including: mullet (*Mugil* sp. [n=4]), Osteichthyes (n=6), sea catfish (*Ariidae* [n=1]), requiem shark teeth (*Carcharhinidae* [n=2]), and a *Perumytilus purpuratus* shell (n=1). Along with the marine species, Zone II faunal materials also included: lizard (*Lacertilia* [n=1]), rat/mice (*Sigmodontinae* [n=2]), unidentified Vertebrata (n=4), and unidentified bone (n=4) (Mora 2003; Pavao-Zuckerman 2004). In addition to the bone and marine shell, 81 grams of land snail shell (*Scutalus* sp.) were also recovered from Zone II. The Zone II/III transition contained fewer cultural materials than the overlying Zone II, but still yielded 43 grams of land snail shell and three bones (*Mugil* sp. [n=1], Osteichthyes [n=1], and unidentified Vertebrata [n=1]) (Pavao-Zuckerman 2004).

Discussion of Blocks B and D

The stratigraphic sequence from both Block B and Block D are highly similar despite their spatial separation of nearly 20 meters. The deposits in both Blocks contained three sediment zones that can be correlated with each other. Zone I in each Block consists of a thin surface layer that contains relatively few artifacts. The primary distinction between Zone I and Zone II in each of the excavation blocks is that the thin Zone I layer is structurally distinct (more compact) than the Zone II layer that it overlies (see Figures 7.36 and 7.37). Thus, it appears that Zone I likely represents the upper portion of the Zone II sediment that has been compacted (and deflated) by surface

Table 7.16. Materials recovered by zone from Block D, Je-1002.

	Debitage	Bifaces	Bone	Carbon (PP)	Land snail (g)	Other
Zone I						
TU13/Surface	6					
TU14/Surface	4					
TU15/Surface	0					
TU16/Surface	9					
Zone Total:	19	0	0	0	0	0
Zone I/II Transition						
TU13/Level 1	32		2		17	
TU14/Level 1	30			1	47.1	
TU15/Level 1	18	1	1		9.7	
TU16/Level 1	19				4	Marine Shell
Zone Total:	99	1	3	1	77.8	1
Zone II						
TU13/Level 2	6				4.9	
TU13/Level 3	4		1		3	
TU14/Level 2	4		1		17.9	
TU14/Level 3	5		4		20.2	
TU15/Level 2	7		4		19	
TU15/Level 3	7		4		11.4	Marine Shell
TU16/Level 2	5		1		3.6	
TU16/Level 3	1		1		1	
Zone Total:	39	0	16	0	81	1
Zone II/III Transition						
TU13/Level 4					2.9	
TU13/Level 5					0.6	
TU14/Level 4	3		1		16.4	
TU14/Level 5	1				2.5	
TU15/Level 4	5		1	1	11.6	
TU15/Level 5	1		1		7.7	
TU16/Level 4					1.3	
TU16/Level 5						
Zone Total:	10	0	3	1	43	0
Zone III						
TU14/Level 6					2.1	
TU15/Level 6					2.2	
Zone Total:	0	0	0	0	4.3	0
Block D Total:	167	1	22	2	206.1	2

processes (e.g., wind deflation, occasional light rains). As such, Zone I and Zone II in both blocks can be considered a single depositional unit.

In contrast to Zones I and II, Zone III is distinct in Blocks B and D. Texturally and structurally, the Zone III deposits in both blocks are similar (both consist of a slightly compact to compact, medium-grained sandy silt with rock and pebble inclusions). Additionally, Zone III in each block contained the lowest numbers of cultural materials of any zone. Given the textural and structural distinction of this zone from all other zones, combined with the limited presence of cultural materials, Zone III is interpreted as representing sterile subsoil across the eastern end of Je-1002. The few artifacts that were recovered from Zone III contexts likely were displaced through rodent or root movement from the base of the overlying Zone II.

It is important to note that the transitional zones (e.g., I/II and II/III) noted in the artifact tables above do not represent diffuse sediment transitions, but rather where the arbitrary 5-cm excavation levels overlay the contact between two zones. Because of that overlay, the cultural materials from that level could not be clearly assigned to one zone or the other, and were therefore described as a combination of both zones. However, when the stratigraphy of both Block B and D are considered together, it seems most likely that the artifacts recovered from the transitional zones (I/II and II/III) are associated with Zone II.

Because Zone I and II are considered the same depositional unit, the artifacts from those zones (and the transitional I/II zone) can also be considered together. Zone III in each of these excavation blocks has been interpreted as representing sterile subsoil, so the transitional zone II/III should also be included with Zone II. In sum, the Zone II appears to represent the extent of cultural deposition across the eastern end of Je-1002. Given the presence of a diagnostic Early Preceramic artifact (midsection of a Paiján projectile point) in the upper portion of Zone II in Block D, it is reasonable to suggest that all of the Zone II deposits in Blocks B and D are also Early Preceramic in age.

If the Zone II deposits across the eastern end of Je-1002 have the same depositional history, then there appears to be a significant amount of *in situ* Early Preceramic cultural materials on this portion of the site. The Early Preceramic deposits extend to a depth of 17-24 cm below surface across the eastern end of the site. No internal stratigraphic divisions within the Early Preceramic deposits were visible, which limits our understanding of the timeframe of site occupation and any possible changes in site function over time. Interestingly, however, the bulk of the Early Preceramic cultural materials are found in the upper 15 cm of this layer (excavation levels 1-3). The lone diagnostic artifact recovered from Blocks B and D (a Paiján point midsection) was also recovered from the upper 15 centimeters of the cultural deposits (T.U. 15, Level 1), which may indicate that the bulk of the Early Preceramic cultural materials found in this layer relate to the Paiján occupation/use of this portion of the site.

If the roughly upper 15 cm of the Early Preceramic deposits (and bulk of the cultural materials) relate to the Paiján occupation of the site, then the relatively few artifacts that were recovered in the lower 2-9 cm of the deposits may relate to an earlier occupation at Je-1002. There is evidence from both surface (a broken Fishtail point) and excavation contexts (lower levels of Block A yielded cultural materials associated with an AMS date of 11,014±64 RCYBP [13,073-12,860 cal B.P.]) at Je-1002 of an Early Preceramic occupation that antedated (and possibly overlapped) the Paiján. Although it cannot be demonstrated for certain, it is possible that the lower portions of the Early Preceramic layer on the eastern end of Je-1002 is related to a Fishtail occupation, while the upper portions are related to a temporally later (perhaps overlapping) Paiján occupation.

Aside from the possible temporal separations within the Early Preceramic deposits on the eastern end of Je-1002, the cultural materials recovered from Blocks B and D also provide insight into the nature of activities that occurred in these locations. Block B contained very few materials other than lithic debitage. This contrasts sharply with the Block D materials, which included a wide range of subsistence related materials (bones, shell, carbon) along with the comparatively lesser amounts of lithic debitage. The high frequency of lithic debitage (to the near exclusion of other artifact classes) in Block B may indicate that this was a location for the manufacture of stone tools.

The cultural materials from Block D are suggestive of a much different set of activities. Lithic debitage is present, but is overshadowed by the relatively large amounts of land snail shell and bone that were also recovered. The presence of the shell and bone, combined with the relatively persistent scatter of carbon flecks throughout Zone II, indicates that this location was likely used for the preparation/consumption of a wide range of resources. Land snails dominate the resource types that are represented, but a relatively broad range of marine species are also represented. Mullet (*Mugil* sp.) and unidentified fish (Osteichthyes) are the most common marine resources represented, but the two shark teeth, two marine shells, and sea catfish bone also indicate the exploitation of a range of coastal/marine resources. Thus, Block D appears to have been a location where a variety of both terrestrial and marine resources were probably prepared and consumed.

The exploitation of a wide range of both terrestrial and marine resources has been documented in Paiján and other Early Preceramic sites across the north coast of Perú (Chauchat 1998; Malpass 1983; Moseley 1992; Richardson 1978). Because a Paiján point midsection was found in stratigraphic association with the relatively wide range of resources documented in Block D, it is reasonable to surmise that these resources are related to the Paiján occupation of site Je-1002.

Summary of Je-1002 Excavations

The materials excavated in Blocks B and D, when compared with those from Block A (Stackelbeck 2008), provide some general insights into the Early Preceramic occupations of site Je-1002. The relatively well-defined Early Preceramic midden layer documented on the eastern end of Je-1002 cannot be directly correlated with the deeper and more complex deposits identified in the central portion of the site. However, AMS dates from Block A indicate that the lower zones (Zones 3/4 and 5) date between 11,014±64 RCYBP (13,073-12,860 cal B.P.) and 8,854±62 RCYBP (10,176-9,704 cal B.P.) (Stackelbeck 2008).

The AMS dates from Block A span the Early Preceramic period and are indicative of a relatively long-term/repeated use of the site. Although the stratigraphic zones do not correlate directly, they are similar in terms of texture, color, and inclusions (albeit deeper) to the Zones II and III identified in Blocks B and D. The early date of 11,014±64 RCYBP was collected from the base of Block A Zone 3/4 and was in stratigraphic association with an unidentified biface fragment manufactured from quartz crystal. The use of quartz crystal as a raw material in bifacial reduction is known in Paiján site assemblages (Chauchat 1998; Chauchat et al. 2004; also see Chapter Eight), but is more commonly associated with the manufacture of Fishtail projectile points (Briceño 1999; Dillehay 2000). The broken Fishtail point that was recovered from the surface of Je-1002 was similarly manufactured from quartz crystal. It is likely, therefore, that this early date and the few cultural materials that were stratigraphically associated with it (lower portions of Block A Zone 3/4) are representative of the Fishtail occupation of site Je-1002.

The younger date of 8,854±62 RCYBP (10,176-9,704 cal B.P.) was collected from Feature 3 in Block A, which overlays the Zone 3/4 deposits. Stackelbeck (2008) has interpreted Feature 3 as representing a dense transitional Late Early Preceramic/Middle Preceramic (LEM) burn area/refuse dump. Because the LEM deposits overlay Zone 3/4 in Block A, it provides a fairly clear end date for the Early Preceramic deposits in Block A and suggests that the upper portions of Zones 3/4 correlate with the upper portions of Early Preceramic deposits on the eastern end of the site—which contained diagnostic Paiján materials.

In general, the excavations at Je-1002 suggest that Early Preceramic foragers occupied/utilized this location over a period of nearly 2,000 years. A general midden-like layer across portions of the eastern and central areas of the site was deposited between roughly 11,000-9,000 B.P. and appears to span virtually the entire Early Preceramic period of the north coast of Perú. Cultural materials from both the Fishtail and Paiján complexes were identified within the excavated portions of Early Preceramic deposits and on the site surface. However, no internal stratigraphic divisions (relating to different occupations over time) within the Early Preceramic layer were discernable, nor were any features or clear spatial patterns among activities documented.

In spite of the lack of internal divisions related to different occupations, there does appear to be a rise in both the amount cultural materials and diversity of faunal species exploited over time within the Early Preceramic deposits in both Blocks B and D on the eastern end of the site. Given the AMS dates from Block A and the cultural materials recovered from associated depths within the Early Preceramic layer (quartz crystal biface with the earliest date and a Paiján midsection in the upper portion of the layer), it is reasonable to suggest that the Paiján occupation of Je-1002 is associated with the observable rise in density and diversity of cultural materials within the Early Preceramic deposits.

It is important to note, that if the Fishtail complex is associated with the lower deposits and the Paiján with the upper, there is no clear difference in site function between these two occupations. Rather, the primary change is one of intensity of the occupation. The function of site Je-1002 seems to indicate relatively short-term (absence of subsurface features, no internal spatial patterning), repeated occupations in which a wide range of activities was pursued (as indicated by the diversity of subsistence resources prepared and consumed at the site and the full spectrum of lithic production). Some of these resources, specifically the marine/coastal resources, were not available in the immediate vicinity of the site—indicating that they were acquired at some distance and transported to the site for consumption. In addition to the materials recovered from excavation, the single circular structure and human burial found on the surface of the site (both are thought to be associated with the Early Preceramic occupation based on associated, nearby diagnostic tools) also indicate activities other than subsistence and lithic production took place at Je-1002. Together, the surface and excavation data indicate a range of activities that are representative of a short-term basecamp (probably seasonal or shorter timeframe) location that was re-occupied over a long period of time (perhaps 2,000 years).

The rise in intensity of occupation (mentioned above) may indicate either longer-term occupations, greater intensity in the range of resource types exploited, or both. Because the portions of the Early Preceramic deposits at Je-1002 that are considered to represent the most intensive occupations are thought to be correlated with the Paiján, it appears that the Paiján engaged in a wider range of activities and types of subsistence exploitation than the Fishtail occupations of this site. It is unclear if the Fishtail and Paiján occupations represent temporally distinct episodes of use or if periods of overlapping site use occurred. The evidence within the Early Preceramic deposits suggests that the latter is most probable, given the lack of any clear internal segregation (within the site or Early Preceramic deposits) that can be specifically related to one complex or the other. In sum, the Early Preceramic deposits at Je-1002 appear to indicate that this landform functioned as a short-term basecamp for both Fishtail and Paiján occupants, and was reused in a similar fashion over a long period of time. It also appears likely that the different occupations Je-1002 were temporally (if not physically) overlapping during some period of the site's history.

Je-1010

Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0675605 Northing: 9219679
Site Dimensions: East/West: 196 m North/South: 79 m
Chronology: Early Preceramic

Site Description:

Je-1010 is located on a long, low terrace that extends west from the western base of Cerro Organos into the Quebrada del Batán (Figure 7.1). The site is characterized by a generally light density scatter of lithics with areas of medium to high density concentrations. Numerous lithic tools were identified and collected from the surface of this site, including several limaces, a Paiján projectile point, and retouched flakes. There was a small cluster of limaces and limace fragments in the western portion of the site and may indicate a production locus or some other kind of activity area. Most of the lithic tools observed were located on the northern and western portions of the site (Figure 7.38).

Je-1010 Excavations:

A single 1 x 1 m test unit was excavated at Je-1010 to a maximum depth of 10 cm below surface (two 5-cm levels). The test unit was position in the northern portion of the site where a fragment of a Paiján point and an unidentified point had been recorded during survey. The density of artifacts on the surface was not high, but the unit was located in an area that I believed had good potential for containing intact deposits.

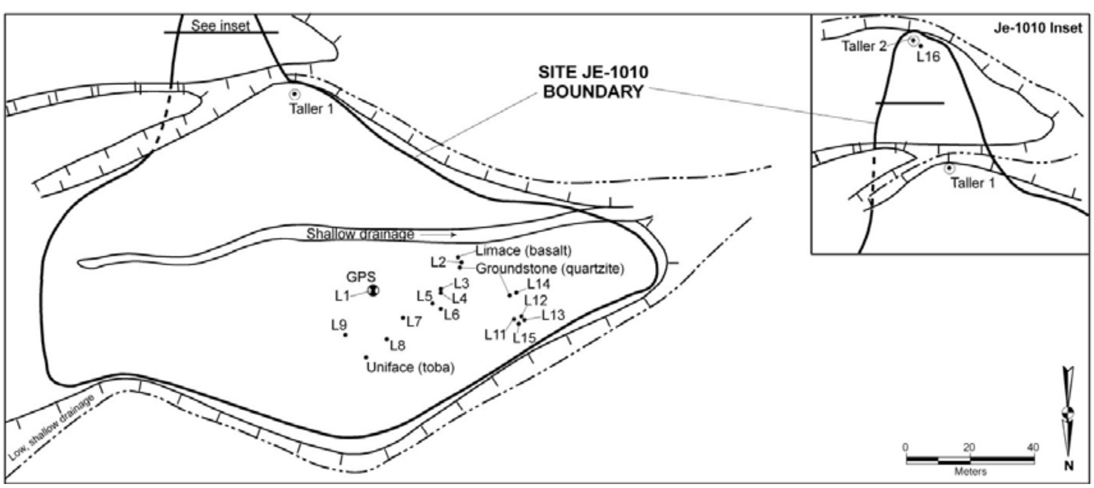

Figure 7.38. Site map of Je-1010.

However, no intact subsurface deposits or cultural materials were identified in T.U. 1. The sediment in T.U. 1 was a loose to lightly compact fine sandy silt that contained numerous rock inclusions (predominantly exfoliated rhyolite from the adjacent cerro). The lack of stratigraphy and cultural materials suggested that this site was totally deflated and no further excavation was conducted. As a result, no information regarding the nature of the site occupation at Je-1010 was gained during the limited excavation.

Summary and Discussion of Excavation Results

A total of 42 m^2 of excavation units were conducted at ten Early Preceramic sites in the QBT. The results of each of these excavations have been presented and discussed in terms of stratigraphy, materials recovered, features identified, site chronology, types of activities represented, and implications for understanding site function during the Early Preceramic period. Individually, the excavation conducted at each of these sites provides varying levels of insight into the use and nature of occupation of specific landforms over time. When considered collectively, however, we can begin to characterize larger patterns of Early Preceramic chronology, subsistence, and site types in the QBT.

Stratigraphy and Chronology

Of the ten Early Preceramic sites tested in this study, nine contained intact cultural deposits that were correlated with the Early Preceramic period. The depth of the Early Preceramic cultural deposits varies between individual landforms and appears to be directly related to highly local, micro-topographic variability. Sites, or more commonly portions of sites, that are slightly to fully shielded from the persistent southwesterly winds tended to contain the deepest cultural deposits (with well-developed stratigraphic sequences). Areas of sediment deflation are present on all sites (only one site was totally deflated [Je-1010]). However, because some portions of sites are shielded from the wind there tend to be ‘pockets’ or larger areas that have not been substantially deflated and contain subsurface deposits.

In most of the sites tested in this study, Early Preceramic cultural layers tended to directly overlie more compact and rocky sediment zones that are probably related to the Pleistocene landform surfaces. In some cases (Je-439, for example) information regarding the geomorphological and depositional history of specific landforms was ascertained. In general, the sediment sequences across the project area appear to suggest a period of landform stabilization during the Late Pleistocene (possibly correlated with the Younger Dryas (YD) expression in South America) that created the surfaces on which the earliest occupations are found. Periods of active alluviation punctuated by episodic stabilization are directly indicated at two sites (Je-439 and 790) by the presence of identifiable paleosurfaces—perhaps indicating climatic fluctuations associated with the YD and onset of Early Holocene-like conditions (see above discussion and Chapter 2, this volume; Stackelbeck 2008). At both of these sites, Early Preceramic cultural materials were recovered from above and below the paleosurfaces, indicating that these landforms (and the project area) continued to be occupied throughout the climate fluctuations.

Subsistence

Although the lower valley region appears to have been occupied relatively continuously throughout the Early Preceramic period, subsistence practices do not appear to have changed dramatically during this time. The earliest dated cultural levels in the QBT (11,200±700 [Je-790], 11,014±64 [Je-1002]) demonstrate the early exploitation of a relatively wide range resources from diverse ecological zones. Over the next 1000 years (by ca. 10,000 RCYBP), similar subsistence practices continue, but appear to intensify. Intensification is suggested by the appearance and continued accumulation of dense midden deposits, containing numbers of different species, at several sites within the study area (Je-431, 439, 790, and 1002). Based on the AMS dates from the upper portions of these midden deposits, the exploitation of diverse resources from multiple ecological zones continued through the end of the Early Preceramic period (ca. 9,000 RCYBP) into the transitional Late Early/Middle Preceramic period (ca. 9,000-8,500 RCYBP)(see also Stackelbeck 2008).

Intensification, in this sense, does not refer to increasing specialization in the exploitation of specific resource types (although this does appear to have occurred with land snail exploitation over time). Rather, intensification refers to the increased knowledge of local ecological zones and the exploitation of a wide range of resources from those zones (i.e., broad spectrum resource use and logistical intensification) (Bar-Yosef 2002; Dillehay and Rossen 2002; Flannery 1986; Henry 1989a; Rossen 1991). In the neighboring upper Zaña Valley, Dillehay and Rossen (Dillehay et al. 1989; Dillehay and Rossen 2002; Piperno and Dillehay 2008; Rossen 1991; Rossen and Dillehay 1999) have suggested that subsistence intensification for Middle Preceramic groups involved a broadening of locally available resource use, specifically a variety of plants (including early domesticates).

Although we do not have comparable data for early horticulture in the lower Jequetepeque, a similar pattern of broad resource use is apparent. This pattern of subsistence is particularly characteristic of the cultural deposits associated with the Paiján complex. The primary resources exploited by the Paiján appear to have been land snails and desert tegu lizard. Other utilized resources include a variety of aquatic/marine and small and large terrestrial game. The presence of the aquatic/marine species is particularly interesting in that it denotes very early familiarity with coastal resources. It appears, however, that the majority of fish resources were probably collected from riverine or estuarine settings (as evidenced by the prevalence of mullet [*Mugil* sp.]). Mullet are a near-shore marine species that are also commonly found in brackish or freshwater settings (Pavao-Zuckerman 2004). During the Late Pleistocene-Early Holocene, the Pacific shoreline would have been some 25-30 km distant from the QBT (Chauchat et al. 2006), while the Jequetepeque and Chamán rivers were substantially closer.

There is little doubt that the Early Preceramic inhabitants of the lower Jequetepeque Valley made visits to the Pacific shore or traded with coastal groups. The presence of several species of marine fish, along with coral fragments and marine shells, indicate a familiarity with coastal resources. However, the fish species represented in Early Preceramic deposits are dominated by mullet, suggesting that offshore (or pelagic) coastal resources were probably only opportunistically collected or scavenged during occasional visits to the coast. The bulk of the subsistence resources appear to have been collected or hunted within the highly varied ecological zones of the *quebrada* systems that penetrate the western Andean flanks. Hunting deer, peccary, and fox (all found in Early Preceramic deposits) or collecting lizard and land snails would have necessitated both an intensive knowledge of local ecological zones and a flexible set of resource acquisition strategies. Both of these conditions appear to have characterized Paiján subsistence and indicate a highly localized use of a broad range of available resources.

Although the general patterns of Early Preceramic subsistence do not appear to have dramatically changed over a period of 2,000 years or so, the character of the subsistence strategies of the Fishtail and Paiján do indicate some distinct differences. Cultural deposits that can be directly identified as Fishtail are rare in the study area. However, the evidence from the Je-996 and the lower levels of Je-1002 (which are believed to represent Fishtail occupations) suggest that Fishtail subsistence did not involve the wide range of species that are characteristic of the later Paiján occupations. The few Fishtail sites (n=4) do not indicate intensive use of land snails or a similar presence of aquatic/marine species (although two examples were recovered). Overall, Fishtail subsistence does not appear to have emphasized the exploitation of as diverse a set of resources as the Paiján, nor to have involved a similarly extensive knowledge of the local landscape.

Site Occupations

The excavations conducted at the ten Early Preceramic sites in the QBT also allow for some general observations to be made regarding site use and duration of occupation. In the broadest terms, the excavations suggest that different types of sites existed within the region. For example, the Early Preceramic middens at sites Je-431, 439, 790, 996, and 1002 are indicative of relatively long-term and repeated use of landforms. In contrast, the cultural deposits at sites Je-979, 804, 919, and 993 are more suggestive of less intensive (i.e., shorter duration), although perhaps repeated, occupations. The range of activities that occurred at individual sites also varied. Sites Je-431, 439, 790, and 1002 all contain evidence for a wide range of domestic and other activities. Sites Je-919, 979, and 993 express more limited ranges of individual activities.

Seasonality of occupation could only be loosely determined for one site—Je-439, which indicated a likely occupation during the austral summer months (December-March). In part, this is due to the wide range of species that were recovered from several of the sites. Some species were probably available year-round, while others may be season specific. It is possible that the exploitation of a diverse set of resources from different ecological zones allowed the Early Preceramic occupants of these sites to compensate for the seasonal availability of specific resources. It seems likely that the wide ranges of species recovered from these sites are indicative of relatively long-term occupations (multiseasonal) or repeated occupations of a site at during different seasons of the year.

Seasonal or multiseasonal occupations, combined with a diverse subsistence base and a wide range of activities, is suggestive of a settlement strategy that emphasized centrally-located basecamps and outlying task-oriented special purpose sites. It is worth noting again that some of the subsistence resources found in the Early Preceramic deposits (particularly the aquatic/marine resources) were clearly acquired at some distance (up to 30-35 km) and transported to these sites for processing and consumption (as indicated by burning/calcining and their location within hearth and pit features). It is possible that some of the more distant resources were acquired by other means than direct access (e.g., trade with other groups). However, the absence of Early Preceramic sites outside of the *quebrada* zone and relative prevalence of aquatic/marine species suggests that these resources were likely directly acquired at special purpose sites and transported back to basecamp locations.

Conclusions

The excavations conducted at ten Early Preceramic sites in the Quebradas del Batán and Talambo have yielded substantial information regarding the nature and duration of the occupation of these sites, subsistence practices and exploited resources, and refined our chronological understanding of the Early Preceramic period in the lower Jequetepeque Valley and broader north coast region. The specific activities that are evidenced at these individual sites allow us to be to identify functional differences between sites, which have been discussed in the preceding sections. The functional differences between sites can be used (along with the survey data [Chapter Six] and lithic analysis data [Chapter Eight]) to reconstruct the different types of sites and systems of settlement organization that existed within the lower Jequetepeque region (discussed in Chapter Nine).

CHAPTER EIGHT

EARLY PRECERAMIC LITHIC TOOLS AND TOOLKITS IN THE LOWER JEQUETEPEQUE VALLEY

Introduction

The purpose of this chapter is to present the detailed analysis of the lithic materials recovered from the survey and excavation of Early Preceramic sites in the Quebradas del Batán and Talambo. Typically, lithic artifacts comprise the largest single data sets recovered from Late Pleistocene-Early Holocene hunter-gatherer sites—this project is no exception (Andrefsky 1998; Dillehay 2000; Odell 2003). As such, the analysis of lithic artifacts can provide important lines of data related to technological strategies, uses of tools, stylistic variation, and functional differences between assemblages and sites that often form the baseline for reconstructing larger patterns of technological organization and subsistence practices, and making broader inferences about mobility patterns, settlement strategies, and social interaction (Amick 1994; Andrefsky 1998, 1994; Bamforth 1986; Binford 1980, 1978, 1977; Bleed 1986; Bradbury and Carr 1999, 1995; Hayden 1981; Kelly 1992, 1988; Gould and Saggers 1985; Magne 1989; Nelson 1997, 1991; Odell 2003, 1996b, 1994; Prentiss 1998; Shott 1989, 1986; Sullivan and Rozen 1985; Torrence 1989, 1983).

The analysis conducted in this study involves typological classifications of all lithic tools, metric analyses, raw material identifications, and limited microscopic use-wear identifications. The results of these analytical techniques are presented for each of the 126 Early Preceramic sites discussed in this study. The individual site assemblages are then used to discuss larger regional patterns of the use of formal and/or expedient technologies in an attempt to characterize any similarities or differences in the organization of technology that may have existed in the lower Jequetepeque Valley during the Early Preceramic period.

Lithic Technological Strategies and Technological Organization

The overarching hypothesis guiding the lithic analysis in this study is that the processes of colonization and regionalization provide an explanatory framework within which the documented cultural variability present in the Early Preceramic period of

Andean South America can best be understood. If this is indeed the case, then the analysis of the lithic artifacts from the Quebradas del Batán and Talambo should provide insight into the different strategies (i.e., settlement pattern, subsistence focus, and technological organization) that were pursued by early groups (specifically the Fishtail and Paiján, and possibly others) that occupied this region of the north coast of Perú. The central argument of this study is that different early groups migrating into and settling the Quebrada del Batán and Talambo and lower Jequetepeque region likely followed distinct strategies that can be conceptualized as existing on a continuum between the polar extremes of the transient explorer and estate settler (see discussion in Chapter Five) (Beaton 1991; Dillehay 2000, 1997a; Dixon 1999). The technological organization for each of these continuum poles can be discerned, at least in part, through the analysis of the chipped stone tools that comprise individual assemblages. Thus, technological organization provides one avenue for characterizing different regional settlement strategies. As with any continuum of possibilities, however, it is likely that a given assemblage may reflect characteristics of both poles.

In terms of technological orientation, the central characteristic that separates the two organizational strategies (transient explorer and estate settler) is the presence of formal or expedient tools. Expedient technologies generally refer to those in which lithic tools are situationally produced for relatively immediate use in a variety of potential tasks. Formal tool forms are absent (although see Rossen 1998, 1991 concerning template forms in expedient assemblages). Expedient tools are generally discarded after the specific task is accomplished or they become non-functioning (e.g., broken, dulled edge), although some examples may demonstrate a multiplicity of individual uses (Andrefsky 1994; Odell 2003, 1996b). Formal (or curated) technologies, in contrast, are typically defined by lithic tools manufactured in anticipation of repeated future use(s) according to predetermined design considerations (Bleed 1986; Hayden et al. 1996; Nelson 1991). Formal tools tend to be multifunctional (Binford 1979; Kelly 1988; Shott 1989), and frequently exhibit resharpening, maintenance, and recycling (Bamforth 1986; Binford 1979; Odell 2003; Torrence 1989).

Technological Strategies and the Concept of Curation

The concept of curation has traditionally been used to relate distinctions between formal and expedient technologies to human behavior (Binford 1980, 1979; Kuhn 1991; Nelson 1991; Shott 1986; Torrence 1983). Curation has been defined in several ways that emphasize different scales of analysis from the level of individual tools to entire assemblages (Amick 1994; Amick and Carr 1996; Bamforth 1986; Binford 1980, 1979, 1977; Henry 1989b; Kuhn 1994; Nash 1996; Nelson 1991; Odell 2003, 2001, 1996a). The concept of curation emerged largely from Binford's (1980, 1979, 1978, 1977) ethnoarchaeological studies among the Nunamiut, and elaborated by others in later works (Bamforth 1991, 1986; Nelson 1991; Torrence 1989). Binford (1979) originally envisioned curated and expedient technologies as overlapping strategies within a single system of technological organization (similar to a continuum). However, these concepts have often been used dichotomously (see critical discussions in Nash 1996; Nelson 1991; Odell 1996a).

The concept of curation has received extensive use and critique by lithic analysts. Criticisms of the use of curation in explaining archaeological assemblages vary widely, but generally revolve around three main arguments: 1) that the concept of curation incorporates several different sets of behaviors and decisions (tool design, anticipated uses, multifunctionality, and economizing behaviors [e.g., maintenance, recycling, raw material conservation]) that are not necessarily directly related (Andrefsky 1994; Bamforth 1986; Hayden et al. 1996; Nelson 1991; Odell 2003); 2) curation may (or may not) have operated in similar ways at different scales of analysis (individual tools, assemblages, technologies) (Amick 1994; Chatters 1987; Odell 1996a, 1996b); and 3) the concept itself can be defined in multiple ways (Odell 1996a; Nash 1996; Torrence 1989).

Odell (1996a) has suggested that curation, as a concept, should be restricted to discussing lithic assemblages in relation to mobility and settlement patterns. In order to relate curation to mobility and settlement, it must be conceptualized as minimally operating on the level of assemblages. Somewhat similarly, Andrefsky (1994) has suggested using the labels formal and informal to describe technological variation, instead of curated and expedient. This approach attempts to avoid much of the confusion and conceptual baggage associated with curation by focusing on the general technological orientation at the assemblage level of analysis.

Given these critiques, curation—as a concept—may be, as some have suggested, too cumbersome for effective use (see Nash 1996). However, this does not negate the fact that lithic artifacts and assemblages may be produced through a variety of different strategies that lead to distinct and/or varying functional roles within a specific technological system (Bleed 1986; Binford 1979, 1977; Hayden et al. 1996; Odell 2003, 2000). The problem for the lithic analysis in this study, and in general, is to meaningfully relate the morphological and metric variability that may exist between the individual artifacts that comprise an assemblage to the specific strategies of lithic manufacture that comprise larger-scale patterns of technological organization.

According to the continuum model guiding this study, a technological strategy that emphasizes the manufacture of formal tools (i.e., transient explorers) will center on a reduction trajectory characterized by the production of formal bifacial and unifacial implements that may serve multiple functional roles and should generally express conservation of the tool through maintenance and/or reworking (Bamforth 1986; Bleed 1986; Odell 2003, 1996b). A bifacial reduction strategy will also produce tool blanks or preforms and failed bifaces (broken or discarded during manufacture) (Andrefsky 1998; Collins 1975; Hayden et al. 1996; Kelly 1988; Kuhn 1994), and may result in 'caching' or storage of blanks or finished tools (Meltzer 2002; Stanford 1999).

Because of their anticipated long use-life, and perhaps for reasons relating to ease of manufacture, resharpening, and/or tool maintenance (Aldenderfer 1991; Bleed 1986; Hayden et al. 1996; Nelson 1991; Torrence 1989), formal tools (both formal bifaces and unifaces) are often manufactured from relatively high-grade raw materials (i.e., raw materials that express desirable flaking properties) (Andrefsky 1994; Binford 1979; Cotterell and Kamminga 1990, 1979; Goodyear 1979; Ingbar 1994; Odell 2003; Shott 1989). Desirable raw materials may be transported through exchange or direct or embedded procurement, over long distances and result in the appearance of non-local, or "exotic", raw materials in site assemblages (Andrefsky 1994; Binford 1979; Goodyear 1979; Ingbar 1994; Odell 2003).

In contrast, a technological strategy that emphasizes the production of informal, expedient tools (i.e., estate settlers) is typically characterized by the manufacture of flake tools for situational and/or immediate use and do not indicate anticipated long use-lives or systematic maintenance/reworking (Gruhn and Bryan 1998; Odell 2003; Rossen 1991; Stothert 1974). Distinct patterns or strategies of flake and flake tool manufacture may be present within an expedient assemblage (Bradbury and Carr 1995; Prentiss 2001; Rossen 1998, 1991; Odell 2003; Sullivan and Rozen 1985), but the general character of the assemblage will indicate the production of flakes (as the intended end product of lithic manufacture) for specific individual uses. Informal tools are typically discarded after their intended use is performed and evidence little to virtually no maintenance/reworking and/or conservation (Rossen 1991; Sievert and Wise 2001; Stackelbeck 2008; Wise 1999).

Expedient tool assemblages also typically evince a greater reliance on locally available raw materials that can be easily accessed, as needed, for tool manufacture. Relatively fewer to no non-local raw materials will be present in an expediently produced assemblage (Andrefsky 1998; Dillehay 2000; Dillehay et al. 1989; Rossen 1991; Sievert and Wise 2001). Although dominated by flake tools, expedient assemblages may contain a few specialized tool forms such as grinding stones or projectile points made on flakes that relate to specific subsistence activities.

It is important to note that these characterizations of formal and informal technological strategies are hypothetical generalizations used for the purpose of modeling the polar extremes of the transient explorer-estate settler continuum and are conceptually operational only on assemblage and higher scales (e.g., industry or complex). Individual tools may be classified as formal or informal, but the overall orientation of technological organization (as formal or expedient) can only be understood through higher scale analyses ideally involving regional industry/assemblage patterns (Odell 1996a).

It is probable that no individual lithic assemblage will display characteristics related to a specific strategy (Andrefsky 1998; Binford 1980; Odell 2003, 1996a). Rather, most lithic assemblages will exist ‘in between’—displaying varying frequencies of the characteristics that define the polar extremes; which likely reflects the overlapping utility of these two strategies as active responses by hunter-gatherers to local and regional social and environmental conditions that may have existed. The central point here is that by defining the polar extremes, it is possible to use those characteristics to ascertain the general orientation of lithic production (with regard to technological strategy) of an assemblage—and that the orientation of the technological strategy is reflective of broader aspects of the organization of forager technology, society, and economy (Andrefsky 1998; Amick and Carr 1996; Bamforth 1986; Binford 1980; Hayden et al. 1996; Henry 1989b; Ingbar 1994; Kelly 1992; Nelson 1991; Odell 2003, 2001, 1996b; Torrence 1994; 1989). This approach attempts to avoid the dichotomous curated vs. expedient argument, in favor of a determination of the general orientation of the lithic technology (i.e., formal or informal) at the regional assemblage level, that is inferred from specific strategies of lithic production that were employed at contemporaneous sites (e.g., bifacial, unifacial, or flake-based tool production).

It is further argued that by understanding the specific technological strategies employed at different Early Preceramic sites (manufacturing processes, range of functional tool types and uses, and raw material selection and use) not only can we characterize the technological orientation, but we will also gain a broader insight into the overall organization of technology that can be used (along with other archaeological correlates—see Chapter Five) to characterize the settlement strategies that were pursued by the different early complexes that occupied the north coast of Perú. This application is particularly appropriate for the study of contemporary/overlapping Early Preceramic complexes in the north coast region due to the documented presence of bifacial, unifacial, and flake-based tools and technological strategies (presented in Chapter Four) (Briceño 1999; Chauchat 1998; Chauchat et al. 2004; Dillehay 2000; Dillehay et al. 1992; Dillehay et al. 1989; Gálvez 1999; Malpass 1983; Ossa 1978; Richardson 1978; Rossen 1998; Stackelbeck 2008).

Methodological Considerations

The study of lithic artifacts from Early Preceramic sites on the north coast of Perú presents a unique combination of problems. Chief among these is the fact that most sites are superficial scatters located on deflated landforms and may represent multiple occupations, time periods, and/or technologies. The removal of stratigraphic context through sediment deflation can result in the mixing of lithic artifacts from different periods (or technologies) and obscure or mask intra-assemblage variation.

A second major factor affecting lithic identification and analysis is that most typologies and terminologies have been based on lithic reduction categories developed to explain the prehistoric record in other parts of the world—particularly North American Paleoindian and Archaic assemblages and European Middle and Upper Paleolithic assemblages (Bordes 1961; Bordes and Sonneville-Bordes 1970; Bordaz 1970; Dibble 1995, 1987; Leroi-Gourhan and Brezillon 1972). Whether they employ stage-based reduction models (Bradbury and Carr 1999; Bradley 1975; Callahan 1979; Collins 1975; Whittaker 1994) or cognitive *chaîne opératoire* models (Lemmonnier 1992; Young and Bonnichsen 1984), these typologies and terminologies tend to prioritize and emphasize the bifacial reduction strategy and bifacial categories. In South America, this is particularly problematic due to the widely documented presence of early unifacial and flake-based industries (e.g., Ardila 1991; Bryan 1986; Dillehay 2000; Dillehay and Netherly 1983; Dillehay et al. 1989; Gruhn and Bryan 1998; Lavallée 2000; Llagostera 1989; Malpass 1983; Richardson 1981, 1978; Rossen 1998, 1991; Sandweiss et al. 1989; Sievert and Wise 2001; Stackelbeck 2008; Stothert 1985). When combined, these two broad factors (reliance on surface scatters and bifacially-oriented typologies) result in an under-representation of the actual variability within assemblages and can give a false impression of technological orientation.

Unifacial and flake-based reduction, as technological strategies, are distinct from bifacial reduction—and each other—and imply different sets of technological decisions within the knapping process and different intended functional uses of the end products (tools)(Hayden et al. 1996; Odell 1994, 1981; Parry and Kelly 1987; Rossen 1991; Shott 1986; Stackelbeck 2008; Torrence 1989). The identification and analysis of these tools within typological systems and reduction models that prioritize biface trajectories and categories can mask or ignore variation within assemblages related to distinct technological strategies (Dillehay 2000). For example, it would be very easy to classify unifacially-oriented flake reduction as interior (secondary or tertiary) flakes from bifacial production—resulting in the under-recognition of unifacial and/or expedient strategies. Equally as likely is the possibility of identifying trimming or thinning flakes from formal unifaces as bifacial thinning flakes since they both can possess a lipped platform, a characteristic that is often considered to be diagnostic of bifacial production (Dibble 1997; Sievert and Wise 2001; Stackelbeck 2008). Chauchat and others (Chauchat et al. 2006; Chauchat et al. 2004) have attempted to address this problem through meticulous refitting of tools and waste flakes from a limited number of Early Preceramic contexts in the Cupisnique region. Their results are encouraging, but systematic attempts like this one are uncommon and often unfeasible.

Other factors, such as observer error and analytical repeatability must also be considered when designing a methodology for lithic analysis. Observer error has been well documented and received much discussion in the literature concerning lithic analysis (Bradbury and Carr 1999; Fish 1978; Odell 1989; Prentiss 1998; Rozen and Sullivan 1989; Sullivan and Rozen 1985). From these discussions it is imperative that any analysis attempt to use measurements or attributes that are mutually exclusive and require as little as possible observer judgment during identification or recording. The use of specific measurements and/or attributes is, of course, dependent upon the specific goals of the analysis and the overarching research questions.

With these critiques in mind, separate methods were employed for identifying and measuring the debitage from all sites recorded in the Quebradas del Batán and Talambo. The analysis of lithics from these sites involves a typological classification of all lithic tools according to defined categories, as well as the recording of selected metric values. Previously conducted lithic analyses in the north coast region have alternatively emphasized bifacial or flake-based reduction strategies at both the site and regional assemblage level (see Chauchat 1998; Chauchat et al. 2004; Dillehay et al. 1989; Malpass 1983; Ossa 1978, 1973; Richardson 1978; Rossen 1998, 1991; Stackelbeck 2008; Uceda 1992). However, very few analyses have attempted to document and discriminate between different technological strategies within individual assemblages or examine how these strategies may have been concomitantly employed within a technological system.

This highlights a serious shortcoming in our understanding of the Early Preceramic period, given the documented presence of contemporaneous complexes that contain both formal and informal tools (Briceño 1999; Chauchat et al. 2006; Dillehay 2000; Gálvez 2004; Richardson 1981, 1978). The analytical method employed here explicitly recognizes that different technological strategies may have operated conterminously within individual assemblages and attempts to elucidate patterned variation that may be indicative of those strategies. In tandem with the typological classification of the tools, this method makes use of several metric variables that were chosen specifically to give a gross index of tool size while attempting to limit observer error and maximize repeatability of the measurements.

Lithic Analysis Methods

Large, multi-site lithic analyses have been conducted in both the Zaña Valley to the immediate north of the project area (Dillehay et al. 1989; Rossen 1998, 1991; Rossen and Dillehay 1999) and in the Quebrada Cupisinique/Chicama Valley to the south of the project area (Becerra 1999; Briceño 1999, 1997; Chauchat 1998, 1988, 1982; Chauchat et al. 2006; Chauchat et al. 2004; Gálvez 1999, 1992). Each of these separate analyses focused on large collections of Early (Q. Cupisnique and Zaña) and Late Early/Middle Preceramic (Zaña) lithic assemblages. The results of these studies, which are discussed below and throughout this chapter, form the baseline understanding of lithic variability present within the immediate region, and their general approaches and methods informed the specific methods employed in this study.

In order to characterize the variability that may be present in Early Preceramic technological organization, a multidimensional approach to the analysis of the Quebradas del Batán and Talambo assemblages was employed. This approach combines the analysis of formal and informal tools, raw materials, limited use-wear analysis, and intra- and inter-site contextual data to generate characterizations of individual site assemblages and the activities that are likely represented by the constituent tools. The individual site assemblages can then be compared to ascertain organizational similarities and differences between sites and to refine previous characterizations of Early Preceramic lithic technology. The specific methods used in the formal and informal tool analysis, debitage analysis, and raw material characterizations are presented in the following sections.

Lithic artifacts, specifically chipped stone tools and debitage, comprise the largest single dataset within the Quebradas del Batán and Talambo assemblage. An opportunistic sample of surface lithics (primarily tools and representative flakes) was collected from each site identified during the survey of the Quebradas del Batán and Talambo. Although opportunistic, each of these collections attempted to recover a representative sample of the diversity of lithic materials and raw material types that were present on the surface of each site. A total of 1,035 lithic tools were recovered during survey and excavation.

Tool Analysis

The previously conducted analyses in the Quebrada Cupisnique region by Chauchat and others documented a variety of both formal bifacial, unifacial, and flake tools within sites containing both Paiján and Fishtail assemblages (Becerra 1999; Briceño 1999, 1997; Chauchat 1998, 1988, 1982; Chauchat et al. 2006; Chauchat et al. 2004; Gálvez 1999, 1992). In contrast, the slightly later (ca. 9,000-5,500 B.P.) lithic assemblages in the Zaña Valley, which were manufactured within a semi- to fully sedentary plant-oriented economy, consisted entirely of unifacial flake tools (both retouched and unretouched) (Dillehay et al. 1997; Dillehay et al. 1989; Rossen 1998, 1991; Rossen and Dillehay 1999). Given these previous results from contemporaneous and later assemblages in nearby regions, it is apparent that documenting the variety (in both form and function) of lithic tools present within the Quebrada del Batán and Talambo assemblages may be a key to understanding organizational differences between different Early Preceramic complexes and how they may have changed over time.

Like the tool analyses conducted in the Zaña and Quebrada Cupisnique, the specific methods of tool analysis in this study contained two primary components: 1) visual typological identification; and 2) measurement of metric variables to record variation in tool size (Chauchat et al. 2004; Rossen 1991; Rossen and Dillehay 1999). Each individual tool (both formal and informal) was visually classified into a specific typological category (see Table 8.1). These categories are not designed to represent perceived functional differences between tool classes (although this may be true in some cases). Rather, each typological category is solely designed to represent a morphological characterization of individual tools based on defined sets of visual attributes.

Implicit in this analysis is the attempt to identify tools as formal or informal. As discussed previously, formal tools are distinguished by tool designs that anticipated

Table 8.1. Chipped stone tool typological classification and descriptions (This table was also presented as Table 2.1 in Chapter Two—Methods).[1]

Tool Type	Code	Description
Primary Biface	9	Flakes removed on both faces of the object, mainly through primary flaking (i.e., hard-hammer) such that the two sides meet to form the single edge that circumscribes the object; the flaking may reflect a random or systematic pattern; cortex may be present; cross-section of the artifact is thick and irregular; edge of the artifact is typically sinuous; may have been used as a functional tool, but usually represents an early stage in the production of a more refined tool form (i.e., aborted bifacial blank or production failure)
Secondary Biface	10	Shaping consists of flake removal on both faces of the object, mainly through secondary flaking (i.e., soft-hammer) with some primary flaking, and possibly tertiary flaking (i.e., pressure); the flaking reflects a more systematic pattern; cortex is generally not present; cross-section of the artifact is thinner and lenticular; biface edge may be slightly sinuous to straight; may have been used as a functional tool, but usually represents a later stage in the production of a more refined tool form (i.e., aborted preform or production failure)
Projectile Point	11	Shaping is achieved through primary, secondary, and tertiary flaking (hard- and soft-hammer percussion and pressure) on both faces; flake removal is systematic, resulting in a longitudinally asymmetrical form with a pointed distal end and a haft element at the proximal end; latitudinally, the form is generally symmetrical; the cross-section is generally thin, and the artifact edge is straight or only slightly sinuous; these tools may be classified by known stylistic or chronological types (e.g., Fishtail, Paiján) or other as yet unnamed forms
Unidentified Biface Fragment	12	A portion of an object that has been shaped by removing flakes on both faces; likely resulting from a fracture during the course of manufacture, or possibly through use or post-depositional activity; there is not enough of the original form remaining to assign it as either a primary, secondary, or other biface
Limace	13	Form produced by systematic primary, secondary, and tertiary flake removal on one face; generally thick to nearly triangular in cross section, with one flat (unworked) side; longitudinally, may be symmetrical or may be rounded on one end and fine-pointed on the other; latitudinally, generally symmetrical and slightly tear-drop shaped
Limace Fragment	14	Incomplete unifacial form, but recognizable as a portion of a limace (see description above); broken during manufacture, use, or post-depositional process
Uniface	15	Form produced by systematic or unsystematic primary, secondary, and/or tertiary flake removal on one face, usually the dorsal surface of a large flake blank; secondary and/or tertiary flaking may be present on one or both lateral edges, and/or on one or both ends; may have cortex present; may be thick or thin in cross section; generally asymmetrical longitudinally; may be symmetrical or asymmetrical latitudinally; may be wide or relatively narrow; forms include: ovate, tear-drop shaped, sub-rectangular, lanceolate-like, crescent, waisted, or irregular; depending on the form, there may be evidence of provisioning for a haft element on one end
Unidentified Uniface Fragment	16	Incomplete unifacial form, and *not* recognizable as a portion of a limace; broken during manufacture, use, or post-depositional process
Retouched Flake	17	A flake of any class with evidence of tertiary flaking (i.e., pressure) along any or all lateral edges; generally thin in cross-section; may or may not be symmetrical along the latitudinal and longitudinal axes
Utilized Flake	18	A flake of any class with evidence of small flake removal consistent with use-wear; no evidence of intentional shaping; evidence of use may be found on any or all lateral edges

[1] These categories and descriptions are drawn from studies in the Zaña, Jequetepeque, and Cupisnique/Chicama and from generalized lithic typologies (Andrefsky 1998; Chauchat 1998; Chauchat et al. 2006; Chauchat et al. 2004; Dillehay et al. 1989; Odell 2003; Ray and Lopinot 1998; Rossen 1998, 1991; Rossen and Dillehay 1999; Stackelbeck 2008).

relatively long use-lives that included episodes of resharpening/maintenance (Aldenderfer 1991; Bleed 1986; Hayden et al. 1996; Nelson 1991; Odell 1981; Torrence 1989). Some formal tools were hafted to form a composite tool (e.g., projectile and foreshaft; hafted scrapers); others were intended for hand use. Formal tools also tend to be manufactured from high-quality raw materials and may include materials from non-local or "exotic" sources (Andrefsky 1994; Shott 1989; Odell 2003). Formal tools typically continue to be used until the tool fails (i.e., breaks) or can no longer be rejuvenated—at which point they may be discarded or recycled into another function (Ahler 1971; Andrefsky 1998, 1994; Bamforth 1986; Binford 1979; Odell 1996a, 1996b).

In contrast, informal tools are characterized by designs intended for situational and/or immediate use (Bleed 1986; Gruhn and Bryan 1998; Hayden et al. 1996; Rossen 1991; Young and Bamforth 1990). Informal tools were not intended to have long use-lives and typically were not systematically maintained or reworked. Distinct patterns (or types) of flake tools may be present within an assemblage (Bradbury and Carr 1995; Prentiss 2001; Rossen 1998, 1991). Informal tools also typically indicate a greater reliance on locally available raw materials, with fewer examples of non-local materials being used for manufacture (Andrefsky 1998, 1994; Dillehay et al. 1989; Rossen 1991; Sievert and Wise 2001). Informal tools may be discarded after their intended use is performed or tool failure occurs (breakage) and generally evidence little to no maintenance/reworking or conservation (Rossen 1991; Sievert and Wise 2001).

The typological categories used in this study draw from the methodologies, terminologies, and results of both the Zaña and Quebrada Cupisnique analyses (Becerra 1999; Briceño 1999, 1997; Chauchat 1998, 1982; Chauchat et al. 2004; Dillehay et al. 1989; Gálvez 1999, 1992; Rossen 1998, 1991; Rossen and Dillehay 1999), among others (Aldenderfer 1998; Becerra and Carcelén 2004; Bell 2000; Lynch 1980; Malpass 1983; Rick 1996, 1980; Stackelbeck 2008; Uceda 1992). However, none of these analyses is directly applicable to this study, given the emphasis on attempting to distinguish between contemporary/overlapping Early Preceramic groups that may have organized their technologies and economies in different ways.

In the Quebrada de las Pircas (Zaña Valley) sites analyzed by Dillehay (Dillehay and Netherly 1983; Dillehay et al. 1997; Dillehay et al. 1989) and Rossen (1998, 1991), all sites were considered to be Middle Preceramic and part of the same cultural system. In the Quebrada Cupisnique region, the emphasis in the lithic analysis was to recreate the *chaîne opératoire* through typological classification and replicative experiments, and more fully document the technological and decision-making processes associated with the production of Paiján lithic tools—specifically Paiján projectile points (Chauchat 1998; Chauchat et al. 2004).

Several of the sites in the Quebradas del Batán and Talambo are clearly not single component and may not relate to the same cultural group. In addition, the goal of this study is not to further document the specific technological process associated with the manufacture of Paiján projectile points (which has already been done very well [Chauchat et al. 2006; Chauchat et al. 2004]). Rather, the goal is an attempt to discriminate the possible variability between Early Preceramic systems of technological organization and examine how these systems are related to mobility/settlement, and more broadly to specific strategies of colonization.

Upon completion of the typological classification, specifically defined metric attributes were measured. These attributes included length, width, thickness, weight and for some tools (projectile points with intact haft elements) length and width of stem. Length was measured in millimeters as the longest dimension of a particular tool. Width was measured at the widest point perpendicular to the dimension of length. Thickness was measured at the thickest point on a tool that was perpendicular to both length and width, resulting in a three dimensional picture of an individual tool. The weight of each tool was measured in grams on an electronic scale.

Each of these metric attributes, along with the typological classification, was recorded on a separate form for each tool. In addition to the metrics and typology, the location of any retouch, reworking, or tool breakage was recorded on each tool form. Raw material of manufacture was also recorded for each tool. Numerous distinctive and/or diagnostic tools were also drawn on individual tool forms, although only a sample of the total number of tools was illustrated. All of the tools collected from survey and excavation in the 2002-2003 field season were analyzed according to these metric variables. However, the tools from the 1999 and 2000 field seasons were not originally measured with the same variables. An attempt was made to re-analyze as many of these tools as possible, using the same metric variables. However, some of the tools were unable to be re-analyzed according to the same metrics. These tools are included in the raw counts of tool types and sub-types (when applicable) and in the raw material usage totals. They are not, however, included in the statistical analyses of the metric variables for individual tool types.

Lastly, functional analyses of a limited number of selected tools were performed. These analyses included use-wear analysis on 15 tools (conducted by Tom Dillehay, Vanderbilt University) and blood-residue analysis on 6 tools (performed by John Fagan, Archaeological Investigations Northwest). The rather small number of tools that could be exported from Perú for these specialized analyses limits the broad applicability of the functional interpretations.[2] However, the tools that were selected for the analyses were chosen because they were diagnostic to specific time periods (Fishtail and Paiján projectile points) or were representative examples of different tool types (projectile points, bifaces, unifaces, retouched flakes, utilized flakes). The results of the use-wear analysis are presented along with the discussion of the individual tools. However, the blood-residue analysis failed to identify any trace proteins or residue on the tools that were submitted for analysis.

Raw Material Analysis

Raw material was identified for each chipped stone tool in the assemblage. Raw material type and texture (Table 8.2) was assessed visually for each lithic artifact, along with specific variety of material (Table 8.3). The raw material types and many of the specific varieties used in this study were drawn from previously published material identifications for lithic assemblages in the Zaña and Cupisnique regions (Becerra 1999; Chauchat 1998; Chauchat et al. 2004; Gálvez 1999; Rossen 1998, 1991; Rossen and Dillehay 1999). Exploitation of different raw materials can provide insight into the degree of mobility and pattern of movement pursued by hunter-gatherer groups (Andrefsky 1991; Becerra 1999; Binford 1980; Bamforth 1991; Dillehay 1997a; Goodyear 1979; Henry 1989b; Ingbar 1994; Kelly 1995, 1992).

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[2] Lithic tools were exported from Perú under the permission and supervision of the Instituto Nacional de Cultura.

Table 8.2. Lithic raw material types and textures (this table was also presented as Table 2.3 in Chapter Two-Methods).

Raw Material Type	Code	Raw Material Texture	Code
Quartz	1	Very fine-grained (VFG)	1
Quartzite	2	Fine grained (FG)	2
Rhyolite	3	Coarse grained (CG)	3
Basalt	4		
Chalcedony	5		
Silex	6		
Andesite	7		
Hematite	8		
Unidentified	9		

Table 8.3. Lithic raw material varieties (based on descriptions of color and degree of translucence) (this table was also presented as Table 2.4 in Chapter Two-Methods).

Raw Material Variety	Code	Raw Material Variety (con't.)	Code
Toba (T)	1	Mottled white (MW)	12
Toba-Green Variety (G)	2	Mottled brown/black (MBB)	13
Opaque (O)	3	Mottled brown (MB)	14
Semi-opaque (SO)	4	Mottled caramel (MCa)	15
Crystal (C)	5	Mottled red/black (MRB)	16
Mottled red/pink (MR)	6	Mottled red/caramel (MRC)	17
Caramel (Ca)	7	Tiger stripe (MC)	18
Mottled blue/white/red (MBWR)	8	White (W)	19
Semi-translucent brown (STB)	9	Mottled pink/white (MPW)	20
Mottled white/tan (MWT)	10	Red (R)	21
Mottled gray/blue (MGB)	11	Mottled black/grey (MBG)	22

Additionally, different strategies of lithic production (formal and expedient) may be reflected in the differential use of distinct raw material types and/or sources (Andrefsky 1994; Becerra 1999; Ingbar 1994; Odell 1989b; Stackelbeck 2008). Each of these potential lines of insight will be useful in characterizing and understanding variability present in the organization of technology within individual site assemblages and within the overall settlement/mobility patterns of the Quebrada del Batán and Talambo region. These patterns can then be compared with the results from the other nearby regions such as the Zaña and Quebrada Cupisnique to gain insight into the long-term trends in raw material resource acquisition and lithic production patterns from the Late Pleistocene into the Early Holocene across the north coast of Perú.

Results of Lithic Analysis

Results of the morphological analysis of the lithics from the Quebradas del Batán and Talambo will be discussed first. This discussion includes the typological analysis of all tools (including identified tool types and sub-types). The metrics, raw materials, and possible function of each tool sub-type will also be presented. Following the presentation of the tool data, the entire debitage assemblage for the Quebradas del Batán and Talambo will be discussed according to typological category and metric dimensions. These data will inform our understanding of the variety of different tool types that were employed during the Early Preceramic period and aid in the reconstruction of the specific technological strategies that may have existed.

Lastly, this study will present and discuss the various data garnered from the analysis of the Quebrada del Batán and Talambo lithic materials. It is anticipated that these different lines of analysis will provide the necessary baseline for evaluating the individual technological strategies employed during the Early Preceramic. Greater insight into the particular strategies will allow for a reconstruction of the overall organization of technology between various Early Preceramic groups that inhabited the lower Jequetepeque region. A better understanding of the technological organization will help refine our understanding of the types of sites present within the region and the pattern of settlement that resulted in their deposition.

Lithic Tool Analysis

As Table 8.4 illustrates, a total of 1053 lithic tools and tool fragments (993 from survey, 60 from excavation) were recovered and analyzed from the Quebradas del Batán and Talambo. Eighteen cases (n=18) of refitting tool fragments were identified within the assemblage, which reduces the actual number of individual tools represented to 1035. All tools and tool fragments were initially divided into 10 morphological categories (see Table 8.1 for definitions). In addition to these 10 categories, one additional category was also created—Groundstone. Groundstone refers to a lithic tool that displays intentional modification through grinding and/or pecking (i.e., not manufactured through flaking).

The use of these 11 analytical categories resulted in the identification of the eight broad classes of lithic tools that are listed in Table 8.4 (primary biface, secondary biface,

Table 8.4. Total number of Early Preceramic tools by tool class.

Tool Class	Number from Survey	Refit Cases*	Number from Excavation	Total Number of Tools by Class	% of Total Tool Assemblage (n=1035)
Primary Bifaces	49	1	0	48	4.64%
Secondary Bifaces	158	5	3	156	15.07%
Projectile Points	171	8	4	167	16.14%
Unidentified Biface Fragments	187	1	17	203	19.61%
Limaces	75	0	1	76	7.34%
Unifaces	104	2	4	106	10.24%
Retouched Flakes	121	0	4	125	12.08%
Utilized Flakes	115	1	27	141	13.62%
Groundstone	13	0	0	13	1.26%
Total	**993**	**18**	**60**	**1035**	**100.00%**

*In this analysis, refit cases were included with the conjoining piece and counted as a single specimen.

projectile point, limace, uniface, retouched flake, utilized flake, and groundstone). In general, the broad tool classes mirror the analytical categories—with three specific exceptions. The limace fragment and unidentified uniface fragment analytical categories were subsumed within the limace and uniface tool classes, respectively. Despite being fragments, these tools are still attributable to their respective class and are included in the discussions of those tool classes.

The analytical category of unidentified biface fragments is another case and represents a different set of problems. This category, by definition, is something of a 'catch-all' in that these unidentifiable fragments represent portions of tools that may be attributable to one of several different broad classes (e.g., primary bifaces, secondary bifaces, and/or projectile points). Because the lithics included in the unidentified biface fragment analytical category (n=203) could not be assigned to a specific tool class, they are not included in the following discussion of the QBT tool assemblage. However, these fragments are included in discussions of raw material use within the overall assemblage.

A range of variability in form exists within each of the eight remaining broad tool classes; some of which is patterned consistently enough to allow for the identification of formal types and sub-types. In general, each of the eight broad classes of lithic tools represent different *types*. Any patterned variation observed within a category has been interpreted as representing *sub-types* (Table 8.5). Among the primary biface, secondary

Table 8.5. Lithic typological classes and sub-types.

Typological Category	**Type**	**Sub-type**
Primary Bifaces	Primary Biface	none
Secondary Bifaces	Secondary Biface	Lenticular Ovate
Limaces	Limace	Lenticular Bi-pointed Rounded
Unifaces	Uniface	Oval Tear-drop Adze Triangular Bi-pointed Non-parallel
Retouched Flakes	Retouched Flake	One Margin Two Margins Multiple Margins Notched
Utilized Flakes	Utilized Flake	One Margin Two Margins Multiple Margins
Groundstone	Groundstone	Hammerstone *Mano* *Batan*

biface, limace, uniface, retouched flake, utilized flake, and groundstone classes a total of 21 sub-types were identified. Some sub-types were identified by earlier studies of Early Preceramic lithic assemblages (Becerra 1999; Becerra and Carcelen 2004; Becerra and Gálvez 1996; Bonavia 1982; Briceño 1999, 1997; Chauchat 1988; Chauchat et al. 2006; Chauchat et al. 1992; Chauchat et al. 2004; Dillehay 2000; Dillehay et al. 1992; Dillehay et al. 1989; Gálvez 2004, 1999; Ossa 1978; Ossa and Moseley 1972; Malpass 1986, 1983; Rick 1980; Rossen 1998, 1991; Stackelbeck 2008; Uceda 1992). Most, however, are newly identified sub-types.

In the few cases where a type and sub-type were previously recorded, this study has attempted to use and/or duplicate the earlier nomenclature and terminology. However, most of these sub-types represent patterned variability that has not been previously described within Early Preceramic assemblages. Each of these types and sub-types are presented and discussed below.

The Projectile Point class is not included in Table 8.5. This is because the Projectile Point class contains by far the largest amount of intra-class variation and necessitates separate discussion. Studies of Early Preceramic lithic assemblages in northern and central Perú have long recognized the presence of a wide range of variability in projectile point form (Bonavia 1982; Chauchat 1982, 1975; Dillehay et al. 1992; Lanning and Hammel 1961; Lynch 1980, 1967; Malpass 1983; Ossa 1978; Rick 1980; Uceda 1992). However, we do not understand if this variability represents different functional or stylistic point types; or, if any of these types are technologically, socially, or chronologically related. Given that the Early Preceramic period on the North Coast is represented by several (possibly multiple) overlapping, contemporaneous complexes, it is imperative that we better understand what this variability actually represents.

Two distinct projectile point types—specifically the Fishtail and classic Paiján types—are known to occur across portions of the north coast (Chauchat et al. 2004; Dillehay 2000). In addition to the Fishtail and Paiján types, there also exist a large number of projectile point forms that do not fit into either of these types and represent unknown or unrecognized types (Gálvez 1999; Malpass 1983). The unidentified points are typically stemmed forms that are often uncritically classified as Paiján or Paiján variants, and highlight a significant deficiency in our understanding of variability present within Early Preceramic lithic assemblages on the north coast.

The QBT lithic assemblage contains a relatively large number of projectile points (n=167), including both known (e.g., Fishtail and classic Paiján types) and unknown stemmed and unstemmed point forms. The presence of known and unknown points collected from dated sites within a relatively small region provides an important opportunity to examine the technological and temporal relationships between these different forms. As a result, all projectile points were analyzed as to group, type, sub-type, and variety. The specific attributes used to make these classificatory refinements are discussed below (see the Projectile Point section). The results of this analysis indicates that the wide range of variability known within early points of the north coast region can be meaningfully divided into several distinct point types—some of which are temporally diagnostic—that provide new insights into Early Preceramic lithic technology.

Early Preceramic Lithic Tool Typology

<u>Primary Biface and Primary Biface Fragments</u>

Primary bifaces can be functional tools with various uses (e.g., cutting, chopping), but usually represent an early stage in the production of more refined tool forms (i.e., aborted or discarded bifacial blank or production failure). In either case, they are a recognizable lithic form that has been noted by several previous studies and occurs frequently in Early Preceramic assemblages of the North Coast region (Bonavia 1982; Briceño 1999; Chauchat et al. 2004; Chauchat 1988; Dillehay 2000; Gálvez 1999; Ossa and Moseley 1972; Lanning 1970; Malpass 1983; Uceda 1992). Primary bifaces associated with Paiján and other Early Preceramic assemblages are often referred to as *Chivateros*-type bifaces (Becerra 1999; Chauchat et al. 2004; Gálvez 1999)—a name drawn from the *Chivateros* site complex on the Peruvian central coast (Bonavia 1982, 1979; Fung et al. 1972; Lanning 1970; Patterson 1966). *Chivateros*-type bifaces do not represent a specific sub-type of primary bifaces, but rather a generalized term (as it is used today) for virtually all Early Preceramic primary bifaces identified along the coast of Perú (Chauchat et al. 2004; Dillehay 2000; Lavallée 2000).

Primary bifaces (Figures 8.1 and 8.2) are identifiable as a lithic tool with flakes removed from both faces (obverse and reverse) of the object, mainly through primary flaking (i.e., hard-hammer direct percussion) such that the lateral edges of the two faces meet to form a single edge that circumscribes the object. The flaking on both faces may be random or systematically patterned. The artifact edge is typically sinuous with a thick and irregular convex cross-section. Cortex may be present, but is relatively rare in the Quebrada del Batán and Talambo assemblages (n=4; 8% of all primary bifaces).

Primary bifaces (n=48) were recovered from 31 sites and represent 4.6% of the total Early Preceramic tools recovered in the Quebradas del Batán and Talambo. Of the 48 primary bifaces, 30 are complete tools and 18 are fragments. The mean sizes of the complete primary bifaces in the Quebrada del Batán and Talambo assemblage are presented in Table 8.6.

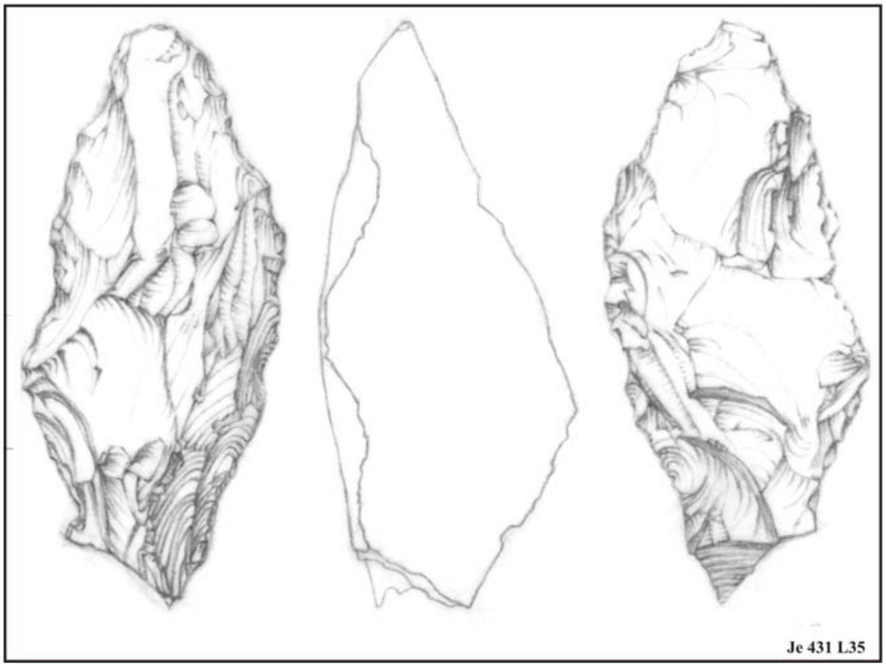

Figure 8.1. Primary biface (Je-431, L35) from the QBT assemblage (actual size).

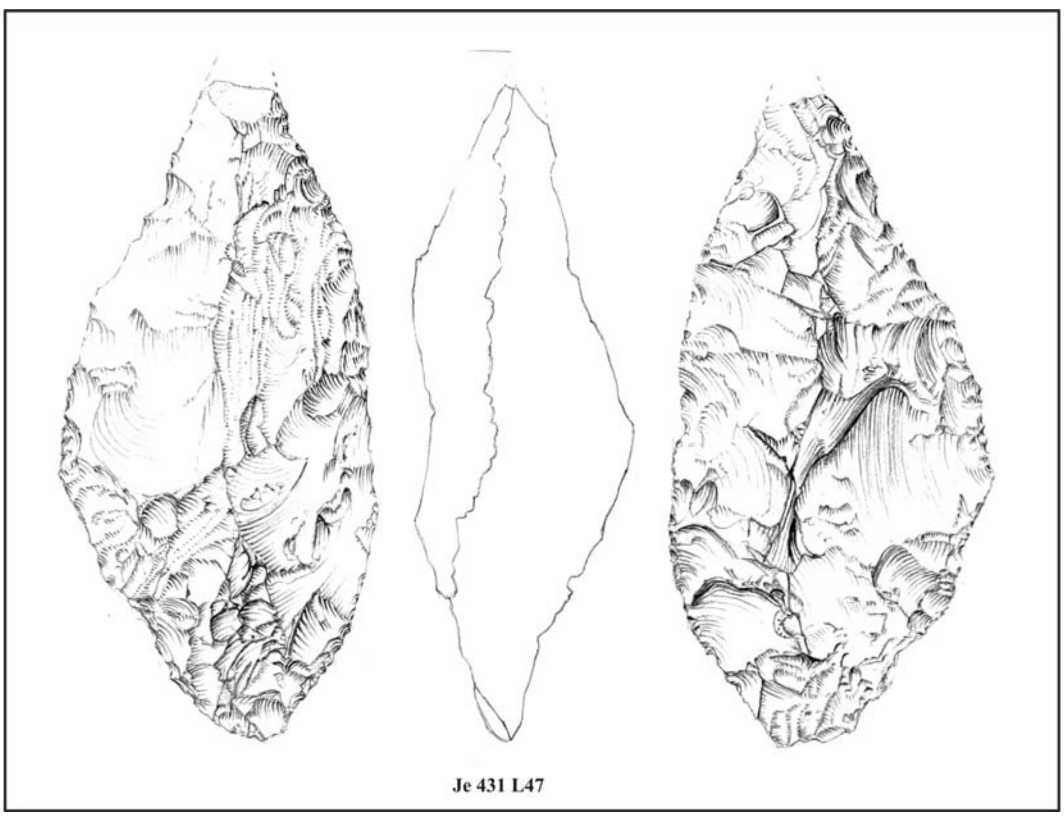

Figure 8.2. Primary biface (Je-431, L47) from the QBT Assemblage (actual size).

Table 8.6. Metric attributes of complete primary bifaces.

Attribute	Number	Minimum Value	Maximum Value	Mean	Standard Deviation
Length	30	4.7	13.6	9.1	2.07
Width	30	3.3	7.5	4.7	1.01
Thickness	30	1.6	4.3	2.6	0.57
Weight (g)	30	43.7	247.2	102.2	50.6

Table 8.7. Primary bifaces by raw material.

Raw Material	Number	%
Quartzite, FG	15	31.2%
Quartzite, VFG, (Toba)	13	27.1%
Rhyolite	7	14.6%
Quartzite, CG	6	12.5%
Basalt, FG	4	8.3%
Quartz (Opaque)	3	6.3%
Total	48	100.0%

Among the complete primary bifaces, four specimens were clearly manufactured on large flakes (bulb of force and platform still visible). The majority (n=26), however, appear to have been reduced directly from nodular or tabular cobbles of raw material. A total of six different raw materials were used in the manufacture of primary bifaces (Table 8.7). However, fine-grained and very fine-grained quartzites were most commonly used and account for more than 58% (n=28) of the variability in raw material selection.

<u>Secondary Biface and Secondary Biface Fragments</u>

Secondary bifaces and secondary biface fragments (n=156) were recovered from 48 sites during survey and excavation in the Quebradas del Batán and Talambo and comprise 15.07% of the total tool assemblage. Similar to primary bifaces, secondary bifaces are often thought to represent a stage in process of manufacturing a more refined tool form—typically projectile points—and are commonly referred to as foliate pieces (Chauchat 2006; Chauchat et al. 2004). Later-stage tool manufacture is clearly indicated in the QBT secondary bifaces by the presence of initial stem and/or notching preparation that was observed on a number of specimens (n=12; 7.7% of all secondary bifaces). However, it is also possible that secondary bifaces could have been used as finished tools for various functions (e.g., scraping, cutting, chopping). Among the 156 secondary bifaces in the QBT assemblage, two (n=2; 1.3% of all secondary bifaces) presented clear evidence of intentional use (series of small use scars along one tool margin) in activities unrelated to finished tool manufacture.

Secondary bifaces are shaped by the removal of flakes from both faces of the lithic, primarily though soft-hammer percussion (i.e., secondary flaking) (Figure 8.3). Some pressure flaking may also be present along the lateral margins of the object. Flaking tends to have a systematic pattern, with the bifacial edge being slightly sinuous to straight. Secondary bifaces tend to be thinner in cross-section and take on a more lenticular shape than primary bifaces. Cortex is typically absent and was present on a single specimen within the QBT assemblage (n=1; 0.6% of all secondary bifaces). Although the majority of secondary bifaces appear to have been reduced from primary bifaces (see above), a few examples (n=3) were clearly manufactured on flakes (platform and bulb of force still visible).

The secondary biface tool class contains a relatively wide variety of raw materials and indicates the use in manufacture of virtually all locally available materials (Table 8.8). Like the primary bifaces, quartzites (both fine-grained and very fine-grained varieties) dominate the assemblage. Coarse-grained quartzites, rhyolites, and basalts are present in lower frequencies, but represent important local resources. Interestingly, however, the raw materials used in the manufacture of secondary bifaces do include varieties of quartz (particularly semi-opaque and crystal) and very fine-grained quartzite (green variety) that are not present in primary bifaces. Both of these raw material

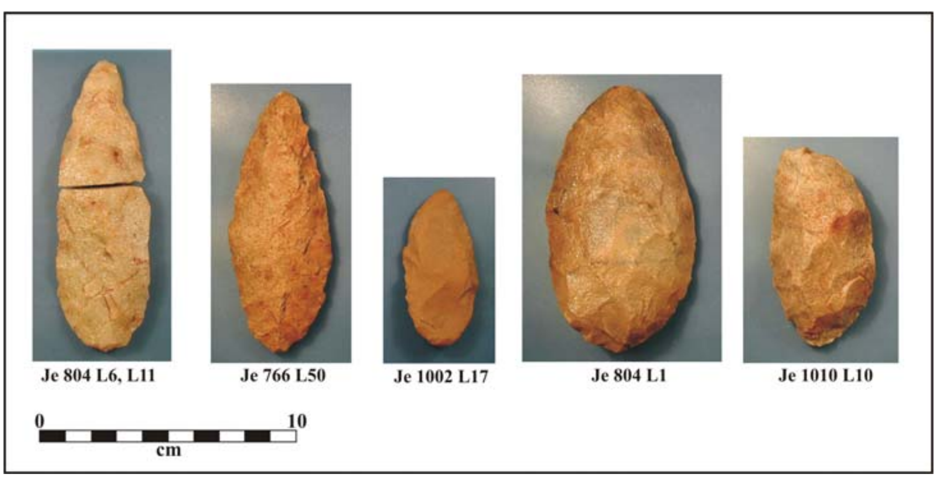

Figure 8.3. Examples of secondary bifaces in the QBT assemblage.

Table 8.8. Secondary bifaces by raw material.

Raw Material	Number	%
Quartzite, FG	68	43.59%
Quartzite, VFG (Toba)	43	27.56%
Rhyolite	13	8.33%
Quartzite, CG	12	7.69%
Basalt, FG	6	3.85%
Quartzite, VFG	3	1.92%
Quartz (Opaque)	3	1.92%
Quartz (Semi-Opaque)	3	1.92%
Rhyolite, CG	2	1.28%
Basalt	1	0.64%
Quartz (Crystal)	1	0.64%
Quartzite, VFG (Green)	1	0.64%
Total	**156**	**100.00%**

varieties are highly distinctive and relatively rare within the overall QBT lithic assemblage—as is indicated by the presence of only a single example of each variety within all secondary bifaces.

Of the 156 total secondary bifaces, 33 are complete (unbroken) specimens and 123 are fragments. Among the 33 complete secondary bifaces, two distinct forms (sub-types) were identified—lenticular (n=12) and ovate (n=20) (Figure 8.4). In addition to these two sub-types, a single rectangular-shaped secondary biface manufactured of very fine-grained quartzite (Toba) was also identified. This form of this specimen is unique within the secondary biface class and probably should be included within the Ovate sub-type (which it most closely resembles). However, given the possibility that this form may represent a separate sub-type, it is not included with any other sub-type and is not discussed further detail.

Lenticular secondary bifaces are characterized by their lenticular outline (Figure 8.4) and are noted in both small and large sizes (see Table 8.9). As noted previously, initial stem and/or notching preparation was observed on a small number of the total secondary bifaces (n=12). Five of these examples are complete Lenticular secondary bifaces. The fact five of the 12 unbroken Lenticular secondary bifaces evidence initial stem and/or notching preparation suggests that this sub-type was likely the preferred for manufacturing more finished tools, particularly projectile points (compared to the Ovate sub-type, which contained no examples with stem or notching preparation).

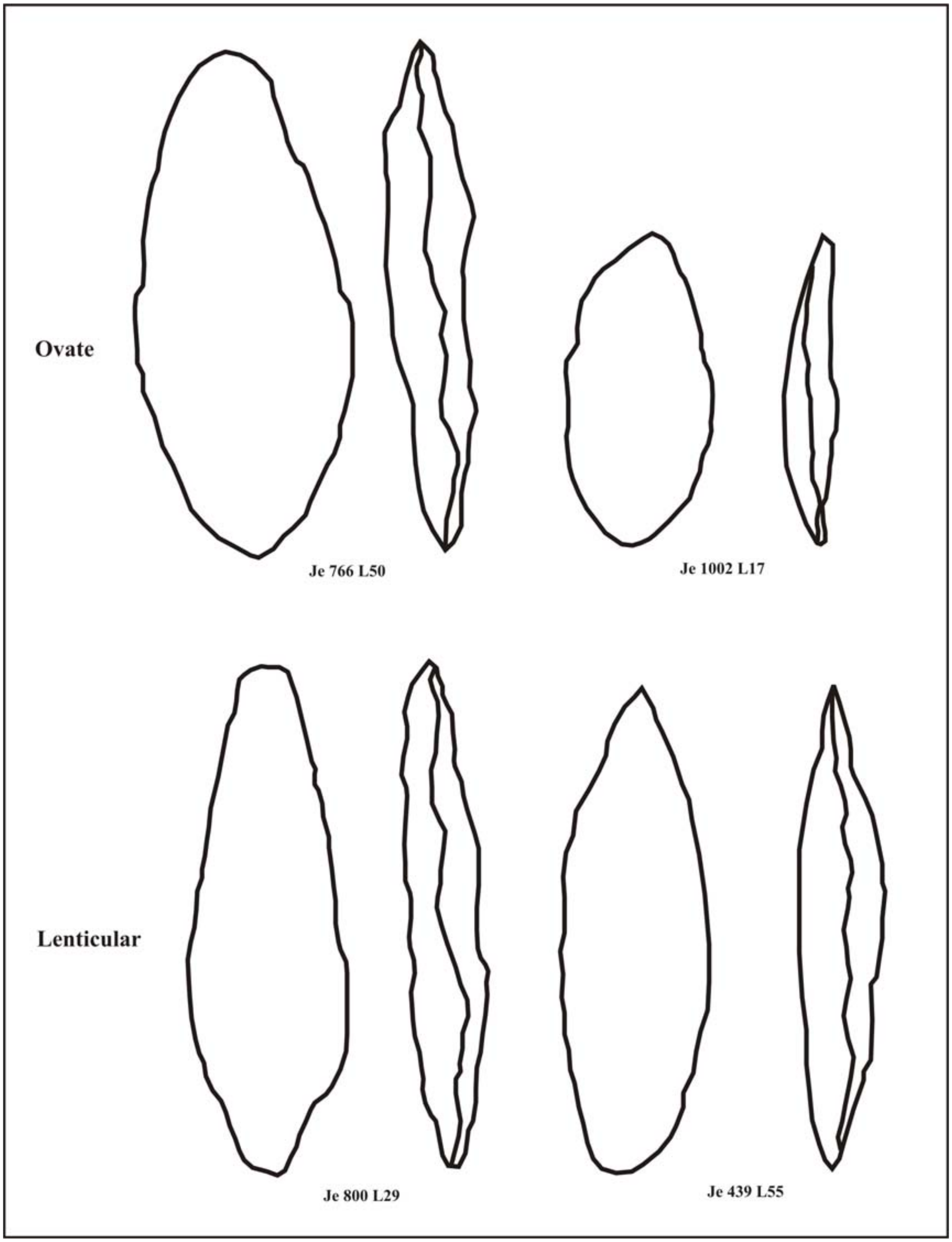

Figure 8.4. Secondary biface sub-types in the QBT assemblage.

Table 8.9. Metric attributes of complete Lenticular secondary bifaces.

Attribute	Number	Minimum Value	Maximum Value	Mean	Standard Deviation
Length	12	4.2	10.5	7.7	2.16
Width	12	1.7	3.9	3	0.61
Thickness	12	0.9	3.8	1.5	0.77
Weight (g)	12	5.4	68.8	31.3	18.71

Table 8.10. Lenticular secondary bifaces by raw material.

Raw Material	Number	%
Quartzite, VFG (Toba)	4	33.33%
Quartzite, FG	4	33.33%
Basalt, FG	2	16.67%
Quartzite, VFG	1	8.33%
Quartz (Crystal)	1	8.33%
Total	**12**	**100.00%**

This assertion also may be reflected in the raw materials used in the manufacture of Lenticular secondary bifaces (Table 8.10). Although admittedly few in number, the raw materials used in the 12 unbroken examples of Lenticular secondary bifaces consist entirely of fine-grained and very-fine grained varieties which are consistent with projectile point manufacture. All of the raw materials represented in the Lenticular secondary biface sub-type were also used for the manufacture of Early Preceramic projectile points in the QBT assemblage. However, it should be noted that the raw material distributions for this sub-type mirror those of all secondary bifaces (see Table 8.8).

In addition to the Lenticular sub-type, a second sub-type (Ovate secondary bifaces) was also identified. Ovate secondary bifaces (n=20) are the most common unbroken form and are characterized by a rounded to oval-shaped outline (Figure 8.3). In terms of size, Ovate sub-type secondary bifaces are similar in size to the Lenticular sub-type (Table 8.11).[3] Raw material use is also similar between the Ovate and Lenticular sub-types, with Ovate secondary biface manufacture dominated by fine-grained and very fine-grained quartzites (Table 8.12).

[3] Metric variables were not recorded for four of the Ovate sub-type Secondary Bifaces collected during the 1999 and 2000 field seasons under the Proyecto Pacasmayo (Dillehay and Kolata 2000).

Table 8.11. Metric attributes of complete Ovate secondary bifaces.

Attribute	Number	Minimum Value	Maximum Value	Mean	Standard Deviation
Length	16	4.5	10.7	7.4	2.05
Width	16	2	6	3.7	0.87
Thickness	16	0.9	2.1	1.5	0.43
Weight (g)	16	8.7	150.7	46.5	33.21

Table 8.12. Ovate secondary bifaces by raw material.

Raw Material	Number	%
Quartzite, FG	9	45.00%
Quartzite, VFG (Toba)	8	40.00%
Basalt, FG	2	10.00%
Quartz (Opaque)	1	5.00%
Total	**20**	**100.00%**

In spite of their similarities in overall size and raw material use, there are important differences (aside from form) between these two sub-types. Unlike the Lenticular sub-type, which contained several examples of initial stem and notching preparation, the Ovate sub-type contained no examples. The Ovate sub-type, however, did contain two of the three examples of secondary bifaces made on flakes. The Lenticular sub-type contained none. One specimen in the Ovate sub-type also evidenced a series of small use scars along the distal margin (1 of only 2 examples of utilization within all secondary bifaces—the other was a fragment unidentifiable as to sub-type). No use scars were identified in the Lenticular sub-type examples.

Although admittedly few in number, these examples suggest that important differences may have existed in the intended uses of the secondary biface forms that comprise these two distinct sub-types. If the Lenticular sub-type represents secondary bifaces that are related to the manufacture of projectile points, then the Ovate sub-type may represent secondary bifaces involved in the manufacture of other kinds of bifacial tools. It seems more probable, however, that the Ovate sub-type bifaces may themselves represent finished tools used for cutting, chopping, or scraping (similar to unhafted formal unifaces), and may not represent a stage in the reduction of other tools (in which case ‘secondary biface’ would be a misnomer).

More examples are needed to clarify this possibility, but the examples in the QBT assemblage do provide some interesting insight. Although secondary bifaces are typically not the focus of systematic study within Early Preceramic assemblages, these two sub-types provide a beginning—based on gross morphological characteristics—that is suggestive of possible variability within the bifacial trajectory in regard to the intended end products. It should not be surprising if more variability exists within the manufacture of bifacial tools than is expressed by stage-based or cognitive models that stress projectile points as the lone intended end-product of lithic manufacture (Chauchat et al. 2004; Ossa 1973; Ossa and Moseley 1972**)**.

Limace and Limace Fragments

A total of 76 limaces and limace fragments (75 from survey, 1 from excavation) were collected from 43 sites in the Quebradas del Batán and Talambo and represent 7.3% of the total number of lithic tools. The limace is a formal Early Preceramic unifacial lithic tool produced through systematic primary, secondary, and tertiary flake removal and shaping of one face only (Figure 8.5) (Chauchat 1988; Chauchat et al. 1992; Chauchat et al. 2004; Malpass 1983; Ossa 1973). These tools are typically thick to nearly triangular in cross-section, having one flat (unworked) face. Lateral edges tend to be symmetrical and may contain very steep flake removal that results in a prominent central ridge down the length of the obverse face of the tool. The proximal end may evince an extant flake platform or be pointed to rounded. Seven (n=7) examples in the QBT assemblage were clearly made on flakes (extant platform on the proximal end; bulb of force still visible on the unmodified ventral surface). The distal end may be fine-pointed to rounded. Cortex is absent on the ventral surface and is rarely present on the dorsal surface. Only two (n=2; 2.6% of all limaces) examples in the QBT assemblage contained dorsal cortex.

Limaces are well known from Early Preceramic sites across much of the North Coast region and are widely considered to be associated with the Paiján complex (Chauchat 1988; Dillehay 2000; Lavallée 2000; Ossa 1973). Interestingly, limaces do not appear to be present in Early Preceramic assemblages from far northern Perú and southern Ecuador, such as at Talara (Richardson 1978, 1973) or Las Vegas (Stothert

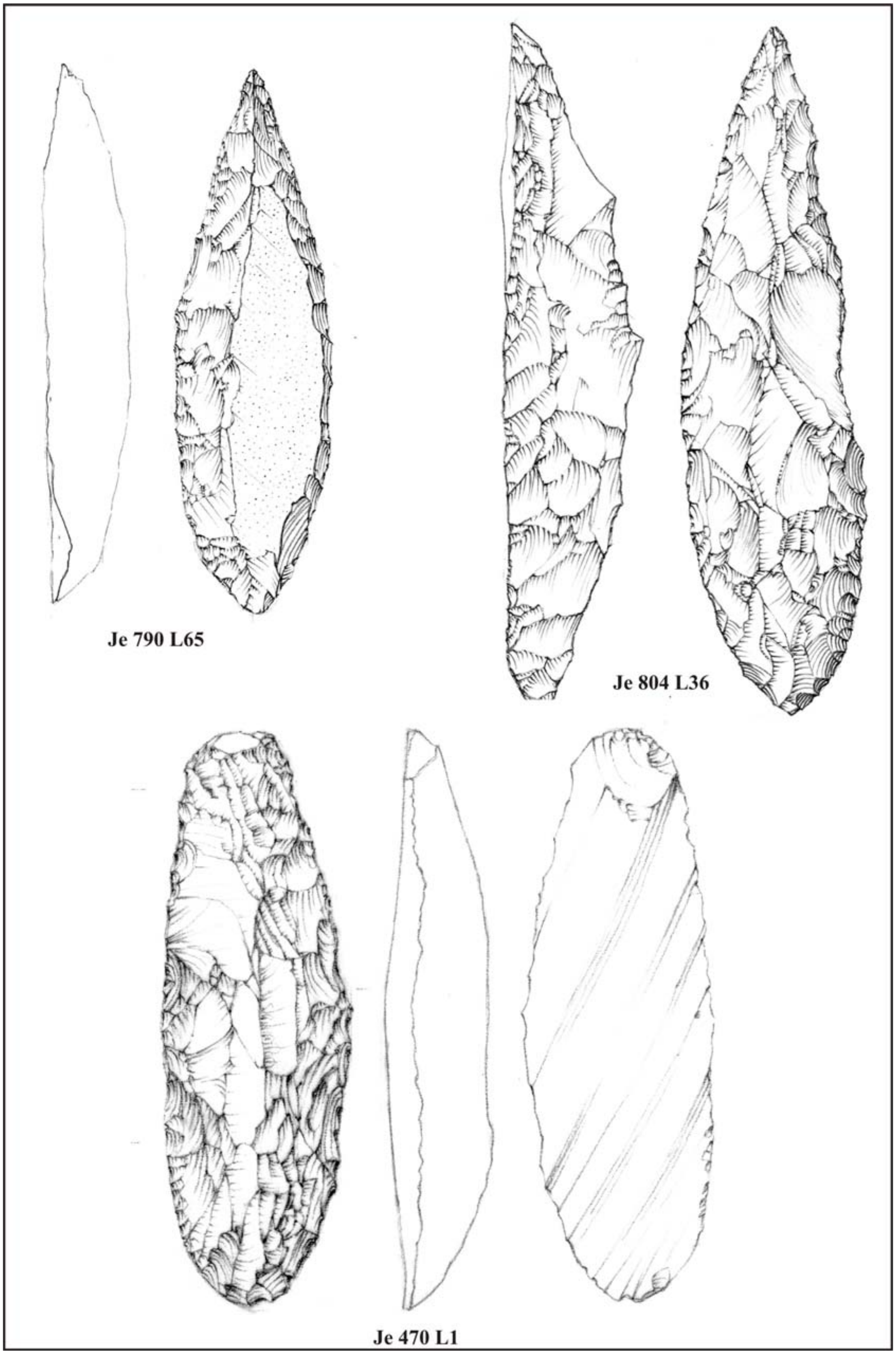

Figure 8.5. Examples of limaces in the QBT assemblage (actual size).

1985), in Paiján and later occupations in the Casma Valley (Malpass 1983), in Early Preceramic assemblages from the northern and central Peruvian highlands (Rick 1980; Rick and Moore 1999), or apparently, in the Early Preceramic assemblages from southern Perú (Lavallée et al. 1999; Sandwiess et al. 1989; Sievert and Wise 2001; Wise 1999). The relatively limited archaeological expression of limaces is suggestive of a somewhat geographically and temporally restricted tool form that may be related to specific Late Pleistocene environmental conditions (such as the forested slopes or mixed parkland-forests of the coastal quebrada drainages) and/or specific technological traditions that were present only in the coastal quebradas in part of the north coast region (limaces are known from approximately the Moche to Zaña Valleys).

It is unclear at present what the specific function of limaces may have been, although they have been suggested to have functioned in some capacity as woodworking implements (Chauchat et al. 2004; Dillehay 2000). This suggestion seems reasonable given the 'heavy-duty' appearance of the tool (i.e., thick in cross-section, typically large and heavy, and steep-sided) (see Table 8.13).[4] Regardless of their specific function, limaces were apparently subjected to serious stress during use and are commonly found with transverse hinge fractures across the medial or distal portions that resulted in tool failure. Among the limaces in the QBT assemblage, 46 were complete (unbroken) tools and 30 were fragments. Within the fragments, seven (n=7; 9.2% of all limaces; 23.3% of all limace fragments) contained transverse hinge fractures. Two additional examples were broken across the medial section and were reworked/recycled for continued use.

Table 8.13. Metric attributes of complete limaces.

Attribute	Number	Minimum Value	Maximum Value	Mean	Standard Deviation
Length	39	6.9	13.2	9.8	1.44
Width	39	2.3	5.6	3.1	0.64
Thickness	39	0.9	3.9	1.8	0.54
Weight (g)	39	23.8	265.0	61.6	41.67

[4] Metric variables were not recorded for seven complete Limaces and two Limace fragments collected during the 1999 and 2000 field seasons under the Proyecto Pacasmayo (Dillehay and Kolata 2000).

Table 8.14. Limaces and limace fragments by raw material.

Raw Materials	Number	%
Quartzite, VFG (Toba)	44	57.89%
Basalt, FG	23	30.26%
Quartzite, FG	2	2.63%
Quartzite, CG	1	1.32%
Rhyolite	1	1.32%
Quartzite, VFG (Green)	1	1.32%
Quartz (Semi-opaque)	1	1.32%
Chalcedony (Mottled blue/white/red)	1	1.32%
Chalcedony (Mottled white/tan)	1	1.32%
Silex (Mottled brown)	1	1.32%
Total	**76**	**100.00%**

Raw materials used for the manufacture of all limaces and limace fragments in the QBT assemblage lend some support to the characterization of limaces as heavy-duty tools. As Table 8.14 illustrates, QBT limaces were overwhelmingly manufactured from very fine-grained quartzite (Toba) and fine-grained basalt. Both of these raw materials, along with fine- and coarse-grained quartzites, rhyolite, and quartz (semi-opaque) are locally available materials that are relatively hard and resistant to accidental fracture (personal observation, based on knapping experimentation).

Interestingly, however, QBT limaces also were manufactured from a relatively wide variety (albeit in very limited numbers) of non-local and uncommon raw materials. These include the relatively rare Green variety of very fine-grained quartzite and the non-local (exotic) chalcedonies and silex (which are likely from highland sources to the east of the project area). These materials are not as hard or durable as the more commonly used quartzites and basalts. It is not surprising then that of all the uncommon and non-local raw materials represented, only a single (n=1) example is unbroken (very fine-grained quartzite [Green]).

It is unclear if all limaces were designed for similar functions. Within the QBT assemblage, three distinct sub-types of Limaces were recognized: Lenticular (n=32); Bi-pointed (n=8); and Rounded (n=3) (Figure 8.6). The Lenticular sub-type (n=32) is by far the most common limace form and is characterized by a rounded to sub-rounded proximal end with straight to convex parallel lateral margins that converge to form a sub-rounded to pointed distal tip. The Bi-pointed sub-type (n=8) is second most prevalent

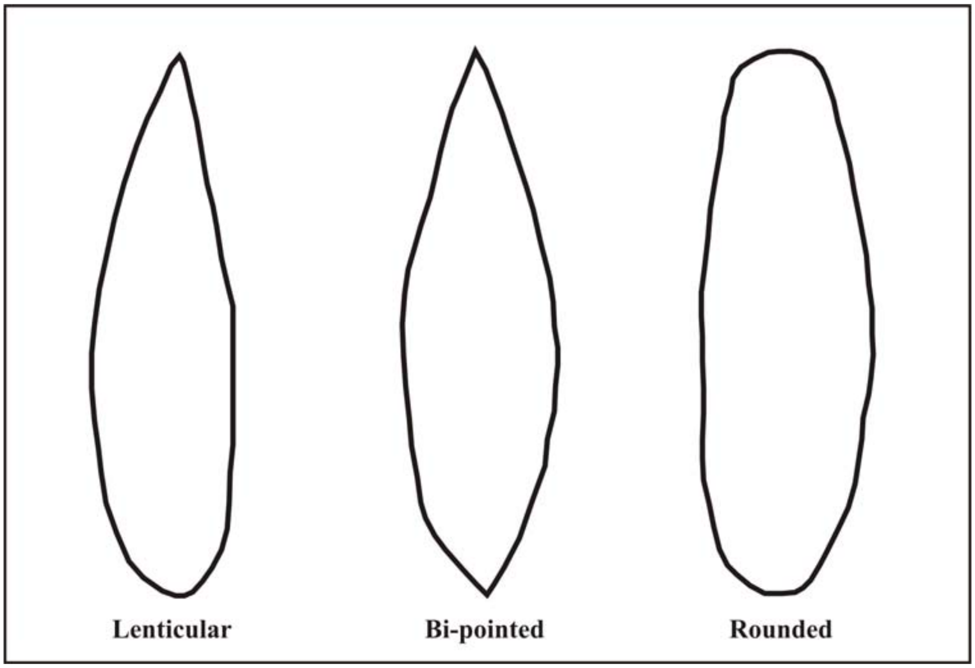

Figure 8.6. Limace sub-types in the QBT assemblage.

limace form and is similar in overall form to the Lenticular sub-type with the notable exception that both the distal and proximal ends are pointed to fine-pointed. The Rounded sub-type (n=3) is the least common limace form and is recognizable by rounded proximal and distal ends. Lateral edges may be straight to convex.

In addition to the three main sub-types three variant forms were also observed in the QBT assemblage. Each of these forms is represented by a single example and considered unique. The first is a large (probably lenticular) limace that has non-parallel lateral edges. The second appears to be a Bi-pointed form that has been partially bifacially worked—some thinning and/or resharpening flakes removed from the ventral surface. The third variant is a small non-parallel sided limace that did not approximate any of the identified sub-types. It is possible that the two non-parallel sided examples represent unfinished tools that were abandoned during manufacture.

The mean size of each of the three main limace sub-types is presented in Table 8.15. Aside from the unique variants, the Lenticular form tends to be heavier, wider, and thicker than the other sub-types. The Bi-pointed form, in contrast, tends to be long, narrow, and weigh less than the other two forms. The Rounded form is typically short,

Table 8.15. Metric attributes of limace sub-types and variants.

Limace Sub-type	N	Mean Length	Mean Width	Mean Thickness	Mean Weight (g)
Lenticular	27	9.76	3.19	1.85	65.17
Bi-pointed	7	10.14	2.77	1.62	46.17
Rounded	2	8.43	3.16	1.38	49.45
Variants*	3	10.52	3.5	1.83	73.33

* Represents unique specimens and not a separate sub-type. Included for comparison only.

Table 8.16. Limace sub-types and variants by raw material.

Raw Materials	Lenticular	Bi-pointed	Rounded	Variants*	Total	% of Complete Limaces
Quartzite, VFG (Toba)	20	3	2	3	28	60.87%
Basalt, FG	11	4	1	0	16	34.78%
Quartzite, VFG (Green)	0	1	0	0	1	2.17%
Quartzite, FG	1	0	0	0	1	2.17%
Total	**32**	**8**	**3**	**3**	**46**	**100.00%**

* Represents unique specimens and not a separate sub-type. Included for comparison only.

wide, and thin. It is impossible from the metric data alone to say if the different sub-type forms are indicative of different intended tool use.

Raw materials used in the manufacture of the different limace sub-types mirror those of the overall limace tool class (see Table 8.14). Table 8.16 breaks down the raw materials used in the manufacture of each limace sub-type and indicates an overwhelming preference for very fine-grained quartzites (specifically the Toba variety) and fine-grained basalt. In general, there are no clear differences between the raw materials used in the manufacture of the different sub-types.

It is unclear if the distinct limace sub-types represent tool designs for intended for different functions. However, there are subtle differences in the sizes of the distinct sub-types identified in the QBT assemblage. This fact, combined with the observable variation in tool form (i.e., pointed, bi-pointed, rounded) minimally suggests a possibility that the different limace forms may represent functionally distinct tools or that these tools functioned in various different capacities. It is possible that some of the different limace forms are temporally distinct and/or related to different early groups that occupied the

QBT (i.e., Fishtail, Early and Late Paiján). At present, however, there is not enough context-specific data for the different forms to assess this possibility.

Chauchat and others have suggested that limaces are likely the end-stage (discarded tools) of larger ovate unifaces that have been retouched/resharpened to the point of exhaustion (Chauchat et al. 2004: 109-110). Simply, they suggest that ovate uniface forms (which are discussed below) are resharpened along the long lateral edges as they became dull through use, resulting in a narrowing of tool width and the development of the prominent central ridge with the successive removal of increasingly steep-angle retouch on only the dorsal surface. It is for this reason that Chauchat includes limaces within discussions of other unifaces and does not consider them a separate class of tool (ibid.).

However, as is discussed in the following section, several different forms (sub-types) of formal unifaces are present within Early Preceramic assemblages on the north coast. It is possible that one or more of these forms do represent tools that were successively resharpened into limaces (e.g., ovate, tear-drop, non-parallel, and small bi-pointed forms). The mean thickness of each of these forms is similar enough to that of the complete limaces in the QBT assemblage to indicate that the various limace forms may have derived from the unifaces. In contrast, the mean lengths of the limaces and unifaces in the QBT assemblage indicates that complete limaces tend to be longer than complete unifaces, with the exception of the adze sub-type (see Tables 8.15 and 8.18).

It is impossible for a resharpened tool to become longer over successive rejuvenations (only thinner and narrower), which argues strongly against the idea that limaces are derived from the various uniface tool forms. Clearly, limaces were

Table 8.17. Metric attributes of complete unifaces.

Attribute	Number*	Minimum Value	Maximum Value	Mean Value	Standard Deviation
Length	52	3.6	12.6	7.8	1.84
Width	52	2.3	7.1	4.1	1.19
Thickness	52	0.9	3.6	1.8	0.65
Weight (g)	52	9.3	300.0	74.3	58.26

*Metric variables were not recorded for thirteen complete uniface collected during the 1999 and 2000 field seasons under the Proyecto Pacasmayo (Dillehay and Kolata 2000).

Table 8.18. Metric attributes of uniface sub-types.

Uniface Sub-type	N*	Mean Length	Mean Width	Mean Thickness	Mean Weight (g)
Ovate	25	8.13	4.29	1.99	88.09
Tear-drop	15	7.44	3.9	1.64	53.07
Waisted	4	8.52	5.59	2.34	136.26
Non-parallel	4	8.02	3.85	1.95	59.08
Small Bi-pointed	2	7.4	3.13	1.4	33.2
Triangular	2	3.75	2.71	0.91	9.6

*Metric variables were not recorded for thirteen complete uniface collected during the 1999 and 2000 field seasons under the Proyecto Pacasmayo (Dillehay and Kolata 2000).

resharpened over time and indicate a curated tool, but that resharpening does not necessarily suggest that these tools were derived from a separate uniface form. Rather, it is suggested here that limaces are an intentional design related to specific intended functions (i.e., a distinct class of formal tools).

A second line of evidence that argues against the idea that limaces represent the exhausted form of unifaces is the fact that many of the broken limaces (23.3% of all limace fragments) exhibit transverse hinge fractures. As was discussed above, these fractures are suggestive of heavy stress and flexing during use that result in tool failure. Exhausted tools (i.e., limaces derived from unifaces) typically would not be used in heavy stress applications unless the tool had been recycled into other functions—which is certainly probable (Bamforth 1986; Bleed 1986; Nelson 1991; Torrence 1989). However, it seems more likely that the design of limace tools reflects an intended use in heavy stress functions that were distinct from the various uniface forms. Limaces would have been discarded when broken (or occasionally recycled into other uses [n=2 examples in the QBT assemblage]), which rendered them unusable in the capacity for which they were designed.

When discussing the function of limaces, we are limited by relatively small sample sizes and a lack of understanding as to which activities this general class of tool may be related. This study has attempted to identify patterned variation within the limace class and has presented some specific morphological, metric, and raw material patterns that appear to reinforce the notion that limaces were a ‘heavy duty’ tool subjected to high stress applications. Use in woodworking and/or woodworking-related activities remain our best estimations of limace function (Chauchat et al. 2004; Chauchat et al. 1992;

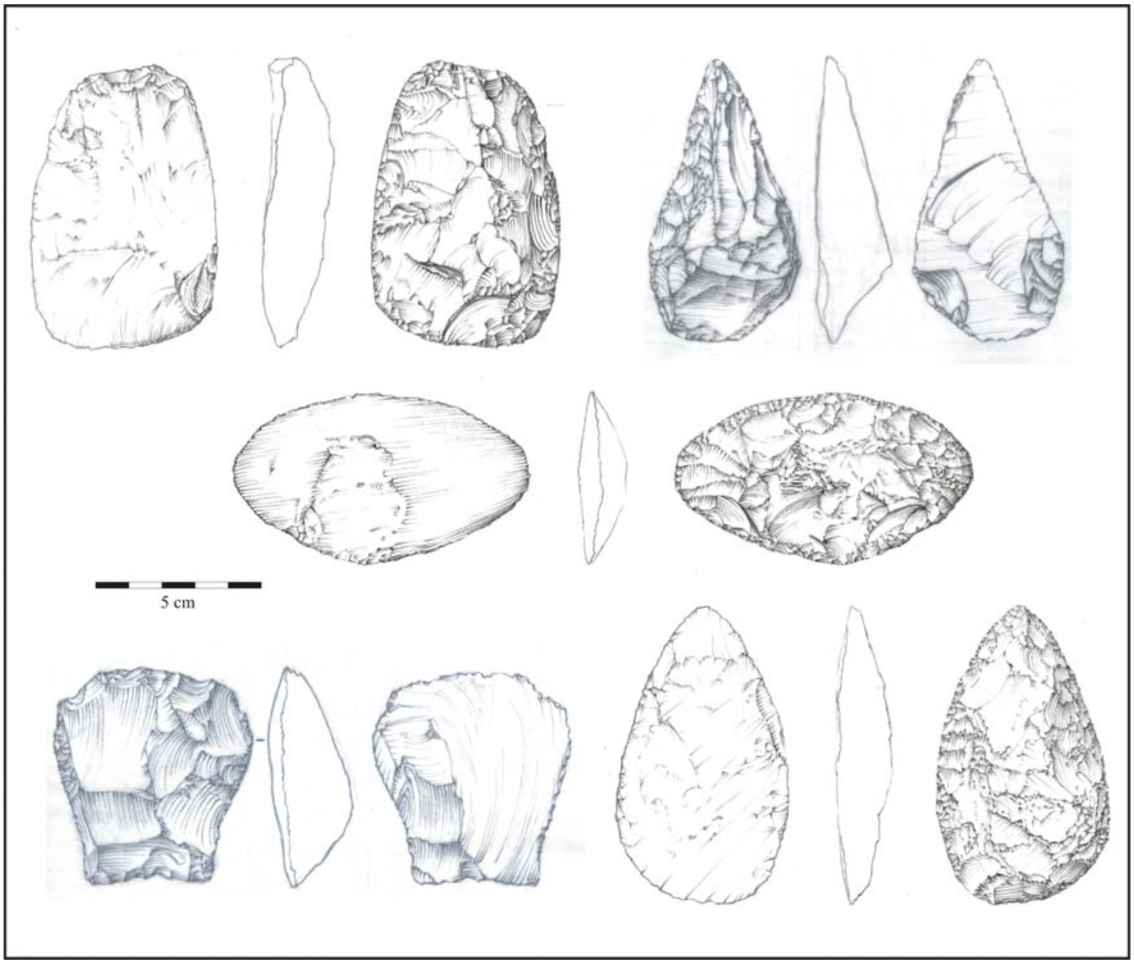

Figure 8.7. Examples of unifaces in the QBT assemblage.

Dillehay 2000). These activities seem especially probable given the geographically restricted manifestation of limaces—appearing only in Early Preceramic contexts in the coastal quebrada systems of the north coast region—in areas believed to have been forested and mixed parkland-forest environments during the Late Pleistocene.

<u>Uniface and Uniface Fragments</u>

A total of 106 unifaces and uniface fragments (102 from survey, 4 from excavation) were collected from 49 sites in the Quebradas del Batán and Talambo and represent 10.2% of the total number of lithic tools. Unifaces are produced through the systematic or unsystematic (dependent on formal or informal form) primary, secondary, and/or tertiary flake removal from one tool face—typically the dorsal surface of a flake blank (platform and bulb of force are commonly visible) (Figure 8.7). Cortex may be commonly present on the dorsal surface. However, among the unifaces in the QBT assemblage, only four (n=4; 3.8% of all unifaces) contained cortex. Secondary and/or tertiary flaking may be present on one or both lateral margins, and on the distal and proximal end.

The uniface tool class encompasses both formal and informal tool forms, some of which apparently had long anticipated use-lives while others represent more expedient tools. It is recognized that retouched flakes and utilized flakes, along with the formal forms presented here, are different kinds of tools within the same class. However, only the formal unifacial forms will be presented in this section. Retouched and utilized flakes are presented in separate sections. The reason for this is that formal tools with long anticipated use-lives represent a technological strategy that is distinct from that of flake-based expedient manufacture and warrant separate discussion.

Most typological discussions involving unifaces are predominantly centered on the various forms of retouched and utilized flakes that comprise those particular assemblages (see Malpass 1983; Rick 1980; Richardson 1981, 1978; Rossen 1991; Stackelbeck 2008). This is an important distinction with Early Preceramic QBT assemblage, which contains several formal unifacial forms—in addition to retouched and utilized flakes. Retouched flakes are generally considered to be an informal, expedient tool (Andrefsky 1998; Odell 2003; Rossen 1998, 1991). Formal unifaces, in contrast, represent intentional designs for repeated maintenance—like projectile points or limaces. This distinction has important implications for characterizing the functions of these tools and the technological strategies of their manufacturers. The key feature that separates formal unifaces from retouched flakes is that they demonstrate purposeful flaking and *shaping* (i.e., not use scars) around the entire margin of the tool on one face resulting in the intended tool form (predetermined design).

Table 8.17 presents the mean size of the complete (unbroken) unifaces (n=65) in the QBT assemblage. As Table 8.17 illustrates, unifaces vary widely in size and shape and may be thick or thin in cross-section, and relatively wide or narrow in width. They may or may not be latitudinally or longitudinally symmetrical. The variability in uniface shape and size is most likely directly attributable to the wide range of potential tool functions that have been suggested for this tool class, including cutting, chopping, scraping, butchering, woodworking (planing and graving), and digging among others (Chauchat 1988; Chauchat et al. 1992; Chauchat et al. 2004; Dillehay 2000; Gálvez 2003, personal communication; Rossen 1991).

A wide range of unifacial tool forms have been documented in Preceramic assemblages in the North Coast region (Briceño 1999; Chauchat 1998, 1988; Chauchat et al. 2004; Dillehay 2000; Dillehay et al. 1992; Gálvez 1992; Malpass 1983; Ossa 1973; Richardson 1981; Rossen 1991; Rossen and Dillehay 1999; Stackelbeck 2008; Uceda 1992) and the north and central Peruvian highlands (Kaulicke 1999; Lynch 1980; Rick 1980; Rick and Moore 1999). Some of the observed forms include ovate, tear-drop, crescent, lanceolate-like, sub-rectangular, and waisted. At present, however, we do not understand if any functional differences exist between the different unifacial forms or if the separate forms are temporally or spatially associated with specific Early Preceramic complexes.

Within the QBT assemblage, six distinct sub-types of unifaces were identified (Figure 8.8), including: ovate (n=32); tear-drop (n=20); waisted (n=5); non-parallel (n=4); small bi-pointed (n=2); and triangular (n=2). The ovate sub-type is characterized by a sub-rectangular to oval-shaped lateral margin and is the most prevalent formal unifacial form. The tear-drop form is characterized by a rounded to ovate proximal end with roughly parallel lateral margins that converge to form a pointed distal end. Together, the ovate and tear-drop sub-types account for 80% of the complete unifaces in the QBT assemblage.

The remaining 20% (n=13) of complete unifaces are representative of four additional sub-types (Figure 8.8). The waisted sub-type (n=5) is characterized by indentations on the proximal end and parallel lateral margins that form a broad, rounded distal end (Figure 8.9). The distal end is typically steeply beveled and often indicates resharpening. The lateral edges within the waisted proximal end are often ground, suggesting that this form was likely a hafted tool. Waisted unifaces have not been previously discussed for North Coast Preceramic assemblages; however Lynch (1980) identified a similar form at Guitarrero Cave in the Callejón de Huaylas (Central Peruvian highlands) that was interpreted as a steep-ended scraper.

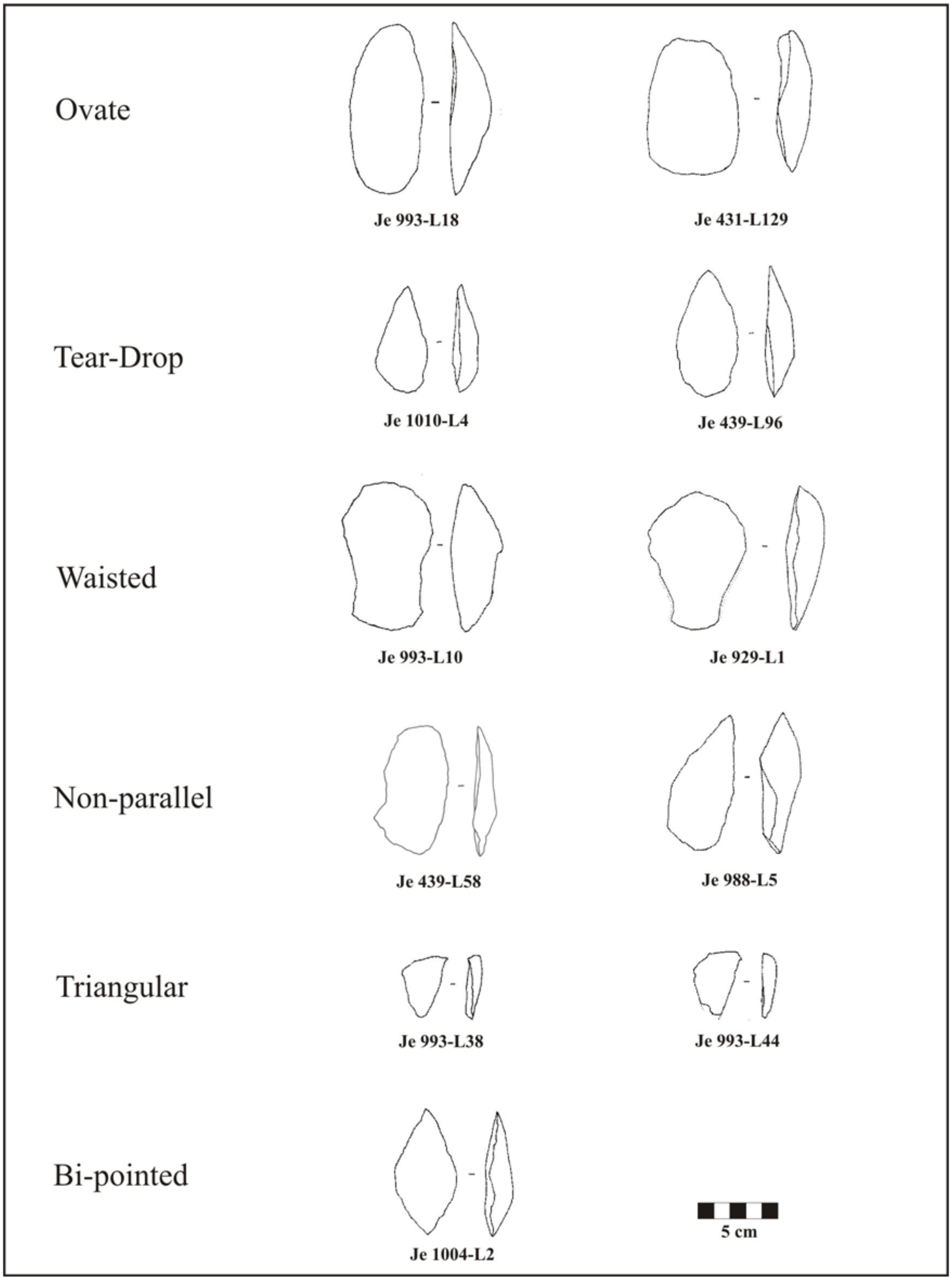

Figure 8.8. QBT assemblage uniface sub-types.

Figure 8.9. Examples of Waisted sub-type unifaces in the QBT assemblage.

The non-parallel (n=4) sub-type is characterized by a rounded proximal end and lacks symmetrical lateral margins. The distal end may be rounded to pointed. It is possible that non-parallel unifaces represent broken and/or reworked examples of either the ovate or tear-drop forms. However, in the absence of larger sample sizes, they are considered to represent a distinct sub-type of unifaces.

Triangular (n=2) and small bi-pointed (n=2) represent the final two uniface sub-types. The triangular form is characterized by small size, a general three-sided appearance, and the presence of a 'spur' or graver that protrudes from one corner (see Figure 8.8). Both the triangular unifaces that were identified in the QBT assemblage were recovered from a single site (Je 993).

The small bi-pointed sub-type is similar in form to the more common tear-drop form, but is distinguished by a pointed proximal end—in addition to the pointed distal. The small bi-pointed form was identified on two sites within the QBT assemblage (Je 851 and Je 1004). It is also possible that the small bi-pointed form is a variant of the limace tool class. This sub-type is included with the unifaces because they are shorter, generally thinner, and weigh less than any of the identified limace sub-types (see Tables 8.15 and

8.18). It is possible, however, that the small bi-pointed form represents a heavily resharpened limace form.

The mean sizes for each of the uniface sub-types are presented in Table 8.18. The mean size of waisted unifaces tends to be larger and substantially heavier than any of the other sub-types. In contrast, the triangular sub-type unifaces are shorter, thinner, and weigh substantially less than any other sub-type. The ovate, tear-drop, and non-parallel forms are all of roughly similar sizes—although the ovate form does tend to be heavier than the tear-drop and non-parallel forms. The small bi-pointed sub-type is smaller and lighter than all other sub-types, except triangular. Although there are some clear distinctions in the mean sizes of the uniface sub-types, these patterns tell us little about the function of these tools, with the exception that they were likely designed for different intended uses (Bleed 1986; Hayden et al. 1996; Nelson 1991; Torrence 1994). The metric data does, however, reinforce the typological distinctions made in this study based on tool form.

In contrast to the metric data, the pattern of raw material use is relatively similar across all uniface sub-types (Table 8.19). Very fine-grained quartzite (Toba) is the most

Table 8.19. Uniface sub-types by raw material.

Raw Material	**Ovate**	**Tear-drop**	**Waisted**	**Non-parallel**	**Small Bipointed**	**Triangular**	**Total**	**% of Complete Unifaces**
Quartzite, VFG (Toba)	22	12	4	1	1	1	41	63.08%
Basalt, FG	4	5	1	2	1	0	12	18.46%
Quartzite, FG	1	1	0	1	0	0	4	6.15%
Quartzite, CG	2	0	0	0	0	0	2	3.08%
Silex (Tiger stripe)	1	0	0	0	0	1	2	3.08%
Quartzite, VFG (Green)	0	1	0	0	0	0	1	1.54%
Silex (Mottled White)	1	0	0	0	0	0	1	1.54%
Chalcedony (MBWR)	0	1	0	0	0	0	1	1.54%
Quartz (Semi-opaque)	1	0	0	0	0	0	1	1.54%
Total	**32**	**20**	**5**	**4**	**2**	**2**	**65**	**100.00%**

common raw material (63.08% of complete unifaces) used in the manufacture of unifaces in the QBT assemblage. Fine-grained basalts and quartzites are less common, but still relatively frequent (18.46% and 6.15%, respectively). In general, the QBT unifaces tend to be made from locally available, relatively hard and durable raw materials. There are, however, a few examples of unifacial tools that were manufactured from varieties of non-local materials—including silex (n=3) and chalcedony (n=1)—that are softer and less durable than the more frequently used quartzites and basalts. The unifaces made from non-local materials represent several different sub-types (ovate, tear-drop, and triangular) and are not suggestive of a pattern of raw material selection for a specific sub-type. Interestingly—and similar to the limaces—none of the complete unifaces in the QBT assemblage were manufactured from rhyolite (only one broken uniface fragment [n=1; 0.94% of all unifaces and uniface fragments] was manufactured from rhyolite).

In sum, the unifaces in the QBT assemblage indicate patterned variation in size and gross shape, but do not indicate similar variability in the raw materials used for their manufacture. The fact that the vast majority of unifaces, regardless of sub-type, were manufactured from locally available stone does not provide us with much insight into potential differences in function. However, the prevalence of local stone is suggestive of a pattern of raw material selection that is consistent with relatively low mobility and localized resource procurement (Andrefsky 1998; Bamforth 1986; Binford 1980; Church 1994; Odell 2003).

As mentioned above, unifaces are often characterized as expedient tools (Andrefsky 1998; Odell 2003; Rossen 1991; Sievert and Wise 2001; Stackelbeck 2008). However, the presence of both formal and informal uniface forms within the general tool class is indicative of a more complex pattern that does not follow standard curated vs. expedient technological dichotomies (Amick and Carr 1996; Bamforth 1986; Binford 1980, 1979; Henry 1989b; Nash 1996; Nelson 1991; Odell 2003, 1996a). Specifically, the QBT assemblage contains both formal (formal uniface sub-types) and informal (retouched and utilized flake) tool forms. The effort invested in the manufacture and maintenance of the waisted (which was likely hafted), oval, tear-drop, non-parallel, and bi-pointed sub-types is clearly greater than that of informal tool forms and was likely similar to that of Early Preceramic bifaces. The triangular sub-type more closely resembles retouched flakes (and other flake-based strategies) in terms of effort expended in manufacture. However, this specific form may be geographically widespread as similar examples have been documented in Ecuador (Bell 2000) and Central America (Acosta 2008)—perhaps suggesting a repeated, formal design.

The specific function of the different formal and expedient sub-types remains speculative. It is likely that the different forms had similar and/or overlapping uses. At present, however, we do not understand if the observable patterns in tool design represent different intended functions for individual forms or specific tool types from unrelated, contemporaneous lithic industries (i.e., Fishtail, Paiján, or other). For example, it is possible that some of the sub-types are related to the Fishtail complex and others are related to the Paiján—rendering the use of the different sub-types as discreet cultural markers problematic. It is also possible that the various forms of unifaces represent tools designed to meet a suite of potential functions that were common to the economy of each of the Early Preceramic complexes that inhabited the north coast.

It is clear, however, that formal unifaces—and limaces—were an integral component of Early Preceramic toolkits. On a daily basis, perhaps more important than their bifacial counterparts, given the wide variety of potential functions these tools could have fulfilled and the fact that many were apparently successively resharpened. The varied sub-types of unifaces present in the QBT assemblage argue strongly against the notion of equating unifacial technology with expediency. The formal uniface sub-types identified here are not expedient tools. It has become clear that unifacial technology (as a whole) encompasses both formal and informal manufacturing strategies that cannot be neatly parsed into the standard curated vs. expedient framework or within the standard debris and discard pattern associated with bifacial reduction. Rather, for assemblages that contain both formal and informal uniface forms, we must begin to consider the prevalence or frequency of individual types/sub-types and begin to relate these to specific manufacturing strategies.

Retouched Flakes

A total of 125 retouched flakes (121 from survey and 4 from excavation) were recovered from 53 sites in the QBT region and represent 12.08% of the total number of lithic tools. Retouched flakes represent any class of flake with evidence of tertiary flaking (i.e., pressure retouch) to produce a specific, modified tool edge along any or all lateral margins (Figure 8.10). Retouch may be present on either the dorsal or ventral surfaces, although dorsal surface retouch is the most common. Retouched flakes are generally thin in cross-section and may or may not be symmetrical along the latitudinal and longitudinal axes—reflecting the original shape of the detached flake. Facets from subsequent flake removals may or may not be present on the dorsal flake surface. Extant cortex on the dorsal tool surface may be common. Among the retouched flakes in the Early Preceramic QBT assemblage 23 examples (n=23; 18.4% of all retouched flakes) contained cortex.

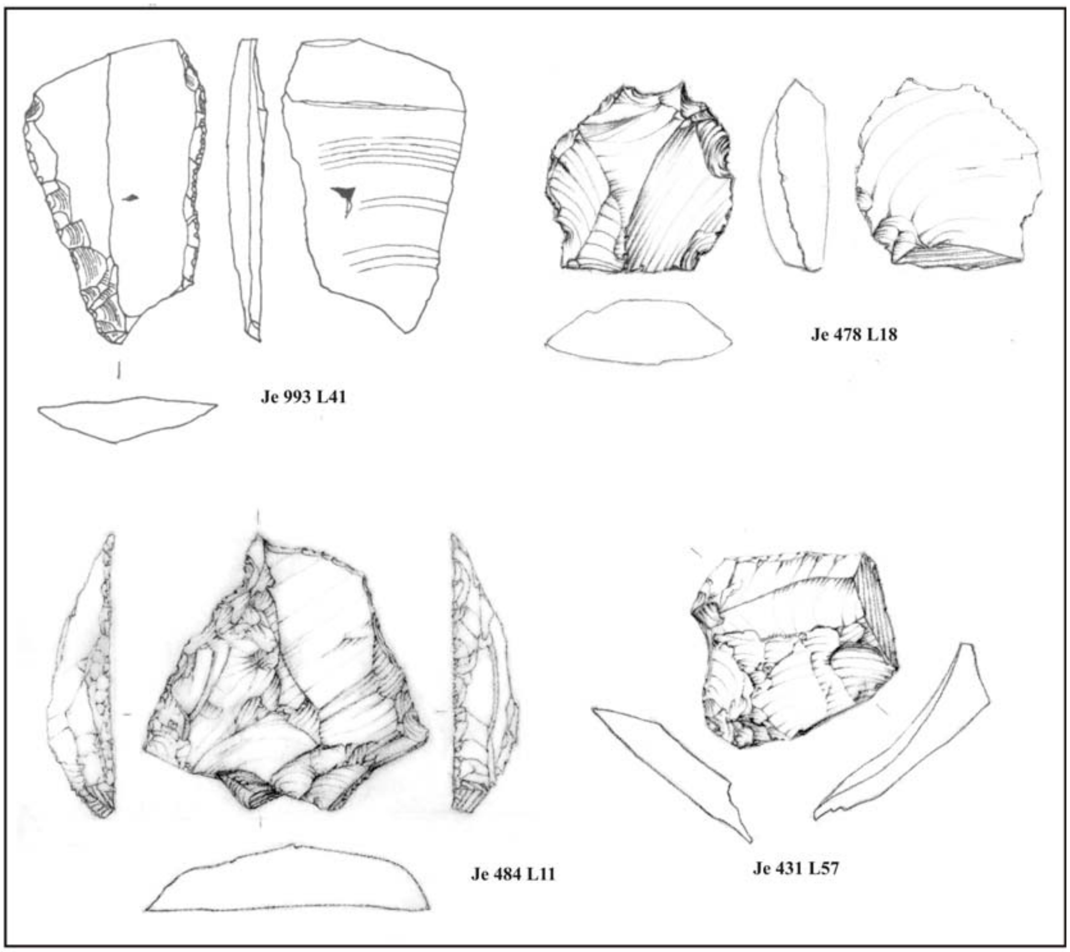

Figure 8.10. Examples of retouched flakes in the QBT assemblage (actual size).

Retouched flakes are generally considered to be informal, expedient tools (Andrefsky 1998; Odell 2003; Rossen 1998, 1991). Unlike formal unifaces, which represent intentional designs for repeated use and maintenance, retouched flakes generally are intended for situational and short-term (i.e., expedient) use. The specific amount of retouch involved in producing a serviceable tool edge can vary substantially between individual tools from minimal to extensive. The amount and location of retouch is likely related to the particular activity or activities for which the tool functioned.

Several previous analyses of expedient, flake-based technologies in the north coast region have been conducted (see Dillehay and Netherly 1983; Dillehay and Rossen 2001; Dillehay et al. 1997; Malpass 1983; Richardson 1978, 1973; Rossen 1998, 1991; Stackelbeck 2008). Each of these studies focused on assemblages that lacked bifaces and were characterized by simple utilized flakes and retouched flakes. The results of these studies indicate three important trends in expedient assemblages, including: 1) heavy reliance on locally available raw materials—to the near exclusion of 'exotic' or non-local materials; 2) multiple different forms of expedient tools may exist within an assemblage; and 3) flakes that are used as tools may be directly produced—as the end product of reduction—or scavenged byproducts from the production of formal tools.

The last trend is, perhaps, the most interesting in terms of understanding and characterizing expedient technologies. In assemblages where bifaces or formal unifaces are present, the production of flakes for use as tools is often considered ancillary to the perceived goal of lithic manufacture (i.e., formal tool manufacture) (see Chauchat et al. 2004; Rasmussen 1998). In this sense, the production of flakes for use as tools becomes an 'embedded' component of the overall lithic technological strategy. Thus, these assemblages contain expedient tools, but are typically not considered representative of expedient technological strategies.

In assemblages that do not contain bifaces and/or formal unifaces, the production of flakes for use as tools is the end product, or goal, of the lithic technological strategy (Andrefsky 1998; Odell 2003). These are the quintessential examples of an expedient technological strategy. Because they are recognized as expedient strategies, they allow for more detailed modeling of the process of flake production and tool manufacture.

Thus, if formal tools are present, expedient tools are byproducts of lithic manufacture. If no formal tools are present, expedient tools are the end products of lithic manufacture. This dichotomy is purposefully simplified to highlight the particular problem for understanding Early Preceramic assemblages of the north coast, where both formal and expedient technologies are contemporary and overlapping (Dillehay 2000; Lavallée 2000). Can we discriminate between the retouched and utilized flakes that were embedded products of tool manufacture and those that were end products? If we can gain insight into the production of these tools, we can begin to make inferences regarding specific lithic technological strategies—and consequently, the mobility and settlement strategies of the tool manufacturers.

Within the Middle Preceramic Nanchoc Lithic Tradition assemblages of the upper Zaña Valley, Rossen (1998, 1991) was able to identify 26 recurring forms among the expedient tool assemblage that included core tools, denticulates, and quadrilateral, semi-lunar, triangular, and pentagonal flakes, among others. The production of expedient tools occurred along three stages that involved the amount of reduction (e.g., core versus secondary flakes) and the presence of retouch (Rossen 1998: 273).

Stackelbeck (2008: 394) used a similar, but modified approach to model the production of retouched flakes and formal unifaces in the lower Jequetepeque Valley. In her model, unifacial tools are also produced along a three stage trajectory that is defined by amount of reduction and presence of retouch. This model incorporates the presence of waste flakes (or debitage) in the reduction process and allows for greater insight into the particular stage at which an expedient or formal unifacial tool leaves the reduction process. The results of her study indicated that retouched flakes were manufactured on a wider range of flake categories (e.g., core fragments, cortical flakes, interior flakes, and flake fragments), than simple utilized flakes (which are primarily made on interior flakes and flake fragments) and were an intended end product (along with formal unifacial tools) of the lithic technology (Stackelbeck 2008: 392-400).

In both of these models, retouched flakes are classified to the final stage (Stage 3) of expedient lithic reduction (Rossen 1998: 273; Stackelbeck 2008: 394). For Rossen (1991), retouched flakes are but one of several distinct expedient tool forms. In contrast, Stackelbeck (2008) sees retouched flakes as one of the intended end products of a unifacial lithic technology.

Based on the results of these studies, we may expect to see a relatively wide range in the patterning, amount, and location of retouch on individual expedient tools—resulting in a number of distinct, recurring forms (Odell 2003; Rossen 1991; Stackelbeck 2008). The specific kinds of flakes and debitage that are used in tool manufacture may also reflect important differences within an assemblage (Stackelbeck 2008). Because retouched flakes are generally produced to fulfill specific, situational needs, we should expect to encounter relatively large numbers of this tool type on sites where wide ranges of activities were undertaken. Relatively high frequencies of retouched flakes may also appear on special purpose or task-oriented sites where specific sets of activities that involved the use of these tools were undertaken.

Among the 125 retouched flakes in the Early Preceramic QBT assemblage four distinct patterns (sub-types) of retouch location have been identified. These include flakes with retouch along one margin (n=42), retouch along two margins (n=54), retouch along multiple margins (n=9), and flakes with a retouched notch (n=3). As Table 8.20 indicates, retouched flakes with the QBT assemblage are generally small in size and have low weights. A few large examples—with lengths exceeding 9-10 cm and weights in excess of 100 grams—are known, but uncommon.

The metric attributes for the four sub-types of retouched flakes are presented in Table 8.21. In general, the different sub-types are similar in terms of gross size and weight. Flakes with retouch along two margins tend to be longer, wider, and weigh more

Table 8.20. Metric Attributes of retouched flakes in the QBT assemblage.

Attribute	Number*	Minimum Value	Maximum Value	Mean	Standard Deviation
Length	107	0.28	13.8	5.62	2.33
Width	107	0.94	8.41	4.14	1.5
Thickness	107	0.38	3.28	1.38	0.57
Weight (g)	107	1.77	300	43.32	47.26

*Metric variables were not recorded for eighteen retouched flakes collected during the 1999 and 2000 field seasons under the Proyecto Pacasmayo (Dillehay and Kolata 2000).

Table 8.21. Metric Attributes of retouched flakes by sub-type.

Retouched Flake Sub-type	N*	Mean Length	Mean Width	Mean Thickness	Mean Weight (g)
One Margin	43	4.97	3.88	1.32	35.44
Two Margin	52	6.31	4.31	1.46	51.77
Multiple Margin	9	5.6	5.11	1.51	45.09
Notched	3	3.12	1.97	0.65	4.33

*Metric variables were not recorded for eighteen retouched flakes collected during the 1999 and 2000 field seasons under the Proyecto Pacasmayo (Dillehay and Kolata 2000).

Table 8.22. Retouched flake sub-types by debitage category.

	Retouched Flake Sub-type				
Flake Category	One Margin	Two Margin	Multiple Margin	Notched	Total
Cortical Flake	0	3 (5.7%)	0	0	3 (2.8%)
Partial Cortical Flake	4 (9.1%)	12 (22.6%)	1 (11.1%)	0	17 (15.6%)
Interior Flake	20 (45.5%)	19 (35.8%)	5 (55.6%)	1 (33.3%)	45 (41.2%)
Lipped Interior Flake	1 (2.3%)	0	1 (11.1%)	0	2 (1.8%)
Flake Fragment	17 (38.6%)	17 (32.1%)	0	2 (66.7%)	36 (33.0%)
Broken Flake	0	1 (1.9%)	2 (22.2%)	0	3 (2.8%)
Shatter	2 (4.5%)	1 (1.9%)	0	0	3 (2.8%)
Total	**44 (100%)**	**53 (100%)**	**9 (100%)**	**3 (100%)**	**109 (100%)**

than other sub-types, but substantial overlap exists in the size ranges of the one margin, two margin, and multiple margin sub-types. There does appear to be clear distinction in both size and weight between the notched sub-type and the other three—with the notched being much smaller and lighter. However, this observation may be a product of the low sample size (n=3) for the notched sub-type rather than an actual difference in size.

Although the metric data provide a rough approximation of the gross size of the different sub-types of retouched flakes, the amount of overlap in size ranges limits the usefulness of this information. The overlap in size among the different sub-types is a direct result of the expedient nature of these tools (Rossen 1991; Stackelbeck 2008). The size of a retouched flake is dependent on the size and character of the original flake on which it is made. Because similar kinds of flakes were used for each sub-type (see Table 8.22), overlapping size ranges among different sub-types are expected.

Following Stackelbeck's (2008) model of expedient tool production, it is more profitable to examine the different sub-types according to the category of flake on which they were made. Table 8.22 presents each of the retouched flake sub-types by flake category. In general, this information indicates that virtually any debitage category—including shatter—could potentially be and was retouched to create a modified tool edge.

Among the categories of flakes used to manufacture retouched flakes, there is a clear preference for interior flakes (n=45; 41.2% of retouched flakes) and flake fragments (n=36; 33% of retouched flakes). Just over 74% (n=81) of all retouched flakes were made from these two flake categories. Flake categories indicative of early core reduction—cortical flakes (n=3; 2.8%) and partial cortical flakes (n=17; 15.6%)—combined represent 18.4% of the retouched flakes. Interestingly, flakes that indicate formal tool reduction (i.e., lipped interior flakes [n=2; 1.8%]) are not well represented among retouched flakes.

Although virtually all debitage categories are represented among retouched flakes, the relatively high frequency of two specific categories may suggest that Early Preceramic tool makers practiced some selectivity in the kinds of flakes that were chosen for retouch. Although not directly applicable to the Early Preceramic assemblages, Stackelbeck's (2008: 394) trajectory model may provide some insight into the question of retouched flakes as embedded products or end products of lithic manufacture. The presence of lipped flakes (n=2; 1.8%)—indicating formal tool reduction—suggest that at least some of the retouched flakes in the QBT assemblage were embedded products of formal tool production. The use of lipped flakes to make retouched tools is not unexpected, given the presence of projectile points and formal unifaces in the assemblage. However, the low frequency of retouched flakes made from lipped flakes is interesting because it seems to suggest that many of the retouched flakes were not embedded products of formal tool manufacture. Rather, they may have been the intended end products.

Still, it is difficult to determine which retouched flakes were produced as embedded or end products because of the relatively high frequencies of flake categories that cross-cut both formal and expedient reduction strategies, such as partial cortical flakes, interior flakes, and flake fragments. The use of different flake categories among the individual retouched flake sub-types provides some insight. In both Stackelbeck's (2008) unifacial trajectory and Rossen's (1991) expedient trajectory, retouched flakes that were produced as end products (i.e., not embedded) made use of the full spectrum of debitage categories.

Among the four different sub-types of retouched flakes in the QBT assemblage, the two margin sub-type contains the widest range of flake categories (Table 8.22). Interestingly, examples of the two margin sub-type are made from every flake category except lipped interior flakes (which are indicators of formal tool manufacture). If we follow the unifacial and expedient trajectory models, the presence of all flake categories—with the conspicuous exception of lipped interior flakes—would seem to indicate that these tools were manufactured as end products, and not embedded byproducts of formal tool manufacture.

The one margin and multiple margin sub-types display a more limited selection of debitage categories. Both also contain examples that were manufactured from lipped interior flakes. This may indicate that these sub-types were manufactured on the flake byproducts of formal tools (i.e., embedded in formal tool production). The few examples of the notched retouched flakes do not allow any significant statements to be made regarding that sub-type.

Thus, there are indications that retouched flakes in the QBT assemblage were produced both as end products *and* embedded byproducts of formal tool manufacture. The presence of two distinct reduction strategies further indicates that both formal and informal (or expedient) lithic technologies may have been operating concurrently—at least at some sites—within the same technological system. Among the Early Preceramic sites in the QBT region, the two margin sub-type co-occurs with either the one margin or multiple margin sub-types on 12 sites (Je 431, 439, 790, 804, 856, 873, 976, 988, 993, 996, 1006, and 1011). Interestingly, the two sub-types (one margin n=46, multiple margin n=9) that appear to represent a formal technology, occur in roughly equivalent numbers (n=55 combined) to that of the two margin sub-type (n=54) that may represent informal tool production.

Formal lithic technologies are usually associated with relatively high mobility and curation strategies. Informal technologies, in contrast, are typically associated with expediency and more restricted mobility or sedentarism (Binford 1980; Kelly 1992; Rossen 1998; Stackelbeck 2000). The indication that both of these technological strategies may be co-operating within assemblages has implications for understanding Early Preceramic mobility and may provide one line of evidence for discriminating between different organizational strategies.

Raw materials used in the manufacture of the retouched flakes in the QBT assemblage are presented by sub-type in Table 8.23. In general, this tool class indicates the use of an extremely wide range of raw material types, including both local and non-local materials. Local raw materials, including very fine-grained quartzite (n=68; 54.4%), fine-grained quartzite (n=22; 17.6%), and fine-grained basalt (n=17; 13.6%), dominate the retouched flake assemblage. Other local materials occur in lesser frequencies, including varieties of quartzes and very fine-grained quartzites. An emphasis on local stone is not unexpected given the typical association of expedient tools with locally available raw materials (Odell 2003; Rossen 1991; Stackelbeck 2008).

Table 8.23. Retouched flakes by raw material.

	Retouched Flake Sub-type						
Raw Material	**One Margin**	**Two Margin**	**Multiple Margin**	**Notched**	**Unassigned**	**Total**	**Frequency**
Quartzite, VFG (Toba)	22	35	6	0	5	**68**	**54.4%**
Quartzite, FG	5	8	1	1	7	**22**	**17.6%**
Basalt, FG	7	7	2	0	1	**17**	**13.6%**
Quartz (semi-opaque)	3	0	0	1	0	**4**	**3.2%**
Chalcedony (mottled red/pink)	1	2	0	0	0	**3**	**2.4%**
Rhyolite	1	1	0	0	0	**2**	**1.6%**
Quartz (opaque)	0	1	0	1	0	**2**	**1.6%**
Chalcedony (semi-translucent brown)	1	0	0	0	0	**1**	**0.8%**
Quartz (crystal)	1	0	0	0	0	**1**	**0.8%**
Silex (mottled white)	1	0	0	0	0	**1**	**0.8%**
Silex (red)	1	0	0	0	0	**1**	**0.8%**
Quartzite, VFG (non-Toba)	1	0	0	0	0	**1**	**0.8%**
Quartzite, VFG (Green)	1	0	0	0	0	**1**	**0.8%**
Basalt, VFG	1	0	0	0	0	**1**	**0.8%**
Total	**46**	**54**	**9**	**3**	**13**	**125**	**100.0%**

However, a relatively wide range of non-local or 'exotic' raw materials were also used (albeit in much lower frequencies) in the manufacture of Early Preceramic retouched flakes. Local materials (n=118) account for 94.4% of the retouched flakes, while non-local materials (n=7) represent only 5.6% of retouched flakes. Varieties of chalcedony and silex, along with very fine-grained basalt comprise the non-local materials in the retouched flake assemblage. If we compare the raw material use for the different sub-types to the previously noted possibility that both formal and informal technological strategies were represented in the assemblage some interesting patterns emerge.

The two margin sub-type—which was thought to represent informal reduction—is almost entirely comprised of local raw materials (n=52; 96.3% of two margin sub-type). Only two examples of a non-local chalcedony (n=2; 3.7% of two margin sub-type) were identified. The one-margin sub-type—which was suggested to represent embedded production—also display heavy reliance on local raw materials (n=41; 89.1% of one margin sub-type). However, this sub-type also indicates a much more frequent use of 'exotic' raw materials (n=5; 10.9% of one margin sub-type). The multiple margin and notched sub-types both are entirely comprised of locally available raw materials.

Thus, the one margin sub-type (embedded production) indicates the use of a relatively wide range of non-local materials, while the two margin sub-type (end product manufacture) displays limited use of non-local materials. These patterns are based on relatively low frequencies, but they mirror what we would expect between formal and informal technologies. Formal technologies are typically considered characteristic of groups with higher mobility and exotic materials are often considered indicative of that high mobility (Andrefsky 1998; Binford 1980; Bamforth 1986; Ingbar 1994; Kelly 1992). Informal technologies, in contrast, are typically equated with reduced mobility and an increased use of local materials.

This lends support to the suggestion that the one margin and two margin sub-types represent retouched flakes produced according to different lithic reduction strategies (formal and informal). It is possible the two manufacturing trends noted among the QBT retouched flakes are indicative of two groups with distinct reduction strategies, or a single group that made use of both strategies to produce tools for different functions.

At present, it is not clear if a functional difference exists between retouched flakes produced as end products or embedded byproducts. The mean sizes of the different sub-types are highly similar and may suggest similar functions regardless of sub-type.

A single retouched flake, recovered from an excavation context (FS#315.1.1; Je 996 TU1), was subjected to microwear analysis. This artifact is an example of the one margin sub-type and contains numerous small abrasion tracks oriented perpendicular to the use edge, along with a smeared, bright polish that is broadly present within 5 mm of the tool edge (Fig 8.11). These indicators suggest that this tool was likely used for scraping of soft materials (probably soft, wet plants or meat). This tool probably represents only one of the myriad potential uses that retouched flakes may have subjected. Further microwear analyses are necessary to document the range of uses and determine if any functional differences existed between the individual sub-types.

In spite of our relatively limited knowledge of the specific function(s) of retouched flakes, the presence of distinct reduction strategies within the Early Preceramic QBT assemblage does highlight some specific problems with the curated vs. expedient dichotomy. In the broad sense, the presence of retouched flakes should not be viewed strictly as evidence of expediency. Rather, these tools must be considered within the context of a reduction trajectory—as either end products of that trajectory or products

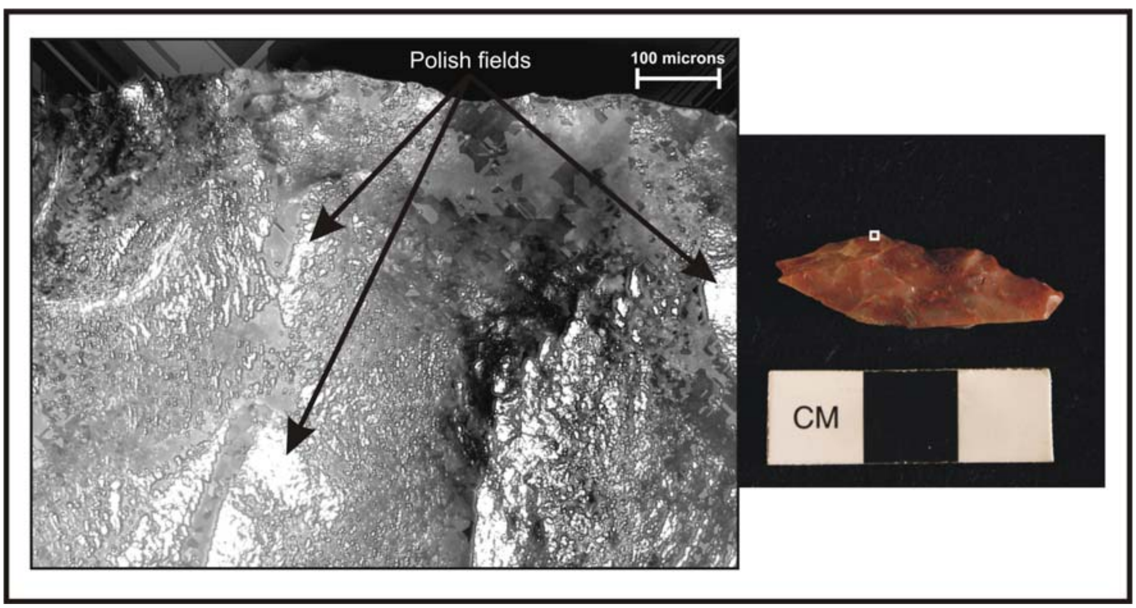

Figure 8.11. Microscopic use-wear indicators on a retouched flake from Site Je-996.

embedded within manufacture of other tools. Considering retouched flakes in this manner has profound implications for our understanding of the flexibility of lithic technologies and may provide inferences regarding technological organization and mobility. This is especially important in areas, like the north coast, where both formal and informal technologies were contemporaneous and overlapping at both the intra- and inter-site level.

Utilized Flakes

A total of 141 utilized flakes (114 from survey [including one refit case] and 27 from excavation) were recovered from 51 sites in the QBT region and represent 13.62% of the total number of lithic tools. Utilized flakes are expedient tools. As such, they are characterized by flakes of any class with evidence of edge damage or small flake scars consistent with use-wear. No evidence of intentional flake removal or shaping is present. Evidence of use may be found on any or all lateral edges and may be continuous or irregular. Extant cortex on the dorsal tool surface may be common. Among the utilized flakes in the QBT assemblage 35 examples (n=35; 24.8% of utilized flakes) contained cortex.

Like retouched flakes, utilized flakes are considered representative of informal tool manufacture (Andrefsky 1998; Odell 2003; Rossen 1998, 1991; Stackelbeck 2008; Young and Bamforth 1990). However, utilized flakes epitomize the concept of expediency among lithic tools and lack any of the purposeful edge modification that characterizes retouched flakes. Utilized flakes were generally intended for specific, situational and short-term uses. Use can vary widely in terms of activity type (e.g., cutting, scraping, graving, chopping, among others) and worked material (soft and hard plant material, meat, wet and dry hides, bone, and/or shell) (Odell 2003; Stackelbeck 2008; Vaughan 1985).

Among the utilized flakes in the Early Preceramic QBT assemblage a single example (FS#770.1.1; Je 439, TU8) was subjected to microwear analysis (Figure 8.12). This small, utilized flake contains multiple step fractures with pronounced edge rounding and flattening. Numerous striae oriented parallel, perpendicular, and transverse to the use edge were observed. In addition, a heavy, bright polish was noted on the

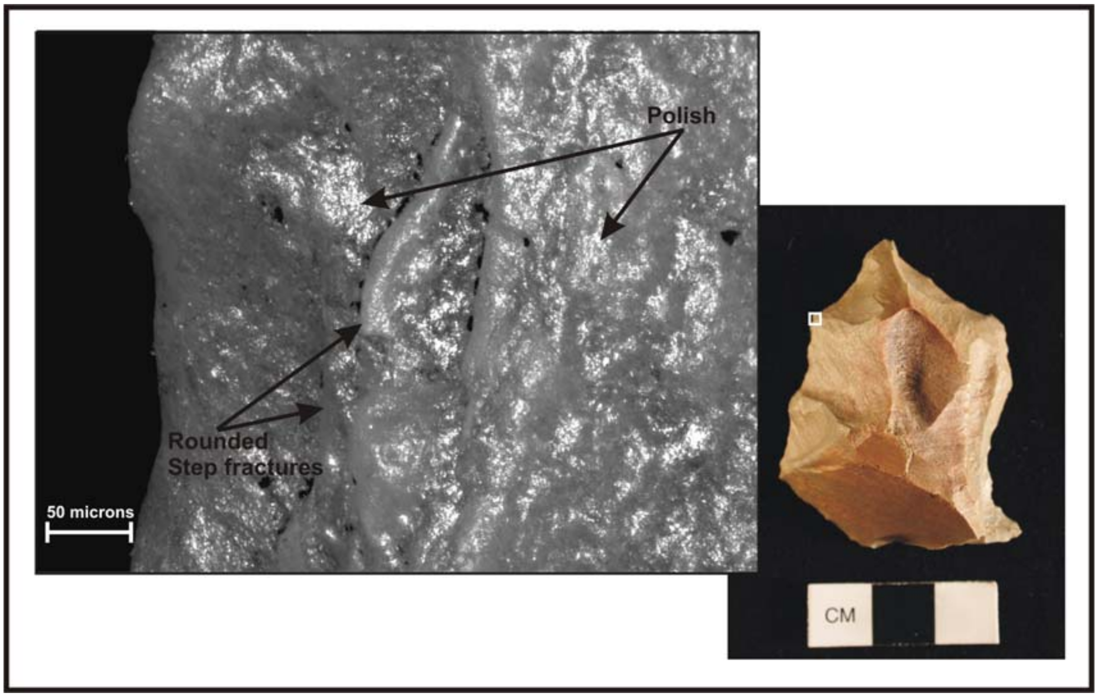

Figure 8.12. Microscopic use-wear indicators on a utilized flake from Site Je-439.

rounded/flattened surfaces near the use edge. The use indicators on this simple tool are suggestive of multiple actions that likely include both planing of a medium to hard material (probably wood) and cutting and scraping of soft to medium materials (most likely fresh hides).

As noted above, utilized flakes were likely generally intended for short-term, situational uses. However, the apparent multifunctionality of this tool (see Figure 8.12)—based on the relatively wide range and location of microwear use indicators—suggests that some utilized flake were subjected to repeated use in distinct activities. Thus, macroscopic indicators of use (flake scars, polish, and edge damage) may also vary widely in terms of location, type, and intensity and may represent distinct functional uses.

Following the analysis of the retouched flakes, three distinct sub-types of utilized flakes were identified in the Early Preceramic QBT assemblages. These sub-types are based on the location and amount of use-wear indicators along the lateral margins and include: one margin (n=97; 68.8% of utilized flakes); two margin (n=34; 24.1% of utilized flakes), and multiple margin (n=3; 2.1% of utilized flakes). Seven utilized flakes were unassigned.

In general, the utilized flakes in the Early Preceramic QBT assemblage are relatively small in terms of gross size and all of the sub-types are similar (see Table 8.24). The relative uniformity in size of utilized flakes is not surprising since these tools are unmodified and dependent on the size of the flake. The relative uniformity in mean metric attributes between the different sub-types, however, may indicate some sort of 'ideal' size for flakes that could be potentially considered for use.

As was discussed in the section on Retouched flakes, production trajectory models of informal technologies indicate that the debitage category represented by individual utilized flakes may be useful in identifying flakes that are embedded byproducts of formal tool production from those that were the intended end products of lithic manufacture (Rossen 1998, 1991; Stackelbeck 2008). Table 8.25 identifies the number of utilized flakes from each debitage category by sub-type. Although virtually all debitage categories are represented in the utilized flake assemblage (broken flakes are the lone exception), there are clear distinctions between the different sub-types.

Table 8.24. Metric attributes of utilized flakes by sub-type.

Utilized Flake Sub-type	**N**	**Mean Length**	**Mean Width**	**Mean Thickness**	**Mean Weight (g)**
All Utilized Flakes	133	4.72	3.51	1.11	23.84
One Margin	96	4.72	3.49	1.13	22.59
Two Margin	34	4.61	3.59	0.99	25.33
Multiple Margin	3	5.76	3.45	1.55	47.07

*Metric variables were not recorded for eight retouched flakes collected during the 1999 and 2000 field seasons under the Proyecto Pacasmayo (Dillehay and Kolata 2000).

Table 8.25. Utilized flake sub-types by debitage category.

Flake Category	**Utilized Flake Sub-type**			**Total**
	One Margin	**Two Margin**	**Multiple Margin**	
Core	1 (1.0%)	0	0	1 (0.8%)
Cortical Flake	3 (3.1%)	0	0	3 (2.2%)
Partial Cortical Flake	24 (24.7%)	6 (17.6%)	0	30 (22.4%)
Interior Flake	29 (29.9%)	16 (47.1%)	2 (66.7%)	47 (35.1%)
Lipped Interior Flake	2 (2.1%)	3 (8.8%)	0	5 (3.7%)
Flake Fragment	29 (29.9%)	9 (26.5%)	1 (33.3%)	39 (29.1%)
Broken Flake	0	0	0	0
Shatter	9 (9.3%)	0	0	9 (6.7%)
Total	**97 (100%)**	**34 (100%)**	**3 (100%)**	**134 (100%)**

One margin sub-type utilized flakes are the most common and display the widest range of debitage categories, including a small, exhausted core. Despite the relatively wide range of categories, there is a clear preference for interior flakes (n=29; 29.9% of one margin sub-type), flake fragments (n=29; 29.9% of one margin sub-type), and partial cortical flakes (n=24; 24.7% of one margin sub-type). Similarly, the two margin sub-type is also dominated by the interior flake (n=16; 47.1% of two margin sub-type) and flake fragment (n=9; 26.5% of two margin sub-type) categories. The multiple margin sub-type is represented by only three examples—all of which are either interior flakes (n=2; 66.7%) or flake fragments (n=1; 33.3%). However, the low frequency of the multiple margin sub-type limits any comparisons with the other sub-types.

Both the one margin and two margin sub-types contain examples of lipped interior flakes (n=3 and n=2, respectively), albeit in low frequencies. Lipped interior flakes are considered indicative of formal tool production (Sievert and Wise 2001; Stackelbeck 2008) and suggest that both of these sub-types represent embedded byproducts. The range of debitage categories represented in the one margin sub-type suggest that flakes intended for quick use and discard (hence the use-scars on one margin only) could potentially be selected from any point in the formal tool reduction trajectory. Interestingly, when multiple or repeated uses were anticipated (as indicated by use-scars on two or multiple margins), a more restricted range of debitage categories is evident. This may suggest that there was some selectivity in the type of flake depending on the anticipated intensity of the intended use. It is also possible that this effect of sample size, given the progressively lower frequencies of flakes with use on two or more margins.

The raw materials represented in the Early Preceramic QBT assemblage utilized flakes are presented in Table 8.26. In general, the raw material use patterns are very similar to those of the retouched flakes (see Table 8.23) and indicate a heavy reliance on locally available materials. Local materials include very fine-grained quartzites (toba [n=97; 68.8%] and non-toba [n=1; 0.7%]), fine-grained basalt (n=12; 8.5%), very fine-grained green quartzite (n=11; 7.8%), fine-grained quartzite (n=5; 3.6%), quartz varieties (crystal [n=3; 2.1%] and semi-opaque [n=2; 1.4%]), and rhyolite (n=1; 0.7%). Considered together, locally available raw materials comprise 93.6% of the utilized flakes.

Table 8.26. Utilized flakes by raw material.

Raw Material	Utilized Flake Sub-types			Unassigned	Total	Frequency
	One Margin	Two Margin	Multiple Margin			
Quartzite, VFG (Toba)	65	23	3	6	97	68.8%
Basalt, FG	8	4	0	0	12	8.5%
Quartzite, VFG (Green)	10	1	0	0	11	7.8%
Quartzite, FG	2	2	0	1	5	3.6%
Basalt, VFG	1	2	0	0	3	2.1%
Quartz (crystal)	1	2	0	0	3	2.1%
Quartz (semi-opaque)	2	0	0	0	2	1.4%
Chalcedony (mottled caramel)	1	0	0	0	1	0.7%
Quartzite, VFG (non-Toba)	1	0	0	0	1	0.7%
Silex (mottled pink/white)	1	0	0	0	1	0.7%
Silex (mottled red/black)	1	0	0	0	1	0.7%
Silex (mottled brown/black)	1	0	0	0	1	0.7%
Chalcedony (caramel)	1	0	0	0	1	0.7%
Chalcedony (mottled blue/white/red)	1	0	0	0	1	0.7%
Rhyolite	1	0	0	0	1	0.7%
Total	**97**	**34**	**3**	**7**	**141**	**99.9%**

However, like the retouched flakes discussed previously, a relatively wide range of non-local or 'exotic' raw materials from highland sources are also represented among the utilized flakes. Non-local materials occur in very low frequencies and include varieties of chalcedony (n=3), silex (n=3), and very fine-grained basalt (n=3). Together, non-local materials represent 6.4% of the utilized flakes.

The raw material use patterns from the utilized flakes (93.6% local, 6.4% non-local) mirrors that of the retouched flakes (94.4% local, 5.6% non-local). Unfortunately, however, the production trajectory patterns that were discernable among the retouched flakes (i.e., some were embedded byproducts and others were end products) are not as evident in the utilized flakes. The presence of lipped interior flakes and the emphasis on a few debitage categories across the utilized flake sub-types suggests that most, if not all, of these tools were embedded byproducts of formal tool production (Rossen 1991; Stackelbeck 2008).

Projectile Point Typology

A total of 167 projectile points (163 from survey and 4 from excavation) were recovered from 46 sites in the QBT region and represent 16.14% of the total number of lithic tools. Projectile points are manufactured through systematic primary, secondary, and tertiary bifacial flake removal (using hard- and soft-hammer percussion and pressure flaking). The systematic flaking results in a longitudinally asymmetrical form with a haft element (typically includes a stem and notching) on the proximal end and parallel lateral margins that converge to form a pointed distal tip. Latitudinally, the form is generally symmetrical and typically thin (in relation to width and length) in cross-section. Cortex is generally absent on projectile points (no examples with cortex were documented in the QBT assemblage).

As a class, projectile points contain, by far, the largest amount of intra-class morphological variation. There are two primary reasons for this: 1) the projectile point form contains a larger number of readily and consistently identifiable/measurable attributes than any other class of lithic tools—which lends itself to more intensive and refined analyses; and 2) projectile points may be classified by known stylistic and/or chronological types (e.g., Fishtail and Paiján projectile points).

There are problems, however, with using the known point types as the baseline for classification. First, although both the Fishtail and Paiján types are well known, each "type" contains a wide range of variation in point form (Chauchat et al. 2004; Cooke 1998; Dillehay 2000; Dillehay et al. 1992; Gálvez 2004; Lavallée 2000; Nami 2007; Politis 1991; Ranere and Cooke 1991; Suárez 2003). It is possible that both of these broad "types" subsume distinct forms that may provide more specific information on geographic distributions, mobility, technological relationships, and chronological position. Because the numbers of individual points recovered from sites are typically very low and often fragmentary, few studies have attempted or had the opportunity to examine intra-type variability in detail.

The Fishtail "type" (ca. 11,100-10,100 B.P.) shows considerable variability in form across its known distribution from the southern cone of South America to Central America and southern Mexico (Acosta 2008; Bell 2000; Bird 1938, 1969; Briceño 2004, 1999; Cooke 1998; Dillehay 2000; Dillehay et al. 1992; Lavallée 2000; León C. et al. 2004; Politis 1991; Ranere and Cooke 1991; Suárez 2006). Thin and wide stemmed (Chauchat and Zevallos 1979; Lavallée 2000), pronounced and rounded shoulders (Suárez 2003), fluted and unfluted (Dillehay 2000; Politis 1991) varieties have been documented and are all typically subsumed within the general ‘Fell type’ Fishtail label (Dillehay et al. 1992; Lavallée 2000). At present, we do not know if this variability represents distinct types of Fishtail points, geographic variation within the same type, or temporal variation.

This situation is similarly true (albeit for different reasons) for the Paiján “type”, which also contains a wide range of different stemmed forms (compare examples in Becerra 1999; Chauchat et al. 2004; Malpass 1983; Ossa 1973). In comparison to Fishtail points, Paiján points have a restricted geographic distribution and have subsequently undergone more regional-scale analysis and technological modeling (Chauchat et al. 2006; Chauchat et al. 2004; Malpass 1983; Ossa 1976; Uceda 1992). The presence of several different varieties of Paiján points has been previously recognized (Gálvez 2004: 25; Malpass 1983). However, like the Fishtail points, these varieties are generally subsumed within the larger descriptive of ‘Paiján’. *As a result, the Paiján “type” has come to include virtually all stemmed projectile points on the north coast that cannot be clearly attributed to another type* (e.g., Fishtail, Laurel-leaf, or a highland type).

The Paiján point type represents a relatively long-lasting cultural expression on the north coast (ca. 10,800-9,000 B.P.). However, the uncritical ‘lumping’ of varied point forms within a single type has severely limited our understanding of any changes in technological organization that may have occurred during this period. The analysis of the stemmed points within the QBT assemblage suggests that the Paiján “type” is actually comprised of several distinct types with different and overlapping temporal relationships.

Ossa (1976, 1973) and Ossa and Moseley (1972) attempted to distinguish different types of Paiján points based on a rough division in stem width and the length of the point blade. Somewhat similarly, Chauchat and others (Chauchat et al. 1992; Chauchat et al. 2004) and Malpass (1983) used blade shape in combination with stem shape in attempts to distinguish patterning within the Paiján type. With the exception of Malpass (1983), each of these studies has assumed at the outset that a single idealized template (a classic Paiján form) existed for the manufacturers of Paiján points. Their results bear this assumption out, alternatively suggesting that an hypothesized ideal

Paiján form was used for hunting large terrestrial mammals (Ossa and Moseley 1972) or large marine fish (Chauchat et al. 2004).

The notion of a single ideal mental template for Paiján points does not match the documented wide range of variability in point form. The idea of a long-lasting, unchanging, ideal point form is far too simplistic to adequately explain the extant diversity in the archaeological record and must be rejected in favor of a more complex understanding of Paiján technology. For example, in the lower Casma, Malpass (1983) recognized several distinct point types (not all of which were Paiján) with possible different uses and temporal affiliation from the Early through the Middle Preceramic.

It is for these reasons that the broad projectile point class was refined beyond the class (type) and sub-types framework by which all other tools in the QBT assemblage were categorized (see Figure 8.13). Figure 8.13 represent a hierarchical diagram of the analytical framework used in this study to generate the identification of specific point types. The specific aim of this framework is to allow analysis of all projectile points under a rubric that is repeatable and potentially applicable to different regions of the north coast. Only those points that contain an intact haft element or proximal end (unbroken enough to allow identification) can be analyzed using this framework.

The focus on characteristics of the haft element for primary typological classification is based on the idea that—in contrast to the point blade which has been a focus of previous studies—the hafted portion of the tool is the least likely to have its shape modified through later retouch and/or tool maintenance. As Suárez (2003) has noted for Fishtail points, successive resharpening of the blade can alter the appearance and size of the exact same points enough to consider calling them separate types. Studies that focus on blade characteristics risk the misidentification of types based on how much successive retouch episodes have altered the blade shape. A second benefit of focusing on haft elements is that points with medial or distal fractures can still be typologically analyzed if the haft is extant.

The general class (All Projectile Points) was divided into three broad groups (Fishtail [n=4], Stemmed [n=161], and Unstemmed [n=2])(Figure 8.13) that attempt to recognize the known projectile point types, but allow for the identification of unknown types and further refinement of groups that have been previously identified. Groups were

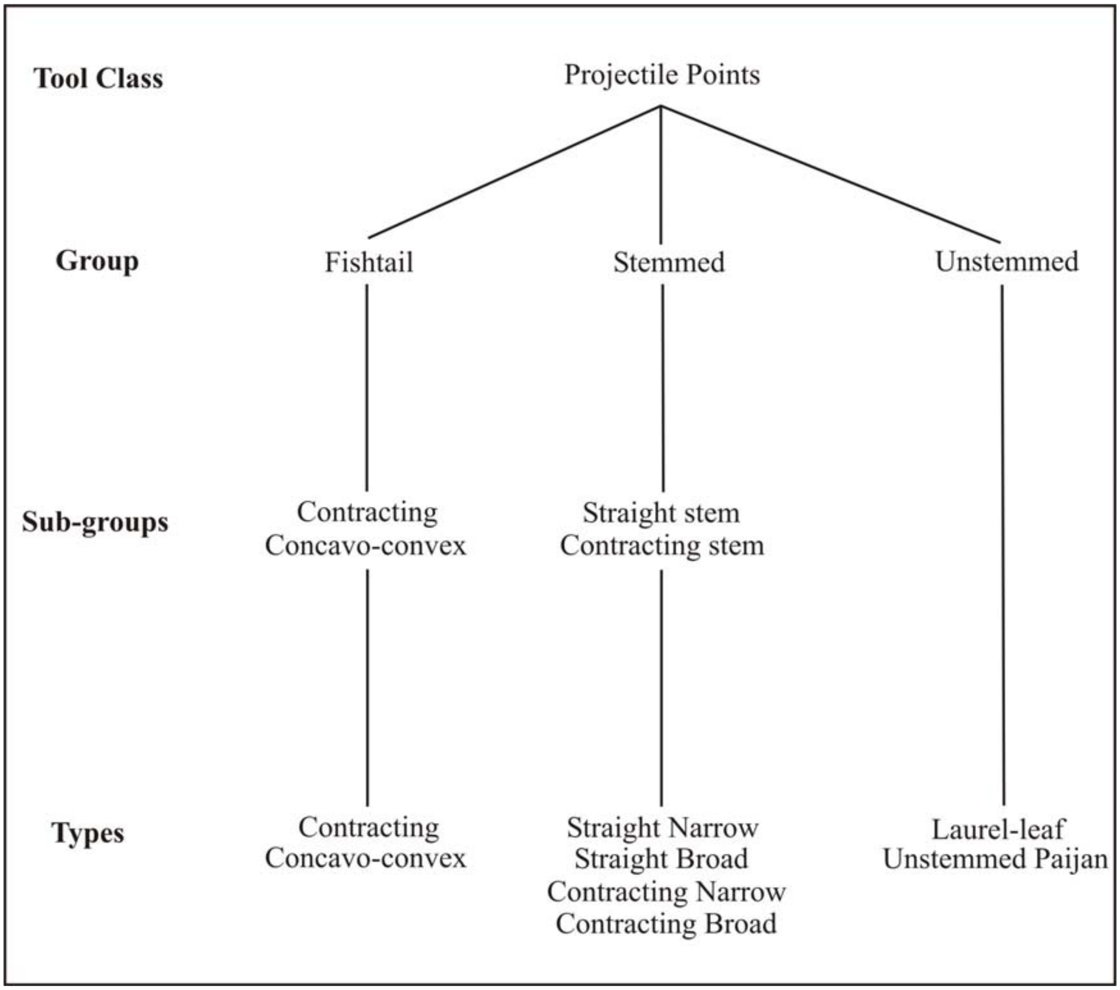

Figure 8.13. Schematic of the projectile point typology used in the analysis of the QBT assemblage.

further refined into distinct sub-groups for the Fishtail (contracting and concavo-convex) and Stemmed (straight and contracting stems) based on morphological characteristics of the point stem (specifically stem form). No sub-groups were identified in the Unstemmed group.

When possible, sub-groups were broken down into Types based on characteristics independent to a particular Group. For example, the two Fishtail sub-groups could not be meaningfully further refined and are considered to represent specific types. In contrast, the straight and contracting stem sub-groups of the Stemmed point group were broken into four distinct point types (Straight narrow, Straight broad, Contracting narrow, and Contracting broad) based on stem width—an attribute that has been used previously by both Malpass (1983) and Ossa (1973) to characterize Paiján points. The two examples that comprise the Unstemmed groups are considered to represent separate types (Laurel-leaf and Unstemmed Paiján) (Malpass 1983; Rick 1980). Each of the individual types will be discussed below.

The primary reason the projectile point class was refined using this framework of groups, sub-groups, and types is that distinct, recognized types of projectile points (specifically, the previously identified Fishtail, classic Paiján, and Laurel-leaf types) occur within the QBT assemblage—along with a large number of points that did not clearly fall into any of the known types and represented unknown or unidentified point types. This situation highlights the previously mentioned deficiencies in our understanding of variability present within individual point types and, more broadly, Early Preceramic lithic assemblages. Given that the Early Preceramic period on the North Coast is represented by several (possibly multiple) overlapping, contemporaneous complexes, it is imperative that we better understand what the variability in projectile point form actually represents. The following discussions address and provide new insights into these problems.

Fishtail Group

A total of four (n=4) points were included in the Fishtail group and represent 2.4% of the total number of projectile points (Figure 8.14). Each of the Fishtail points were recovered from surface contexts on different sites (n=4 sites). Although none of the points were directly associated on the same site, the four sites (Je 979, 996, 1002, and 1010) from which they were collected are located in close proximity to one another (see site distribution map in Chapter Six), suggesting that these points represent more than isolated finds. As the photos in Figure 8.14 illustrate, the four Fishtail points display a relatively wide range of morphological variability.

Two points display contracting stems with ground margins (Je 1002 L5 and Je 979 L9), while the other two have concavo-convex stems with ground margins (Je 996 L9 and Je 1010 L8). One point (Je 1002 L5) has a small flute on one face and another point is basally thinned (Je 996 L9). Points Je 979 L9 and Je 1010 L8 are neither fluted nor thinned. The stem base on two points is flat and lightly ground (Je 979 L9 and Je 1010 L8), while the stem base on specimen Je 996 L9 is concave, but also lightly ground.

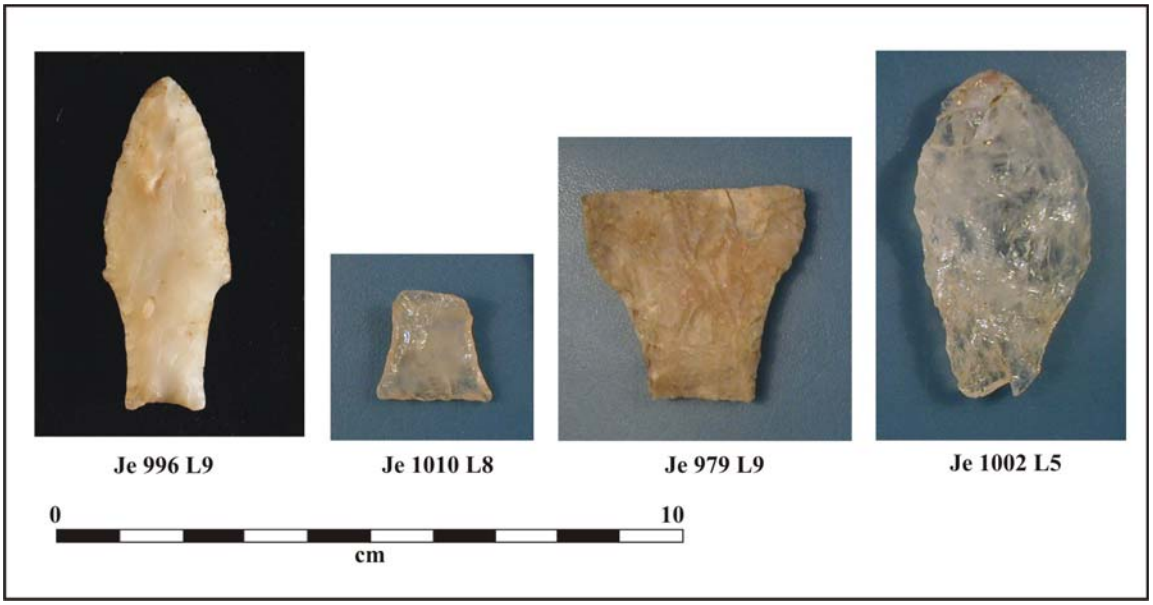

Figure 8.14. Fishtail projectile points in the QBT assemblage.

The stem base on Je 1002 L5 is partially broken, but appears to have been a flat base. Shoulders are somewhat pronounced and angular on point Je 996 L9. In contrast, the shoulders are rounded on points Je 979 L9 and Je 1002 L5.

Although the four points that comprise the Fishtail group are a small sample, two distinct sub-groups (contracting and concavo-convex) are identifiable based on the shape of the haft element (i.e., stem form). The contracting sub-group consists of points Je 979 L9 and Je 1002 L5 (Figure 8.14). Both of these points display relatively broad contracting stems with flat stem bases. Shoulders are sub-angular to rounded. Both of the points in this sub-group are manufactured from very high quality raw materials, including a non-local mottled gray/blue silex (Je 979 L9) and semi-opaque crystal quartz (Je 1002 L5).

Neither of the points in the contracting sub-group appears to have been heavily resharpened or reworked. In fact, point Je 1002 L5 appears to have been broken during manufacture. This point is fluted on one face and the base of the stem is broken—which appears to have resulted from the force applied during fluting. The point was probably abandoned at that time.

Although this point was recovered from a surface context on the eastern end of Je 1002, deeply buried Early Preceramic cultural deposits were present in central portion of the site. The lowest levels of Block A yielded an unidentified biface fragment associated with a date of 11,014±64 RCYBP (see Chapter Seven discussion of Je 1002 stratigraphy and chronology). The biface fragment is manufactured of the same raw material (semi-opaque quartz crystal) as the Fishtail point found on the site surface and the associate date of ca. 11,000 B.P. is considered to represent of the age of the Fishtail occupation at the site.

The two points that comprise the concavo-convex sub-group (Je 1010 L8 and Je 996 L9) have a markedly different stem form than those of the contracting sub-group. Points Je 1010 L8 and Je 996 L9 are characterized by sharply contracting stems that flare outward at the stem base, giving these points the classic 'fishtail' appearance (Figure 8.14). The stems are relatively narrow and the stem base is flat (Je 1010 L8) to concave (Je 996 L9). Lateral edges and bases of the stems are ground on both points.

Point Je 996 L9 is the only complete Fishtail point in the QBT assemblage, although it has been heavily reworked (Figure 8.14). This point is, overall, small, thin and very finely worked. The blade is relatively short and symmetrical, with pronounced, angular shoulders. Fine pressure flaking along both lateral margins resulted in a slight beveling on one face and indicates that this point was probably resharpened multiple times. The stem base is concave and basally thinned on one face. Je 996 L9 was manufactured from a high quality non-local mottled white chalcedony. AMS dates taken from carbon samples at Je 996 suggest that the Fishtail occupation of the site likely occurred between ca. 11,000-10,600 B.P. (see Chapter Seven [Table 7.13] for stratigraphic and chronological discussion).

Microwear analysis was conducted on this point (see Figure 8.15). Several locations, including the interior central ridge, the center of the point stem, and several locations along the lateral margins of the point, were examined for indicators of use. The interior surface of the point contained short, deep striae that are oriented longitudinally and cross ridges on the tool surface. These striae were likely produced by contact with a hard material (perhaps bone or stone) as a result of impact abrasion. Occasional and uneven small step and scalar scars were observed along the blade edges, along with a few abrasion tracks and striae. Edge striae were parallel to sub-parallel to the tool edge. A smeared, homogenous polish was also present on flattened high points on both the tool margins and interior surfaces and ridges.

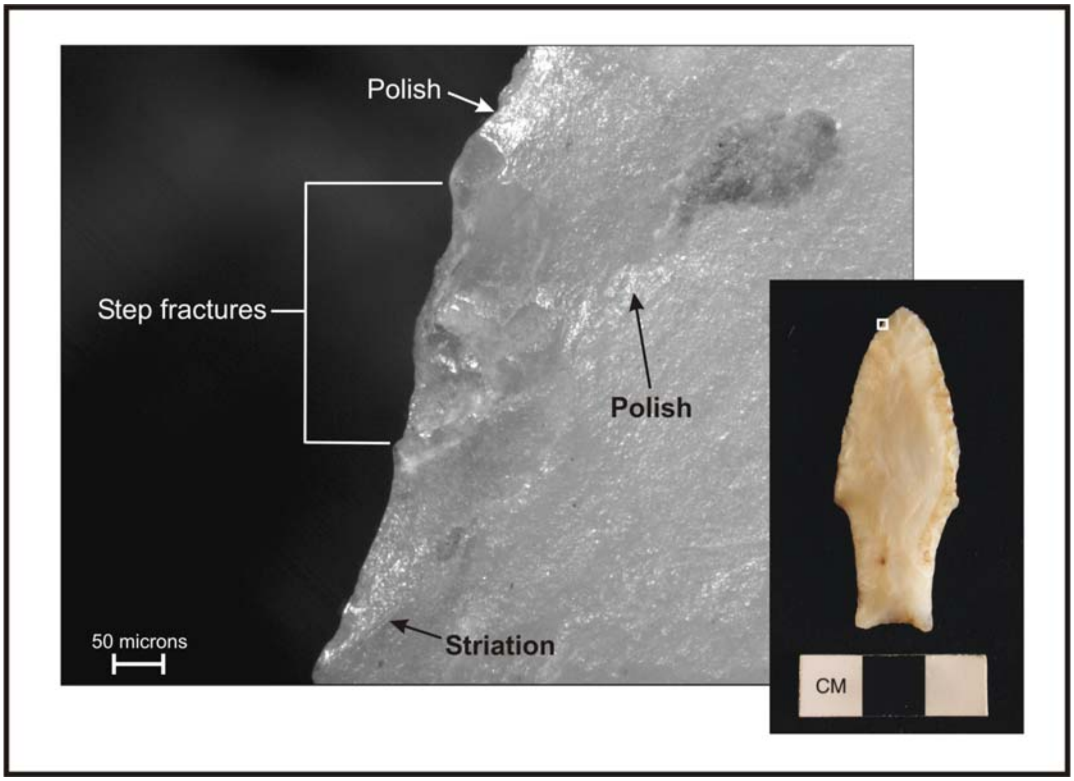

Figure 8.15. Microscopic use-wear indicators on the Fishtail point from Site Je-996.

Overall, the microwear indicators identified on this point are suggestive of impact action and limited abrasion (probably from meat, hide, and bone). Interestingly, the microwear indicators do not strongly suggest any cutting or slicing actions, only actions associated with impact. Although the indication that these points were used for hunting may seem obvious, the lack of butchery related actions suggests that animals—once killed—were likely processed with other tools. More microwear studies are needed to confirm these limited indications, but it may be that Fishtail points were only used as specialized hunting implements.

The second point in the concavo-convex sub-group—Je 1010 L8—is represented only by the broken basal portion of the stem. Other than the form of the stem, base shape, and presence of edge grinding, little can be said about this point fragment. Je 1010 L8 was manufactured from a semi-opaque crystal quartz.

Metric data for each of the four Fishtail points in the QBT assemblage are presented in Table 8.27. Although the sample size is quite small, some interesting potential patterns are observable. First, the contracting points are wider and heavier than

Table 8.27. Metric attributes of Fishtail points in the QBT assemblage.

Sub-group	Artifact #	Length	Width	Thickness	Weight (g)
Contracting	Je 979 L9	n/a	3.66	0.51	6.84
	Je 1002 L5	5.18	2.87	0.92	12.6
Concavo-convex	Je 996 L9	5.03	2	0.49	5.62
	Je 1010 L8	n/a	1.83	0.66	2.1

the concavo-convex. This pattern is especially notable between points Je 1002 L5 and Je 996 L9, which are nearly complete and complete specimens. Secondly, the length of the two complete points (Je 1002 L5 and Je 996 L9) is nearly identical. If we consider that Je 1002 L5 represents a point abandoned during manufacture, and Je 996 L9 is a point that has undergone resharpening (presumably through extended use), then the similarity of the length measurements may represent something approximating the optimal or common size of Fishtail points in the north coast region.

These patterns become more meaningful when the QBT points are compared with other Fishtail points, particularly the few recovered from across the north coast region. Briceño (1999: 19-39) recovered several Fishtail points on two sites (PV 23-130 and PV 23-204) in the Quebrada Santa Maria in the Chicama Valley, which is approximately 50-55 km south of the QBT project area. Like this study, the Q. Santa Maria Fishtail sites were few in number and yielded only a few points and point fragments (n=8 from PV 23-130). Similar to those in the QBT assemblage, the Q. Santa Maria points display a relatively wide range of morphological variation (Briceño 1999, Figure 21). Among the four most complete points, two clearly have concavo-convex stem forms, one appears to be a contracting form, and one is indeterminate (perhaps a late stage preform?) but most closely resembles a contracting form. Three of the stem bases are concave, while one is flat. All of the Q. Santa Maria Fishtail points are manufactured from crystal quartz.

At the La Cumbre site in the Moche Valley, Ossa and Moseley (1972) recovered a single medial fragment of a Fishtail point. The stem is broken and cannot be clearly identified, but the point does have rounded shoulders and is fluted on both faces. The raw material used in the manufacture of this point is described as a fine-grained chert (Ossa 1976).

In northern Perú, Chauchat and Zevallos (1979) reported a single Fishtail point that was recovered from a looter in the Piura Alta area. This point is complete and has a concavo-convex stem with a flat base. The shoulders are pronounced and angular. The raw material used in manufacture is unclear, but appears to have been similar to the chert used at La Cumbre (see discussion in Briceño 2004: 31).

More recently, a single Fishtail point was reported from the high altitude Laguna Negra site (3,775 masl) in northern Perú (León C. et al. 2004). This point is manufactured from high-quality red jasper and displays a contracting stem with rounded shoulders and a flat base. The authors' suggest (2004: 12) that this point is atypical in form compared to other Fishtails in Perú and the classic Fell's Cave-type (Bird 1969, 1938). However, this point does resemble the contracting stem sub-group within the QBT assemblage.

All of the Fishtail points recovered from northern Perú (QBT, Q. Santa Maria, La Cumbre, Piura Alta, and Laguna Negra) are similar in size (approximately 5-6 cm in length). Interestingly, the size of these points is also very similar to Fishtail points from the Fell's Cave type site and other sites in Argentina, Uruguay, and Ecuador that average 4-7 cm in length (Bell 2000; Bird 1969; Politis 1991, Table 2; Suárez 2001, 2000). Aside from the similarities in size, however, there remains a relatively wide range of morphological variability between Fishtail points from both similar and different regions. As the points in the QBT assemblage demonstrate, this is especially true across northern Perú.

It has been recognized for some time that much of the morphological variation in Fishtail point form is likely related to the amount and intensity of resharpening that a particular point has undergone (Politis 1991). Suárez (2003) put forth an elegant idealized model of point resharpening in the southern cone that demonstrates how a majority of variation in Fishtail blade and shoulder shape can be subsumed within a single type (Fell type).

Although it accounts for changes in blade and shoulder shape, this model does not explain variability in stem form. Resharpening should only affect (i.e., alter) the shape of the haft element—which presumably is embedded and bound in a foreshaft—if the point was un-hafted each time it was resharpened. It seems unlikely that hafted points would be removed from their binding for resharpening. There is little doubt that successive resharpening will dramatically alter the shape of the point blade and shoulders, but the haft element should remain relatively unaffected.

We are left then with the task of explaining the morphological variability in haft element form—which, as discussed above, is prevalent among the Fishtail points across northern Perú. It is suggested here that the framework used for classifying stem form among the QBT Fishtail points is one useful way to clarify this variability. Although resharpening does change blade and shoulder shape over time, the contracting and concavo-convex stem form sub-groups represent real, patterned variation that is distinct from that induced by resharpening. Variability in stem form (i.e., haft element shape) is generated during point manufacture and not related to later use modifications. Thus, these two forms of stems should probably be considered *different types* of points within what is more broadly known as Fishtail.

It is suggested here that the concavo-convex stem form sub-group—which is most similar in form to the Fishtails from the southern cone region—should be referred to as the Fell type, after the type site. In contrast, the contracting stem form sub-group is virtually unknown and will be referred to as the Santa Maria type, after the first location of their discovery in Perú (Briceño 1999, 1997). These two types, Fell and Santa Maria, are not necessarily limited to Fishtail points in Perú. Rather, these types are an explicit recognition of the morphological variability that has been documented in Fishtail points from Panama to Argentina.

These two types appear to be contemporaneous and have similar geographic distributions. In northern Perú, both types have been found in the same region (QBT and Q. Santa Maria) and appear to be relatively widespread. The Fell type has been found in both northern (Piura Alta) and southern (Q. Santa Maria) sections of the north coast region (Briceño 1999; Chauchat and Zevallos 1979). Similarly, the Santa Maria type also has been found in both the northern (Laguna Negra) and southern (QBT, Q. Santa Maria, possibly La Cumbre) sections of the north coast region (Briceño 1999; León C. et al. 2004; Ossa 1976).

It is difficult to assess the distribution of the two different types outside of the Peruvian north coast because most Fishtail points—regardless of form—are broadly referred to as 'Fell type' points. However, based on published photos and descriptions it is possible that each of these types may have wide geographic distributions. Both point types appear to have been recovered in Panama (Ranere and Cooke 1991) and at El Inga in northern Ecuador (Bell 2000).

Fishtail points from Andean South America and Central America generally date between ca. 11,100-10,100 B.P. (Bell 2000; Cooke 1998; Dillehay 2000; Dillehay et al. 1992; Nami 2007; Politis 1991; Suárez 2003). Within the QBT assemblage, the Fell type was associated with an age range of ca. 11,000-10,600 RCYBP and the Santa Maria type was associated with a single date of 11,014±64 RCYBP. Although the age ranges of both types fall within the known Fishtail range, these dates suggest that the different types may have slightly different temporal relationships in different regions. This, however, cannot be demonstrated without additional dates.

These two types provide a new framework for analyzing the geographic distributions and temporal affiliation of different Fishtail points based on the morphological variation of haft elements. It is not clear whether the two distinct types are present throughout all of the known range of Fishtail points (such as the southern cone) or what these different haft forms represent. As others have noted (Dillehay 2000; Politis 1991; Suárez 2003), it is possible that morphological variability in Fishtail points relates to manufacture by distinct groups, different intended uses, or perhaps technological or stylistic change over time.

In the case of the Quebradas del Batán and Talambo and broader north coast region, the presence of two distinct types of Fishtail points has potentially important ramifications for our understanding of the contemporaneous technological complexes of the Early Preceramic period. Most significant is the fact that both the Fell and Santa Maria types are found on the same site (or sites that are very close to each other). This suggests that if they were manufactured by different groups of people, those groups were in close contact or exchange relationships with each other. It is also possible that both point types were produced by the same group. They may represent design characteristics for tools with different intended uses (i.e., necessitated a different haft technology) or technological or stylistic change within the same group over time—although the microwear indicators identified on one point in this study are suggestive of use as relatively specialized hunting implements.

More data is needed to address these possibilities. However, the Fishtail points in the QBT assemblage—and others from the north coast region—do provide some insight into the technological organization of the Fishtail complex. First, Fishtail points are found in small numbers on individual sites and not many Fishtail sites have been identified. A total of eight Fishtail sites (Laguna Negra, La Cumbre, two sites in the Q. Santa Maria, and the four new sites identified in the QBT region) have been documented in north coast region. Low numbers of sites and limited numbers of points suggest relatively limited use of the region.

The raw materials used in the manufacture of Fishtail points also support a pattern of limited occupation within the region. All of the points and fragments identified in Q. Santa Maria were manufactured from quartz crystal (Briceño 1999; Chauchat 1998), as were two of the points in the QBT assemblage. However, the remaining two points in the QBT assemblage were manufactured from non-local silex and chalcedony that outcrop to the east in the Andean highlands. Similarly, the point from Laguna Negra (a highland site) was manufactured from jasper, which also outcrops in the highlands (León C. et al. 2004). The points from La Cumbre and Piura Alta are both reported as manufactured from 'chert' (Chauchat and Zevallos 1979; Ossa 1976), which is also probably a highland silex variety.

The only local raw material used for point manufacture appears to have been quartz crystal. Non-local highland raw materials were also frequently used. The repeated use of only one type of local raw material indicates either a notable selective preference for quartz crystal or a limited knowledge of the range of available local resources, or perhaps both. The selective preference for only one local raw material resource is even more striking when compared to the range of varieties of highland raw materials that have been documented (jasper, chalcedony, and multiple varieties of silex).

Stemmed Point Group

The Stemmed point group is comprised of 161 points (96.4% of all projectile points) collected from 46 sites. Stemmed points were recovered both from surface contexts during survey (n=158) and excavation contexts (n=3). In terms of morphological variability within the entire QBT lithic assemblage, the Stemmed point group contains, by far, more complexity than any other tool category.

The complex variability that characterizes this group is a direct result of our limited understanding of the different types of Early Preceramic projectile points present throughout the north coast, particularly the Paiján type. Figure 8.16 contains 38 examples of stemmed points from the QBT assemblage. These points display an extremely wide range of variability in overall size, blade shape, notching, and stem forms representing different varieties and distinct types (Fig 8.16). The majority of these points, however, are considered to belong to the broad Paiján "type" and highlight a significant deficiency in our understanding of this early complex.

The Paiján complex of the north coast is a relatively long-lived archaeological phenomenon (ca. 10,800-9,000 B.P.). Although it spanned nearly two thousand years, we have very little insight into any of the technological changes that may have occurred during this vast period of time. Changes in lithic tool forms, hafting strategies, or raw material use often are indicators of more broad changes in subsistence or mobility patterns (Andrefsky 1994; Bamforth 1986; Binford 1980; Henry 1989b; Ingbar 1994; Kelly 1992, 1988; Nelson 1991; Odell 2003; Torrence 1989). The range of morphological variability that exists among the stemmed points of the north coast—most of which are considered to be Paiján—suggests that substantial social, economic, and technological changes may have occurred. To date, however, we have been unable to formally recognize any specific changes in the archaeological record. In order to gain insight into potential changes, we must have a better understanding of the variability among stemmed points and be able to make chronological interpretations of that variability.

As discussed previously, several researchers have recognized that different varieties of Paiján projectile points exist (Chauchat et al. 2006; Chauchat et al. 2004; Gálvez 2004; Malpass 1983; Ossa 1973). However, most of the systematic attempts to characterize morphological variability within the broad Paiján "type" have primarily focused on a combination of blade shape and stem form attributes (Chauchat et al. 2004; Malpass 1983; Ossa 1973; Ossa and Moseley 1972; Uceda 1992). The results of these studies have tended to emphasize a single, ideal Paiján form (referred to here as the

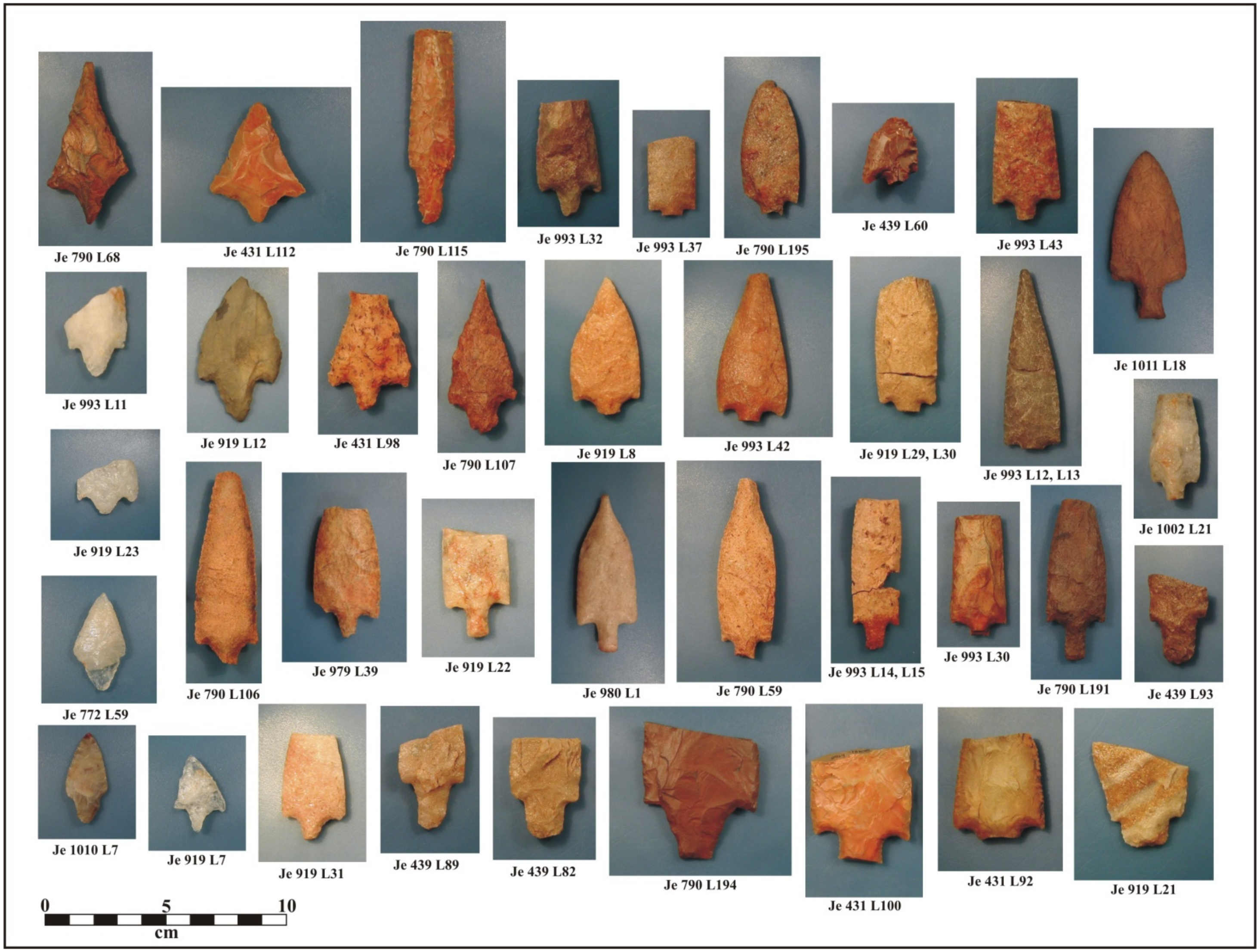

Figure 8.16. Examples of stemmed projectile points in the QBT assemblage.

Classic Paiján type) with the primary use(s) dependent on the kinds and quantities of faunal remains recovered from a few select sites. Points that do not fit the ideal form are often classified as unknown variants or the products of novice flintknappers (Chauchat et al. 2004; Malpass 1983).

Rather than searching for an ideal form, the analysis conducted in this study suggests that the variability present among stemmed points of the north coast Early Preceramic period is more likely related to *intentional* design differences within manufacturing process. By focusing on a series of haft element attributes (stem form, stem width, stem base form, and shoulder form)—instead of the more common focus on blade attributes—the substantial amount of variability among Early Preceramic stemmed points can be refined into meaningful patterns that are interpreted as representing distinct point types that have chronological significance.

The specific attributes used in this analysis of stemmed point haft elements include stem form, stem width, stem base form, and shoulder form (Figure 8.17). When possible (e.g., haft elements were unbroken or extant enough to permit attribute identification), each point was characterized according to a range of possible forms for each haft attribute. The range of possible forms for each attribute was defined by identified examples within the QBT stemmed point assemblage. Thus, it is quite possible that additional or alternate forms may exist in other regions. Although this analysis and typology is drawn specifically from the QBT assemblage, the methods, terminology, and results are applicable to Early Preceramic stemmed points from across the north coast.

The first attribute to be identified was stem form, which consists of only two possible forms—straight and contracting stems. Stem width was characterized second and also contains only two possibilities (narrow and broad stems). The third attribute is stem base form. Stem base form consists of four possible states, including rounded, slightly rounded, pointed, and flat stem bases.

The final attribute characterized was shoulder form. The primary reason for characterizing this attribute last is that projectile point shoulders are subject to modification through resharpening and use, which may alter their original shape (see Suárez 2003). As a result, shoulder form cannot always be considered representative of variability introduced during point manufacture. Rather, variability in shoulder form

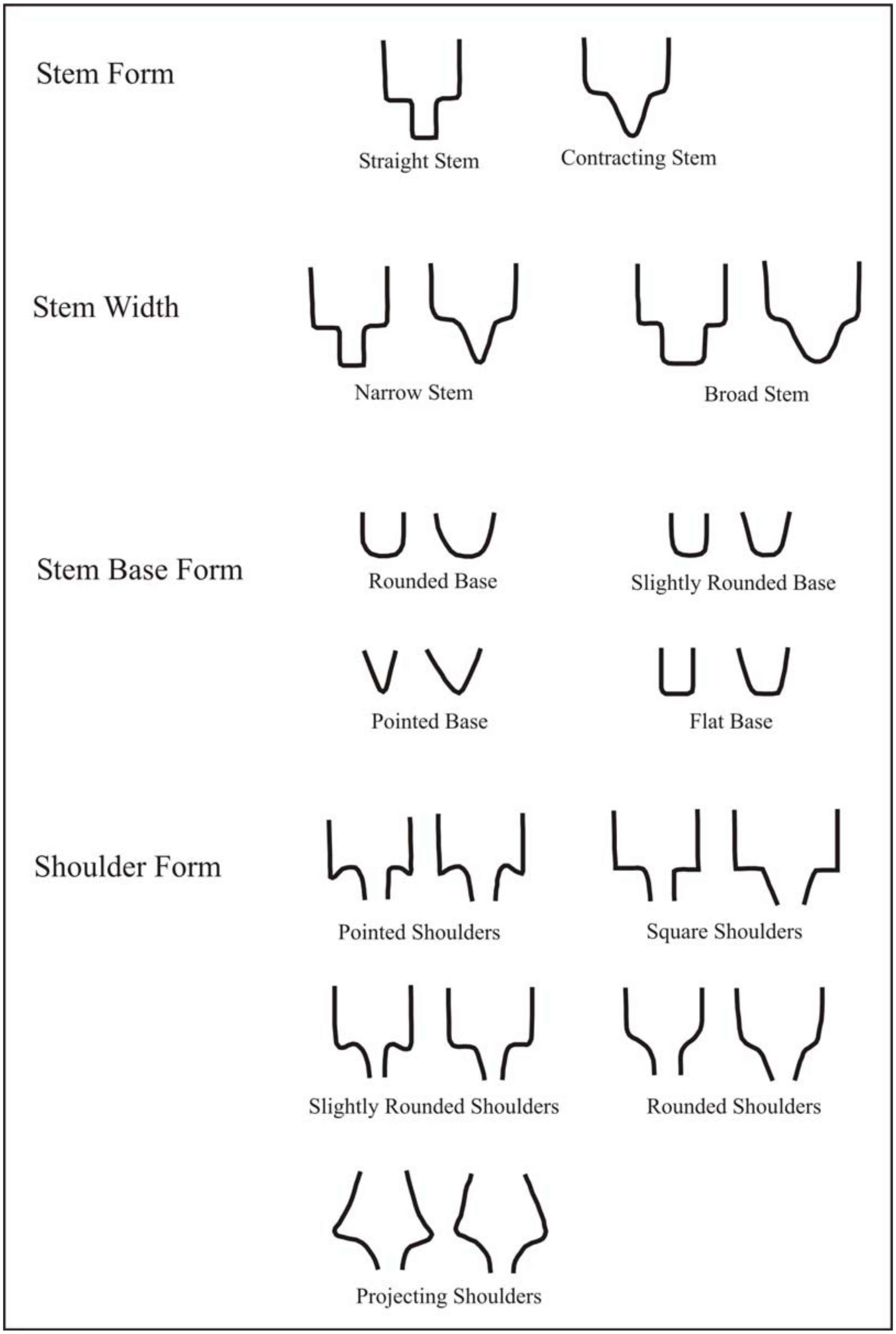

Figure 8.17. Haft attributes used in the analysis of stemmed projectile points.

should only be used to define potential varieties within existing types based on other attributes. Five different shoulder forms were identified within the assemblage and include pointed, square, slightly rounded, rounded, and projecting shoulders. All identified states within each attribute are presented in Figure 8.17.

All of the stemmed points in the QBT assemblage (n=161) were analyzed according to this method. As a result, the wide range of variability within the stemmed point group was refined into two broad sub-groups (straight stem sub-group and contracting stem sub-group) and four distinct types (straight narrow stem, straight broad stem, contracting narrow stem, and contracting broad stem). In addition, the four types of stemmed points were further refined into sub-types (n=14) and varieties (n=39) (Figure 8.18).

The two broad sub-groups were based strictly on stem form (straight stems [n=79] and contracting stems [n=82]) and roughly split the assemblage. Although this division is important, each of the two sub-groups contains too wide a range of morphological variability to be interpreted as meaningful types. Rather, the relatively even numbers of both straight and contracting stem forms may indicate something akin to separate traditions, or perhaps a temporal distinction, among what has been known as the Paiján complex.

It is suggested here that the second level of the analysis—stem width attribute—results in the identification of archaeologically meaningful types within the stemmed point assemblage (Figure 8.18). Identification of stem form resulted in two broad sub-groups. These sub-groups were further refined with stem width into four morphologically similar clusters of points that are interpreted as representing distinct types. The number of points in each particular type is relatively even among the contracting stem forms (contracting narrow [n=42] and contracting broad [n=40]), but indicate more of a disparity among the straight stem form (straight narrow [n=63] and straight broad [n=16]). Although they still contain a relatively wide range of morphological variability, the four classes that result from the stem form/stem width attribute analysis are internally consistent enough to warrant classification as distinct types of stemmed points.

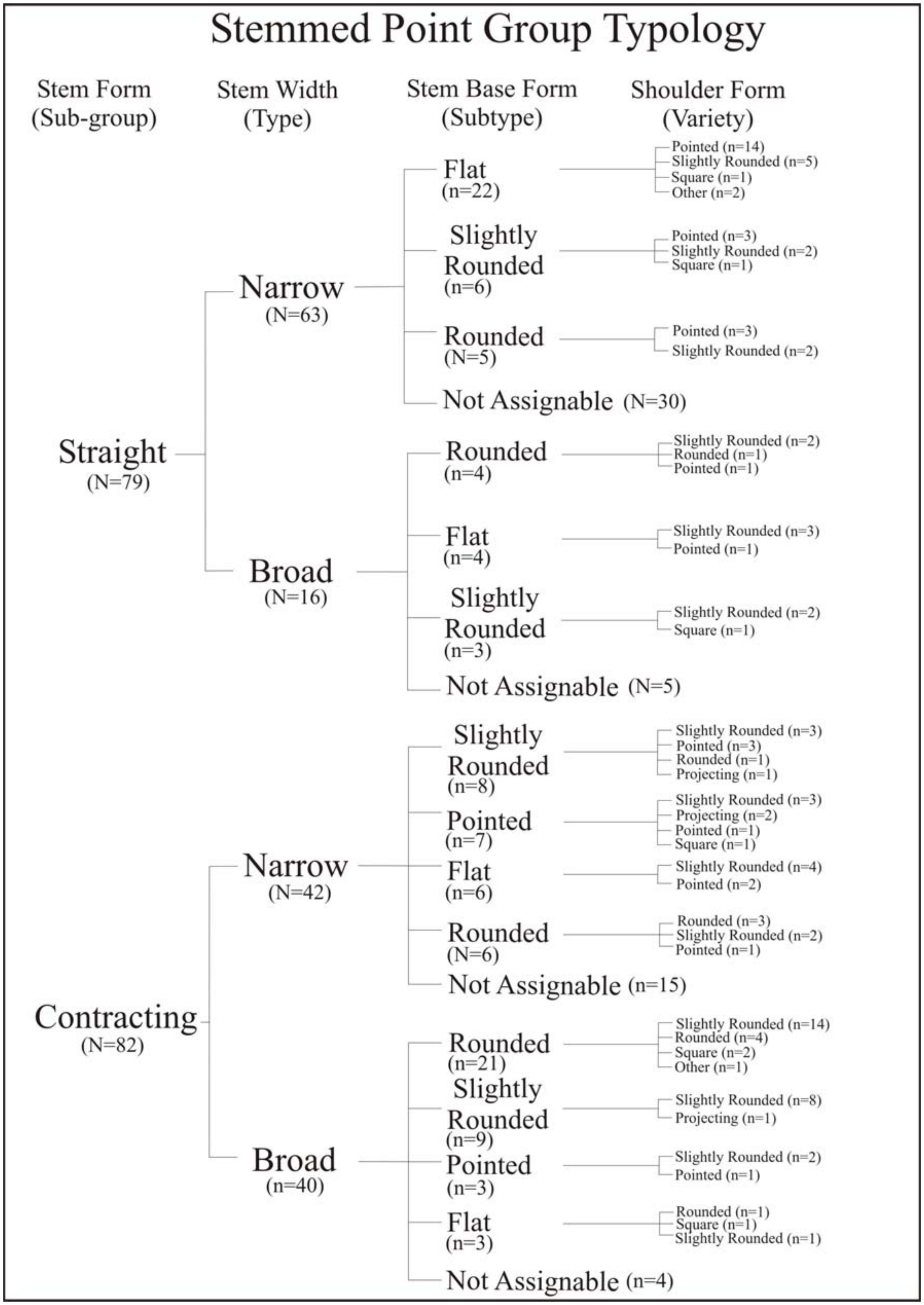

Figure 8.18. QBT assemblage stemmed point group typology.

The third (stem base form) and fourth (shoulder form) levels of the stemmed point analysis refined the four distinct types according to smaller, intra-type morphological patterns. Four different stem base forms were identified in the total stemmed point assemblage (flat, pointed, slightly rounded, and rounded) (see Figure 8.18). Among these four stem base forms, only pointed stem bases appear to be type specific—found only in the contracting narrow and contracting broad types. The remaining three stem base forms (flat, slightly rounded, and rounded) are present in all four types. Stem base form is considered to represent different sub-types within each specific type.

As noted above, shoulder form cannot be assumed to represent variability introduced during point manufacture because of potential modification through resharpening and use. In this analysis, variability in shoulder form is only used to define *potential* varieties within the four distinct types. Five different shoulder forms were identified within the assemblage (pointed, square, slightly rounded, rounded, and projecting) (see Figure 8.18) and provide some insights into intra-type patterning. Only one shoulder form—slightly rounded—was present in all types and may simply reflect normal use, edge damage, and successive resharpening of some other shoulder form. Other shoulder forms, including square and projecting are absent in some types. In general, the presence and/or frequency of the different shoulder forms is highly variable between the different identified types and sub-types.

Each of these sub-groups, types, sub-types, and varieties will be discussed in the following sections. However, the bulk of this discussion will center on the level of the four identified types, which will each be discussed separately. Information on the sub-types and varieties present within the distinct types will also be presented for each type.

<u>Straight Narrow Stem Type (Classic Paiján)</u>

The Straight Narrow Stem type is the most populous of the four types identified in the QBT assemblage and is represented by 63 examples (39.1% of all Stemmed Points). This type corresponds to the Classic Paiján point form that has been described by several different studies (Chauchat et al. 2006, 1988; Chauchat et al. 2004; Dillehay

2000; Lavallée 2000; Malpass 1983; Ossa 1978). Chauchat et al. 2004 have provided a detailed description of this point type:

> "The Paiján point is a bifacial point that is most often elongated. Its base is formed by a stem that is also narrow and elongated. The stem is delimited by barbs whose bases are never rounded, but are pointed and generally oriented toward the base or, more rarely, slightly to the side. The apical part of the point, or tip, is characterized by its long needle shape. On points with convex sides this elongation is manifested as an inflection of the superior edges, which become concave, then rectilinear toward the tip. The supposed finished points are also characterized by clearly detectable abrading along the entire length of the two edges, thus eliminating their sharpness." (Chauchat et al. 2004: 9).

Figure 8.19 contains examples of Straight Narrow (Classic Paiján) points from the QBT assemblage. Straight Narrow type points include both corner- and basally-notching, although as Chauchat's definition noted corner-notching is by far the most prevalent. The elongated stems are typically straight, but slightly excurvate examples are present as well (Figure 8.19).

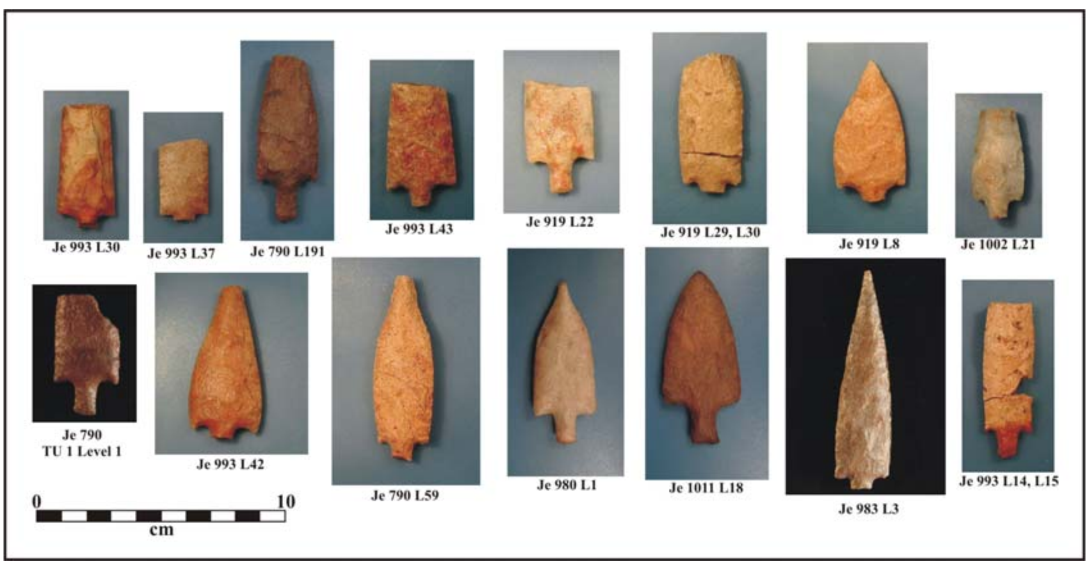

Figure 8.19. Examples of Straight Narrow stem (Classic Paiján) points in the QBT assemblage.

As these few examples illustrate, there is a consistency in overall stem form that defines this type. However, there is no such consistency in blade shape. The 15 examples of Straight Narrow type points in Figure 8.19 display a range of blade forms that vary from to roughly triangular to convex. Some of the variability in blade form may be a product of different mental templates (i.e., different intended forms) during manufacture. If this is so, then distinct sub-types within the Classic Paiján form may be identifiable.

It is equally likely, however, that at least some of the variability in blade form is related to episodic and/or patterned resharpening—especially along the distal blade margins. Some of the points shown in Figure 8.19 display a pronounced needle-nose blade shape (particularly Je 980 L1), while others display a less pronounced and/or uneven distal reworking (see examples Je 919 L8 and Je 790 L59). Other points, such as Je 993 L42 , Je 983 L3, and Je 1011 L18 do not express similar, if any, blade reworking.

The Straight Narrow type points in the QBT assemblage suggest that the pronounced needle-nose blade form that is often considered characteristic of the Classic Paiján type may be a product—at least in part—of extensive resharpening along the distal blade margin and not entirely related to the intended or manufactured form (mental template) of the point. As Chauchat et al. (2004: 9) noted in their definition of Paiján points, these points tend to contain edge grinding along much of lateral margins of the blade to remove their sharpness. Edge grinding on projectile points is used to blunt the blade edges where haft bindings or wrappings encircle the point and affix it to the shaft or spear (Boldurian and Cotter 1999; Lahren and Bonnichsen 1974; Rots 2005). The presence of edge grinding along substantial portions of the blades of Classic Paiján points suggests that they were deeply hafted within a foreshaft and bound around much of the extant blade. Retouch/resharpening on a tool hafted in this manner would only occur along the usable portions of the blade—which is precisely where the classic needle-nose retouch is located.

Resharpening of a point blade occurs when the tool becomes dulled through use (Andrefsky 1998; Odell 2003). Intensive or repeated use of a maintained tool should result in more pronounced retouch/resharpening. Thus, points with a substantial amount of retouch/resharpening (like the needle-nose form) should display indicators of intensive use and/or a multiplicity of uses. In order to assess the relationship between the needle-nose retouching and possible intensity of use, two needle-nose shaped point fragments from the QBT assemblage were analyzed for microwear indicators (Figures 8.20 and 8.21).

The small, needle-nose shaped medial fragment recovered from site Je 431 (Figure 8.20) displays little edge rounding and only sporadic grain loss along the lateral margins. A smeared, uneven polish with pitting was observed on flattened and rounded domes in areas of major contact near the lateral margins and along the central flake scar 'ridge' on the tool interior. The brightness of the polish, smearing, and fine pitting is consistent with use in drilling and/or perforating fresh hides.

The second needle-nose fragment was recovered from site Je 804 and is somewhat larger and serrated (Figure 8.21). Microwear analysis indicated extensive, heavy edge rounding with crushing and grain loss along the lateral margins. Several small striae oriented parallel to sub-parallel to the use edge were also documented. A bright polish is infrequently present on flattened and rounded domes along the lateral margins. The probably function of this tool, given the heavy edge damage, rounding, parallel striae, and polish is intensive or repeated butchering of fresh hide and meat.

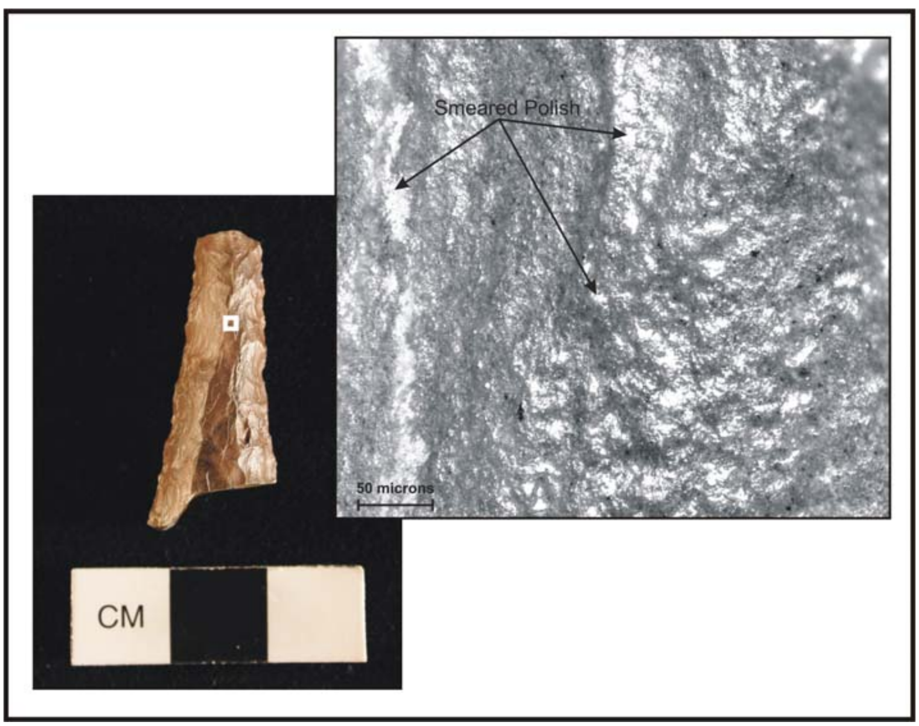

Figure 8.20. Microscopic use-wear indicators on a needle-nose shaped point fragment from Site Je-431.

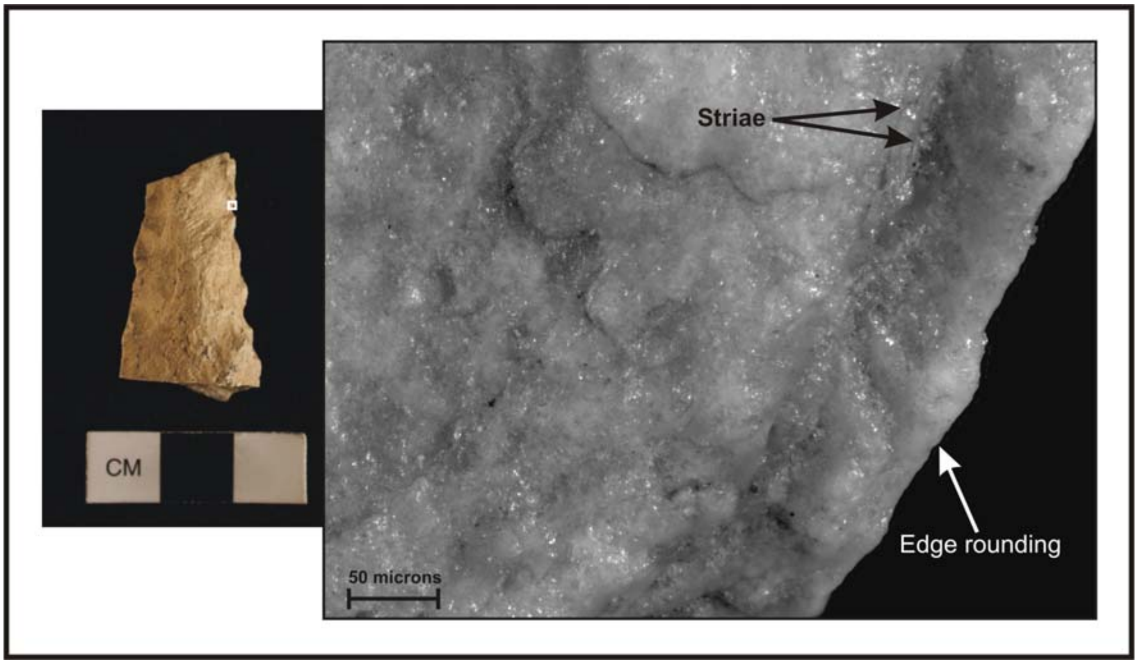

Figure 8.21. Microscopic use-wear indicators on a needle-nose shaped point fragment from Site Je-804.

Although these two biface fragments may not be representative of all Classic Paiján points, there is a clear suggestion from the microwear analysis that these points were used in butchering and hide working activities. It is interesting that the smaller, more finely worked point has little edge rounding along the lateral margins and a greater amount of flattening with polish on the tool interior. This suggests that the point had been resharpened after use—thus rejuvenating the edges, but maintaining (and increasing over time) the wear on the interior high points.

In contrast, the larger, more serrated fragment showed heavy edge rounding and extensive grain loss along the lateral margins, with less extensive polish. It appears that this tool was subjected to intensive use and may have been broken and/or discarded prior to resharpening—which would have removed the rounding and rejuvenated the lateral margins. The less extensive polish on both the lateral margins and on the tool interior suggest that this point did not have as long a use-life as the more finely retouched example from site Je 431 (Figure 8.20).

Although these are only two examples, they do provide support for the idea that the needle-nose shaping may be related to intensity or repeated use and resharpening episodes. Microwear indicators on these two point fragments are suggestive of use in hide working and butchery for Classic Paiján points. It seems likely that as the point blade becomes dulled through use, areas of the blade margins—above the haft bindings—are resharpened. Successive resharpening produces the classic needle-nose shape. It is possible, given the use-wear indicators of drilling/perforating on one tool fragment, that this shape was intentional and related to hide perforation. However, more use-wear studies are needed to confirm these assessments.

If the scenario of deep haft strategy/repeated use and resharpening produced the pronounced needle-nose Paiján form, then we can infer two additional characteristics about Classic Paiján points. First, Classic Paiján points should have blades that are long enough to accommodate haft binding and still leave functional tool edge. Chauchat and others have already noted the propensity for elongated blades among Paiján points (Chauchat et al. 2004: 9-11; Malpass 1986: 99), which appears to support the deep haft/resharpening scenario. Secondly, if later retouch is resulting in the pronounced needle-nose distal blade shape then we may expect that unretouched Classic Paiján points or points in intermediate stages of resharpening would display markedly different blade forms—perhaps to the point of appearing to be different types of points.

Figure 8.22 contains illustrated examples of Classic Paiján (Straight Narrow) type points (Figure 8.22). The points are similar in terms of general stem form, fineness of pressure flaking, and point thickness, but the blades show differing amounts of retouch ranging from extensive to less extensive to none. Dissimilarities between the points are most pronounced in shoulder form and blade shape—each of which may be altered by later retouch. Although it cannot be conclusively demonstrated, these examples suggest that among stemmed points in the Straight Narrow type (Classic Paiján), the vast majority of intra-type variability—particularly in blade and shoulder attributes—may be related to haft strategy and post-manufacture retouch.

Although blade and shoulder shape may show substantial variation, the Straight Narrow type is overall relatively uniform in haft characteristics. Only three subtypes (stem base forms) were identified within this type, including flat stems (n=22), slightly rounded stems (n=6), and rounded stems (n=5) (see Figure 8.18). A large number of the Straight Narrow stems were partially broken, which prohibited identification of stem base form (n=30; 47.6% were unassignable). Among the three identified stem base forms, the

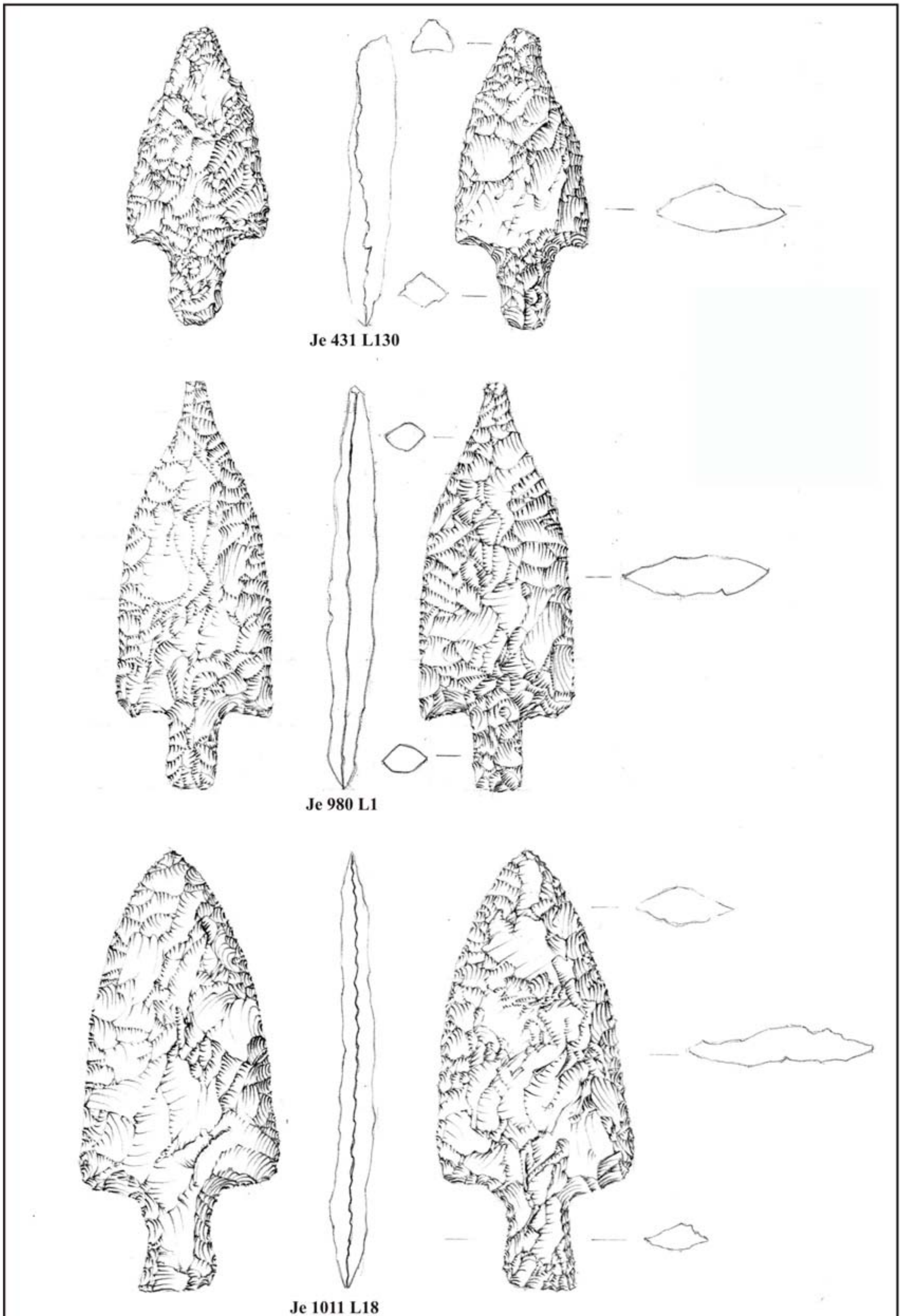

Figure 8.22. Illustrated examples of Classic Paiján (Straight Narrow) points in the QBT assemblage (actual size).

flat base subtype is the most common—representing 34.9% of all the Straight Narrow points. The slightly rounded and rounded stem base forms account for 9.5% and 7.9% respectively of the variability within this type.

Examination of the shoulder forms within these subtypes also reveals a range of variability. Among the Straight Narrow points that contained identifiable shoulders, three distinct varieties were present (pointed, slightly rounded, and square). Pointed shoulders are the most common form within each of the subtypes of the Straight Narrow point type (n=20) and account for 60.6% of the identifiable examples (63.6% of the flat base subtype, 50% of the slightly rounded base subtype, and 60% of the rounded base subtype) (Figure 8.18). Straight Narrow points with slightly rounded shoulders are less common (n=9; 27.2% of identifiable examples) and account for 22.7% (flat), 33.3% (slightly rounded), and 40% (rounded) of the stem base form subtypes respectively. Two examples displayed a square shoulders (n=2; 0.6% of identifiable examples)—one each in the flat and slightly rounded stem base form subtypes. Lastly, two examples (n=2; 0.6% of identifiable examples) displayed shoulders that appeared unfinished or were the work of novice flintknappers and were classified as 'other'. Both of these points were made on small flakes and show little to no attempt at bifacial thinning.

Although a range of subtypes and varieties exist within the Straight Narrow point type, there is a clear tendency among this type toward a specific form—straight narrow stems, flat stem bases, and pointed shoulders. This is, of course, the exact definition of the Classic Paiján point (see Chauchat et al. 2004: 9 quote above). However, there are enough intra-type examples that do not fit this description to warrant their interpretation as subtypes within the Classic Paiján type—notably the slightly rounded and rounded stem base form subtypes.

Table 8.28 presents the metric attributes for all (n=12) of the unbroken/complete Classic Paiján (straight narrow) type points in the QBT assemblage. The relatively small sample size of complete points within the straight narrow type (12 out of 63 examples; 19% of type examples) limits our ability to identify any possible intra-type size patterning, but does provide a representative characterization of the Classic Paiján point size that can be compared with other types in the QBT assemblage and with point size measurements from other regions. One important point to note is that the four examples

Table 8.28. Metric attributes of Classic Paiján (Straight Narrow) points in the QBT assemblage.

Site	Artifact #	Length	Width	Thickness	Weight (g)	Shoulder Width	Stem Length	Stem Width
JE 431	L97	3.04	1.3	0.29	1.1	1.26	0.39	0.62
JE 431	L130	4.83	2.16	0.72	7.6	2.07	1.13	0.83
JE 790	L59	7.4	2.43	1.1	22	2.16	0.67	0.88
JE 800	L28	8.92	3.18	1.23	29.1	2.6	1.46	1.27
JE 804	L89	8.07	2.55	0.98	19.6	2.39	1.18	1.14
JE 804	L98	8.95	2.49	0.86	19.8	1.94	0.48	0.95
JE 900	L2	4.21	1.85	0.96	5.6	1.74	1.26	0.61
JE 980	L1	6.5	2.52	0.77	11.6	2.38	1.16	0.89
JE 990	L4	6.68	2.61	0.99	17.2	2.49	1.21	0.9
JE 993	L6	2.71	1.33	0.69	2.3	1.33	0.54	0.56
JE 1001	L1	6.08	3	1.03	17.3	2.61	1.12	0.91
JE 1011	L18	7.04	3.23	0.56	12.9	3.06	1.5	1.07
Means		**6.2**	**2.39**	**0.85**	**13.84**	**2.17**	**1.01**	**0.89**

*All measurements are presented in centimeters with the exception of Weight, which is in grams.

with length measurements of less than 5.0 cm (Je 431 L97, Je 431 L130, Je 900 L2, and Je 993 L6) are either made on flakes or have been heavily retouched/resharpened and probably are not indicative of the intended or original length for points of this type. In general, the Classic Paiján points within the QBT assemblage tend to be relatively long (6-9 cm in length), narrow (2-3 cm in width), and thin.

Both Chauchat (Chauchat et al. 2004: 9-11) and Malpass (1986: 99) have noted the typically long length of Paiján points (suggesting an average length of 11-16 and 10-15 cm, respectively). However, none of the Classic Paiján points within the QBT assemblage approach the lengths they report (commonly 6-9 cm in length). This discrepancy may indicate that Classic Paiján point type has greater variability in size, particularly length, than previously known. Conversely, it is also possible that the discrepancy in size between the QBT assemblage and those from other regions may indicate a greater degree tool resharpening and conservation than previously considered.

The raw materials used for manufacturing Classic Paiján type points in the QBT assemblage include a relatively wide variety of materials (Table 8.29). However, there is a clear preference for fine-grained and very fine-fine grained quartzites. In the Cupisnique/Chicama region to the south, Chauchat and others have reported a similar breadth of variety with a preferential focus on specific raw materials (Becerra 1999;

Table 8.29. Classic Paiján (Straight Narrow) point subtypes by raw material.

Raw Material	Classic Paiján subtypes: Flat	Slightly Rounded	Rounded	Unassignable	Type Total (n)	% of Type
Quartzite, FG	11	2	3	21	37	58.73%
Quartzite, VFG (Toba)	4	2	1	2	9	14.29%
Rhyolite	3	2	1	1	7	11.11%
Quartz (Semi-opaque)	3	0	0	1	4	6.35%
Quartz (Crystal)	1	0	0	1	2	3.17%
Quartz (Opaque)	0	0	0	2	2	3.17%
Quartzite, CG	0	0	0	1	1	1.59%
Silex (Mottled brown)	0	0	0	1	1	1.59%
Subtype Total	**22**	**6**	**5**	**30**	**63**	**100.00%**

Becerra and Gálvez 1996; Chauchat et al. 2006; Chauchat et al. 2004). In the Cupisnique/Chicama region Paiján points were overwhelmingly manufactured from the abundant and locally occurring rhyolite (several varieties) and green tuff. Fine-grained quartzites and quartz are also noted, but in much lower frequencies.

In the QBT assemblage, rhyolites (n=7) were used in the manufacture of Classic Paiján points, but in lower frequencies than the more common fine-grained quartzite (n=37) and very fine-grained quartzite (toba) (n=9). Both the fine-grained quartzite and very fine-grained quartzite (toba) outcrop at numerous locations within the project area and are also common in cobble form within the several *quebrada* drainages that cross-cut the survey area. Less well represented, yet locally available, raw materials include quartz (crystal, semi-opaque, and opaque) and a coarse-grained quartzite. Quartz veins and large crystal outcrops are present in both the Quebradas Talambo and Batán, typically along the ridges that border the head or uppermost portion of the drainage. Quartz crystals in excess of 30 cm in length have been observed in these locations, although most are smaller (5-15 cm in length) (personal observation, 2003).

A single example of non-local raw material (n=1; 1.6% of Classic Paiján points) was used in the manufacture of Classic Paiján points in the QBT assemblage. Specimen Je 439 L60, which has a broken stem and was not attributable to a specific subtype, is manufactured of a very high quality, mottled brown silex that is believed to be of highland origin (outcropping approximately 30-50 km to the east) (Dillehay 2000; Dillehay et al. 2003; Gálvez 2004). Overall, however, immediately locally available materials (n=62; 98.4% of Classic Paiján points) dominate the Classic Paiján point assemblage.

The 63 examples of Classic Paiján (Straight Narrow) points in the QBT assemblage were recovered from 20 sites (Figure 8.23). Figure 8.23 displays the location of each of these sites. The majority of sites containing Classic Paiján points (n=13) are located in the Quebrada del Batán near the intersection of the Batán and Q. Higuerón drainages, while the remaining sites (n=7) are located throughout the Q. Talambo area. This distribution clearly illustrates an intense and widespread use of the coastal quebrada systems by the makers of the Classic Paiján point type and other types of Paiján points as well (see following discussions of other Paiján types).

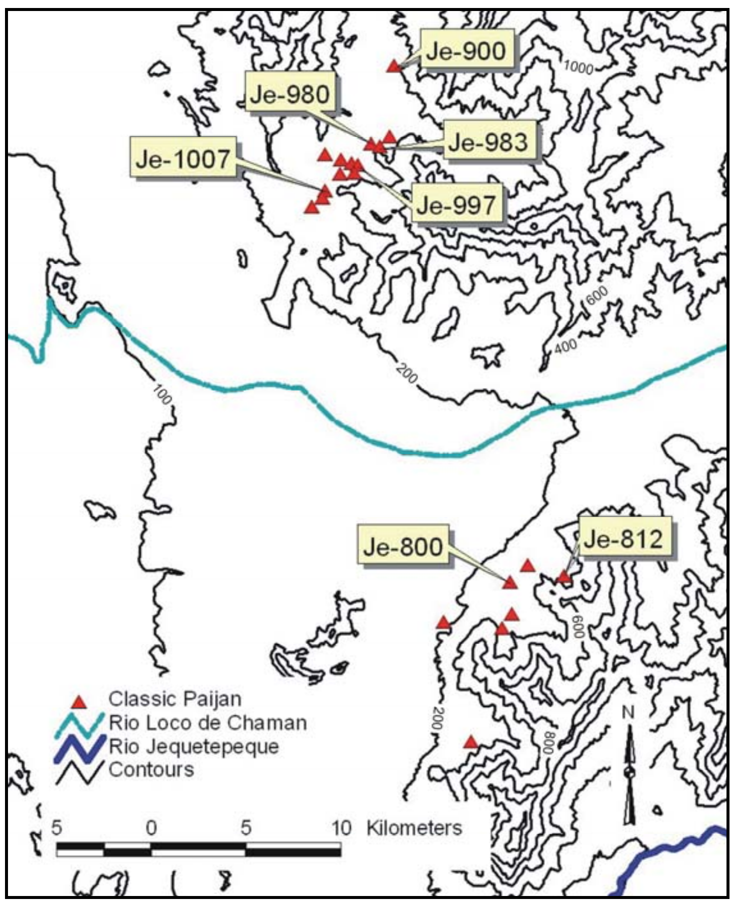

Figure 8.23. Distribution of sites with Classic Paiján points (n=20; labeled sites are single component) (plotted on the Chepén Topographic Quadrangle, 1:100,000 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcView 3.2 GIS program).

Only a single example of the Classic Paiján point type was recovered from an excavation context—FS# 427.1.1, recovered from Zone I at site Je 790. This stratigraphic unit (Je 790 Zone I) yielded AMS dates of 9,530±70 RCYBP (11,131-10,600 cal B.P.), and 9,334±50 RCYBP (10,697-10,306 cal B.P.) from two distinct excavation contexts (Blocks A and B), and a date of 11,220±700 RCYBP (14,975-11,207 cal B.P.) from a shallow pit/hearth feature (Block A, Feature 9) (see discussion of Je 790 in Chapter Seven). According to these dates, the age of this point could potentially range from 11,200-9,300 RCYBP.

Je 790 is large, multicomponent site that appears to contain multiple, overlapping episodes of occupation during the Early Preceramic period (see discussion of excavation results in Chapter Seven). Correlating occupational episodes from different areas of the site is difficult, given the limited number of diagnostic artifacts recovered *in situ*. The artifacts and artifact densities, including two broken bifaces, recovered from the same excavation context (TU 1) as the lone diagnostic point (Classic Paiján point) are most similar to those recovered in Block A (dated to 11,220±700 RCYBP) and are probably related to the same or penecontemporaneous occupations. This date is somewhat earlier than most reported dates for the early Paiján—which typically fall around 10,800-10,600 RCYBP (Chauchat et al. 2006; Dillehay 2000; Lavallée 2000). However, the lower end of the rather large error range (±700) for this date is directly in line with an age range of 10,800-10,500 RCYBP and is probably most accurate for this point. The later dates from Block B (9,334±50 and 9,530±70 RCYBP) are more in line with what is considered to be the age range for the terminus of the Paiján complex (Chauchat et al. 2006; Dillehay 2000; Lavallée 2000) and probably represent the same for this point type.

Clearly, there is a pressing need for additional dates to better clarify the temporal position of the Classic Paiján type. However, the age of the deposits and similarities in associated artifacts from Je 790 suggest that the Classic Paiján point type probably ranges between ca. 10,800-9,500 RCYBP—which agrees with other dates from previous studies in nearby regions. To date, we have been unable to sub-divide the broad Paiján complex into meaningful temporal units or phases. If the age range of ca. 10,800-9,500 RCYBP for the Classic Paiján type is accurate, then this type (Straight Narrow stem form) can be considered diagnostic of the earliest phase of the Paiján complex.

Straight Broad Stem Type (Talambo)

The Straight Broad Stem type is the least common type of stemmed point identified in the QBT assemblage (n=16; 9.9% of all stemmed points). The 16 points defining this type were recovered from 11 sites—4 in Q. del Batán and 7 in Q. Talambo (Figure 8.24). As Figure 8.24 illustrates, the locations in which these points are found are much less common and more widely spaced when compared to the Classic Paiján points discussed previously. The majority of sites yielding this type are located on low slopes or terraces that overlook *quebrada* drainages. Because the majority of these points were recovered from the Talambo area, that name has been applied to this type.

Among Paiján points, broad and narrow stem varieties were recognized early on by both Ossa (1973) in the Moche valley and Malpass (1983) in the lower Casma valley. In both of these studies, broad stem points were considered to represent a separate type from the narrow stemmed Classic Paiján points. In each of these studies, however, broad stem points were typically found in association (often on the same sites) with the narrow stem Classic Paiján points. For Malpass the broad stem type represented clear evidence of stylistic variability within the Paiján complex (1983: 122-138).

However, it should be noted that in this study the Talambo type is defined by stem form (straight) and stem width (broad) and does not necessarily directly relate to the broad stem types of either Ossa or Malpass—which focused on stem width and blade/shoulder shape. In the QBT assemblage, Talambo points are bifacially-flaked and have long, wide stems with parallel to nearly parallel lateral stem margins (Figure 8.25). These long stems typically have widths that are equivalent to 50% or more of the width of the point blade. Stem base form varies between rounded (n=4), flat (n=4), and slightly rounded (n=3) examples. These points are often large and the blade is typically wide, but blade shape is highly variable with examples of parallel, convex, and triangular margins all identified. Shoulder forms present within the QBT examples included slightly rounded (n=7), pointed (n=2), rounded (n=1), and square (n=1).

Talambo (straight broad) points are typically thin compared to their width and display bi-convex to plano-convex cross-sections with extensive pressure flaking along the lateral blade and stem margins. Only a single complete example of this type was identified in the QBT assemblage. The metric attributes for that point, Je 790 L107, are

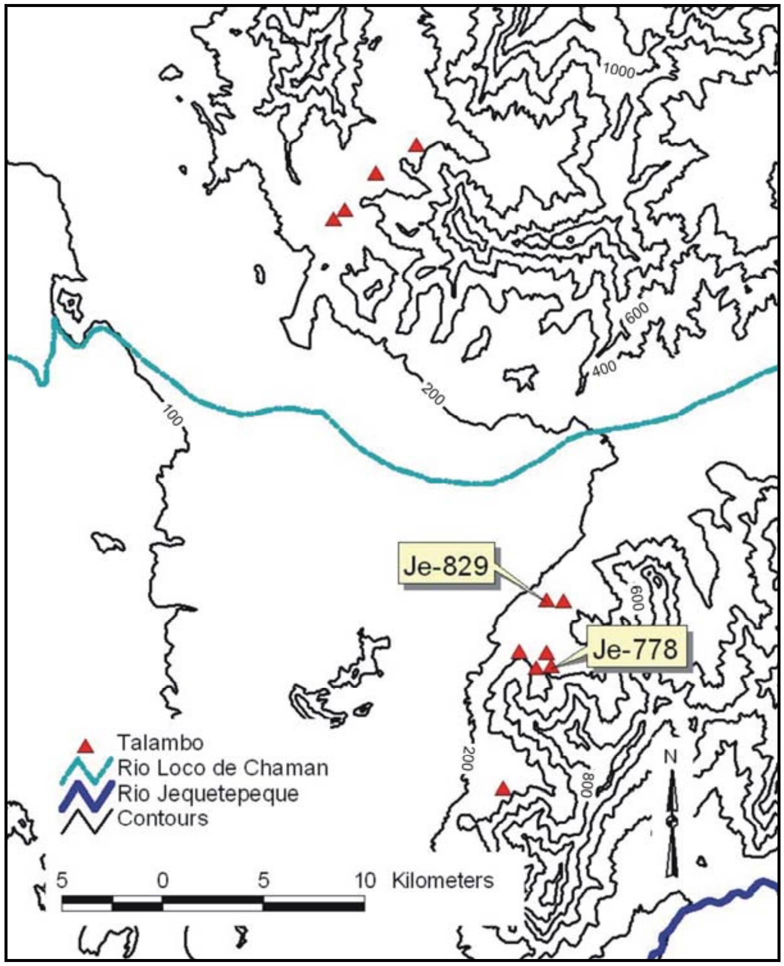

Figure 8.24. Distribution of sites with Talambo points (n=11; labeled sites are single component) (plotted on the Chepén Topographic Quadrangle, 1:100,000 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcView 3.2 GIS program).

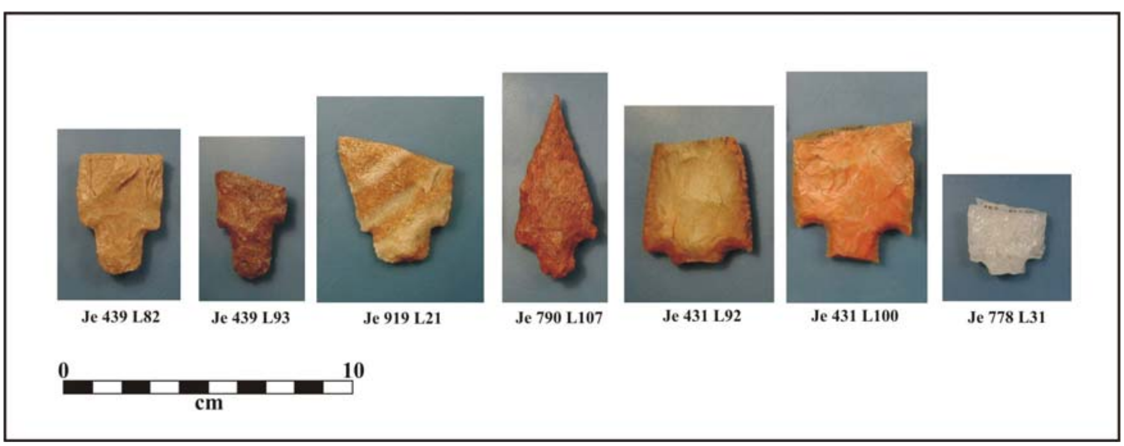

Figure 8.25. Examples of Straight Broad stem (Talambo) points in the QBT assemblage.

presented in Table 8.30. The presence of only one complete Talambo point limits the effectiveness of metric attribute comparisons with Classic Paiján points, but does allow for some tentative observations. The lone complete Talambo point is one of the smaller examples of this type—which may be why it is unbroken. Given this, the metric comparisons between this point and the means from the complete Classic Paiján points indicate the possibility of a real size distinction between the types. The Talambo point is larger in all respects than the mean measurements for the Classic Paiján points, but especially in terms of width and stem width.

The possible size differences between the Classic Paiján and Talambo points does not appear to reflect any substantial change in raw material use (Table 8.31). Among the 16 Talambo points in the QBT assemblage, fine-grained and very fine-grained quartzites dominate the raw materials (56.25%). These two raw material types comprised just over 73% of the Classic Paiján points. Other raw materials types, such as rhyolite, coarse-grained quartzite, were also used in the manufacture of Talambo points but much less frequently than the fine-grained quartzites. Basalt, quartz, and the green variety of very fine-grained quartzite are present in individual cases.

Table 8.30. Metric attributes of the Talambo (Straight Broad) Point from Je-790.

Site	Artifact #	Length	Width	Thickness	Weight (g)	Shoulder Width	Stem Length	Stem Width
JE 790	L107	6.78	3.05	1.1	15.6	2.98	1.25	1.45

Table 8.31. Talambo (Straight Broad) subtypes by raw material.

	Straight Broad Subtypes					
Raw Material	**Rounded**	**Flat**	**Slightly Rounded**	**Unassignable**	**Type Total (n)**	**% of Type**
Quartzite, FG	1	1	2	2	6	37.50%
Quartzite, VFG (Toba)	1	2	0	0	3	18.75%
Quartzite, CG		1	1	0	2	12.50%
Rhyolite	2	0	0	0	2	12.50%
Quartzite, VFG (Green)	0	0	0	1	1	6.25%
Quartz (Opaque)	0	0	0	1	1	6.25%
Basalt, FG	0	0	0	1	1	6.25%
Subtype Total	**4**	**4**	**3**	**5**	**16**	**100.00%**

Compared to the Classic Paiján points, the use of quartz (no crystal or slightly opaque varieties) is greatly reduced in Talambo point manufacture. In addition, there are no examples of non-local materials (i.e., silex or chalcedony). Although these two differences are noteworthy—lower frequency in the use of quartz and no exotic materials—the overall pattern of raw material use is similar to that of Classic Paiján points and indicates a broad reliance on locally available resources.

The broad stemmed Talambo point type is relatively uncommon when compared to the other types of stemmed points identified in the QBT assemblage. The 16 examples that represent this type (collected from 11 sites) comprise only 9.9% of all stemmed points. Interestingly, in the QBT these points frequently co-occur with another stemmed type. Only two sites (Je 778 and 829, both in the Q. Talambo area) were encountered that contained no diagnostic artifacts other than Talambo (straight broad) type points. Among the nine sites where Talambo points co-occur with other types, all three other stemmed point types (Classic Paiján, Contracting Narrow, and Contracting Broad) were identified.

The relatively small number of points and frequent occurrence with other stemmed types begs the question of how this type is related to the others. Are Talambo points a stylistic expression or technological distinction that is contemporaneous with the other stemmed types (i.e., coeval types)? Do they represent a single type in a temporal sequence of stemmed points within the Paiján complex? If so, how are the different types related?

AMS dates associated with this type provide some insight into these questions. A single example (FS# 391.1.1) of the Talambo point type was recovered *in situ* from a datable excavation context (Je 431, Block B, TU 1, Level 4, 18 cmbd). Site Je 431 is a large, multicomponent basecamp that contained all four stemmed point types on the surface. However, the only point recovered from subsurface contexts at the site was this Talambo point (see Chapter Seven, Figure 7.4). The results of the excavation of Block B at Je 431 were presented and discussed by Stackelbeck (2008: 220-228) and has been summarized in Chapter Seven of this document. The Block B deposits are interpreted as a dense and thick Late Early Preceramic midden containing a variety of faunal materials including land snails, several fish/aquatic species, terrestrial mammals, birds, and reptiles.

Table 8.32. AMS dates from Block B, Je-431.

Site	T.U.	Level	cmbd	PP #	Zone	AMS date	Error	Cal BP (2 sigma)	Material
Je-431	1	2	8	3	I	>15,600		uncalibrated	Wood Charcoal
Je-431	1	4	20	9	I	8,983	65	10,244-9,912	Wood Charcoal
Je-431	1	7	30-35	gen	I	9,032	50	10,270-9,939	Wood Charcoal
Je-431	13	2	10	1	I	9,041	48	10,282-10,043	Wood Charcoal

Four AMS dates taken on wood charcoal collected from Block B produced a very tight age range (with one outlier), suggesting that the Block B materials were deposited over a relatively short period of time (perhaps 200-300 years) (Table 8.32). These dates are presented in Table 8.32 and were also presented and discussed in Chapter Seven. Three of the dates are particularly relevant to understanding the chronological position of the Talambo point type. The first date (>15,600) is problematic and appears to represent either a contaminated sample or the introduction of ancient carbon into younger deposits and is not considered representative of the age of the deposits. The remaining three dates, all from deeper deposits, cluster tightly around 9,000 RCYBP (8,983±65, 9,032±50, and 9,041±48 RCYBP) and clearly indicate a late Early Preceramic age for the Talambo point recovered in this midden.

An age of ca. 9,000 RCYBP for the Talambo point type stands in contrast to the much earlier age range indicated for the Classic Paiján type (ca. 10,800-9,500 RCYBP). If we return to the question of coeval types vs. sequential types posed earlier in this section, the chronological positions of these distinct point types suggest that different types of stemmed Paiján points existed at different times during the Early Preceramic period. The narrow (Classic Paiján) and broad (Talambo) types of the straight stem point group do not appear to represent contemporaneous stylistic expressions or technological variability within the Paiján complex. Rather, the Talambo point, with an age of ca. 9,000 RCYBP, represents a distinct type that appears to be temporally diagnostic to the late Early Preceramic period.

<u>Contracting Narrow Stem Type</u>

The contracting narrow stem type is comprised of 42 examples (n=42; 26.1% of all stemmed points). These points were recovered from 21 individual sites—17 in Q. del

Batán and 4 in Q. Talambo (Figure 8.26). As Figure 8.26 indicates, the majority of sites that contained contracting narrow stem points are located near the intersection of the Q. del Batán and Q. Higuerón drainages and in the lower Q. del Batán drainage. Relatively few sites are located in the upper reaches of the different *quebradas* that comprise the Q. del Batán drainage system and even fewer sites (n=4) are located in the Q. Talambo region. Each of the four sites in the Q. Talambo are large, multicomponent sites.

The relationship between contracting stem points and the more widely recognized straight stem Classic Paiján points is poorly understood. Both Chauchat (Chauchat et al.

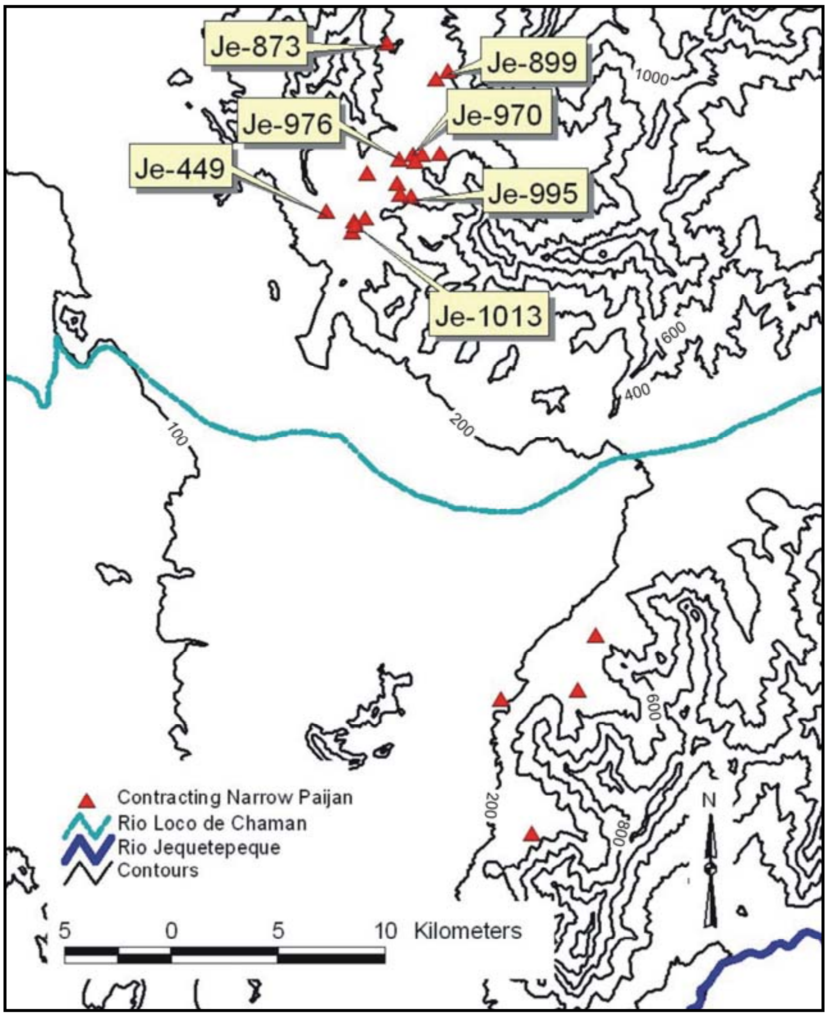

Figure 8.26. Distribution of sites with Contracting Narrow stem points (n=21; labeled sites are single component) (plotted on the Chepén Topographic Quadrangle, 1:100,000 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcView 3.2 GIS program).

2006; Chauchat et al. 2004) and Malpass (1986, 1983) have recognized the presence of contracting stem forms within Paiján assemblages, but were unsure if they represented variability within the Paiján manufacturing process or distinct types of points. Compounding this problem, as with the straight stemmed forms, was the presence of both narrow and broad examples of the contracting stemmed forms (Malpass 1983; Ossa and Moseley 1972).

Malpass (1983: 95-100) recognized a distinction between the narrow and broad contracting stem forms and considered them to represent different types. Although the different types were often found on the same surface sites, the technological and temporal relationships between these types—and the straight stemmed types—remained unclear. For Chauchat (Chauchat et al. 2006; Chauchat et al. 2004), the contracting stem points represented manufacturing variability within the Paiján type that was oriented toward the production of the straight stem Classic Paiján point form.

As was discussed previously, early understanding of the relationships between these points was hampered by the concurrent use of both blade shape and stem form attributes to identify typological variability. In the present study, only haft element attributes (stem form, stem width, stem base form, and shoulder form) were used to identify variability and assign types. This method resulted in the identification of two types of contracting stem points (contracting narrow and contracting broad) that are distinct from their straight stem counterparts within the Paiján complex.

Contracting narrow stem points, in general, are smaller than the other three Paiján types identified in this study (Figure 8.27). These points tend to be relatively short and thin, although long examples were also identified. The stems are also often short and narrow—although again, specimens with longer stems were noted. Typically, contracting narrow points are finely pressured flaked along the lateral margins to achieve the intended shape, bi-convex in cross-section, and have pronounced shoulders that range in form from rounded to projecting. It is worth noting that the projecting shoulder form was identified only on contracting stem points (both contracting narrow and contracting broad). Neither of the straight stem point types (Classic Paiján and Talambo) contained examples of this shoulder form.

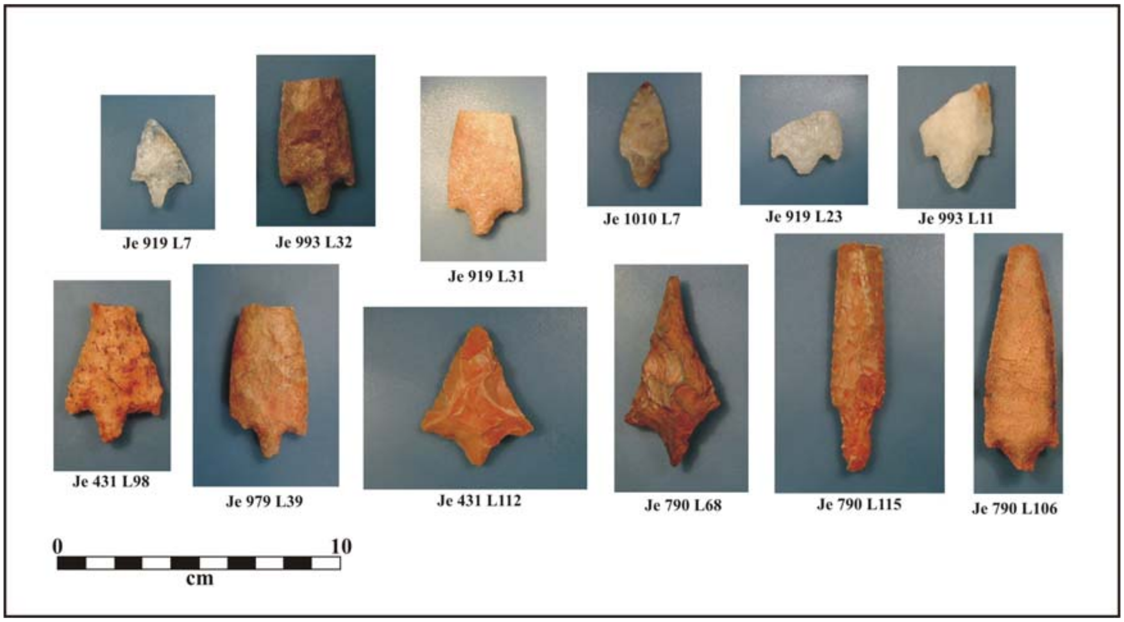

Figure 8.27. Examples of Contracting Narrow stem points in the QBT assemblage.

Nine complete examples of contracting narrow stem points were identified in the QBT (Table 8.33). As Table 8.33 illustrates, this type encompasses a relatively wide range of variability in terms of size and shape. Overall, however, the contracting narrow point type represents the smallest of the stemmed point types that comprise the Paiján complex. This observation is best illustrated by mean weight of the contracting narrow type (9.14g), which is considerably lower than the mean weights of the Classic Paiján, Talambo, or Contracting broad stem types. It is possible that the small size indicated for this type is a reflection of the small sample of complete points, or more likely, an indication that this type received extensive blade resharpening (thus reducing size and weight). Several of the points identified to this type do display evidence of extensive resharpening along the blade margins.

In spite of the small sample size or amount of resharpening, it seems clear that contracting narrow points were intended to be relatively small. Aside from the mean length and weight measurements, which may be altered through successive resharpening, the mean thickness of these points is also the lowest of any of the Paiján complex types. The thickness of a point is generally not altered through resharpening and supports the interpretation that this type was intended to be a smaller point.

Table 8.33. Metric attributes of Contracting Narrow stem points in the QBT assemblage.

Site	Artifact #	Length	Width	Thickness	Weight (g)	Shoulder Width	Stem Length	Stem Width
JE 431	L112	4.88	3.9	0.95	12.7	3.66	1.01	1.53
JE 790	L68	6.78	3.2	1.13	15.1	3.51	1.56	1.24
JE 804	L97	6.34	3.92	0.67	14.7	3.9	1.74	1.44
JE 853	L4	4.12	2.35	0.72	6.6	2.23	0.82	1.09
JE 899	L1	3.07	2.37	0.65	4	2.37	0.54	0.85
JE 901	L4	5.59	3.02	1.03	15.6	2.36	1.2	1.08
JE 919	L7	3.34	2.17	0.7	3.9	2.16	0.92	0.7
JE 971	L5	3.66	2.12	0.94	6.8	2.1	0.58	0.93
JE 1010	L7	3.78	1.74	0.47	2.9	1.65	1	1.06
Means		**4.62**	**2.75**	**0.81**	**9.14**	**2.66**	**1.04**	**1.1**

*All measurements are presented in centimeters with the exception of Weight, which is in grams.

What the difference in size between the contracting narrow type points and other types of Paiján points represents is a matter that will require increased comparative samples from other regions to fully understand. However, if we assume that the gross morphological characteristics of a point are related to intentional design characteristics for anticipated tool use(s) (see Bleed 1986; Hayden et al. 1996) then the small size of these points may be an indicator of use in different activities or sets of activities than other Paiján complex points, such as the Classic Paiján, Talambo, or Contracting Broad stem points.

Raw material selection and use may provide some support for the idea of different design and intended uses among the point types that comprise the Paiján complex. Table 8.34 provides the raw materials used in the manufacture of the contracting narrow points identified in the QBT assemblage. Like the raw materials used in the manufacture of the other Paiján complex points, contracting narrow stem points show a strong preference for immediately locally available materials and a preference for fine-grained quartzites. Only one specimen was manufactured from a clearly non-local material (chalcedony), which outcrops in the highlands some 30-50 km to the east.

In spite of the common emphasis on local materials, there are patterns that are distinct to this type. Most noticeable is the relatively high percentage of opaque quartz (26.2%) that was used in manufacture. Although fine-grained quartzite was the most

Table 8.34. Contracting Narrow sub-types by raw material.

Raw Material	Contracting Narrow subtypes					Type Total (n)	% of Type
	Slightly Rounded	Pointed	Flat	Rounded	Unassignable		
Quartzite, FG	3	2	3	2	7	17	40.48%
Quartz (Opaque)	1	3	2	2	3	11	26.20%
Quartzite, VFG	1	2	0	1	0	4	9.52%
Quartz (Semi-opaque)	1	0	0	0	2	3	7.14%
Rhyolite	1	0	0	0	2	3	7.14%
Basalt, FG	0	0	1	0	0	1	2.38%
Quartz (Crystal)	1	0	0	0	0	1	2.38%
Quartzite, CG	0	0	0	0	1	1	2.38%
Chalcedony (mottled caramel)	0	0	0	1	0	1	2.38%
Subtype Total	**8**	**7**	**6**	**6**	**15**	**42**	**100.00%**

common raw material (40.48%), the amount of quartz (all three varieties) that was used to manufacture contracting narrow points is substantially higher than in any of the other Paiján complex point types identified in the QBT assemblage. Quartzes account for only 12.69% of Classic Paiján points, 6.25% of Talambo points, and 17.5% of Contracting Broad points. In contrast, 35.72% of contracting narrow points were manufactured with quartz (Table 8.34).

By itself, the relatively high percentage use of quartz is not enough to distinguish the raw material use patterns of the contracting narrow points from other Paiján point types. However, because of the noted difference in size between contracting narrow points and other Paiján types, the observed differences in raw material use become more important. If the small size of contracting narrow points is a product of different anticipated uses—a possibility discussed above—then the differences in raw materials selection (notably the high frequency of quartz) may reflect real technological distinctions between this type and the others that comprise the Paiján complex.

A single example of the contracting narrow stem type was recovered from a dated excavation context (FS# 543.1.1; Je 1002, TU 9, Level 1). This point was recovered from just below the surface in the upper portion of a land snail midden that yielded an

AMS date of 8,854±62 RCYBP (10,176-9,704 cal BP) (Stackelbeck 2008: 253). The age of these deposits suggest a very late to terminal Early Preceramic Period age for the contracting narrow point type. However, localized areas of the upper deposits at site Je 1002 had been heavily impacted and disturbed by later Moche and Chimú reoccupations of the site. Because this point was so near the surface, it is possible that it was redeposited or in poor context.

Clearly, more examples of this point type from dated contexts are required to fully document its position within the Paiján complex temporal sequence. However, if the late to terminal Early Preceramic Period age is accurate—as it appears to be at present—then the contracting narrow stem point type represents a very late Paiján expression. The date of ca. 8,800 RCYBP also suggests that the contracting narrow type is contemporary or overlapping with the Talambo (straight broad) type.

Contracting Broad Stem Type

The contracting broad stem type is represented by 40 examples (n=40; 24.8% of all stemmed points). These points were recovered from the surface of 26 sites—17 in Q. del Batán and 9 in Q. Talambo (Figure 8.28). Like each of the other Paiján complex point types, sites containing the contracting broad stem type are predominantly clustered along the lower Q. del Batán drainage. However, the contracting broad stem type was identified at more sites than any of the other stemmed point types.

Within the QBT assemblage, contracting broad stem points tend to be large, although some smaller examples were identified (Figure 8.29). Compared to the three other stemmed point types, contracting broad stem points are often longer, wider, thicker, and weigh more. Both Ossa and Moseley (1972) and Malpass (1983) noted that 'broad stemmed points' tend to be longer and have wider stems than other point types. Stems on the contracting broad type are typically very long and wide. Like the Talambo (straight broad stem) point type, the stems typically have widths that are equivalent to 50% or more of the blade width. Malpass (1986: 102) suggests that a difference in the quality of flaking may exist between broad and narrow stemmed point examples from the Casma region—noting specifically that broad stemmed points tend to be finely flaked with parallel margins and regular surfaces. There are examples of contracting broad stem

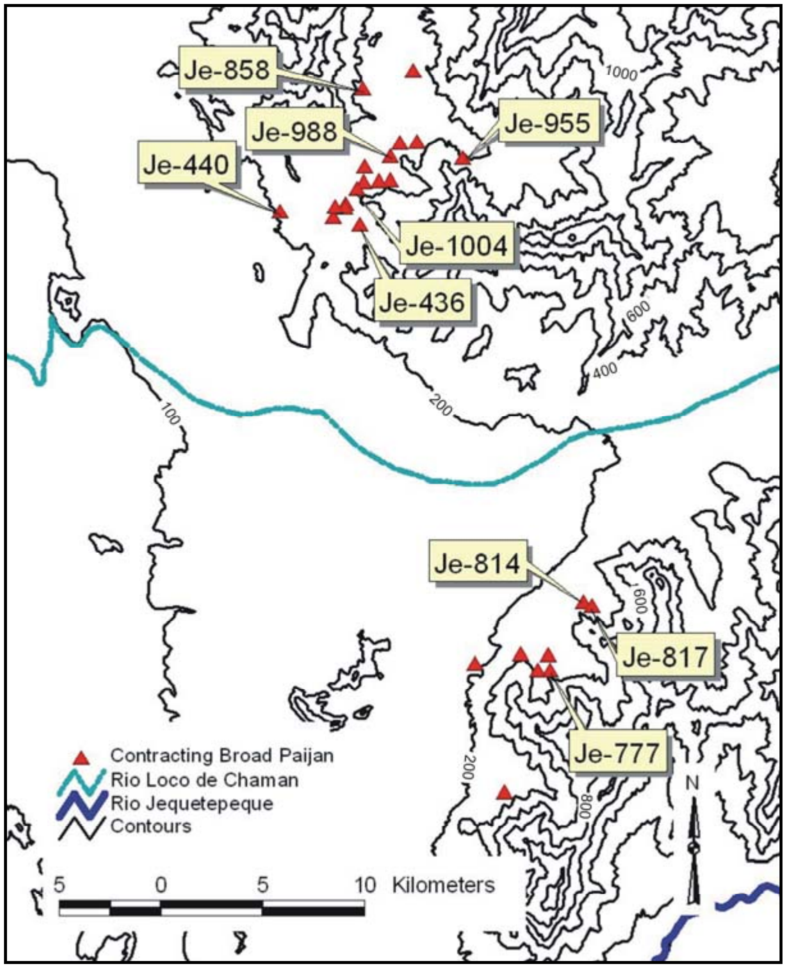

Figure 8.28. Distribution of sites with Contracting Broad stem points (n=25; labeled sites are single component) (plotted on the Chepén Topographic Quadrangle, 1:100,000 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcView 3.2 GIS program).

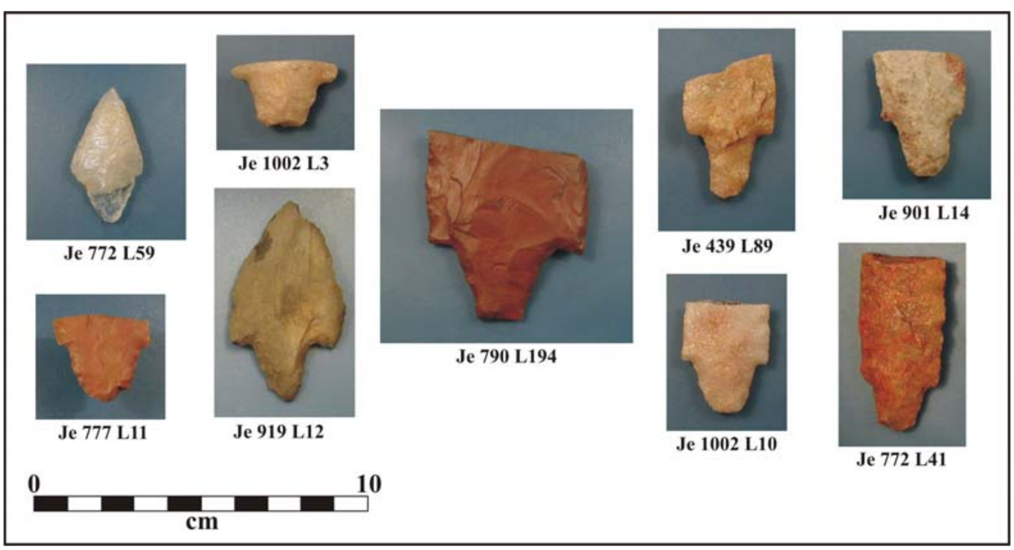

Figure 8.29. Examples of Contracting Broad stem points in the QBT assemblage.

Table 8.35. Metric attributes of Contracting Broad stem points in the QBT assemblage.

Site	Artifact #	Length	Width	Thickness	Weight (g)	Shoulder Width	Stem Length	Stem Width
JE 431	L114	5.19	2.75	0.78	10.3	2.09	1.23	1.66
JE 919	L12	6.04	3.51	0.89	16.9	3.23	1.75	1.56
JE 431	L120	8.54	3.44	1.32	36	3.04	2.18	1.84
JE 766	L49	13	3.28	1.17	45.3	2.39	1.65	1.62
JE 772	L59	4.03	2.17	0.69	4.7	2.17	1.43	1.63
JE 990	L5	6.35	3.28	1.05	20.6	2.95	1.14	1.78
Means		**7.19**	**3.07**	**0.98**	**22.3**	**2.65**	**1.56**	**1.68**

points in the QBT assemblage that display these qualities. However, as Figure 8.29 illustrates, examples with irregular surfaces and non-parallel margins are also frequently encountered.

Table 8.35 details the metric attributes from six complete examples of the contracting broad stem points within the QBT assemblage. It has been suggested that points of this type were typically around 10 cm in length (Malpass 1983; Ossa and Moseley 1979). Although the contracting broad stem type is generally contains the largest points in the QBT assemblage, only a few examples would have approximated or exceeded the length suggested by earlier studies. The contracting broad stem points in the QBT assemblage do appear to have been intended to be large points (mean length is 7.19 cm)(Table 8.35), but the few complete examples that were recovered are more suggestive of a point that was designed to be relatively long, thick, and heavy. We do not know at present for what specific uses this type of design may have been intended, but it is reasonable to suggest that these points may have functioned differently or served different functions than the Classic Paiján, Talambo, or Contracting narrow types.

If we ignore the question of possible function(s) and focus solely on gross morphology, contracting broad stem points are most similar—in terms of metric attributes—to Talambo points (straight broad stem). These two types share an emphasis toward relatively long, thick, and heavy points and have the highest mean values for each of the dimensional metric attributes. These two types (Talambo and contracting broad) are more morphologically similar to each other than to any other type. Outside of the distinction in stem form (i.e., straight vs. contracting), other important distinctions

Table 8.36. Contracting Broad sub-types by raw material.

Raw Material	Contracting Broad subtypes					Type Total (n)	% of Type
	Rounded	Slightly Rounded	Pointed	Flat	Unassignable		
Quartzite, FG	10	5	0	0	1	16	40.0%
Quartzite, VFG (Toba)	2	3	2	1	0	8	20.0%
Quartzite, CG	3	0	0	1	1	5	12.5%
Quartz (Opaque)	2	1	0	0	2	5	12.5%
Basalt, FG	0	0	1	1	0	2	5.0%
Rhyolite	2	0	0	0	0	2	5.0%
Quartz (Semi-opaque)	1	0	0	0	0	1	2.5%
Quartz (Crystal)	1	0	0	0	0	1	2.5%
Subtype Total	**21**	**9**	**3**	**3**	**4**	**40**	**100.0%**

between the two types include: 1) the presence of pointed stem bases among contracting broad points, which are only found among contracting stem forms, and 2) a single example of the projecting shoulder form, which is also only found in contracting stem points.

Aside from morphological similarities, raw materials used in the manufacture of both contracting broad and Talambo type points are also highly similar. Table 8.36 describes the raw materials used in the manufacture of contracting broad type points and is suggestive (like all of the stemmed point types) of an intense reliance on locally available raw materials dominated by fine-grained and very fine-grained quartzites. Other materials used in lesser frequencies included coarse-grained quartzites, quartz varieties, basalt, and rhyolite. No non-local (i.e., exotic) raw materials were used to make contracting broad points.

If we compare the raw material use patterns of the contracting broad points with those of the Talambo points (see Tables 8.31 and 8.36) there is a striking similarity in the frequency of both fine-grained quartzite (40.0% and 37.5%, respectively), very fine-grained quartzite (toba variety) (20.0% and 18.75%, respectively), and coarse-grained quartzite (12.5% for both). Many of the minor raw materials are also similar in frequency. These patterns indicate that the raw material use for the contracting broad and

Talambo types is nearly identical and suggests that the procurement patterns and mobility were also similar.

Although contracting broad stem points were recovered from more individual sites than any of the other stemmed point types, unfortunately no examples were recovered from subsurface contexts. Thus, we currently do not have a very good idea of the age range for this type or its temporal relationship with the other stemmed point types. The contracting broad type shares stylistic attributes (pointed stem bases and projecting shoulder forms) with the contracting narrow type, which is thought to date to 8,800 RCYBP. Contracting broad type points are metrically similar to Talambo points, with which they share nearly identical raw material use patterns. Talambo points also date to the end of the Early Preceramic period ca. 9,000 RCYBP. Although somewhat tenuous, the similarities that this type shares with others may be indicative of a similar age range (ca. 9,000-8,800 RCYBP). Thus, it is likely that the Contracting broad type is also diagnostic to the later part of the Paiján expression.

<u>Discussion of the Stemmed Point Group</u>

The presence of multiple, overlapping early complexes and/or adaptations has long been suggested on the north coast based on the identification of different lithic traditions (e.g., Unifacial, Paiján, Highland) and recognition of some known point types and many unknown forms within early assemblages. The stemmed point group of the QBT assemblage is no exception. However, by focusing on haft element attributes this analysis has resulted in the identification of four distinct point types (Classic Paiján, Talambo, Contracting narrow, and Contracting Broad) and provided new insights into the temporal position and relationship between the individual types. These results provide a framework through which the variability that exists among Early Preceramic stemmed points can be more clearly identified and related to specific phases within the larger period of ca. 10,800-9,000 RCYBP. The ability to meaningfully divide Early Preceramic stemmed points from the north coast region into distinct types with temporal boundaries has important consequences for our understanding of the larger Paiján complex phenomenon.

Perhaps the central point made clear from this analysis is that the broad Paiján complex was not a monolithic cultural expression represented by a single, idealized point type. Rather, what we have known as the Paiján seems more akin to a complex set of cultural expressions (in this case technological and lithic typological changes over time) that are suggestive of social and organizational changes during the Early Preceramic period. The relationship between these different technological expressions remains poorly understood, but some general patterns can be observed.

First, there is a clear change in point types over time. The Classic Paiján type (39.1% of stemmed points) appears to be the earliest of the Paiján complex expressions and dates to ca. 10,800-9,500 RCYBP. This is also the longest lasting point type within the complex and is found throughout the entire QBT survey region. Among the four point types identified in this study, the Classic Paiján type with its straight, narrow stem form is the most internally consistent. Variability in blade form and shape resulting from haft technique and resharpening produced most of the intra-type variability—although it is possible that some of this variability is also related to different intended tool functions.

After ca. 9,500 RCYBP the Classic Paiján type disappears in the QBT region and is replaced by three distinct stemmed types—Talambo, Contracting Narrow, and Contracting Broad points. These types are neither as internally consistent nor as long lasting as the earlier Classic Paiján. Together, they comprise the bulk (60.8%) of all stemmed points. Individually, however, their frequencies (9.9%, 26.1%, and 24.8%, respectively) and spatial distributions vary considerably. The Talambo and Contracting narrow types date to ca. 9,000-8,800 RCYBP—or the late Early Preceramic period. The Contracting Broad type is believed to be of similar age based on stylistic and technological similarities. Thus, these three types appear to represent contemporaneous, yet distinct late Early Preceramic point types.

Secondly, the technological relationship between these distinct types remains unclear. The contemporaneous presence of three distinct types after 9,500 RCYBP is indicative of increasing specialization in point design over time. Increasing specialization in tool design is related to more specific intended functional uses for different types of projectile points, but may also be related to increased social distance (i.e., greater isolation) between the groups who manufactured these points (Anderson

1996; Bleed 1986; Odell 2003). In either case—more specialized function or increased social distance—the appearance of multiple new point types suggests that the Early Preceramic inhabitants of the QBT were 'settling in' or becoming more localized in their settlement/mobility and focusing on specific sets of exploitative activities and local resources that fostered a need for more specialized point forms. It is possible that the three different late Early Preceramic types represent discrete cultural units or groups. However, it seems equally if not more likely that some points may have been made to be true projectiles, others knives or butchery tools, and/or multi-functional tools by the same cultural group or groups.

At present, it is unclear if each of these types is technologically descended from the earlier Classic Paiján type. The appearance of contracting stems points during this period—along with the continued persistence of points with straight stems—is suggestive of two rather distinct technological traditions operating in the same region. It is not inconceivable that a single industry or technology could produce both straight and contracting stems, but this seems unlikely given the design similarities between the thick and heavy Talambo (straight stem) and Contracting broad stem type points. Would a group make points with highly similar designs (and probably similar intended functions) using markedly different haft elements?

It is certainly a possibility. However, it seems equally likely that the differences in haft element manufacture represent different, yet contemporaneous, technological traditions that were making similar tools for similar uses. If this is the case, then the straight stemmed Talambo points may have direct technological ties to the earlier Classic Paiján type. The Contracting narrow and Contracting broad types would represent a distinct technological tradition that only appears in the QBT region after 9,500 RCYBP. It is possible that the contracting form is descended from the much earlier Fishtail complex—which contains the contracting Santa Maria type. Although based on only four sites, Fishtail points do co-occur on all of those sites with either the Contracting narrow or Contracting broad types. Fishtail points co-occur on only one site (Je 1002) with the Classic Paiján type and do not co-occur with the Talambo type.

If the contracting stem tradition is a local development out of the Fishtail complex, this would suggest that some Fishtail groups became less mobile over time and began to focus their subsistence on resources available in the QBT region (i.e., regionalize). This would also indicate that the Late Paiján was comprised of at least two distinct populations that maintained different technological traditions. Until we identify more Fishtail sites, these associations remain speculative.

Whether the contracting stem tradition is a local development or demonstrates contact and stylistic diffusion from contemporaneous highland technologies (which also share affinities with some contracting stem points [see Rick 1980]) or other regions, cannot be determined at present. There is no evidence that the contracting stem tradition or the development of the three Late Paiján types resulted from a new population or group moving into the QBT region. In fact, subsistence practices, raw material use, and the range of other tool types appear to have been remarkably similar among three Late Paiján types. Rather, if these three types do represent the development of different technological traditions, then it is most likely a byproduct of increasingly localized settlement/mobility over the duration of the Early Preceramic period that resulted in much greater technological heterogeneity by the end of that period.

Interestingly, none of these late Early Preceramic point types lasts for long. The lithic technologies of Middle Preceramic occupations in the QBT region and in the neighboring upper Zaña/Nanchoc region are comprised entirely of unifacial flake tools (Dillehay et al. 1989; Rossen 1991; Stackelbeck 2008). By 8,500 RCYBP at the latest, these point types drop out of the tool inventory—along with bifacial reduction strategies entirely.

Unstemmed Point Group

Only two (n=2; 1.2% of all projectile points) examples of unstemmed points were identified in the QBT assemblage. Each of these points was recovered from different sites (Je 804 and Je 901). Unstemmed points are characterized by the absence of any identifiable haft element (stem or shoulders). This does not mean that these points were unhafted. This is purely a morphological distinction, but does imply a different hafting technique and mental template during manufacture. These two points are very different in form and were classified for the purposes of this analysis as distinct types—laurel-leaf

Table 8.37. Metric attributes of Unstemmed points in the QBT assemblage.

Site	Artifact #	Length (cm)	Width (cm)	Thickness (cm)	Weight (g)
JE 901	L1	11.91	2.95	0.97	35
JE 804	433.1.1	9.56	2.61	1.12	28.17

Figure 8.30. Unstemmed Laurel-leaf point from Site Je-804.

type and an Unstemmed Paiján type. Each of the points will be discussed individually, but the metric attributes for both are presented in Table 8.37.

The laurel-leaf type unstemmed point (FS#433.1.1) was recovered during excavation at site Je 804 (TU 1, level 1, 5 cmbs). The point is leaf-like in appearance with parallel lateral margins and pointed ends and is manufactured from the locally occurring fine-grained quartzite (Figure 8.30). The point is long, well thinned, and has fine pressure flaking along the distal margins and tip. Although this point was recovered from an excavation context, no associated charcoal was recovered that would allow for precise dating.

This point is similar to those identified by Malpass (1983: 100-105, 259-262) in the lower Casma Valley (Malpass' Type 8a). The point is also similar to the willow-leaf points identified by Lynch (1980, 1967) in the Cajellón de Huaylas and to those identified by Rick (1980: 156-158)(Rick's Type Group 4) in the central Highlands of Perú. The laurel-leaf points excavated by Rick (1980: 147) at Pachamachay were present throughout much of the cave's sequence and dated between ca. 9,500-3,500 B.P. Malpass (1983: 124) considers the similar points in the lower Casma to be of roughly the same age. In addition, Dillehay and others identified similar laurel-leaf style points in the Zaña that they believed to be early Holocene in age (Dillehay 2008, personal communication). Thus, it seems very likely that this point may be related to the Early Preceramic period.

Because this is a unique example within the assemblage, little can be inferred from this point. It is possible that this is a local attempt to copy a highland point style, or perhaps indicate a foray to the coastal zone by highland groups. Either would provide interesting evidence for contact between coastal and highland populations during the Early Preceramic period. At this time, however, these possibilities remain purely speculative.

Microscopic examination of this point indicated several distinct use-wear indicators (see Figure 8.31). Moderate edge rounding, rounding/flattening of crystals, and extensive grain loss were observed along the distal tip and distal lateral margins. A few abrasion tracks (on polish) oriented sub-parallel to the edge were noted along the

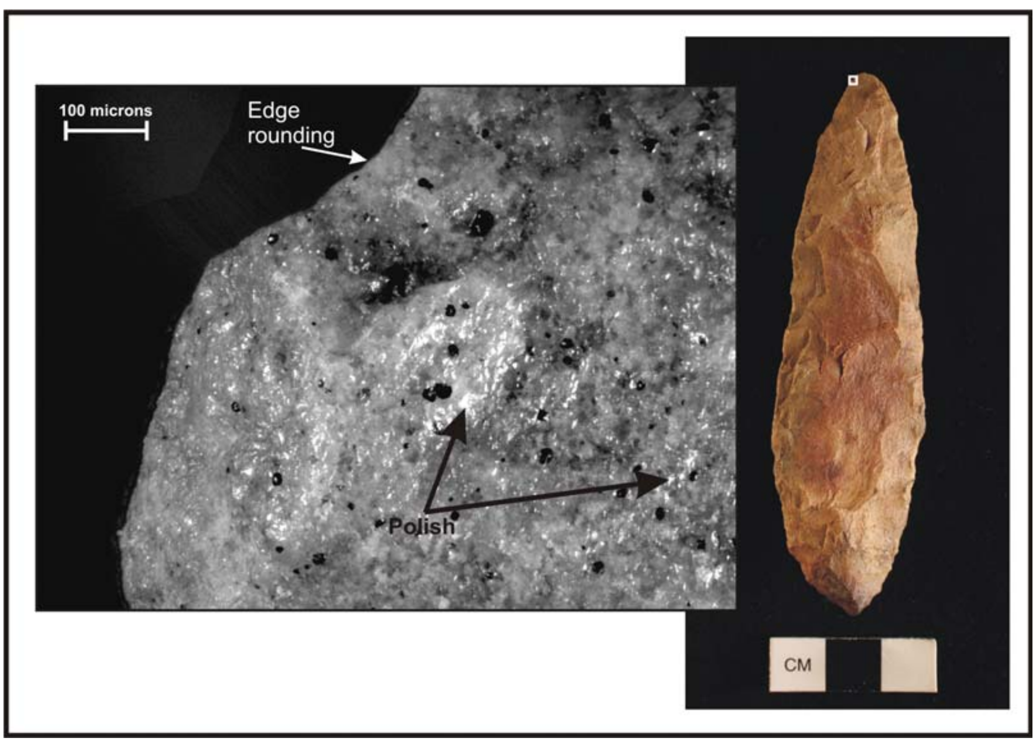

Figure 8.31. Microscopic use-wear indicators on the Laurel-leaf point from Site Je-804.

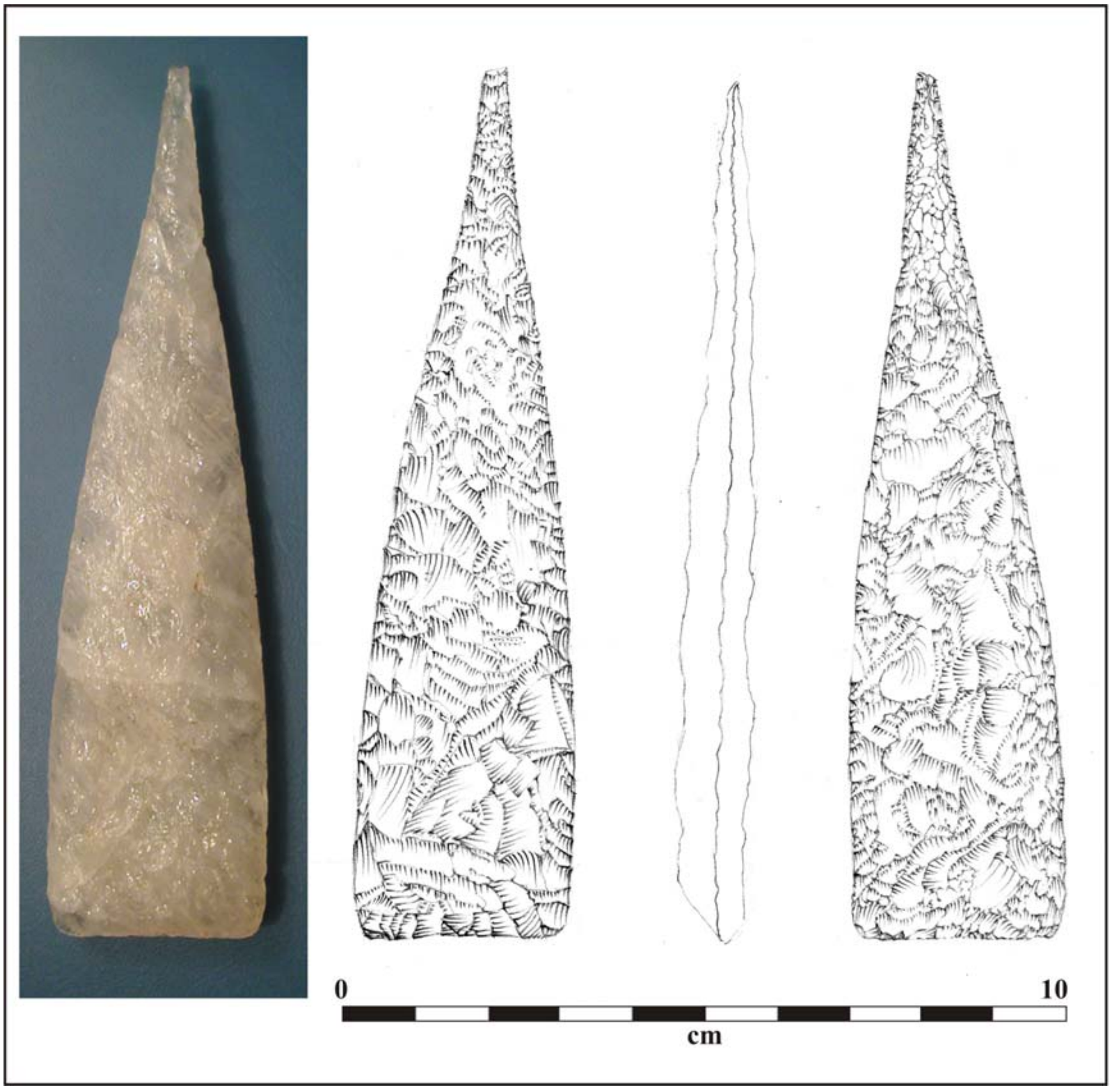

Figure 8.32. Unstemmed Paiján point from Site Je-901.

lateral margins and a bright, homogeneous polish was observed on flattened surfaces along the lateral margins and into the tool interior. Estimated action and material for this tool is slicing/cutting of a soft to medium material—probably indicating the butchery/processing of fresh hide/meat.

The second unstemmed point in the QBT assemblage is an Unstemmed Paiján point (Je 901 L1). The point has been identified as an Unstemmed Paiján based on the characteristic needle-nose retouch that is located along the distal portions of the blade (Figure 8.32). In every way, except the absence of a stem, this point is similar to the Classic Paiján type. The point is very finely flaked and made from a semi-opaque quartz. Both lateral edges were heavily ground along the proximal one-half of the blade. The base was also heavily ground. There is a clear bevel on the proximal end where a series of small flakes to thin the base were removed. The basal thinning and the presence of edge grinding suggest that this point was hafted.

It is possible that this point originally was manufactured with a stem. The stem may have been broken off during manufacture or use and the proximal end was reworked into its present form. This seems likely given the fact that no other unstemmed Paiján points were identified in the QBT assemblage. Regardless of whether the point was ever stemmed, it shares strong morphological affinities with the Classic Paiján type and is probably contemporary in age—ca. 10,800-9,500 RCYBP.

Groundstone and Groundstone Fragments

Groundstone implements are lithic tools that display intentional modification through grinding and/or pecking (i.e., not manufactured through flaking) (Andrefsky 1998; Nelson 1991; Nelson and Lippmeier 1993; Odell 2003). These tools range in size from relatively large and non-portable objects (e.g., *metates* or *batanes*) to small, hand-held implements (e.g., hammerstones and *manos*). During the survey of the QBT region, total of 13 (1.26% of the total tool assemblage) groundstone tools (11 *manos* and 2 hammerstones) were collected from 8 Early Preceramic sites.

The 11 collected *manos* are comprised of shaped and smoothed quartzite and andesite cobbles that occasionally displayed evidence of battering or pecking damage (Figure 8.33). *Manos* are hand-held implements and were typically used for grinding and/or pounding a wide variety of potential materials (e.g., plants/seeds, bone, shell,

Figure 8.33. Examples of *manos* found on Early Preceramic sites in the QBT.

Figure 8.34. Examples of *batanes* identified on Early Preceramic sites in the QBT.

minerals) (Nelson 1991). Hammerstones are also hand-held tools, but typically functioned in lithic manufacture. Hammerstones often display heavy abrasion, deep pitting, and crushing/grain loss along the margins of the tool that were used for flaking (multiple edges/surfaces may have been used). Persistent or long-term use and contact with skin can result in these tools becoming smoothed or even developing a slight polish on undamaged surfaces. Both of the hammerstone examples in the Early Preceramic QBT assemblage were small quartzite cobbles.

In addition to the 13 *manos* and hammerstones that were collected during survey in the QBT region, a total of ten (n=10) *batanes* were identified and recorded at 5 sites. *Batanes* are large, flat slabs, typically of quartzite or andesite that have been intentionally modified through pecking and grinding—or become modified through repeated episodes of grinding/pounding (Figure 8.34). Modification usually is present only on one surface of the rock slab and may involve smoothing, evidence of battering/crushing, and/or a concave depression. Like *manos*, *batanes* may have been used to process a variety of different materials (e.g., plants/seeds, bone, shell, minerals) (Nelson 1991; Stackelbeck 2008). Because of their size, *batanes* were recorded in the field and left in place. As such, they are not included in the number of total tools recovered during survey and excavation, but are noted in the individual site descriptions (see Appendix I).

Batanes are unique among the lithic tools in the Early Preceramic QBT assemblage in that their weight and size probably prohibited their transport from site to site. Previous studies (Dillehay et al. 2003; Stackelbeck 2008) have suggested that these tools represent 'site furniture' (*sensu* Binford 1978), indicating anticipated re-occupation or re-use of a particular location or perhaps long-term occupations. Interestingly, of the ten *batanes* identified on Early Preceramic sites in the QBT region, seven (n=7) were recorded on two sites (Je 431 [n=3] and Je 439 [n=4]). Three of the *batanes* recorded at site Je 439 were located in close proximity to one another and appear to represent a grinding/processing activity area (Figure 8.35).

The specific function of this activity area cannot be determined with certainty. However, grinding slabs with associated *manos*, particularly in clusters, are often associated with some kind of plant or seed processing (Aldenderfer 1993; Dillehay et al. 1989; Kraybill 1977; Nelson 1991; Odell 2003; Stothert 1985; Wright 1994). It is likely that this cluster of associated grinding stones represents similar specialized activity. Direct evidence (i.e., carbonized floral remains, phytoliths, pollen) for plant processing and use from Early Preceramic contexts is rare, but can be inferred based on non-plant evidence such as groundstone (Dillehay 2000; Dillehay and Rossen 2002; Stackelbeck 2008).

Figure 8.35. Activity area with multiple grinding stones at Site Je-439.

Specialized plant processing activity areas, like the one from Je 439 (Figure 8.35), may indicate a heavy reliance on plant materials (as food, construction material, or medicinal components) and/or a greater intensity in exploitation. A reliance on plant materials—with specialized activity areas containing site furniture—is suggestive of reduced mobility and probably logistical procurement (Dillehay and Rossen 2002). Both sites containing multiple *batanes* (Je 431 and Je 439) have been identified as basecamps (see Chapter Nine) and are associated with Paiján occupations (see Chapter Seven). The presence of the multiple groundstone implements suggests and strongly supports the identification of these sites as basecamps, as well as logistically organized subsistence/settlement.

Site Assemblages and Lithic Toolkits

One problem that hinders Early Preceramic and other studies in the arid coastal and foothill regions of western Perú is the deflated nature of many sites (see discussions in Chapters Two and Three). Although sites with intact deposits exist—several are discussed in Chapter Seven—the majority of recorded Early Preceramic sites are deflated surface scatters (Chauchat et al. 2006; Chauchat et al. 2004; Dillehay 2000; Gálvez 2004). In addition, excavations at sites that do contain intact deposits often yield few to no tools. In this study, only 60 of the 1,035 analyzed tools (5.8% of all tools) were recovered during excavation.

Thus, deflated sites offer the potential to recover relatively large numbers of individual tools, but their exposure on the surface effectively erases most contextual information and severely limits any insight into the stratigraphic and temporal relationships between different tool types. Although previous studies have identified numerous tool types, they have been largely unable to discriminate the temporal relationships between these types or document other associated types of tools (Briceño 2004; 1997; Chauchat et al. 2006; Chauchat et al. 2004; Dillehay 2000; Gálvez 2004, 1999; Malpass 1983; Uceda 1992). These kinds of information are necessary to understand the character of lithic toolkits, how different tools are related, and how toolkits may have changed over time.

This lithic analysis and excavation data from this study resulted in the identification of distinct, temporally diagnostic projectile point types (Classic Paiján, Talambo, Contracting Narrow, and Contracting Broad stemmed points) within what has been broadly known as 'Paiján'. Because these types have been directly dated—or have associated dates from excavation contexts—they provide an opportunity to examine lithic toolkits by determining the range of tools (e.g., primary and secondary bifaces, limaces, unifaces, retouched flakes, utilized flakes, and groundstone) that are associated with the individual point types. If lithic toolkits can be identified for the Fishtail, Early Paiján (Classic Paiján points) and Late Paiján (Talambo, Contracting Narrow, and Contracting Broad points), then we may be able to gain insight into changes or similarities in the composition of toolkits and possible differences in the organization of technology over the course of the Early Preceramic period. Understanding how toolkits change or remain stable over time can potentially provide direct information about the types of economic activities that were pursued at different times within the Early Preceramic period.

This is not to suggest that projectile points were more important than any other tool form, such as limaces, unifaces, or flake tools. In fact, the range of other tool types (n=9) and sub-types (n=22) present in the Early Preceramic QBT assemblage, combined with the limited microwear analyses conducted, suggest that these tools likely functioned in far more activities and a wider range of economic uses than any of the projectile points. Rather, some of the projectile point types appear to be temporally diagnostic (see discussion of the Stemmed Point Group in this chapter) and provide an avenue for distinguishing the range of tools that were in use during different phases of the Early Preceramic period.

A total of eight projectile point types were identified during the analysis of the Early Preceramic QBT assemblage—Fishtail Concavo-convex, Fishtail Contracting, Classic Paiján, Talambo, Contracting Narrow stemmed, Contracting Broad stemmed, Unstemmed Paiján, and Laurel-leaf. These eight types were identified on a total of 45 sites (see Appendix IV). The table in Appendix IV lists the tool assemblage for each of the 45 sites that contained projectile points according to the typology of Early Preceramic points and other tools developed in this analysis.

From the information presented in Appendix IV, we can begin to see patterns of association among the different Early Preceramic tool types. The most notable—and problematic—pattern is that the different point types frequently co-occur on the same site. Among the 45 sites that contained projectile points, 20 (44.4%) have two or more point types present. In fact, 12 sites contain three or more distinct point types and account for 60% of the sites containing more than one point type. It is not coincidental that the sites that contain the most point types are also typically the largest in size and contain the widest range of other types of tools—suggesting that these locations probably witnessed frequent re-occupation throughout the Early Preceramic period and are multicomponent sites. The pattern has also been identified by previous Early Preceramic studies in the north coast region (Briceño 1999; Chauchat 1998; Chauchat et al. 2006; Dillehay 2000; Dillehay et al. 2003; Gálvez 2004, 1999; Malpass 1983; Uceda 1992).

In spite of the presence of a wide range of tool types on these sites, the presence of multiple point types—some of which are diagnostic to different phases within the Early Preceramic period—makes it exceedingly difficult to determine which tools may be temporally or technologically related. In order to examine the temporal and technological relationships between the individual point types and the range of other tool types with which they may be associated, we must identify those sites that contain only one projectile point type (i.e., single component sites). Identifying single component sites, and documenting the range of other tools that may also be found on those sites, provides one avenue for eliminating the effect of surface deflation that results in the mixing of types and toolkits that may belong to different phases within the Early Preceramic.

Among the 45 sites in the QBT assemblage that contained projectile points, 25 (55.6%) contain only a single type of projectile point (see Table 8.38). Table 8.38 presents each of the 25 single component sites with all other associated tools identified at those sites. Tool categories and/or sub-types that are not represented on these sites (e.g., ovate secondary bifaces, adze unifaces, notched retouched flakes, *batanes*, and others) have been removed from Table 8.38. In addition, those point types (such as Fishtail concavo-convex, Fishtail contracting, Unstemmed Paiján, and Laurel-leaf) that only co-occurred on sites with other types were also removed from the table.

Table 8.38. Lithic tool types from Early Preceramic single component sites in the QBT.

	Paijan				**Primary Bifaces**	**Secondary Bifaces**	**Limaces**			**Unifaces**				**Retouched Flakes**			**Utilized Flakes**		**Groundstone**
	Classic Paijan	Talambo	Contracting Narrow	Contracting Broad		Lenticular	Lenticular	Bi-pointed	Variants	Ovate	Tear-drop	Non-parallel	Bi-pointed	One Margin	Two Margin	Multiple Margin	One Margin	Two Margin	Mano
Je-436				1			1												
Je-440				1										2					
Je-449			1				1				1								1
Je-777				1															
Je-778		1			1					1				1			4		
Je-800	2				1	1			1									1	
Je-812	1													1					
Je-814				1	1		1												
Je-817				2	2												1		
Je-829		1			4														
Je-858				1															
Je-873			1											1	1		1	1	
Je-899			1																
Je-900	1										1			1					
Je-955				1															
Je-970			1							1					1		1		
Je-976			3												1	1			
Je-980	1										1								
Je-983	1						1								1				
Je-988				1	1							1			1	1	2		
Je-995			1				1										1		
Je-997	1									1							1		
Je-1004				1			1	1					1		2				
Je-1007	1				1							1		1			2		
Je-1013			1							1						1	1		
Total	**8**	**2**	**9**	**10**	**11**	**1**	**6**	**1**	**1**	**4**	**3**	**2**	**1**	**7**	**7**	**3**	**14**	**2**	**1**

Thus, Table 8.38 presents the range and type/sub-type of tools that were found on single component Paiján sites. Each of the four Paiján point types are represented among the single component sites and include Classic Paiján (n=7 sites), Talambo (n=2 sites), Contracting Narrow stemmed (n=7 sites), and Contracting Broad stemmed points (n=9 sites). Although often present in low frequencies or represented by single examples, the range of tool types/sub-types that co-occur on single component sites with the different Paiján point types provides an opportunity to examine any differences in toolkit composition.

One problem with this method is that the tools present on multi-component sites have been removed from comparison. Multi-component sites in the QBT and other, nearby regions are typically the most complex in terms of surface features, most likely to contain domestic architecture, and contain the highest numbers and largest densities of tools (Briceño 1999; Chauchat 1998; Dillehay et al. 2003; Gálvez 2004; Stackelbeck 2008). Excluding these sites likely reduces the variability that may have existed among individual toolkits, as well as reducing the number and kind of activities that are represented in those toolkits. In spite of this problem, it is necessary to examine single component sites by themselves in order to ensure that the toolkit for each Paiján point type—even if reduced in variability—can be characterized.

Figure 8.36 presents each of the four Paiján point types and the number of tools (by type) with which they are associated on single component sites. In the most general sense, Figure 8.36 indicates that a relatively high degree of similarity exists in the types of tools that are associated with the different Paiján point types—suggesting that the toolkit associated with each point type was also similar. This is not unexpected, given that each of these toolkits represents the activities of Early Preceramic mobile foraging peoples in the same region.

There are, however, some important differences between the different point types. Notice that among the Classic Paiján, Contracting Narrow, and Contracting Broad types the projectile point is clearly the most common tool represented in the toolkit (Figure 8.36). This is not the case for the Talambo points, which number only two, and are found on sites where both primary bifaces and utilized flakes are more common. However, the

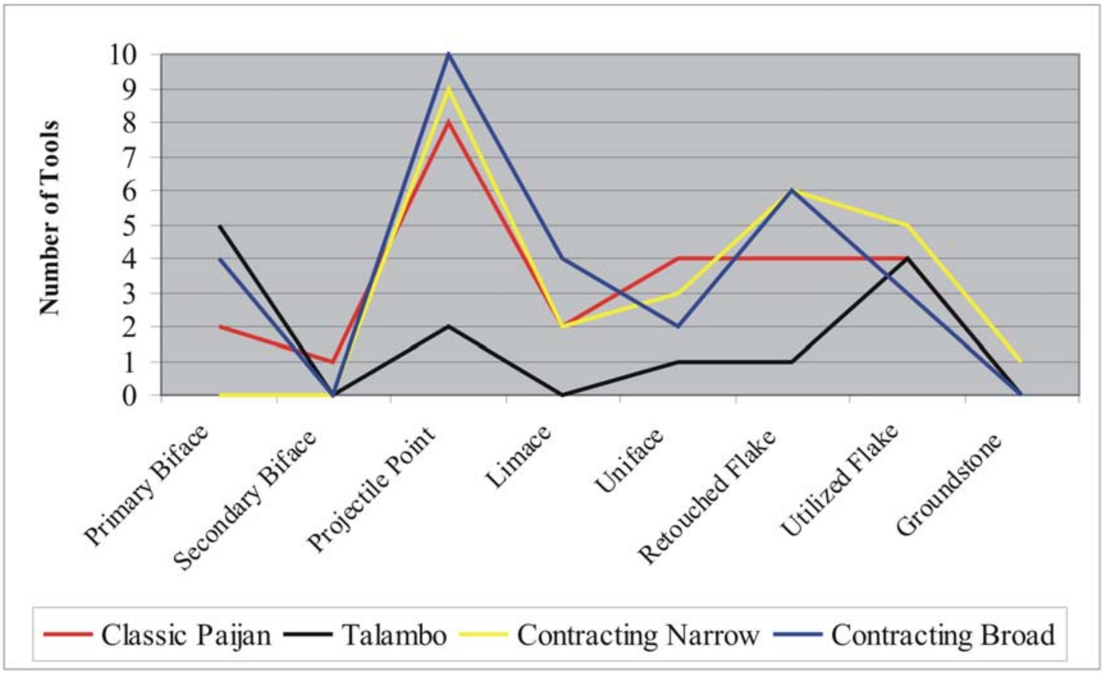

Figure 8.36. Toolkit composition for each Paiján point type based on single component site assemblages.

frequencies of individual tools identified on the two single component sites containing Talambo points are low and may, at least in part, reflect sample size bias.

Among the other three point types, it is interesting that both the Contracting Narrow and Contracting Broad types are associated with a greater number of expedient tools (particularly retouched flakes) than are the Classic Paiján points. The Contracting Narrow type is also the only type associated with a groundstone tool on a single component site. Conversely, the Classic Paiján points are associated with a slightly higher number of formal uniface tools than either of the Contracting stem point types and is also the only point type associated with secondary bifaces. Because these types are temporally diagnostic to the Early (Classic Paiján) (ca. 10,800-9,500 B.P.) and Late Paiján (Talambo, Contracting Narrow, Contracting Broad) (ca. 9,500-8,500 B.P.), the differences in frequencies of tool types between the individual types may represent actual changes in toolkit composition over time.

If we compare the relative frequencies—rather than the counts—of the tool types associated with Classic Paiján (Early Paiján) to those of the combined Late Paiján point

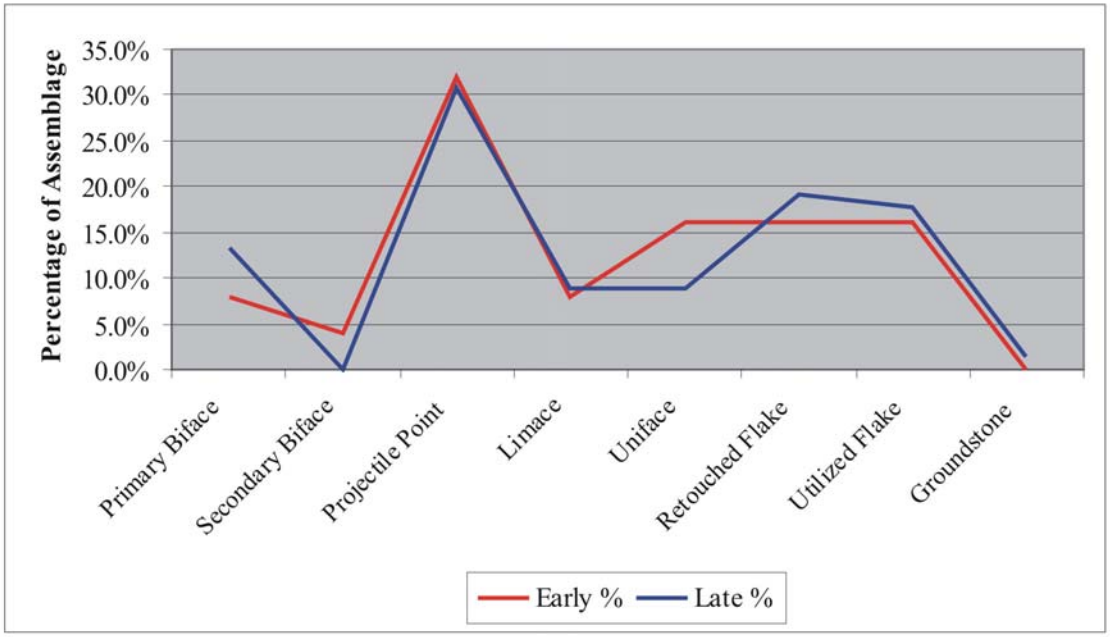

Figure 8.37. Early and Late Paiján toolkits based on single component site assemblages.

types (Talambo, Contracting Narrow, and Contracting Broad) we can better examine how Paiján toolkits changed over time (Figure 8.37). Figure 8.37 presents both the Early and Late Paiján toolkits by the percentage each tool type represents on the single component sites (Early Paiján [7 sites], Late Paiján [18 sites]). In general, Figure 8.37 suggests that throughout the Paiján period (ca. 10,800-9,500 B.P.) lithic toolkits remained relatively similar. Projectile points are the most common and comprise nearly identical percentages of the toolkit in both the Early and Late Paiján phases (32% and 30.9%, respectively). Limaces, which are less common (8.0% and 8.8%, respectively), also changed little in frequency over time.

In spite of these similarities, there are important differences between the Early and Late Paiján toolkits. The most important of these differences is that formal unifaces are much more frequent in Early Paiján assemblages, while retouched flakes and utilized flakes are more frequent in Late Paiján assemblages. This trend was first observed when comparing all four Paiján point types together (see Figure 8.36) but is more distinct when comparing the Early and Late phases.

The importance of this trend is that it suggests that Early Paiján toolkits contained a larger number of formal tool forms (specifically unifaces) than later assemblages.

Conversely, Late Paiján toolkits appear to have sacrificed some formality for a greater amount of expedient tool production. Although the overall composition of the Early and Late Paiján toolkits are similar, the trend of increasing frequencies of expedient tools over time is important because it likely reflects the larger trend of reducing mobility and broadening subsistence practices (including an emphasis on plant resources) that have been suggested to have occurred along the western flanks of the Andes around or after 9,000 B.P. (Dillehay et al. 1997; Dillehay and Rossen 2002; Piperno and Dillehay 2008; Piperno and Pearsall 1998; Rossen 1991; Stackelbeck 2008).

Thus, this trend suggests that Late Paiján groups in the lower Jequetepeque Valley were likely becoming less mobile than their Early Paiján predecessors. This reduction in mobility may have been tied to a growing importance of plant resources for subsistence. The lone groundstone implement (a *mano*) recovered from a single component site is associated with the Late Paiján. No pattern can be discerned from the presence of a single implement, but the association of groundstone with the Late Paiján toolkit does fit well the notion of reducing mobility and an increasingly broad subsistence base.

The Early Paiján toolkit is also suggestive of a relatively broad range of subsistence activities, but emphasizes a greater degree of formal tool manufacture. Formal tools are manufactured in anticipation of repeated future use(s) and are typically designed for relatively long use-lives and maintenance, which often indicates relatively high mobility (Aldenderfer 1991; Bamforth 1986; Bleed 1986; Hayden et al. 1996; Nelson 1991; Odell 2003; Torrence 1989). This would seem to suggest that the Early Paiján were more mobile than their Late Paiján descendants. However, the overall similarity between the Early and Late Paiján toolkits suggests that although mobility appears to have decreased over time during the Early Preceramic period, it was likely a gradual shift.

Discussion and Conclusion

This chapter presented a detailed analysis of the 1,035 Early Preceramic lithic tools recovered during the survey and excavation in the QBT region. The principle goal of this analysis, which involved typological classification, metric analysis, and raw material identification, was to identify variability in the organization of technology that existed during the Early Preceramic period. The transient explorer-estate settler model (Beaton 1991; Dillehay 2000, 1997a; Dixon 1999)—as it has been defined and applied in this research—implies that variability in the technological organization of different, yet contemporary, groups following distinct settlement strategies should be discernable at the level of regional assemblages.

Two main problems have persistently hindered any attempt to characterize Early Preceramic technological organization: 1) the documented presence of several contemporary early complexes (including Fishtail, Paiján, and others) who produced a range of overlapping bifacial, unifacial, and flake tools (Briceño 2004; 1997; Chauchat et al. 2006; Chauchat et al. 2004; Dillehay 2000; Gálvez 2004, 1999; Malpass 1983; Uceda 1992); and 2) the mixing of site assemblages through deflationary erosion, which has severely limited our ability to reconstruct the toolkits of different early complexes (Chauchat 1988; Dillehay 2000; Gálvez 2004). This study has attempted to mediate these problems by first characterizing all of the tools in the entire regional assemblage to ascertain the range of types and sub-types present. Individual tool types and sub-types were discussed in terms of metric variability, raw material use patterns, and functional indicators (when available). The purpose of intensively examining individual tool types is to garner as much information as possible regarding the amount and character of intra-type variability present within broadly recognized and well-known Early Preceramic tool types. These characterizations were then followed by an examination of associated tools on single component sites in order to reconstruct the toolkits associated with different projectile point types. Focusing toolkit reconstruction on single component sites avoids the problem of mixed assemblages that is often created by multiple occupations and sediment deflation.

As a result of this approach, nine tool types—including 21 sub-types—were identified among the non-projectile point tools (i.e., primary bifaces, secondary bifaces, limaces, unifaces, retouched flakes, utilized flakes, and groundstone). Many of the sub-types described here are previously unrecognized or unrecorded in Early Preceramic assemblages. The importance of recognizing and characterizing intra-type variability is that it affords us the opportunity to examine the distributions of individual tool types in a more comprehensive manner and begin to associate specific types and/or sub-types with other tools that may be temporally diagnostic (particularly projectile points).

For example, previous studies recognized the presence the formal unifaces in Paiján assemblages (Becerra 1999; Chauchat et al. 2004; Gálvez 1999). As has been shown in this study, however, the uniface tool type is comprised of at least six distinct sub-types that likely functioned in different activities and may be associated with different Early Preceramic complexes. Through associations such as these we can begin to create a more holistic picture of the differences in toolkit composition and technological organization that existed during the Early Preceramic period.

Perhaps the most important result of this analysis, however, is the recognition that several distinct types of projectile points exist within the Early Preceramic assemblage and that some of these types are temporally diagnostic. A detailed framework for analyzing Early Preceramic projectile points has been put forth in this research. It is hoped that this framework, which is based on haft characteristics, will allow for a high degree of replicability, terminological standardization, and greater comparability between future studies of Early Preceramic points. This framework resulted in the identification of eight projectile point types within the three broad groups (Fishtail, Paiján, and Unstemmed points) that made up the Early Preceramic QBT assemblage.

Among the four Fishtail points in the QBT assemblage, two distinct types were identified (Fell and Santa Maria types) based on haft element morphology. These two types appear to be contemporaneous or overlapping (ca. 11,000-10,600 B.P.) based on associated AMS dates from excavation contexts. Comparisons with Fishtail points recovered on other sites across the Peruvian north coast and Central Andes suggest that these two types have similar geographic distributions and are occasionally found on the same site. It is possible that these points represent different groups, but more likely are related to different anticipated functions. However, detailed studies of larger samples of Fishtail points are needed to address these possibilities.

No single component Fishtail sites were identified in the QBT region. This fact is unfortunate and limits our ability to identify which tool types or sub-types may have comprised the Fishtail toolkit and gain greater insight into mobility and subsistence patterns. In spite of this limitation, the fact that these points are found on only a few sites in the region—combined with the frequent use of non-local raw materials—is suggestive of short-term occupations in the QBT and relatively high mobility.

Like the Fishtail, what has been traditionally known as the 'Paiján' also represents a range of distinct stemmed point types. It had been previously recognized that a wide range of variability existed among stemmed points in the north coast region (Gálvez 2004; Malpass 1983). This variability, although recognized, has largely been subsumed within the larger descriptive of 'Paiján'. As a result, this type has come to include virtually all stemmed projectile points found on the north coast. This 'lumping' together of stemmed points was derived, in part, from the focus on blade attributes in earlier analyses (Chauchat et al. 2004; Chauchat et al. 1992; Malpass 1983; Ossa 1976, 1973; Ossa and Moseley 1972). The focus on blade attributes is understandable, given the distinctive needle-nose shape found on many Paiján points. This study, however, argues that the needle-nose shaping probably represents tool maintenance/blade resharpening that resulted from deeply hafted points.

The focus of the analysis of stemmed points in the QBT assemblage centered on the haft element, and not attributes of the blade. As a result, four distinct types of stemmed points were identified within the broad 'Paiján' type. These four point types—Classic Paiján, Talambo, Contracting Narrow stem, and Contracting Broad stem—indicate that the Paiján complex was not a monolithic cultural expression. Rather, what we have known as the Paiján comprises a complex set of interrelated expressions that are suggestive of economic and technological changes over time.

There is a clear change in point types over time. The Classic Paiján type is the earliest of the Paiján complex and ranges in age from ca. 10,800-9,500 B.P. based on associated AMS dates from excavation. Local raw materials were overwhelmingly used in the manufacture of Classic Paiján points, which stands in contrast to the contemporary Fishtail points that frequently made use of non-local materials. Needle-nose retouch of the blade is also common characteristic of the Classic Paiján type. Microwear indicators on two needle-nose fragments are suggestive of intensive butchering/hideworking activities and support the previously mentioned idea that repeated resharpening/tool maintenance probably resulted, at least in part, in the needle-nosed blade shape.

Although blade shape may vary substantially, Classic Paiján points are overall relatively uniform in terms of haft element attributes.

The remaining three types (Talambo, Contracting Narrow stem, and Contracting Broad stem) are all believed to range in age between ca. 9,500-8,500 B.P. based on associated dates from excavation contexts. Together, these point types have been interpreted in this study as the Late Paiján. The spatial distributions for these point types vary considerably, but they do occur on the same sites and are considered to be contemporaneous. These types are neither as internally consistent nor as long lasting as the earlier Classic Paiján type, but display a similar heavy reliance on locally available raw materials for point manufacture.

It is unclear, at present, if each of the Late Paiján types is technologically descended from the earlier Classic Paiján type. Talambo type points show clear affinities with the Classic Paiján and share the straight stem attribute. The relationship between the Classic Paiján and the Contracting Narrow and Contracting Broad stem points, however, is not as clear. The appearance of contracting stem forms after ca. 9,500 B.P. that are contemporary with straight stem forms is suggestive of the introduction of a new technological tradition into the region. It is possible that the contracting stem form is a legacy of the earlier Fishtail stem forms and represents increased regionalization of Fishtail groups over time. It is also possible that the contracting form represents contact with or movement of Highland groups into the coastal foothills sometime during the late Early Preceramic. It may be that the Late Paiján, as it is defined here, represents two distinct technological traditions that operated coterminously within the QBT.

However, reconstruction of the toolkits associated with the different Paiján projectile point types appears to argue against the presence of different technological traditions. In this study, 25 sites containing only one projectile point type were identified. These sites are interpreted as single component and have been used to identify which tools are associated with specific point types and in what frequency. In general, the tools associated with each of the four Paiján types on single component sites are similar. This similarity in toolkits is believed to be a product of relatively similar subsistence practices over time within the same region (QBT).

Similarities in subsistence practices over time does not equate to unchanging practices. In fact, an examination of the frequencies of individual types within toolkits over time reveals interesting patterns that are suggestive of changes in mobility and subsistence. Early Paiján (Classic Paiján) toolkits were compared with the combined Late Paiján (Talambo, Contracting Narrow, Contracting Broad) toolkits and indicated that formal unifacial tool types comprised a greater percentage of Early Paiján toolkits, while informal retouched and utilized flake tool types comprised higher percentages in Late Paiján toolkits. This trend of reducing formality and increases in expediency is suggested to reflect the larger trend of reducing mobility and rising importance of plants as subsistence resources that is believed to have been occurring along the western flanks of the Central Andes around or after 9,000 B.P. (Dillehay et al. 1997; Dillehay and Rossen 2002; Piperno and Dillehay 2008; Piperno and Pearsall 1998; Rossen 1991; Stackelbeck 2008).

The toolkit of the Paiján complex, as a whole, reflects broad-spectrum resource use through a wide range of individual tool types. However, based on the frequencies of tools associated with the different point types there does appear to be a gradual shift in the importance of plant resources between the Early and Late Paiján periods. A number of groundstone implements (including both *manos* and *batanes*) were identified in the QBT region, but only one example (a *mano*) was found on a single component site (Je 449). Interestingly, this example was associated with a Late Paiján Contracting Narrow point, as well as a small, stone-lined structure (see Chapter Six). Associations like these suggest and strongly support a pattern of reduced mobility and changing subsistence between the Early and Late Paiján.

In sum, the primary goal at the outset of this chapter was to attempt to characterize the technological organization of the different Early Preceramic complexes that are known to have inhabited the lower Jequetepeque Valley. Typological classification identified a wide range of tool types and sub-types that provided an opportunity to examine toolkit composition over time. It is hoped that the typological framework put forth in this research will aid and clarify future studies involving Early Preceramic assemblages. Although only limited information was gained on the few Fishtail points and sites discovered in the QBT, the ability to meaningfully divide the broad Paiján complex into temporal phases with distinct types has provided new, important insights into this early complex. These analyses indicate that gradual, yet significant, changes in the frequency of formal unifaces and expedient flake tools between the Early and Late Paiján provide direct insight into the on-going process of regionalization. The changes in subsistence and mobility that accompanied this process are reflected in the composition of toolkits over time.

CHAPTER NINE

EARLY PRECERAMIC SITE TYPES AND SETTLEMENT PATTERNS IN THE LOWER JEQUETEPEQUE VALLEY

Introduction

This chapter presents the final two criteria used to assess possible functional differences between Early Preceramic sites in the QBT (lithic tool frequency and the amount of activities). These assessments, like the location, size, and presence of domestic structure criteria discussed in Chapter Six, are based on the materials recovered and individual characteristics of each Early Preceramic site in the QBT. Once completed, the functional differences identified with these five criteria will be used to characterize the site types within the QBT assemblage. Site type identifications will rely on the general model of Early Preceramic site types that was outlined and discussed in Chapter Six. The specific types of sites that are identified in the Early Preceramic QBT assemblage will be used to reconstruct and model settlement organization and mobility for the contemporary/overlapping Fishtail and Paiján complexes.

Lithic Tool Frequency

In the most general sense, artifact frequency describes the number of artifacts within a given context (e.g., excavation level, feature, test unit, or site). Depending on the analytical scale, frequency can be an indicator of differences in the intensity of activities, and perhaps, number of occupations (Andrefsky 2001; Odell 2003, 1996b). Lower-level analytical contexts, like excavation levels, test units, or features that express different frequencies of the same artifact types or classes may be an indicator of variability in the intensity with which different activities were pursued. In site-level comparisons, variability in the frequency of artifact types or classes may relate to functional differences between locations (Odell 2003, 1996b).

The results of the QBT survey (presented in Chapter Six), along with those of previous studies in the north coast, have noted a relatively wide range in artifact frequencies (particularly lithics) on Early Preceramic sites (Briceño 1999; Chauchat 1998; Chauchat et al. 2006; Dillehay et al. 1997; Dillehay et al. 1989; Gálvez 2004;

Malpass 1983; Ossa and Moseley 1972; Ossa 1978; Richardson 1981; Rossen 1991; Uceda 1992). In general, most sites yield only one or a few tools while a few contain comparatively high numbers of tools. Variability in tool frequency between sites can potentially be used—in combination with other attributes—to characterize functional differences.

An important problem with comparisons of tool frequencies is the failure to account for site re-occupation. Re-occupation produces a palimpsest of overlapping deposits in the archaeological record (Bettinger 1991; Binford 1983, 1979; Dillehay 1997). The problem of palimpsest deposits is particularly relevant for Early Preceramic sites in the north coast, where persistent eolian deflation can mix materials that may be related to stratigraphically and spatially distinct occupations.

Repeated occupation of a site can potentially produce different effects in the archaeological record. If similar activities are conducted at a specific site over time, the material signature of those activities may become over-represented in the archaeological record. This process can be referred to as *amplification*. Conversely, in situations where later re-occupations pursued different activities over time (i.e., site function changed over time), the spectrum of activities represented broadens. This can also result in tool frequencies that are not reflective of the reality of distinct occupations. This process can be referred to as *false diversity*.

At least two early complexes (Fishtail and Paiján) are represented among the Early Preceramic sites in the QBT. In addition, the relatively long-lasting Paiján complex comprises Early and Late phases that are often represented on the same sites (see Chapter Eight). It is not coincidental that sites on which these different early complexes and phases co-occur are typically the largest and have the highest number of tools—indicating substantial re-occupation. Thus, it is likely that both *amplification* and *false diversity* have shaped the archaeological record of Early Preceramic sites and must be considered in order to characterize potential functional differences between sites.

With respect to analyzing lithic tool diversity, the problems of *amplification* and *false diversity* can be addressed by examining the number of tools present on single component sites. In this study, 25 single component sites have been identified (see Chapter Eight, Table 8.38). The identification of these typically small, shallow sites as single component is based, in part, on the presence of a single diagnostic projectile point type, and is assumed to represent a relatively short-term occupation by a single cultural group. Single component sites provide an opportunity to assess variability in tool frequency produced by short-term occupations, eliminating the potential biases that can be introduced by palimpsest re-occupations.

Figure 9.1 presents the number of tools and tool fragments recorded at each of the 25 single component sites in the QBT. In general, the number of tools and tool fragments identified at these sites is low and ranges from 1-12 tools. However, the distribution of tool/tool fragment counts among the single component sites displays three relatively distinct modes (Figure 9.1). It is suggested that these modes can be used to define separate ranges in the number of tools present on individual sites. These ranges can then be used to make comparisons among all the Early Preceramic sites in the QBT assemblage.

The basis of this argument is that variability in the number of tools on single component sites represents actual functional differences between those sites. For example, site Je 858 contained one tool (n=1; a Contracting Broad stem point) while site Je 988 contained ten tools/tool fragments (n=10; a Contracting Broad stem point, a primary biface, a secondary biface fragment, two unidentified biface fragments, a uniface, two retouched flakes, and two utilized flakes) (see Appendix V). These sites are

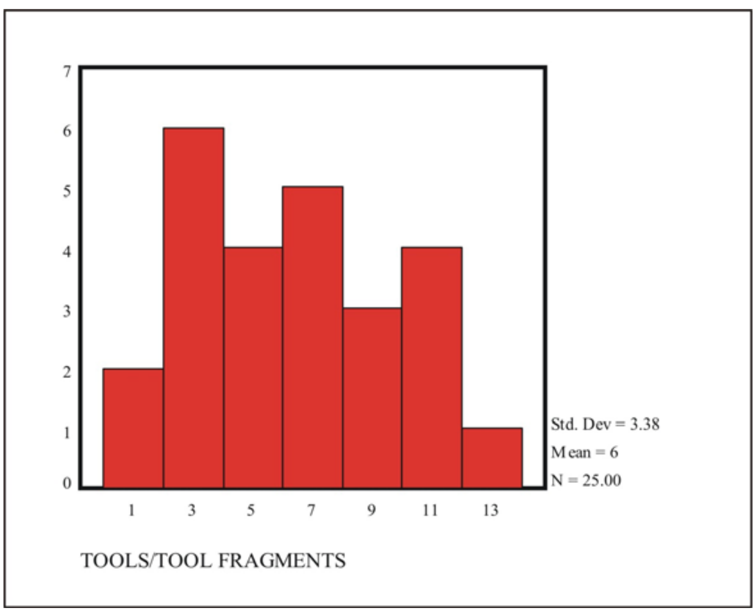

Figure 9.1. Histogram of lithic tools and tool fragments from Early Preceramic single component sites in the QBT.

contemporary (Late Paiján), single component, and have the same diagnostic point types (Contracting Broad stem). However, the number (and range) of tools present suggests that different activities were occurring in each location. This variability in the number of individual tools suggests that these two contemporary, single component sites likely had different functions.

Three ranges of tool frequencies (1-3, 4-9, and 10 or more tools) can be defined based on the three separate modes present within the distribution of tools and tool fragments at single component sites (Figure 9.1). By dividing the 25 single component sites according to these three ranges, sites with similar frequencies can be grouped together and expressed as representing low (1-3), medium (4-9), and high (10 or more) tool frequencies (Table 9.1).

Table 9.1. Tool frequency ranges for single component Early Preceramic sites.

	Tool Frequency		
Site	**Low (1-3 tools)**	**Medium (4-9 tools)**	**High (10+ tools)**
Je-436		x	
Je-440			x
Je-449		x	
Je-777	x		
Je-778			x
Je-800			x
Je-812	x		
Je-814		x	
Je-817		x	
Je-829		x	
Je-858	x		
Je-873		x	
Je-899	x		
Je-900	x		
Je-955	x		
Je-970		x	
Je-976		x	
Je-980	x		
Je-983		x	
Je-988			x
Je-995		x	
Je-997	x		
Je-1004		x	
Je-1007			x
Je-1013		x	
Total Sites	**8 (32%)**	**12 (48%)**	**5 (20%)**

Like the example of sites Je 858 and 988 discussed above, the different frequency groups may be representative of functional differences among the single component sites. The number of single component sites within each of the groups varies (low [n=8; 32%], medium [n=12; 48%], and high [n=5; 20%]), with the highest frequencies being the least well represented (Table 9.1). The mere presence, however, of sites with distinct tool frequencies suggests that functional differences also likely existed between these locations (Bamforth 1986; Binford 1983; Gould and Yellen 1991; Kelly 1992; Kent 1992). Identifying what types of sites may be represented by frequency patterns will require assessments of the specific activities indicated by these tools in conjunction with the feature, subsistence, and temporal data. This information is presented in the following section (Amounts and Types of Activities).

If the frequency groups identified among the single component sites are extended to rest of the Early Preceramic sites in the QBT assemblage a slightly different pattern emerges (Table 9.2). Table 9.2 presents the number of tools (by frequency category) for each of the 126 Early Preceramic sites in the QBT assemblage. Low (n=66; 52.4%), medium (n=35; 27.8%), and high (25; 19.8%) frequency sites are all represented, but in different proportions than those among the single component sites (low [32%], medium [48%], and high [20%]). The difference in tool frequency between the single component sites and assemblage of Early Preceramic sites is suggestive of two important points.

First, sites that express the highest frequency of tools (10 or more tools) comprise a relatively low percentage (19.8%) of the total number of sites. Comparing the number of tools present at these sites to the numbers from the single component sites with high tool frequencies may provide some insight into the amount of re-occupation that occurred at individual locations. For example, among Early Preceramic sites with the highest tool frequencies (n=25), most contain only 10-16 tools (n=14) and are similar to the single component sites with high tool frequencies (10-12 tools). There are relatively few sites (n=11) that express much higher frequencies (tool counts ranging between 20-101 tools) and indicate multiple (perhaps frequent) site re-occupation (Table 9.2). The high numbers of tools present on these sites (even compared to other sites containing high tool frequencies) suggests that there was something unique or important about these locations that resulted in substantially more intensive re-occupation and reuse.

Table 9.2. Early Preceramic sites by frequency of tools according to low (n=1-3), medium (n=4-9), and high (n=10/+) ranges.

Sites with Low Tool Frequency	# of tools	Sites with Low Tool Frequency	# of tools	Sites with Medium Tool Frequency	# of tools	Sites with High Tool Frequency	# of tools
Je-394	1	Je-844	2	Je-436	4	Je-478	10
Je-395	1	Je-855	2	Je-442	4	Je-988	10
Je-397	1	Je-875	2	Je-449	4	Je-1001	10
Je-399	1	Je-881	2	Je-475	4	Je-1007	10
Je-401	1	Je-897	2	Je-856	4	Je-766	11
Je-425	1	Je-899	2	Je-888	4	Je-778	11
Je-430	1	Je-930	2	Je-964	4	Je-800	11
Je-441	1	Je-936	2	Je-1006	4	Je-440	12
Je-447	1	Je-945	2	Je-474	5	Je-851	12
Je-458	1	Je-954	2	Je-798	5	Je-859	12
Je-459	1	Je-960	2	Je-805	5	Je-996	14
Je-471	1	Je-980	2	Je-873	5	Je-470	15
Je-481	1	Je-991	2	Je-915	5	Je-979	15
Je-795	1	Je-998	2	Je-982	5	Je-1010	16
Je-820	1	Je-1003	2	Je-995	5	Je-901	20
Je-825	1	Je-432	3	Je-433	6	Je-1011	22
Je-834	1	Je-769	3	Je-793	6	Je-772	23
Je-843	1	Je-777	3	Je-814	6	Je-484	25
Je-852	1	Je-785	3	Je-818	6	Je-1002	30
Je-858	1	Je-812	3	Je-906	6	Je-919	33
Je-866	1	Je-827	3	Je-970	6	Je-993	51
Je-868	1	Je-849	3	Je-983	6	Je-804	56
Je-879	1	Je-853	3	Je-989	6	Je-439	85
Je-914	1	Je-870	3	Je-443	7	Je-431	96
Je-955	1	Je-900	3	Je-829	7	Je-790	101
Je-984	1	Je-925	3	Je-850	7		
Je-435	2	Je-929	3	Je-990	7		
Je-770	2	Je-969	3	Je-1004	7		
Je-789	2	Je-973	3	Je-971	8		
Je-791	2	Je-981	3	Je-972	8		
Je-803	2	Je-986	3	Je-1012	8		
Je-832	2	Je-997	3	Je-780	9		
Je-841	2	Je-1008	3	Je-817	9		
				Je-976	9		
				Je-1013	9		

Secondly, the majority of Early Preceramic sites indicate little to no re-occupation or reuse. This is based on a comparison of the number of sites per frequency category among single component sites and the entire Early Preceramic assemblage. Sites with low and medium tool frequencies respectively comprise 32% and 48% (total of 80%) of all the single component sites (Table 9.1). Somewhat similarly, sites expressing low and medium tool frequencies comprise 52.4% and 27.8% (total of 80.2%) of all the Early Preceramic sites in the QBT assemblage (Table 9.2). Because it is assumed that the tool frequencies at single component sites are reflective of relatively short-term use, a similar expression of tool frequency among the entire population of Early Preceramic sites can also be interpreted to represent relatively short-term use.

This is not meant to imply that none of these sites were re-occupied. Rather, it is likely that some sites, especially those with medium and high tool frequencies, were re-occupied. In contrast, what the similarity in tool frequencies (between single component and all Early Preceramic sites) and prevalence of low and medium category sites suggests is simply that re-occupation/reuse apparently did not substantially affect the number of tools deposited at the vast majority of Early Preceramic sites. Thus, differences in tool frequency—as it has been characterized in this study—can provide one attribute for potentially discriminating functional differences between sites.

Amount and Types of Activities

Different activities often produce distinct material signatures (Binford 1979, 1977; Brooks and Yellen 1987; Yellen 1977). The amount and type of activities that were pursued at a site, if discernable within the material record, can be used to characterize the functional differences between individual sites (Binford 1983, 1980; Brooks and Yellen 1987; Gargett and Hayden 1991; Hitchcock 1987; Kelly 1995; Kent 1992, 1991; Kent and Vierich 1989; O'Connell 1987; Whitelaw 1983; Yellen 1977). In this analysis, the Early Preceramic material record (including lithic tools and debris, features, floral and faunal remains, non-local materials, and any non-utilitarian artifacts) is used to characterize the amount and types of activities that were pursued at individual sites. The purpose of this assessment is to examine the variability in type and number of different activities between sites. It is suggested that by examining the variability in activities, a better understanding of the functional differences between sites will be generated. Functional differences between sites can then be used in conjunction with site size, location, tool frequency, and domestic structure data to more comprehensively characterize the specific types of sites (within the general Early Preceramic site types discussed in Chapter Two) present within the QBT assemblage.

Because distinct activities are often related to specific correlate material patterns, we can identify certain cultural materials that are indicative of specific activities or sets of activities. Thus, the presence of those specific materials on a given site can be taken as indicators of those activities. Table 9.3 presents a list of 20 specific artifact and feature types that have been encountered on Early Preceramic sites, with the general correlate activity that they most likely represent.

These correlates are drawn from a wide range of previous studies of Early Preceramic sites from across the north coast (Becerra 1999; Briceño 1999, 1997; Chauchat 1998, 1988; Chauchat et al. 2006; Chauchat et al. 2004; Dillehay et al. 1997; Dillehay et al. 1989; Dillehay et al. 2003; Dillehay and Rossen 2002; Gálvez 2004, 1999; Malpass 1983; Ossa and Moseley 1972; Ossa 1978; Richardson 1981; Rossen 1991; Rossen and Dillehay 1999; Stackelbeck 2008; Uceda 1992). As such, it is likely that not all of the activities listed in Table 9.3 will necessarily be represented at any given site, or within the entire site population. Likewise, this list cannot be considered exhaustive of all potential activities or considered to represent mutually exclusive material correlates. Additional studies will likely expand our understanding of the range of Early Preceramic activities and material correlates with new survey, excavation, material analyses, and intra-site spatial data. For the purpose of this study, the cultural materials and features collected or recorded during the survey, excavation, and analysis of each of the 126 Early Preceramic sites in the QBT region will be assessed as to the amount and type(s) of activities that they represent based on the correlates patterns identified in Table 9.3.

The artifacts and feature types present on individual sites within the Early Preceramic QBT assemblage are presented in Appendix IV. This information incorporates the data from survey, excavation, and separate material analyses (including lithic, floral, and faunal analyses) to ascertain the probable activities that are represented at individual sites. Each of the material correlates are drawn from Table 9.3 and are recorded only as to presence or absence—rather than the specific counts of individual artifacts (which have been presented and discussed in other chapters). The total number of activities represented at each site is presented. The purpose of this is simply to identify the number of different, general activities (according to Table 9.3) that are represented by the artifacts and features at individual sites. It is suggested that a general

Table 9.3. General Early Preceramic activities and material correlates.

Artifact and Feature Type or Class[1]	Probable Activity Indicated
Hammerstone	General stone tool manufacture
Lithic debris (cores, flakes from various stages of reduction, shatter)	General stone tool manufacture
Primary lithic reduction materials (cores, decortication flakes, primary bifaces) and unmodified raw material nodules or cobbles	Quarrying/Raw material procurement; Early stage lithic reduction and/or preform manufacture
Lithic Knapping stations	Stone tool manufacturing location
Secondary Biface (*Chivateros* or other)	Stone tool manufacture; Possible animal or plant processing
Projectile point (PPK) (Fishtail, Classic Paiján, Late Paiján types, or others)	Hunting; Butchering; Hide and meat processing
Limace	Woodworking; Possibly gouging or digging
Uniface	Woodworking; Plant or animal processing; Hideworking/Cutting/Scraping
Retouched or Utilized Flake	Cutting/Scraping; Hideworking; Butchering; Plant and animal processing
Groundstone (*manos*, *batanes*)	Grinding; Plant or seed processing
Faunal remains	Food processing and consumption
Floral remains	Food processing and consumption (depending on the specific type of plant); may also indicate construction, tool-making, or medicinal materials
General Midden Accumulations	Processing/Consumption of plants and animals; Refuse disposal; Possible domestic activity
Land snail (*Scutalus* sp. or *Bostryx* sp.)	Processing/Consumption of land snails; Possible mass collection; Possible domestic activity
Hearth	Fire-making (heat, cooking, and/or annealing lithic raw materials); Possible domestic activity
Pit	Temporary storage; Refuse disposal; domestic activity
Human remains	Burial practices; Possible communal activity
Adornments/Decoration (bone beads, shell beads, drilled marine shells)	Non-utilitarian production; Possible status or identity marker; Possible indicator of exchange networks
Non-local materials (marine shell, coral, exotic raw materials)	Possible indicator of group territory/movement; Possible indicator of exchange networks
Other (any artifact or feature that denotes a specific activity not mentioned above)	Various

[1] Drawn from previous Early Preceramic studies in the north coast region (Becerra 1999; Briceño 1999, 1997; Chauchat 1998, 1988; Chauchat et al. 2006; Chauchat et al. 2004; Dillehay et al. 1997; Dillehay et al. 1989; Dillehay et al. 2003; Dillehay and Rossen 2002; Gálvez 2004, 1999; Malpass 1983; Ossa and Moseley 1972; Ossa 1978; Richardson 1981; Rossen 1991; Rossen and Dillehay 1999; Stackelbeck 2008; Uceda 1992).

characterization of the number of activities represented at sites will provide insight into functional differences that may have existed and aid in identifying specific site types.

In general, the data presented in Appendix III indicate a relatively high degree of variability in the amount of activities indicated at Early Preceramic sites. Most of this variability derived from the differential presence of classes of both chipped and ground lithic tools. However, differences in the presence of specific features (e.g., lithic knapping stations, hearths, pits, and human remains), midden deposits, faunal and floral remains (including land snails), and non-local materials also contributed to differences in the number of activities at Early Preceramic sites.

Only one artifact class—lithic debris—was represented at all 126 Early Preceramic sites in the QBT assemblage. As such, the presence of lithic debris was not useful in discriminating functional differences among sites. This is not to suggest that functional differences among the debris assemblages from individual sites do not exist; in fact, this has been documented in previous studies (Chauchat et al. 2006; Chauchat et al. 2004) and is suggested in this study by differences in toolkit composition (see discussions in Chapter Eight). Rather, this comparison merely indicates that the ubiquity of lithic debris (as an artifact class) limits its usefulness in documenting coarse-grained functional differences among sites.

Each of the different activity categories was recorded in terms of presence/absence and totaled for individual sites. Although material and/or feature correlates for all 19 general activities listed in Table 9.3—previous table of activity correlates were present within the QBT Early Preceramic site assemblage, no one site contained evidence for all possible activities (see Appendix IV). In general, most Early Preceramic sites contained evidence for one or a few distinct activities. However, some sites indicated that multiple distinct activities had been pursued in those locations. Figure 9.2 illustrates the number of sites by number of activities represented.

All Early Preceramic sites contain evidence for at least one activity, while no site contained evidence for more than 15 activities. If we consider the specific amounts of activities present at sites as ranges, then we can break the frequencies of activities into four relatively distinct categories: a limited range, medium range, broad range, and a very broad range of activities. Sites that evince a limited range of activities are those that

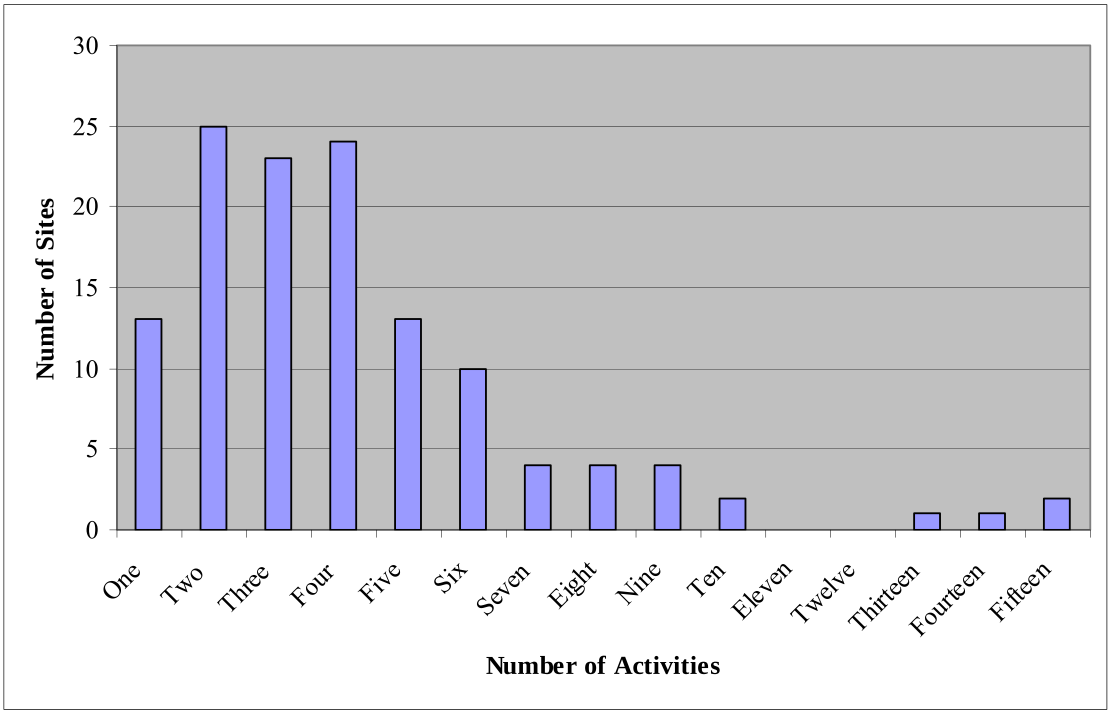

Figure 9.2. The number of Early Preceramic sites by number of activities represented.

contain evidence for one to three distinct activities. Those that express a medium range of activities contain evidence for four to six distinct activities. Those that indicate a broad range of activities contain evidence for 7-10 activities. Lastly, those that indicate a very broad range of activities contain evidence for 13 or more activities.

Sites considered to have a limited amount of activities are those that indicate only one or a few (1-3) activities were pursued. Sites with limited amounts of activities are the largest of the four groups (n=61 sites) and account for 48.4% of all Early Preceramic sites in the QBT (Figure 9.2). A medium range of activities (4-6 activities) was identified at 47 sites and account for 37.3% of all Early Preceramic sites. Sites that are considered to express a broad range of activities (7-10 activities) are less common (n=14 sites) and represent only 11.1% of all Early Preceramic sites. Lastly, very few sites (n=4; 3.2% of all Early Preceramic sites) within the Early Preceramic QBT assemblage indicated that an extremely wide range of activities (13 or more) were pursued at those locations (Figure 9.2). These sites (Je 431, 439, 790, and 1002) comprise the very broad category.

The variability in amounts of activities that is indicated in Figure 9.2 and in the four ranges of activities (limited, medium, broad, and very broad) is based on the presence of artifact and/or feature correlate evidence for probably general activities drawn from survey and excavation of Early Preceramic sites in the QBT region. These patterns do not include Early Preceramic data from other regions (although they have been used to inform the range of likely activities pursued and material correlates). However, the general pattern that can be discerned from this characterization of activities at Early Preceramic sites—that most sites contain evidence for very few activities and a few contain evidence for numerous activities—appears to fit well with previously published descriptions of Early Preceramic sites and site assemblages (particularly Paiján sites and assemblages) from nearby regions (such as the Chicama/Cupisnique, Casma, and Moche Valleys) (Chauchat et al. 2006; Chauchat et al. 2004; Gálvez 2004; Malpass 1983; Ossa 1978; Uceda 1992).

Although seemingly simplistic, the recognition that many sites in the QBT (and other regions) served as loci for limited ranges of activities, while others (albeit few) witnessed a much broader range of activities, is important in that it suggests that different sites likely had distinct functions (Binford 1980; Bamforth 1986; Dillehay 1997; Kelly 1992; Kent and Vierich 1989; Yellen 1977). This point is important for understanding the range in site types that may be identified within the total population of Early Preceramic sites. It is suggested here that the range of activities documented at individual sites is related to the functional role of those sites and can be used in conjunction with other lines of evidence (size, location, presence of domestic structures, and frequency of lithic tools) to characterize the types of sites that are present within the QBT assemblage according the general sites types that have been identified by previous studies of Early Preceramic occupations from across the north coast region (presented and discussed in Chapter Six).

Similar to the previous characterization of tool frequency, the problems associated with re-occupations (*amplification* and *false diversity*) must be discussed in terms of effect on the number of activities represented at specific sites (Bettinger 1991; Binford 1983, 1979). The problem of *amplification*—which is an over-representation of the material signature of specific activities through re-occupation with similar site function—is mitigated in this characterization by considering only the presence/absence of specific material correlates and not the frequency or intensity of the correlate activity. This approach allows for comparisons of sites with similar functions (i.e., similar sets or amounts of activities performed at those locations) irrespective of the intensity with which those activities may have been pursued during individual occupations or multiple re-occupations.

The problem of *false diversity* is more difficult to control when considering only presence/absence of material correlates. *False diversity* may occur when repeated or later occupations pursue activities different from those that were previously performed at a given site (i.e., site function changes over time), creating an impression of activity diversity that may not be reflective of individual occupations. Among the QBT assemblage, the sites that express a broad or very broad range of activities are the most likely candidates for having been created (or altered) through re-occupation and changing site function. However, as the assessment of tool frequency discussed earlier in this chapter demonstrated based on comparisons with single component sites, the majority of Early Preceramic sites in the QBT indicated little to no re-occupation. Only relatively few sites (n=11) expressed tool frequencies that indicated multiple re-occupations. Among these 11 sites with very high frequencies of tools, 10 are characterized as having broad or very broad ranges of activities.

Because the majority of Early Preceramic sites in the QBT do not appear to have witnessed substantial re-occupation, the ranges of activities (limited, medium, broad, and very broad) identified with the total site assemblage appear to be a useful criterion for evaluating differences in site function and contributing to the identification of site types. However, it seems clear that at a few specific sites multiple re-occupations have upwardly skewed both the frequency of tools and the number of activities represented. More specifically, these sites include all four (Je 431, 439, 790, and 1002) that have been identified as having the most diverse range of activities (very broad). As such, the likelihood that these sites represent accumulations from multiple re-occupations must be taken into account when assigning these sites to specific types.

Identifying Early Preceramic Site Types in the QBT

The preceding discussions in this chapter and those presented previously in Chapter Six (Survey Results and Early Preceramic Site Types) have highlighted the general trends of variability within the Early Preceramic sites of the lower Jequetepeque Valley. Five distinct criteria (site location, site size, tool frequency, amounts/types of activities, and the presence of domestic structures) have been used to assess and characterize variability within the overall population of Early Preceramic sites (n=126). Each individual criterion, although they may be related, is intended to provide a separate avenue for characterizing functional differences between sites and contribute to the identification of sites to specific types.

The discussions of these criteria indicate that a substantial amount of variability exists among the Early Preceramic sites of the QBT region. Variability between Early Preceramic sites is not unexpected and has been broadly documented in varying degrees of detail by several previous studies (Becerra 1999; Briceño 2004, 1999; Chauchat 1998, 1988, 1975; Chauchat et al. 2006; Chauchat et al. 2004; Dillehay 2000, 1999; Dillehay et al. 2003; Gálvez 2004, 1999, 1992; Malpass 1983; Ossa 1978, 1973; Ossa and Moseley 1972; Richardson 1981, 1978, 1973; Rossen and Dillehay 1999; Uceda 1992). Despite this recognition of inter-site variability, this study represents the first attempt to systematically characterize the functional differences between a large database of Early Preceramic sites from the north coast region with the express goal of identifying site types and reconstructing settlement organization.

In general, the Early Preceramic sites within the QBT vary markedly in terms of the locations in which they are found, although a clear preference for terrace landforms is evident. The QBT sites also vary widely in terms of size, but contain broad clusters of sites of similar size, which have been described as small, medium, and large. These clusters are based in part on the size of 25 single component sites identified within the QBT assemblage. The lithic tools from each site also have been divided into three frequency categories (light, medium, and high frequency). The three frequency categories are also drawn from the patterns indicated at single component sites within the assemblage. The QBT assemblage is dominated by sites with light and medium frequencies of tools, while a few sites with high frequencies of tools are also present. Early Preceramic sites in the QBT also vary in terms of the amount of different activities that were pursued at individual locations. In general, most sites are suggestive of a limited range of activities, while a few contain evidence for numerous activities. Lastly, a few Early Preceramic sites within the region (n=12) contain domestic structures. The presence of domestic structures is considered to indicate a functional difference between those sites that contain structures and those that do not and appears to represent one of the more important variables for distinguishing different types of sites.

A characterization of all sites according to the five criteria discussed above is presented in Table 9.4. As Table 9.4 illustrates, along with the preceding discussions of the different criteria used in this assessment, there are groups of sites that share the same—or highly similar—characteristics. For example, there are 22 sites that are located on low terraces, are small in size, have low tool frequencies, indicate a limited range of activities, and contain no domestic structures (see Table 9.4). This group of sites can be expanded from 22 to 49 if we also consider those sites that share the same characteristics, but are located on different kinds of landforms (i.e., high terraces [14 sites], *pampas* [10 sites], saddles [1 site], hillslopes [1 site], and paleodunes [1 site]). It is suggested here that sites such as these, which share the same or very similar characteristics, can be interpreted as performing similar functional roles within a settlement system. Although the specific activities that occurred at these sites may have been different, their collective similarity suggests that they represent a distinct *type* of Early Preceramic site.

In order to establish the specific type of site that groups with similar attributes represent, we must refer to the general model of potential site types used in this study, which was presented and discussed in Chapter Six (Survey Results and Early Preceramic Site Types). By examining the general material correlates of the different types of Early Preceramic sites identified by previous studies in the north coast region, the 49 sites discussed above correlate most closely with the Transitory Station site type. This general site type is characterized by small sites with a limited range of activities and low numbers of tools that contain no structures or features. These characteristics compare well with the criteria evaluations identified for the 49 sites noted above (see Table 9.4).

Table 9.4. Summary of five site type criteria for each Early Preceramic site in the QBT.

Site #	Landform	Size		Tool Frequency		Activities		Domestic Structures
		Size (m^2)	Size Category	Number	Range	Number	Range of Activities	
Je-394	Low Terrace	1170	Small	1	Low	2	Limited	0
Je-395	Low Terrace	100	Small	1	Low	1	Limited	0
Je-397	Low Terrace	150	Small	1	Low	2	Limited	0
Je-399	High Terrace	1144	Small	1	Low	1	Limited	0
Je-401	High Terrace	460	Small	1	Low	1	Limited	0
Je-425	High Terrace	1100	Small	1	Low	1	Limited	0
Je-430	High Terrace	750	Small	1	Low	2	Limited	0
Je-431	High Terrace	516780	Large	96	High	15	Very Broad	7
Je-432	Paleodune	1500	Small	3	Low	2	Limited	0
Je-433	Low Terrace	175	Small	6	Medium	2	Limited	0
Je-435	Low Terrace	6250	Small	2	Low	2	Limited	0
Je-436	Low Terrace	1100	Small	4	Medium	3	Limited	0
Je-439	Low Terrace	35020	Medium	85	High	15	Very Broad	1
Je-440	Low Terrace	3600	Small	12	High	4	Medium	0
Je-441	Low Terrace	800	Small	1	Low	2	Limited	0
Je-442	Low Terrace	16800	Medium	4	Medium	3	Limited	0
Je-443	Low Terrace	6600	Small	7	Medium	3	Limited	0
Je-447	Low Terrace	2700	Small	1	Low	1	Limited	0
Je-449	Low Terrace	8000	Small	4	Medium	5	Medium	2
Je-458	Low Terrace	1800	Small	1	Low	2	Limited	0
Je-459	Low Terrace	1100	Small	1	Low	1	Limited	0
Je-470	Low Terrace	104000	Large	15	High	5	Medium	1
Je-471	Pampa	1400	Small	1	Low	1	Limited	0
Je-474	Pampa	7600	Small	5	Medium	4	Medium	0
Je-475	Pampa	46200	Medium	4	Medium	2	Limited	0
Je-478	Pampa	24700	Medium	10	High	4	Medium	0
Je-481	Pampa	375	Small	1	Low	2	Limited	0
Je-484	Pampa	8500	Small	25	High	5	Medium	2
Je-766	Pampa	1600	Small	11	High	5	Medium	0
Je-769	Saddle	750	Small	3	Low	3	Limited	0
Je-770	High Terrace	370	Small	2	Low	3	Limited	0

Table 9.4. (con't.)

Site #	Landform	Size		Tool Frequency		Activities		Domestic Structures
		Size (m^2)	Size Category	Number	Range	Number	Range of Activities	
Je-772	High Terrace	28700	Medium	23	High	7	Broad	0
Je-777	High Terrace	1400	Small	3	Low	3	Limited	0
Je-778	Low Terrace	1296	Small	11	High	5	Medium	0
Je-780	High Terrace	52200	Medium	9	Medium	5	Medium	2
Je-785	Saddle	700	Small	3	Low	3	Limited	0
Je-789	Low Terrace	480	Small	2	Low	1	Limited	0
Je-790	Paleodune	99360	Large	101	High	13	Very Broad	7
Je-791	High Terrace	2625	Small	2	Low	3	Limited	0
Je-793	Low Terrace	900	Small	6	Medium	4	Medium	0
Je-795	High Terrace	3744	Small	1	Low	2	Limited	0
Je-798	High Terrace	1056	Small	5	Medium	4	Medium	0
Je-800	Low Terrace	1672	Small	11	High	6	Medium	0
Je-803	Pampa	3648	Small	2	Low	2	Limited	0
Je-804	Pampa	147375	Large	56	High	10	Broad	1
Je-805	Low Terrace	29100	Medium	5	Medium	2	Limited	0
Je-812	High Terrace	15200	Medium	3	Low	4	Medium	0
Je-814	High Terrace	16250	Medium	6	Medium	4	Medium	0
Je-817	High Terrace	7448	Small	9	Medium	5	Medium	0
Je-818	Hillslope	9720	Small	6	Medium	6	Medium	0
Je-820	Low Terrace	154	Small	1	Low	2	Limited	0
Je-825	Pampa	3283	Small	1	Low	2	Limited	0
Je-827	Pampa	5859	Small	3	Low	3	Limited	0
Je-829	Pampa	7590	Small	7	Medium	4	Medium	0
Je-832	Pampa	4950	Small	2	Low	3	Limited	0
Je-834	Pampa	319	Small	1	Low	1	Limited	0
Je-841	Pampa	650	Small	2	Low	3	Limited	0
Je-843	Pampa	595	Small	1	Low	2	Limited	0
Je-844	Pampa	954	Small	2	Low	3	Limited	0
Je-849	Low Terrace	5157	Small	3	Low	3	Limited	0
Je-850	High Terrace	15260	Medium	7	Medium	4	Medium	0
Je-851	Low Terrace	5824	Small	12	High	8	Broad	0
Je-852	Low Terrace	936	Small	1	Low	1	Limited	0
Je-853	High Terrace	770	Small	3	Low	4	Medium	0

Table 9.4. (con't.)

Site #	Landform	Size		Tool Frequency		Activities		Domestic Structures
		Size (m^2)	Size Category	Number	Range	Number	Range of Activities	
Je-855	High Terrace	7140	Small	2	Low	2	Limited	0
Je-856	High Terrace	7209	Small	4	Medium	4	Medium	0
Je-858	High Terrace	896	Small	1	Low	3	Limited	0
Je-859	High Terrace	9499	Small	12	High	6	Medium	0
Je-866	High Terrace	8370	Small	1	Low	1	Limited	0
Je-868	High Terrace	1485	Small	1	Low	2	Limited	0
Je-870	Saddle	12852	Medium	3	Low	4	Medium	0
Je-873	Low Terrace	3888	Small	5	Medium	5	Medium	0
Je-875	Low Terrace	5394	Small	2	Low	3	Limited	0
Je-879	Low Terrace	1408	Small	1	Low	1	Limited	0
Je-881	Rockshelter	10914	Medium	2	Low	2	Limited	0
Je-888	Low Terrace	2016	Small	4	Medium	3	Limited	0
Je-897	High Terrace	3379	Small	2	Low	2	Limited	1
Je-899	Hillslope	418	Small	2	Low	3	Limited	0
Je-900	Hillslope	740	Small	3	Low	4	Medium	0
Je-901	Low Terrace	25515	Medium	20	High	8	Broad	0
Je-906	Hillslope	9500	Small	6	Medium	6	Medium	0
Je-914	Low Terrace	105	Small	1	Low	2	Limited	0
Je-915	High Terrace	14694	Medium	5	Medium	3	Limited	0
Je-919	Low Terrace	187200	Large	33	High	9	Broad	0
Je-925	Low Terrace	7440	Small	3	Low	4	Medium	0
Je-929	Low Terrace	8060	Small	3	Low	4	Medium	0
Je-930	Low Terrace	966	Small	2	Low	2	Limited	0
Je-936	High Terrace	5460	Small	2	Low	5	Medium	0
Je-945	Low Terrace	576	Small	2	Low	4	Medium	0
Je-954	Low Terrace	3885	Small	2	Low	4	Medium	1
Je-955	Low Terrace	4026	Small	1	Low	3	Limited	0
Je-960	Low Terrace	12400	Medium	2	Low	4	Medium	0
Je-964	Low Terrace	580	Small	4	Medium	4	Medium	0
Je-969	Low Terrace	1189	Small	3	Low	3	Limited	0

Table 9.4. (con't.)

Site #	Landform	Size		Tool Frequency		Activities		Domestic Structures
		Size (m^2)	Size Category	Number	Range	Number	Range of Activities	
Je-970	Low Terrace	14378	Medium	6	Medium	4	Medium	2
Je-971	Low Terrace	22736	Medium	8	Medium	6	Medium	0
Je-972	Low Terrace	13206	Medium	8	Medium	4	Medium	0
Je-973	Low Terrace	4800	Small	3	Low	3	Limited	0
Je-976	Low Terrace	768	Small	9	Medium	5	Medium	0
Je-979	Low Terrace	31980	Medium	15	High	9	Broad	0
Je-980	Low Terrace	22140	Medium	2	Low	3	Limited	0
Je-981	Low Terrace	8106	Small	3	Low	4	Medium	0
Je-982	High Terrace	4455	Small	5	Medium	6	Medium	0
Je-983	Low Terrace	16500	Medium	6	Medium	7	Broad	0
Je-984	Low Terrace	2520	Small	1	Low	2	Limited	0
Je-986	High Terrace	1475	Small	3	Low	3	Limited	0
Je-988	Low Terrace	17679	Medium	10	High	8	Broad	0
Je-989	Low Terrace	94500	Large	6	Medium	6	Medium	0
Je-990	High Terrace	146400	Large	7	Medium	4	Medium	0
Je-991	Low Terrace	1254	Small	2	Low	2	Limited	0
Je-993	High Terrace	206800	Large	51	High	10	Broad	0
Je-995	High Terrace	4300	Small	5	Medium	6	Medium	0
Je-996	High Terrace	12500	Medium	14	High	8	Broad	0
Je-997	High Terrace	9372	Small	3	Low	6	Medium	0
Je-998	High Terrace	17430	Medium	2	Low	4	Medium	0
Je-1001	Low Terrace	64904	Medium	10	High	9	Broad	0
Je-1002	High Terrace	17264	Medium	30	High	14	Very Broad	1
Je-1003	High Terrace	480	Small	2	Low	1	Limited	0
Je-1004	Low Terrace	11800	Medium	7	Medium	6	Medium	0
Je-1006	Low Terrace	7074	Small	4	Medium	5	Medium	0
Je-1007	Low Terrace	7954	Small	10	High	7	Broad	0
Je-1008	Low Terrace	3237	Small	3	Low	2	Limited	0

Table 9.4. (con't.)

Site #	Landform	Size		Tool Frequency		Activities		Domestic Structures
		Size (m^2)	Size Category	Number	Range	Number	Range of Activities	
Je-1010	Low Terrace	15484	Medium	16	High	7	Broad	0
Je-1011	Low Terrace	55485	Medium	22	High	9	Broad	0
Je-1012	Low Terrace	71100	Large	8	Medium	5	Medium	0
Je-1013	Low Terrace	2790	Small	9	Medium	5	Medium	0

This is not to say that these 49 sites are the only sites that represent the Transitory Station type. Most sites do not correlate so neatly with the specific types identified in the general model. It is probable that other sites—sites that may express slightly different characteristics—will also conform most closely to the expected material correlates of this site type. Thus, it is important to recognize that within any hypothetical site type, we should expect a range of variability in the characteristics expressed by actual archaeological sites believed to be constituent of a particular type. The reasons for intra-type variability in the case of the Early Preceramic sites in the QBT and across the north coast region likely relate to the different activities that were pursued at locations, the physical location of targeted resources on the landscape, and the duration of use or amount of reuse a particular site may have experienced.

Therefore, in assigning individual Early Preceramic sites to particular types a range of variability in the individual characteristics that define a type can be expected. Particular sites may share characteristics with more than one type. In cases where sites share commonalities with more than one type, specific assignment is more difficult and problematic. Cases such as these—where specific characteristic(s) of an individual site conforms to multiple types—must be independently evaluated as to whether that characteristic represents intra-type variability or a significant anomaly within the general site type model.

Comparing the characteristics identified for each of the QBT sites with those of the general model of Early Preceramic site types allows an assessment of specific type to be made. Each of the 126 Early Preceramic sites has been classified according to the general site type with which it most closely correlates. There is, naturally, some overlap in the characteristics that define specific types (see site type discussion in Chapter 6). Because a range of variability in individual site characteristics exists, some sites share characteristics with other types. In cases where individual sites express characteristics with the material correlates of one or more types, those sites were classified according to the type they most closely resembled.

A total of nine types of Early Preceramic sites were presented in the model of general site types discussed in Chapter Six (Survey Results and Early Preceramic Site Types). Comparison of the five characteristics used in this assessment of the QBT Early Preceramic sites suggests that six of the nine types of sites are present within the QBT assemblage. Each of these site types and the sites that have been identified as belonging to that type are discussed below. Three general site types—processing stations, rock art locations, and mortuary locations—could not be specifically identified in this analysis. It is recognized that each of these site types may have existed within the Early Preceramic period in the QBT region, but have failed to be identified in this analysis. Possible reasons for the absence of these sites, or the failure of this method to identify them, are discussed below.

Long-term Basecamps (n=2)

Long-term basecamps represent the most intensive use and/or reuse of a particular location by hunter-gatherer groups—often involving multiple re-occupations. Long-term basecamps represent the central location within a logistically organized settlement and economic system (Binford 1980; Henry 1989a; Kelly 1992). Resources are acquired from across the landscape by task groups and are transported to the basecamp for use/consumption (Binford 1980, 1979). Duration of occupation may be multiseasonal (i.e., several weeks or months) and the sites are situated in locations that offer access to a wide range of resources. Long-term basecamps will evidence the pursuit of a wide range of individual activities, have generally high numbers of artifacts, show distinct intra-site spatial arrangements of features and activity areas, and are the sites most likely to contain permanent site furniture (Bar-Yosef 2002; Binford 1990, 1980; Dillehay 1997a; Gould and Yellen 1991; Henry 1989a; Kent 1992; Testart 1982; Yellen 1977).

Within the Early Preceramic sites from the Quebradas del Batán and Talambo, only two sites (1.59% of all Early Preceramic sites) approximate the criteria for long-term basecamps (Je 431 and 790) (Table 9.5). Both of these sites have large sizes, with site Je-431 being the largest Early Preceramic site in the entire study. Aside from size, however, both Je 431 and 790 contained the highest number of lithic tools of all the QBT Early Preceramic sites. These two sites were also among those that expressed the broadest range of activities; as represented by multiple lithic tool forms (bifaces, projectile points, unifaces, limaces, and retouched/utilized flakes), grinding stones and slabs, knapping stations, hearths, midden, floral and faunal remains, and non-local materials (see Appendix III). Lastly, all four of these sites are situated on landforms that offer excellent visibility of the surrounding landscape, but are located away (upslope) from the *pampas* (Figure 9.3).

Aside from the high number of tools and very broad range of activities, the most significant individual characteristic of sites Je 431 and 790 is the presence of multiple domestic structures. Each of these sites contains the remains of seven individual structures. All seven structures at Je-431 were circular in form, while the structures at Je-790 were both semi-lunar (n=3) and L-shaped (n=4) (see discussion in Chapter Six). The presence of multiple structures on these sites likely indicates a low *anticipated* residential mobility and may be indicative of relatively long occupations (multiseasonal) (Kent 1991; Kent and Vierich 1989). The presence of multiple structures—and perhaps long

Table 9.5. Early Preceramic long-term basecamps in the QBT.

Site #	Location	Size	Size Range	Tool Frequency	Number of Activities	Range of Activities	Domestic Structures
Je-431	High Terrace	516780	Large	High	15	Very Broad	7
Je-790	Paleodune	99360	Large	High	13	Very Broad	7

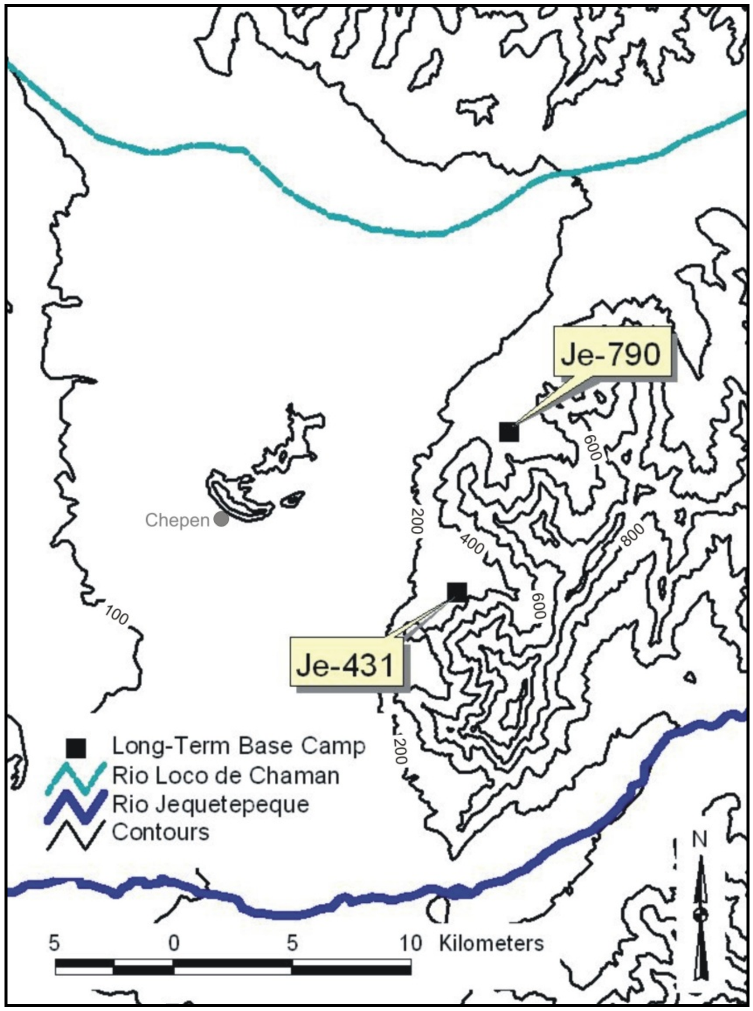

Figure 9.3. Distribution of long-term basecamps in the QBT (n=2) (plotted on the Chepén Topographic Quadrangle, 1:100,000 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcView 3.2 GIS program).

occupations—correlates well with the other characteristics of these two sites, including large size, high tool frequencies, and a relatively broad range of activities represented.

However, as was noted in the discussions of site size (Chapter Six), tool frequencies, and amount of activities (earlier discussion in this chapter) frequent, and perhaps, multiple re-occupations of specific Early Preceramic sites are indicated in the QBT region. It is possible that the presence of multiple structures, high tool frequencies, and very broad range of represented activities at these two sites (Je 431 and 790) is, at least in part, a product of successive re-occupations. Multiple re-occupations at individual sites produce palimpsest deposits that can inflate both tool diversity and range of activities represented (Bettinger 1991; Binford 1983; Dillehay 1997).

The likelihood of multiple re-occupations raises several questions. Most importantly, how long were these apparent “long-term” occupations? What is the size and makeup of the groups who constructed and occupied these sites? What and how many specific activities were pursued at these sites during individual occupations? Lastly, what does the presence of long-term basecamps tell us about Early Preceramic settlement patterns and mobility strategies on the north coast of Perú?

The presence of multiple structures on each of these sites is suggestive of a social group that may be larger than a single nuclear family. The exact size of the social group is heavily dependent on the contemporaneity of the individual structures—which at present cannot be determined. As such, it is impossible to say if these groups represent extended nuclear families, several individual nuclear families, or perhaps some form of nascent kin-based, composite group (Binford 1990; Flannery 2002, 1986; Kelly 1995; Malpass and Stothert 1992). At site Je-431 all of the structures are of the same form (circular), but are located in different areas of the site (i.e., not clustered). At Je-790, there are two distinct structure forms (L-shaped [n=4] and semi-lunar [n=3]) that are located in association with each other (separate clusters of structures). If all of the structures on each site were contemporaneous, this would suggest occupation by a relatively sizable forager groups (perhaps several nuclear families or one or more extended kin groups) (Binford 1990; Flannery 2002; Kelly 1995). If they are not contemporaneous, these structures would represent successive re-occupations by a much smaller social group (perhaps 1-2 nuclear families).

The size of the social group has important implications for understanding Early Preceramic settlement patterns but must be understood within a temporal context. Diagnostic projectile points recovered from both Je 431 and 790 indicate occupation during both the Early and Late Paiján periods. However, AMS dates from midden deposits at site Je 431 indicate a predominantly Late Paiján occupation (9,041±48-8,983±15 RCYBP) (10,282-9,912 cal BP) (see Chapter Seven). At Je 790, both Early Paiján (11,220±700 RCYBP) (14,975-11,207 cal BP) and Late Paiján (9,530±70-9,334±50 RCYBP) (11,131-10,306 cal BP) occupations are represented (see Chapter Seven).

The presence of both Early and Late Paiján diagnostics suggest that re-occupation over time of Je 431 and 790 may have resulted in the multiple structures, high tool frequency, and wide range of activities represented. However, the midden deposits associated with the cluster of the four “L-shaped” domestic structures at Je 790 are indicative of a Late Paiján age (Dillehay et al. 2003; Stackelbeck 2008; see also discussions in Chapter Seven). The similar—and apparently contemporaneous—structures clustered together at Je 790 suggest that Late Paiján occupation of the site was more substantial, probably involved a larger social group and possibly longer anticipated stays.

Because only two sites express the characteristics of long-term basecamps, it is difficult to assess with any reasonable certainty how much of the material pattern at sites Je 431 and 790 is the product of multiple re-occupations and/or how much is related to relatively long occupations by larger social groups. Given the number of tools, amount of activities represented, and presence of domestic structures both of these sites probably functioned as basecamps (short-term) throughout the Early and Late Paiján periods—and witnessed multiple episodes of re-occupation. This probability, however, does not preclude the possibility that the function of these sites may have changed (in terms of length of occupation) between the Early and Late Paiján. In either possibility, the characteristics of sites Je 431 and 790 are suggestive of basecamp locations (and relatively low anticipated mobility), where a wide range of subsistence, technological, social, and other activities occurred.

Short-term Basecamps (n=21)

Short-term basecamps represent seasonal locations of hunter-gatherer occupation. Much like the long-term basecamps, short-term basecamps are the central location of the settlement and economic system. The primary distinction between long-term basecamps and short-term basecamps is the duration of site occupation and frequency of camp movements and amount of site re-occupation (Binford 1980; Henry 1989a; Kelly 1992). With short-term basecamps, resources are still acquired from across the landscape and transported to the basecamp for use/consumption. What makes this type distinct from its long-term counterpart is that the camp is moved more frequently (seasonally) in order to position groups in proximity to targeted resources (Binford 1980; Kelly 1992). Thus, individual landforms are occupied for shorter periods of time and greater *anticipated* camp mobility (compared to long-term basecamps) can result in less spatial segregation of activities within a site and possibly reduced emphasis on the construction of site furniture and/or domestic structures (Kent 1991; Kent and Vierich 1989). The length of the occupation of a short-term basecamp may vary from a few to several weeks depending on local environmental conditions and availability of resources (Binford 2001, 1980; Kelly 1995, 1992).

Because of the variability in potential length of occupation, the characteristics of short-term basecamps also will vary. In general, however, short-term basecamps will indicate a relatively wide variety of individual activities. A wide range of tool forms and moderate to high tool frequencies may be present—although generally not in similar numbers to long-term basecamps where multiple re-occupations may have inflated the number and density of represented activities (see earlier discussions in this chapter). Spatial segregation of individual activities, features, and site furniture may also be present, depending upon the anticipated length of site occupation (Binford 1990; Dillehay 1997a; Gould and Yellen 1991; Kent 1992, 1991).

Among the Early Preceramic sites recorded in the Quebradas del Batán and Talambo, 21 (16.67% of all Early Preceramic sites) have been identified as representing short-term basecamps (Table 9.6). The 21 sites identified as short-term basecamps are more numerous and display a greater amount of intra-type variability than the previously discussed long-term basecamps. In the QBT region, short-term basecamps range in size from small to large, contain medium to high tool frequencies, and indicate a medium to very broad range of activities (Table 9.6). In addition, short-term basecamps display a greater amount of variability in the presence/absence and number of domestic structures. The greater amount of variability present within short-term basecamps (size, tool frequencies, amount of activities, and structures) is likely related to the length of site occupation and/or amount of re-occupation.

As noted above, the length of occupation at short-term basecamps can be highly variable (for example, one site may have been occupied for a single week while another was occupied for several weeks). Variable length of occupation could produce

Table 9.6. Early Preceramic short-term basecamps in the QBT.

Site #	Location	Size	Size Range	Tool Frequency	Number of Activities	Range of Activities	Domestic Structures
Je-439	Low Terrace	35020	Medium	High	15	Very Broad	1
Je-449	Low Terrace	8000	Small	Medium	5	Medium	2
Je-470	Low Terrace	104000	Large	High	5	Medium	1
Je-484	Pampa	8500	Small	High	5	Medium	2
Je-772	High Terrace	28700	Medium	High	7	Broad	0
Je-780	High Terrace	52200	Medium	Medium	5	Medium	2
Je-804	Pampa	147375	Large	High	10	Broad	1
Je-851	Low Terrace	5824	Small	High	8	Broad	0
Je-901	Low Terrace	25515	Medium	High	8	Broad	0
Je-919	Low Terrace	187200	Large	High	9	Broad	0
Je-970	Low Terrace	14378	Medium	Medium	4	Medium	2
Je-979	Low Terrace	31980	Medium	High	9	Broad	0
Je-983	Low Terrace	16500	Medium	Medium	7	Broad	0
Je-988	Low Terrace	17679	Medium	High	8	Broad	0
Je-993	High Terrace	206800	Large	High	10	Broad	0
Je-996	High Terrace	12500	Medium	High	8	Broad	0
Je-1001	Low Terrace	64904	Medium	High	9	Broad	0
Je-1002	High Terrace	17264	Medium	High	14	Very Broad	1
Je-1007	Low Terrace	7954	Small	High	7	Broad	0
Je-1010	Low Terrace	15484	Medium	High	7	Broad	0
Je-1011	Low Terrace	55485	Medium	High	9	Broad	0

significant differences in tool frequencies and amounts of activities represented at those sites. Extreme variability in size, in contrast, is most likely a product of multiple re-occupations (see discussion of site size in Chapter Six).

The primary characteristic that distinguishes short-term basecamps—like long-term basecamps—is that a relatively high number of individual activities were undertaken at those sites. All of the 21 sites identified as short-term basecamps indicate the presence of a medium to broad range of activities, with most sites expressing broad to very broad activity ranges. Like the two sites identified as long-term basecamps (Je 431 and 790), short-term basecamps in the QBT assemblage typically contained a wide range of lithic tools (bifaces, projectile points, unifaces, limaces, and retouched/utilized flakes) and occasionally grinding stones and/or slabs (found on five sites) (see Appendix III). Some sites also contained lithic knapping stations, midden, hearth features, floral and faunal materials, and non-local materials.

In addition to the individual activities represented, eight sites (Je-439, 449, 470, 484, 780, 804, 970, and 1002) contained domestic structures. Four of these sites contained two structures and four contained only a single structure (Table 9.6). As with long-term basecamps, the presence of domestic structures is suggestive of relatively low anticipated mobility (Kent 1991; Kent and Vierich 1989). However, it is important to note that most (n=13) of the 21 short-term basecamps do not contain domestic structures. This fact is significant in that it underscores the greater anticipated mobility that short-term basecamps generally represent compared to long-term basecamps. The fact that eight of short-term basecamps do contain domestic structures likely points to variability in length of occupation (anticipated or actual) of individual sites.

Domestic structures present at short-term basecamps range in form and include circular, L-shaped, V-shaped, and semi-lunar (see Table 6.3). Only one short-term basecamp (Je-484) contains more than one form of structure (both circular and semi-lunar). The presence of one or two structures of the same form on these sites is suggestive of an occupation by small groups—perhaps one or two nuclear families. The exception, Je-484, where two structures of different forms are present may indicate different functions for each of the structures, or it may indicate separate occupations or re-occupation of the site by different groups (who constructed different styles of structures).

Overall, however, the picture that emerges from these 21 sites is one of individual locations that were the focus of a small group's economic, technological, and social activities for a relatively extended period of time (Figure 9.4). It is important to note that in many ways, short-term basecamps are identified by what they are not. They generally do not indicate the low *anticipated* mobility and multiple re-occupations of long-term basecamps. They also do not indicate the special-purpose or task-specific, limited activities that are associated with field camps or transitory stations. The relatively wide amount of intra-type variability that characterizes Early Preceramic short-term basecamps in the QBT is not unexpected, given that these sites encompass at least two early complexes (Fishtail and Paiján) and represent occupations spanning the entire Early Preceramic period (including both Early and Late Paiján periods). Understanding what

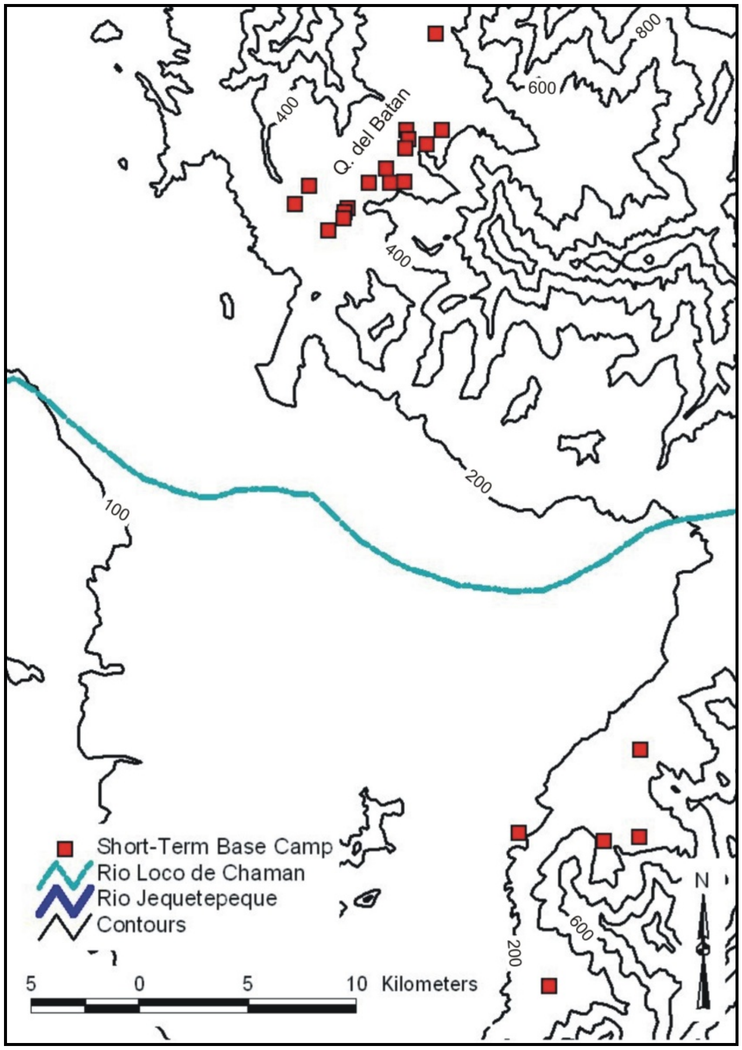

Figure 9.4. Distribution of short-term basecamps (n=21) in the QBT (plotted on the Chepén Topographic Quadrangle, 1:100,000 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcView 3.2 GIS program).

this intra-type variability may represent in terms of mobility and settlement requires a closer examination of these sites from a chronological perspective.

During the survey for Early Preceramic sites in the Quebradas del Batán and Talambo four sites that contained Fishtail projectile points were documented. All four of these sites (Je 979, 996, 1002, and 1010) have been classified as short-term basecamps. The fact that diagnostic Fishtail materials were recovered only from sites classified as short-term basecamps is significant and provides insight into Fishtail settlement of the region. Diagnostic Paiján cultural materials were identified on all short-term basecamps as well. However, as will be discussed in the following sections, Paiján materials are also identified on long-term basecamps, long- and short-term field camps, transitory stations, and quarries/workshops. Diagnostic Fishtail materials, in contrast, are found on only one type of site—short-term basecamps.

Each of the four Fishtail sites expresses very similar characteristics: medium size, high frequency of tools, and broad range of activities (Table 9.6). The notable exception is site Je 1002, which contains a single circular domestic structure and indicates a very broad range of activities. Occupation of a relatively limited number of sites—sites with highly similar characteristics—is suggestive of a residentially organized settlement and redundant use of the landscape (Bettinger 1991; Binford 1980; Kelly 1992; Kent 1991). It should be noted again, however, that each of these four sites also contained Paiján cultural materials. It is possible that contemporary or later re-occupation by Paiján groups may have masked potential variability between these sites or added activities unrelated to the Fishtail occupations, such as the circular domestic structure at Je 1002.

In contrast to the seeming homogeneity of Fishtail sites, Paiján short-term basecamps display a wider range of variability in terms of size, tool frequency, activities, and number of structures present. Among the 25 single component Paiján sites identified in the QBT study based on diagnostic lithic tools (see Table 8.38), five have been identified as short-term basecamps. Two of these sites (Je 983 and 1007) contain materials diagnostic to the Early Paiján period and three (Je 449, 970, and 988) contain materials diagnostic of the Late Paiján period.

The two Early Paiján sites (Je 983 and 1007) range in size from small to medium, express medium to high tool frequencies, and both indicate broad ranges of activities. Neither of these sites contained domestic structures. Somewhat similarly, the three Late Paiján sites (Je 449, 970, and 988) range in size from small to medium, express medium to high tool frequencies, and indicate a medium to broad range of activities. In contrast, however, two of the Late Paiján short-term basecamps contain domestic structures (Je 449 [2 circular structures] and 979 [2 circular structures]).

These five single component sites are, overall, relatively similar—even though they display a greater amount of variability than the Fishtail sites. The variability in size, tool frequency, and activities is probably related to individual durations of occupation. The more significant difference between the Early and Late Paiján single component short-term basecamps is the more frequent presence of domestic structures on Late Paiján sites. Regardless of the variability in duration of occupation that may be present between Early and Late Paiján short-term basecamps, these structures suggest that Late Paiján occupants of the QBT region had a lower *anticipated* mobility (Kent 1991; Kent and Vierich 1989). That is, Late Paiján groups anticipated occupying a site long enough to warrant the investment in more formal structures.

In sum, the 21 short-term basecamps identified in the QBT region suggest that although similar types of sites (short-term basecamps) were occupied by the Fishtail, Early Paiján, and Late Paiján, these sites are likely related to different systems of settlement organization and mobility strategies. Fishtail materials were only recovered from highly similar short-term basecamps and are suggestive of a residentially organized system. Early and Late Paiján materials are found on a wide range of site types (including short-term basecamps) and are more indicative of logistical organization. Among the Paiján short-term basecamps, however, the more frequent presence of domestic structures on Late Paiján sites is suggestive of much lower anticipated mobility than is indicated for the Early Paiján.

Long-term (n=20) and Short-term (n=25) Field Camps

Field camps are locations where task-oriented or special-purpose groups resided while exploiting specific resources. Within a logistically organized foraging system, field camps are considered "temporary operational centers" for the small task groups and are typically occupied only for short periods of time (Binford 1980: 10). Field camps represent locations across the landscape where targeted resources are acquired, processed, and then transported back to the basecamp from which the task group originated. Typically, these sites contain evidence for a relatively limited range of activities and tend to reflect the nature of the resources being targeted in that location.

In general, field camps were likely occupied only for short periods of time. Although two types of field camps were described in the general model of site types presented in Chapter Six (Survey Results and Early Preceramic Site Types), the distinction between long- and short-term field camps is more conceptual than material, and relates only to very limited occupational timeframes (e.g., a few days [short-term] versus several days to a week [long-term]) (Binford 1983, 1980; Kelly 1992; Stackelbeck 2008). Unlike long- and short-term basecamps, where differences in length of occupation have substantial implications for artifact frequency, ranges of activities, and number of domestic structures. The difference between Early Preceramic long- and short-term field camps appears to be relatively minor (see Stackelbeck 2008 for a discussion of the differences in Late Early/Middle Preceramic long- and short-term field camps).

The primary distinction that can be made is the differential presence of artifacts that may be related to length or intensity of occupation. Long-term field camps may contain slightly higher incidence of artifacts related to food preparation and provisioning, given their presumably longer anticipated duration of occupation. However, most long-term field camps will likely not be occupied for enough time to result in domestic midden accumulations or the building of structures. Domestic structures to house the task-group may be present at field camps if the *anticipated* length of occupation warranted or offset such construction (Kelly 1992; Kent 1991; Kent and Vierich 1989).

Among the 126 Early Preceramic sites identified in the Quebradas del Batán and Talambo, 45 are identified as representing field camps (20 long-term and 25 short-term) (Tables 9.7 and 9.8, respectively). Thus, field camps represent 35.71% of the all Early Preceramic sites within the study area. These sites are typically small to medium in size, express low to high frequency of tools, and indicate a medium range of activities. Two sites (Je 897 and 954) contained one (n=1) domestic structure each. However, the primary distinction used to identify a field camp as long- or short-term in the QBT Early Preceramic sites was lithic tool frequency. Long-term field camps tend to express a medium to high frequencies of tools, while short-term field camps generally have low to medium frequencies. Although the rough separation of long- and short-term field camps can be made within the QBT sites, it should be noted that these groups are highly similar to one another and could easily be grouped as a single site type.

Compared with the Early Preceramic basecamps (long- and short-term) identified above, field camps are found on a wider range of landforms within the study area (Figure 9.5). Basecamps are primarily located on terraces (high and low). Only three basecamps (Je-484 [*pampa*], 790 [paleodune], and 804 [*pampa*]) are located non-terrace landforms and represent 11% of the total basecamps. Early Preceramic field camps, in contrast, are

Table 9.7. Early Preceramic long-term field camps in the QBT.

Site #	Location	Size	Size Range	Tool Frequency	Number of Activities	Range of Activities	Domestic Structures
Je-440	Low Terrace	3600	Small	High	4	Medium	0
Je-478	Pampa	24700	Medium	High	4	Medium	0
Je-766	Pampa	1600	Small	High	5	Medium	0
Je-778	Low Terrace	1296	Small	High	5	Medium	0
Je-800	Low Terrace	1672	Small	High	6	Medium	0
Je-814	High Terrace	16250	Medium	Medium	4	Medium	0
Je-817	High Terrace	7448	Small	Medium	5	Medium	0
Je-818	Hillslope	9720	Small	Medium	6	Medium	0
Je-856	High Terrace	7209	Small	Medium	4	Medium	0
Je-859	High Terrace	9499	Small	High	6	Medium	0
Je-873	Low Terrace	3888	Small	Medium	5	Medium	0
Je-906	Hillslope	9500	Small	Medium	6	Medium	0
Je-971	Low Terrace	22736	Medium	Medium	6	Medium	0
Je-972	Low Terrace	13206	Medium	Medium	4	Medium	0
Je-982	High Terrace	4455	Small	Medium	6	Medium	0
Je-989	Low Terrace	94500	Large	Medium	6	Medium	0
Je-990	High Terrace	146400	Large	Medium	4	Medium	0
Je-995	High Terrace	4300	Small	Medium	6	Medium	0
Je-1004	Low Terrace	11800	Medium	Medium	6	Medium	0
Je-1012	Low Terrace	71100	Large	Medium	5	Medium	0

found on terrace (high and low), *pampa*, hillslope, and saddle landforms. Nine of the field camps are located on non-terrace landforms and represent 20% of the total number of field camps (Tables 9.7 and 9.8).

The more varied location of field camps in comparison to basecamps is not unexpected, given the fact that basecamps tend to be centrally located in proximity to multiple potential resources and that field camps are situated in direct relation to targeted resources (Binford 1983, 1980; Grove 2009; Kelly 1995; Morgan 2008). However, the higher diversity of landforms on which Early Preceramic field camps are found is suggestive of the use of a relatively wide range of resources throughout the QBT region. The presence of Early Preceramic field camps situated on a variety of different landform types across the QBT region strongly supports the suggestion of a logistically organized settlement system involving basecamps and special purpose/task-oriented sites.

It is important to note that none of the sites identified as field camps yielded diagnostic cultural materials attributable to any Early Preceramic complex other than the

Table 9.8. Early Preceramic short-term field camps in the QBT.

Site #	Location	Size	Size Range	Tool Frequency	Number of Activities	Range of Activities	Domestic Structures
Je-442	Low Terrace	16800	Medium	Medium	3	Limited	0
Je-474	Pampa	7600	Small	Medium	4	Medium	0
Je-475	Pampa	46200	Medium	Medium	2	Limited	0
Je-793	Low Terrace	900	Small	Medium	4	Medium	0
Je-798	High Terrace	1056	Small	Medium	4	Medium	0
Je-805	Low Terrace	29100	Medium	Medium	2	Limited	0
Je-812	High Terrace	15200	Medium	Low	4	Medium	0
Je-829	Pampa	7590	Small	Medium	4	Medium	0
Je-853	High Terrace	770	Small	Low	4	Medium	0
Je-870	Saddle	12852	Medium	Low	4	Medium	0
Je-897	High Terrace	3379	Small	Low	2	Limited	1
Je-900	Hillslope	740	Small	Low	4	Medium	0
Je-915	High Terrace	14694	Medium	Medium	3	Limited	0
Je-925	Low Terrace	7440	Small	Low	4	Medium	0
Je-929	Low Terrace	8060	Small	Low	4	Medium	0
Je-936	High Terrace	5460	Small	Low	5	Medium	0
Je-945	Low Terrace	576	Small	Low	4	Medium	0
Je-954	Low Terrace	3885	Small	Low	4	Medium	1
Je-960	Low Terrace	12400	Medium	Low	4	Medium	0
Je-964	Low Terrace	580	Small	Medium	4	Medium	0
Je-976	Low Terrace	768	Small	Medium	5	Medium	0
Je-997	High Terrace	9372	Small	Low	6	Medium	0
Je-998	High Terrace	17430	Medium	Low	4	Medium	0
Je-1006	Low Terrace	7074	Small	Medium	5	Medium	0
Je-1013	Low Terrace	2790	Small	Medium	5	Medium	0

Paiján. All 45 Early Preceramic field camp sites did, however, contain lithics that are considered to be diagnostic of the Paiján complex (both Early and Late Paiján periods).

Fourteen (n=14) of the Early Preceramic field camps are single component sites.[2] These 14 sites include both Early (n=4) and Late Paiján (n=10) period sites. In general, the single component field camps range in size from small to medium, display a relatively wide variability in the frequency of lithic tools (from low to high), and indicate a medium range of activities (see Tables 9.7 and 9.8). No domestic structures were present on any of the single component field camps.

The four (n=4) Early Paiján field camps are primarily short-term (n=3; Je 812, 900, and 997), although a single long-term (n=1; Je 800) site was identified. In contrast, Late Paiján field camps consist primarily of long-term (n=7) sites, with only a few (n=3)

[2] Sites Je 440, 778, 800, 812, 814, 817, 829, 873, 900, 976, 995, 997, 1004, and 1013.

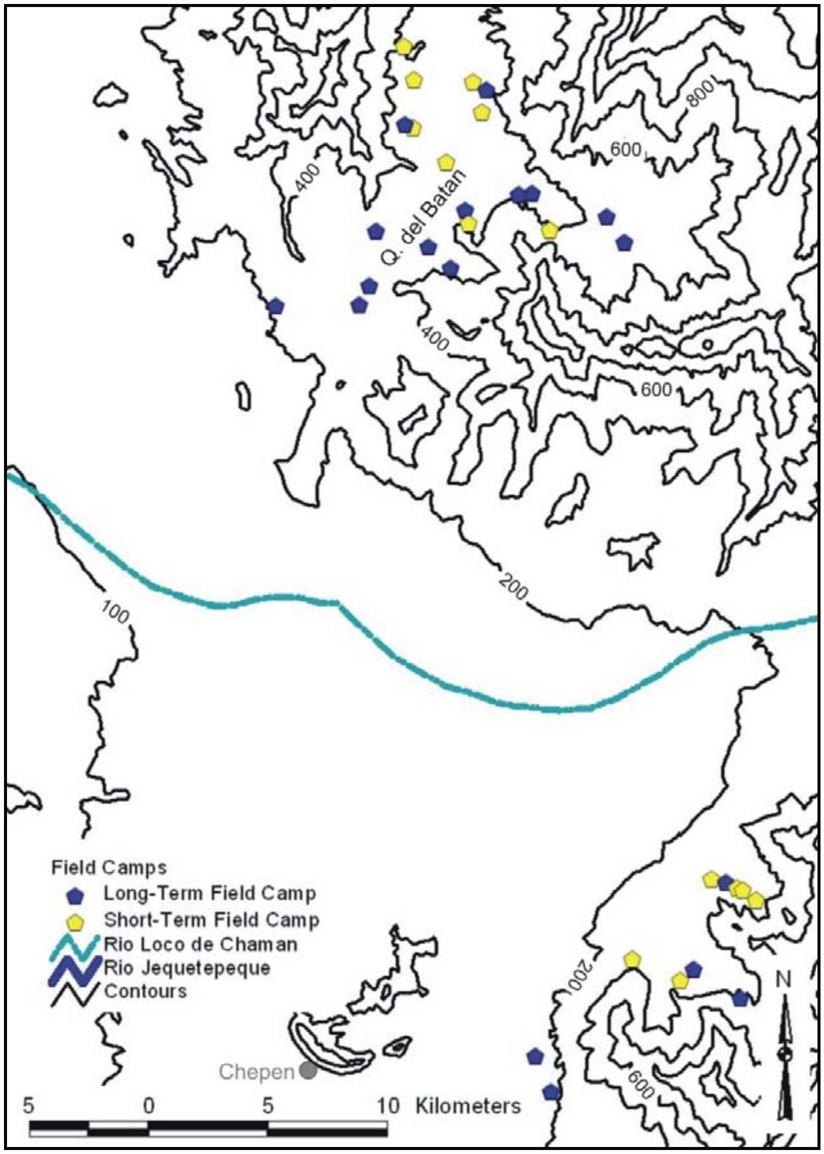

Figure 9.5. Distribution of short-term field camps (n=25) and long-term field camps (n=20) in the QBT (plotted on the Chepén Topographic Quadrangle, 1:100,000 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcView 3.2 GIS program).

short-term sites. It should be noted again that the primary distinction between long- and short-term field camps is the relative frequency of lithic tools. Given this fact, the higher number of long-term field camps in the Late Paiján clearly indicates that more tools (both in frequency and diversity) were being deposited at these sites than in their Early Paiján counterparts. The deposition of higher amounts and wider ranges of tools may possibly suggest: 1) more intensive exploitative activities were being carried out during the Late Paiján (compared to the Early period); 2) larger numbers of people were participating in the activities occurring at field camps, resulting in greater tool use and deposition; and/or 3) field camps were being occupied for somewhat longer periods of time during the Late Paiján.

Given the relatively small sample of single component Early Preceramic sites in the QBT, little can be said other than these possibilities exist and that long-term field camps tend to be more frequent during the Late Paiján. It is clear, however, that the existence of Early Preceramic field camps within the QBT region—both Early and Late Paiján—are strongly suggestive of logistically organized settlement. It is possible that a trend of increasing numbers of long-term field camps between the Early and Late Paiján periods is related to the same pattern of lower anticipated mobility indicated by the differences in short-term basecamps (discussed previously).

Transitory Stations (n=55)

Transitory stations are locations where single or small parties of hunter-gatherers engage in information gathering, such as observing game or perhaps, other people (Binford 1978; Dillehay 2000). Transitory stations are generally characterized by small sites containing low frequencies of tools and indicate limited ranges of activities. Materials deposited at these sites primarily relate to activities that can be accomplished while observing the landscape, such as tool manufacture and/or resharpening (Binford 1979).

Among the 126 Early Preceramic sites recorded in the QBT, 55 (43.65% of all Early Preceramic sites) are identified as transitory stations. This site type is by far the most common among all of the QBT Early Preceramic sites. Transitory stations are characterized by small site size, low (and a few medium) frequency of tools, and limited amounts of activities (generally 1-3 activities often related to lithic tool manufacture/resharpening) (Table 9.9). No domestic structures were identified on any transitory stations. The limited amount of activities and low frequency of tools at these small sites are suggestive of only temporary or ephemeral use of each location.

Another characteristic aspect of Early Preceramic transitory stations in the QBT region is their location on a wide variety of landforms. Transitory stations in the QBT

Table 9.9. Early Preceramic transitory stations in the QBT.

Site #	Location	Size	Size Range	Tool Frequency	Number of Activities	Range of Activities	Domestic Structures
Je-394	Low Terrace	1170	Small	Low	2	Limited	0
Je-395	Low Terrace	100	Small	Low	1	Limited	0
Je-397	Low Terrace	150	Small	Low	2	Limited	0
Je-399	High Terrace	1144	Small	Low	1	Limited	0
Je-401	High Terrace	460	Small	Low	1	Limited	0
Je-425	High Terrace	1100	Small	Low	1	Limited	0
Je-430	High Terrace	750	Small	Low	2	Limited	0
Je-432	Paleodune	1500	Small	Low	2	Limited	0
Je-433	Low Terrace	175	Small	Medium	2	Limited	0
Je-435	Low Terrace	6250	Small	Low	2	Limited	0
Je-436	Low Terrace	1100	Small	Medium	3	Limited	0
Je-441	Low Terrace	800	Small	Low	2	Limited	0
Je-443	Low Terrace	6600	Small	Medium	3	Limited	0
Je-447	Low Terrace	2700	Small	Low	1	Limited	0
Je-458	Low Terrace	1800	Small	Low	2	Limited	0
Je-459	Low Terrace	1100	Small	Low	1	Limited	0
Je-471	Pampa	1400	Small	Low	1	Limited	0
Je-481	Pampa	375	Small	Low	2	Limited	0
Je-770	High Terrace	370	Small	Low	3	Limited	0
Je-777	High Terrace	1400	Small	Low	3	Limited	0
Je-785	Saddle	700	Small	Low	3	Limited	0
Je-789	Low Terrace	480	Small	Low	1	Limited	0
Je-791	High Terrace	2625	Small	Low	3	Limited	0
Je-795	High Terrace	3744	Small	Low	2	Limited	0
Je-803	Pampa	3648	Small	Low	2	Limited	0
Je-820	Low Terrace	154	Small	Low	2	Limited	0
Je-825	Pampa	3283	Small	Low	2	Limited	0
Je-827	Pampa	5859	Small	Low	3	Limited	0
Je-832	Pampa	4950	Small	Low	3	Limited	0
Je-834	Pampa	319	Small	Low	1	Limited	0
Je-841	Pampa	650	Small	Low	3	Limited	0
Je-843	Pampa	595	Small	Low	2	Limited	0
Je-844	Pampa	954	Small	Low	3	Limited	0
Je-849	Low Terrace	5157	Small	Low	3	Limited	0
Je-852	Low Terrace	936	Small	Low	1	Limited	0
Je-855	High Terrace	7140	Small	Low	2	Limited	0
Je-858	High Terrace	896	Small	Low	3	Limited	0
Je-866	High Terrace	8370	Small	Low	1	Limited	0
Je-868	High Terrace	1485	Small	Low	2	Limited	0
Je-875	Low Terrace	5394	Small	Low	3	Limited	0
Je-879	Low Terrace	1408	Small	Low	1	Limited	0
Je-881	Rockshelter	10914	Medium	Low	2	Limited	0
Je-888	Low Terrace	2016	Small	Medium	3	Limited	0
Je-899	Hillslope	418	Small	Low	3	Limited	0
Je-914	Low Terrace	105	Small	Low	2	Limited	0
Je-930	Low Terrace	966	Small	Low	2	Limited	0
Je-955	Low Terrace	4026	Small	Low	3	Limited	0

Table 9.9 (con't.).

Site #	Location	Size	Size Range	Tool Frequency	Number of Activities	Range of Activities	Domestic Structures
Je-969	Low Terrace	1189	Small	Low	3	Limited	0
Je-973	Low Terrace	4800	Small	Low	3	Limited	0
Je-980	Low Terrace	22140	Medium	Low	3	Limited	0
Je-984	Low Terrace	2520	Small	Low	2	Limited	0
Je-986	High Terrace	1475	Small	Low	3	Limited	0
Je-991	Low Terrace	1254	Small	Low	2	Limited	0
Je-1003	High Terrace	480	Small	Low	1	Limited	0
Je-1008	Low Terrace	3237	Small	Low	2	Limited	0

have been identified on terrace (high and low) (n=41), *pampa* (n=10), saddle (n=1), paleodune (n=1), hillslope (n=1) and rockshelter (n=1) landforms (Figure 9.6). Similar to virtually all other Early Preceramic site types in the QBT, there is a pronounced emphasis for locating transitory stations on terrace landforms. However, 14 transitory stations are located on non-terrace landforms, including all other landform types identified during the study. Compared with basecamps and field camps, transitory station sites are distributed across a wider range of landforms and suggest relatively extensive use/exploitation of the entire QBT region. Because transitory stations are generally characterized as locations of information gathering (Binford 1978; Dillehay 2000), this pattern is not unexpected and likely represents purposeful attempts to maximize visibility and information collection.

Among the 25 single component sites in the QBT assemblage, six (n=6) are identified as transitory stations (Je 436, 777, 858, 899, 955, and 980). At each of these sites, materials recovered were dominated by lithic debitage, but often included 1 or 2 projectile points/fragments, and occasionally a uniface or limace. Only one of these sites contains materials diagnostic of the Early Paiján period (Je 980). The remaining five sites (Je 436, 777, 858, 899, and 955) all contain materials diagnostic of the Late Paiján. The relatively small sample of single component transitory stations limits our ability to observe significant patterns in this site type over time, but there does appear to be a trend of increasing numbers of transitory stations from the Early to Late Paiján. Like was observed with the basecamps and field camp sites, an increase in the number (or perhaps need) of information gathering points throughout the QBT is suggestive of logistical settlement organization, and perhaps, more intensive occupation of the region.

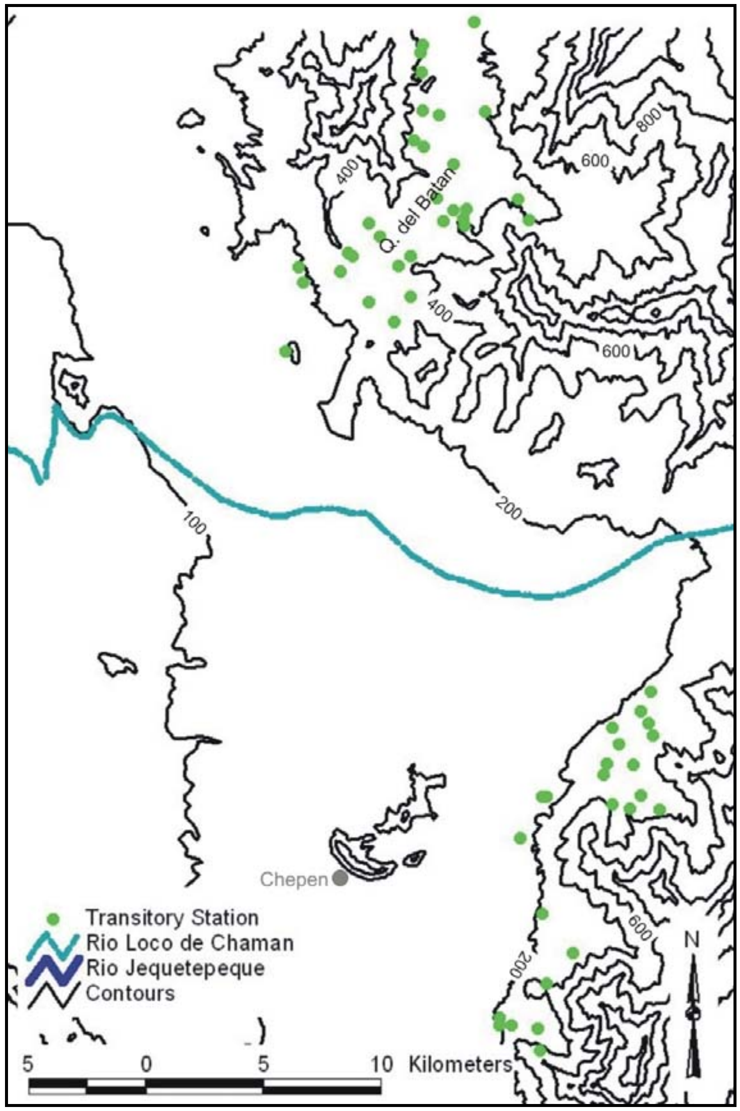

Figure 9.6. Distribution of transitory stations (n=55) in the QBT (plotted on the Chepén Topographic Quadrangle, 1:100,000 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcView 3.2 GIS program).

Quarries/Workshops (n=3)

Quarries/workshops represent locations for the procurement of raw materials for tool manufacture and often the initial reduction into primary bifaces and/or tool blanks/preforms (Becerra 1999; Becerra and Gálvez 1996; Chauchat 1998; Odell 2003). These sites are often situated at natural outcrops of the requisite raw material, but may also be located in near proximity to the outcrop (i.e., a workshop for the production or initial reduction of the desired implements). Although different kinds of raw materials like bone, wood, or shell likely were also quarried or exploited for use in the manufacture of a variety of tools, only lithic quarries/workshops were identified among the Early Preceramic sites in the QBT.

A total of three Early Preceramic lithic quarries/workshops were identified in the QBT (Figure 9.7) and represent 2.38% of the total number of Early Preceramic sites. Quarry/workshop sites are characterized by small to medium size with a low to medium frequency of lithic tools (generally primary and secondary bifaces). A limited to medium range of activities is represented at these sites and no domestic structures were present (Table 9.10).

Previous studies in the nearby Chicama/Cupisnique regions (Becerra 1999; Becerra and Gálvez 1996; Chauchat et al. 1998) noted that lithic quarries were often intensively exploited throughout the Early Preceramic period. This pattern appears to be similar in the QBT quarry sites, although no diagnostic tools were recovered from these sites.

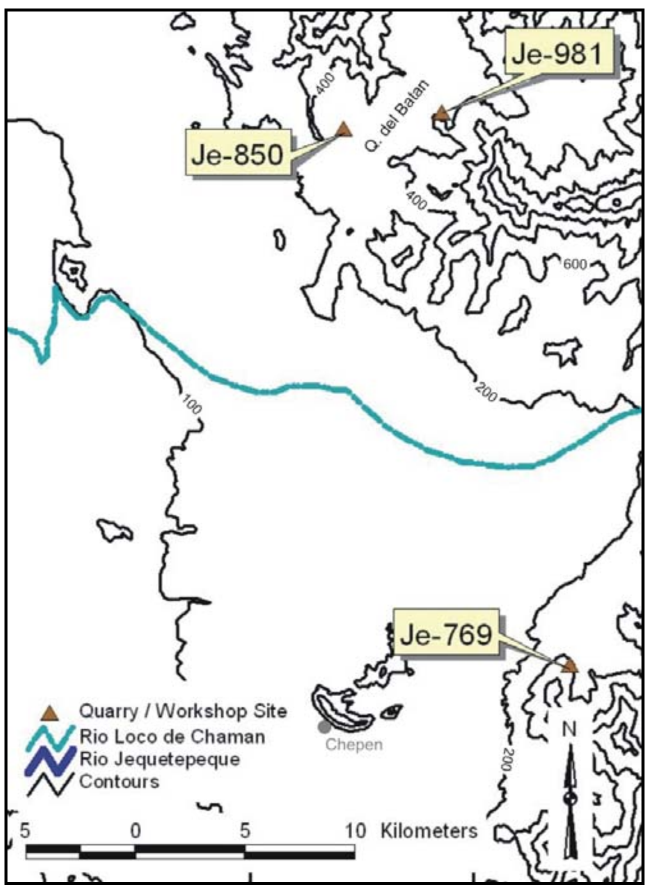

Figure 9.7. Distribution of quarry/workshop sites (n=3) in the QBT (plotted on the Chepén Topographic Quadrangle, 1:100,000 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcView 3.2 GIS program).

Table 9.10. Early Preceramic quarries/workshops in the QBT.

Site #	Location	Size	Size Range	Frequency	Number of Activities	Range of Activities	Domestic Structures
Je-769	Saddle	750	Small	Low	3	Limited	0
Je-850	High Terrace	15260	Medium	Medium	4	Medium	0
Je-981	Low Terrace	8106	Small	Low	4	Medium	0

Processing Stations (no sites identified)

Processing stations represent a specialized type of field camp that involves the mass collection of a specific resource that generates large amounts of low value or waste material during exploitation. This type of site represents an intensive, relatively short-term use of a specific location by a task group to acquire and process a specific, targeted resource (Dillehay 2000: 81). The primary feature of processing stations is often the accumulation of relatively dense amounts of waste byproducts, such as shells (from marine or terrestrial resources), unused portions of butchered animal carcasses, or undesirable sections of processed plants (stems, seed pods, fruit pits/seeds). Evidence for intensive resource collection/processing may also be represented by accumulations of 'waste' tools used during collection/processing activities. However, the range of individual tool categories will likely be low and reflect the specific processing activities and resource type.

No processing stations were identified among the 126 Early Preceramic sites recorded in the QBT. However, given the intensity of the Paiján occupation of the region and the diversity of other site types represented, it seems reasonable to at least speculate that processing stations likely existed—particularly for terrestrial snails (*Scutalus* sp. and *Bostryx* sp.) (Gálvez et al. 1993; Stackelbeck 2008). Based on the densities of land snail shell recovered from subsurface feature contexts, Stackelbeck (2008) has argued that differential levels of land snail exploitation (including intensive processing) appear to have existed during the Late Early/Middle Preceramic periods.

The failure to identify processing stations in the Early Preceramic period may be related to two separate factors. First, the accumulations of waste byproducts that define processing stations are largely composed of organic materials that may not have preserved within the quebradas (although preservation, particularly of shell, is generally excellent in the arid coastal and foothills zones). Second, the processing station site type is essentially a field camp with more intensive (and perhaps specialized) activities. It is possible, absent very dense accumulations of waste byproducts, that any processing station may instead have been identified as a long- or short-term field camp.

Mortuary Locations (no sites identified)

As was noted in Chapter Six, human remains are relatively rare in Late Pleistocene-Early Holocene archaeological contexts (Briceño and Millones 1999; Dillehay 1997b; Lacombe 1994). However, primary interments, secondary burials, and/or disarticulated skeletal elements have been documented on both Early and Middle Preceramic sites in the north coast region (Chauchat and Lacombe 1984; Chauchat et al. 1992; Dillehay 2000; Dillehay et al. 1997; Dillehay et al. 1989; Lacombe 1994; Ossa and Moseley 1972; Rossen 1991). The majority of Early and Middle Preceramic human remains have been identified on sites that also contain evidence for a wide range of activities—often basecamps—and not in specialized, mortuary locations (e.g., mounds, cemeteries, or charnal facilities) (Briceño and Millones 1999; Dillehay 1997b). As such, mortuary locations may represent a specific site type. However, it is more likely that early mortuary activities will represent one activity (or set of activities) among many that occurred at an individual site (Dillehay et al. 1997; Rossen 1991).

Among the 126 Early Preceramic sites in the QBT, only one (n=1, site Je 1002) yielded human remains. The human remains encountered at site Je 1002 consisted of a heavily disturbed burial that was exposed and eroding onto the site surface (see Figure 6.7). Given the context and disturbance, little information can be said regarding this burial. However, it is probable that the burial is associated with a nearby circular domestic structure (see Figure 7.34) and the Paiján (probably Late Paiján) occupation of the site. As such, this burial should not be considered a separate type of site—but rather as an activity within Je 1002 (identified as a short-term basecamp).

Rock Art Locations (no sites identified)

Rock art has been recorded by Chauchat and others in the Cupisnique/Chicama region (Chauchat 1998; Gálvez 1999). These images are typically found on large boulders or exposed rock faces of rockshelter sites or overlook nearby Preceramic sites.

Image types range from simple painted or pecked (petroglyphs) lines and geometric patterns to relatively complex groups of images that may include anthropomorphic representations (see images in Chauchat 1998). However, the temporal association of most rock art is unknown and may be related to later time periods.

No locations containing rock art were identified in the QBT. Given the documented presence of rock art in the nearby Chicama/Cupisnique, it is possible that upslope locations—in passes or near the summits of the low mountains—may contain rock art.

Summary of Early Preceramic Site Types in the QBT

The goal of the preceding discussions have been to better understand the variability extant among Early Preceramic sites in the QBT region and ascertain whether that variability was related to functional differences between individual sites—and if these functional differences could be used to identify site types in the QBT assemblage. In order to more fully characterize the variability present in the assemblage of Early Preceramic sites, five separate criteria were assessed and compared for each site (see previous discussions in this chapter and in Chapter Six). These criteria included: 1) site location (based on landform type); 2) site size (site dimensions were used to create similar groups based on size distributions among single component sites); 3) frequency of lithic tools (the number tools present at a site and divided into groups based on the frequency patterns within single component sites); 4) amount of activities (based on the presence of material correlate indicators for specific activities and were divided into activity ranges based on the amount of activities indicated at single component sites); and 5) the presence of domestic structures. The data used to make the individual assessments for these five criteria are drawn from the results of survey, excavation, and materials analyses (primarily lithic analysis) conducted by this study on the 126 Early Preceramic sites documented in the QBT.

Each of these criteria were defined using patterns of functional, organizational, and chronological variability documented by previous studies of Early Preceramic sites in northern Perú (Becerra 1999; Briceño 1999, 1997; Chauchat 1998, 1988, 1975; Chauchat et al. 2006; Chauchat et al. 2004; Dillehay 2000; Dillehay et al. 2009; Dillehay et al.

2003; Dillehay et al. 1997; Dillehay et al. 1989; Dillehay and Netherly 1983; Gálvez 2004, 1999, 1992; Malpass 1983; Ossa 1978; Ossa and Moseley 1972; Richardson 1981, 1978, 1973; Rossen 1998, 1991; Uceda 1992). The results of these studies (and others) were also used to generate a model of potential Early Preceramic site types (see Chapter Six). Material, spatial, and depositional correlates for each of these potential site types was described and provided a framework with which to interpret the results of the criteria assessments.

As a result of the characterization using these five criteria and model of potential site types, it seems clear that different types of Early Preceramic sites exist within the study area. Six distinct types of sites were identified and include: long-term basecamps (n=2), short-term basecamps (n=21), long-term field camps (n=20), short-term field camps (n=25), transitory stations (n=55), and quarry/workshops (n=3). The criteria assessments used in this study suggest that clear functional differences exist between types (Figure 9.8).

Some of the observed functional differences between sites of separate types, at least in part, are a product of palimpsest deposits from successive re-occupations of favored landforms/settings (see previous discussions in this chapter and Chapter Six). This is particularly true for site types with similar probable functions such as long- and short-term basecamps and long- and short-term field camps. However, between types that are less similar (such as between basecamps and transitory stations, or field camps and quarry/workshops), the functional distinctions are more pronounced. This point is significant in that it strongly suggests that discrete site types probably relate to different functional roles (i.e., separate components) within a system of settlement organization (Bamforth 1991; Binford 1983, 1980; Dillehay 1997; Kelly 1995, 1992; Perlés and Phillips 1991; Tankersley 1998).

In the case of the contemporary/overlapping Fishtail and Paiján occupations, two distinct patterns of site types are indicated. Sites that contained diagnostic Fishtail materials are only attributed to one type—short-term basecamps. Sites containing Paiján complex materials, in contrast, are much more varied and include six distinct types (long- and short-term basecamps, long- and short-term field camps, transitory stations, and

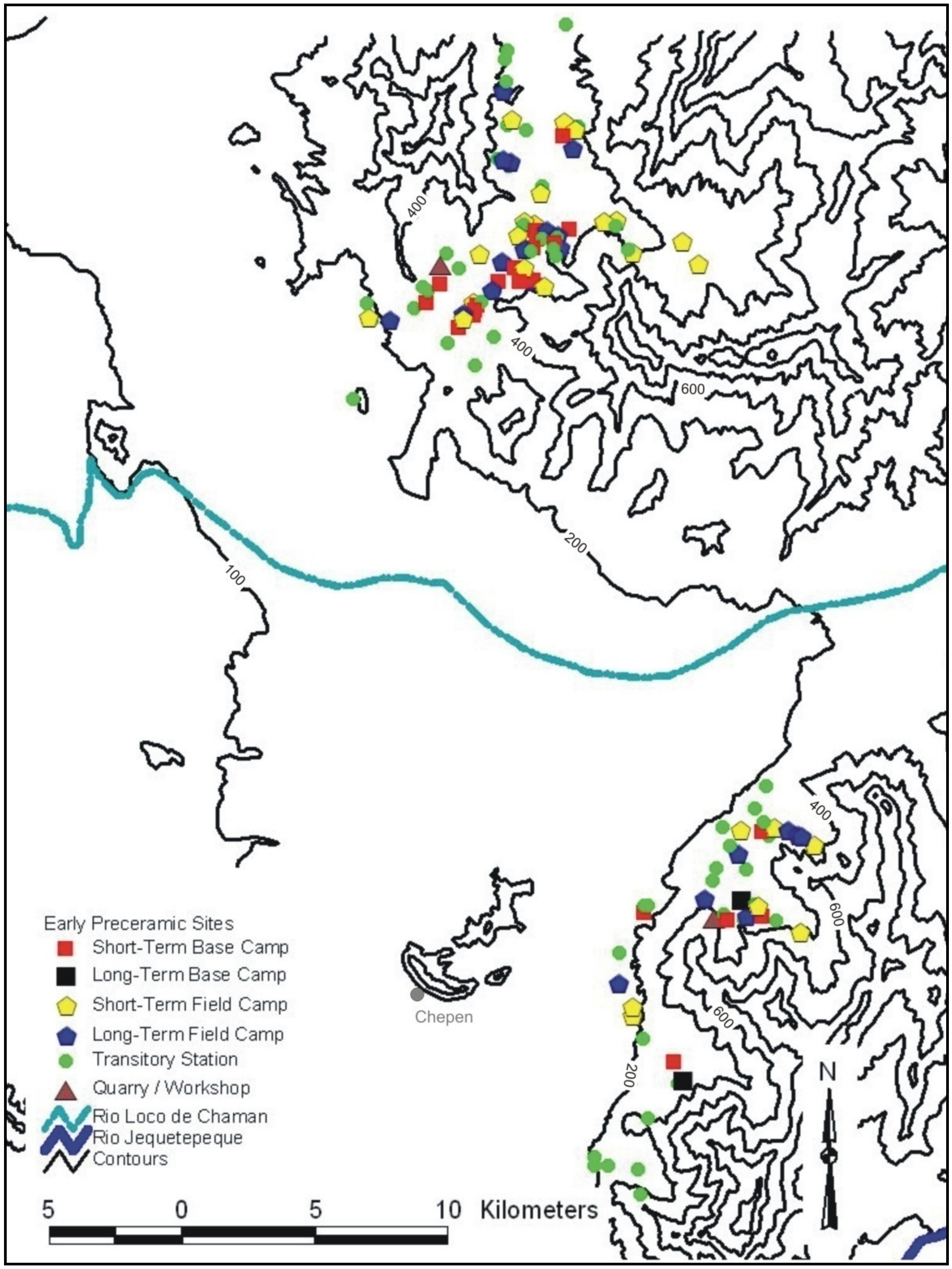

Figure 9.8. Distribution of all Early Preceramic sites (n=126) by type in the QBT (plotted on the Chepén Topographic Quadrangle, 1:100,000 scale [Instituto Geográfico Nacional de la Republica del Perú] using ArcView 3.2 GIS program).

quarry/workshops). Distinct patterns of site types related to different Early Preceramic complexes suggest that the settlement organization for each complex was also distinct.

The use of only a single type of site by the Fishtail complex implies a settlement organization that was redundant across the landscape (i.e., all sites filled similar functional roles) and may have entailed a relatively high residential mobility and frequent camp relocations (Bamforth 1991; Binford 1990, 1980; Kelly 1992). Paiján settlement organization is markedly different from that of the Fishtail in that multiple different types of sites existed. Individual Paiján site types also vary in frequency and are differentially distributed across the landscape. This pattern implies a system of settlement organization that was much less redundant and fundamentally different from the Fishtail (i.e., individual sites fulfilled different functional roles within the settlement system). The variability of types within Paiján settlement organization also suggests relatively lower mobility and more extensive use of the regionally-available resources.

Thus, it appears at the local level that the contemporary/overlapping Early Preceramic Fishtail and Paiján complexes maintained very different mobility strategies and systems of settlement organization. What these distinct organizational systems represent in terms of regional strategies within the transient explorer-estate settler continuum presented earlier in this study (Chapter Five) will be discussed in the following sections. However, it seems clear that during the Late Pleistocene-Early Holocene period at least two distinct approaches to utilizing the landscape operated coterminously within the lower Jequetepeque Valley.

Fishtail and Paiján Settlement Organization in the Lower Jequetepeque Valley

Among the 126 Early Preceramic sites recorded in the QBT region, six distinct types have been identified: long-term basecamps, short-term basecamps, long-term field camps, short-term field camps, transitory stations, and quarry/workshops. As has been briefly discussed, these distinct types provide insights into the nature of Early Preceramic human use of the region and an opportunity to begin to model the settlement and mobility strategies for the contemporaneous/overlapping early complexes that occupied the study area. The following sections focus on the organizational linkages that may have existed between different types of sites and attempt to reconstruct the settlement organization of both the Fishtail and Paiján occupations of the QBT region.

Fishtail Settlement in the Lower Jequetepeque Valley

As noted previously, only four sites (Je 979, 996, 1002, and 1010) contained materials diagnostic of the Fishtail complex. Although the sample size is small when compared to the contemporary/overlapping Paiján complex occupations, striking differences between the individual sites attributed to these two complexes are apparent—and are suggestive of markedly different patterns of settlement. Aside from the obvious difference in the number of Fishtail (n=4) and Paiján (n=126) sites, the most significant characteristic of the Fishtail complex sites is their relative homogeneity. Each of the four Fishtail sites is a short-term basecamp and is similarly characterized by medium size, high tool frequency, and a broad range of activities. Aside from these similarities, each Fishtail short-term basecamp is also located on a terrace landform near the intersection of the Quebrada Higuerón with the larger Quebrada del Batán (see Figure 1.2).

One site, Je-1002, also contained a circular domestic structure on the surface. However, it should be noted again that each of these Fishtail sites also contained Paiján cultural materials. In the case of site Je-1002, the lone domestic structure is believed to be associated with the Paiján occupation of the site—based on the form, which is similar to other known Paiján structures and associated diagnostic cultural materials.

Thus, the primary feature of the few Fishtail sites in the QBT region is their similarity, which suggests a relatively ephemeral and redundant use of the landscape. Excavations conducted at site Je 996 and 1002 yielded low amounts of cultural materials in the levels associated with Fishtail occupations, primarily consisting of lithic debitage and a few retouched and utilized flakes (see Chapter Seven). No features or dense midden were identified in the levels associated with the Fishtail occupations. In general, the Fishtail deposits at Je 996 and 1002 are suggestive of relatively short-term occupations.

All of the diagnostic Fishtail projectile points (n=4) identified in the QBT were recovered from surface contexts. Interestingly, two of these points are manufactured from non-local raw materials (silex and chalcedony probably of highland origin) (see discussion in Chapter Eight). In addition, two retouched flakes associated with the Fishtail deposits at Je 996 were also manufactured from varieties of non-local chalcedony. The remaining two Fishtail points in the QBT assemblage were manufactured of quartz crystal, which is known to outcrop in the region (see discussion in Chapter Eight).

Only a limited amount of faunal material was recovered from the Fishtail levels at Je 996 and 1002. The few identifiable specimens included *Psuedalopex* sp. (South American fox), Lacertilia (lizard), Decapoda (crab claw fragment), and Rajiformes (rays and skates) (see Appendix III [Pavao-Zuckerman 2004]). These species are suggestive of exploitation of both terrestrial and marine/coastal resources. However, each of these possible resources, with the exception of Lacertilia, is represented by only a single specimen. While it seems likely that the South American fox may have been hunted, it is more likely that the marine resources (crab and ray/skate) were scavenged from the shoreline rather than intentionally targeted resources—given the absence of evidence for any other marine resources (such as fish). Marine resources, including a variety of both littoral and pelagic species of fish, have been documented in Paiján contexts in the QBT and other areas (Chauchat 1998; Chauchat et al. 2006; see Appendix III). While it is possible that the marine resources recovered from the Fishtail deposits indicate direct acquisition (e.g., fishing or netting) of a food resource, it is also possible that the crab and ray/shark represent 'trophies' or curiosities scavenged from the shore and not targeted food resources.

A single AMS date of 11,014±64 RCYBP (13,073-12,860 cal B.P.) was collected from the Fishtail deposits at site Je 1002. AMS dates from the Fishtail levels at site Je 996 yielded and age range of 12,260±570 RCYBP (15,881-13,082 cal B.P.) to 10,650±50 RCYBP (12,822-12,423 cal B.P.) (see Chapter Seven). The dates from Je 996 bracket the date from Je 1002 and suggest that Fishtail occupation of the region probably initiated sometime after 11,500 B.P. and persisted until around 10,600 B.P. (approximate cal B.P. range of 13,100-12,400). As has been documented by previous studies, the later end of the Fishtail occupation overlaps temporally and geographically with Early Paiján occupations (ca. 10,800-9,500 B.P.) (Briceño 2002, 1999; Chauchat 1998; Dillehay 2000).

The relatively limited use of the region by Fishtail groups (only four sites), redundant site types (all sites identified as short-term basecamps), low quantities of lithic materials, relatively frequent use of non-local lithic raw materials, and probable limited exploitation of both terrestrial and marine resources is suggestive of a settlement strategy emphasizing residential organization. Within a residentially organized settlement pattern, basecamps are positioned to provide access to targeted resources (i.e., the consumers are moved to the resources) (Binford 1980; Kelly 1995). For the Fishtail in the QBT, the range of targeted resources is unknown but may have included both terrestrial and marine species.

The fact that all four Fishtail sites in the QBT are similarly located near the intersection of the Quebrada del Batán and Quebrada Higuerón suggests that the primary targeted resources were probably terrestrial. The area of the Q. Batán/Higuerón intersection provides excellent visibility of the surrounding quebrada floors and likely would have been a prime location for hunting a variety of game (such as deer, peccary, and fox) or collecting other potentially important resources. However, because examples of marine species were found at site Je 1002 (although in very limited quantities) it is possible that other Fishtail sites may have been situated nearer to the coast (in locations that are likely now submerged).

No Fishtail sites have been documented along or near the coast in north or central Perú (Briceño 1999; Dillehay 2000; Lavallée 2000). Rather, the few other Fishtail sites that are known in the Central Andes are similarly located in *quebrada* systems of the low, western flanks of the Andes (e.g., Quebrada Santa Maria in the Chicama Valley and La Cumbre in the Moche Valley) (Briceño 1999, 1995; Chauchat 1998; Ossa 1978; Ossa and Moseley 1972)—or in highland settings such as at Laguna Negra in northern Perú (León C. et al. 2004) and at El Inga in north-central Ecuador (Bell 2000, 1960; Mayer-Oakes 1986a).

Redundant use of similar landscape locations within a residentially organized pattern of movement is suggestive of high mobility and, probably, small group sizes (Bettinger 1991; Binford 1990, 1980; Dillehay 2000, 1997; Gould 1991; Kelly 1992; Yellen 1977). Basecamps were likely occupied only for short periods of time and moved as locally-available resources began to diminish (Kelly 1995:111-130). Estimations of the duration of basecamp occupation are difficult, but the absence of features (such as storage or refuse pits), site furniture, and structures at Fishtail sites is suggestive of relatively high *anticipated* mobility (Binford 1990; Kent 1991; Kelly 1992).

The possible frequency of and distance between Fishtail basecamp relocations is unknown. However, the relative prevalence of non-local raw materials used in the manufacture of Fishtail lithic tools, combined with the documented presence of Fishtail sites in upland settings, is minimally suggestive of periodic trips or basecamp relocations to the Andean highlands east of the project area. However, most of the known Fishtail sites in the Central Andean region are located in settings similar to those of the QBT sites (Briceño 2004, 1999; Chauchat 1998; Chauchat and Zevallos 1979; Dillehay 2000; Ossa and Moseley 1972). The similar positioning of these sites may indicate that Fishtail movement was centered in the lower, western flanks of the Andes, but also involved relocations into the nearby highlands and to the coast.

The data from the four Fishtail sites presented in this study are strongly suggestive of a regional settlement pattern that likely involved only short-term use of a given location, but was redundantly practiced along the western Andean flanks. Fishtail groups probably relocated relatively frequently between short-term basecamps located in similar ecological settings within the *quebrada* systems of the western flanks of the Andes. Relocating to similar ecological settings would have provided access to similar sets of resources at each site location and may indicate that the economy was tailored to specific regional ecological conditions.

In sum, four Fishtail sites were identified in the QBT region. Data recovered from these sites are suggestive of probable periodic, short-term occupations of landforms that provided direct access to target resources between ca. 11,000-10,600 B.P. Although the sample size is small, the QBT data, in conjunction with other known Fishtail sites, are suggestive of a residentially organized settlement strategy. This strategy likely involved relatively high mobility, frequent camp moves, and redundancy in terms of site types and subsistence practices within the lower, western Andean flanks.

Paiján Settlement of the Lower Jequetepeque Valley

Paiján settlement of the lower Jequetepeque Valley region contrasts sharply with the settlement pattern of the Fishtail. Unlike Fishtail sites, which are represented only by short-term basecamps, Paiján sites encompass a range of types and functions, are much more numerous, and are more widely spread across the landforms available within the QBT region. All of the 126 Early Preceramic sites recorded in the QBT, including the four Fishtail sites, contained materials diagnostic of the Paiján complex (see discussion Chapter Six). Among the Paiján sites, six distinct types were identified (long-term basecamp, short-term basecamp, long- and short-term field camps, transitory stations, and quarry/workshops).

Within the six individual site types there exists a relatively high amount of similarity in terms of size, tool frequency, and range of activities (see previous discussions of site types in this chapter). However, a significant amount of variability exists between the different Paiján site types (inter-type). Site sizes range from small to large, are located on every type of habitable landform identified in the study area, contain low to high frequencies of lithic tools, and express a wide range of activities (from limited to very broad). The important point of this observable diversity, as the different site types suggest, is that functional differences existed between individual Paiján sites.

As has been briefly discussed previously in this chapter, the presence of sites with different functions indicates that the Paiján settlement system is distinct from that of the Fishtail and represents a distinct organizational logic. The settlement system of the Fishtail appears to have been residentially organized, with relatively high mobility and redundant use of similar landforms, resulting in the deposition of sites that express little functional differentiation. The Paiján pattern—of sites with distinct functional roles—could hardly be more different and provides insight into an alternate, yet contemporary, Early Preceramic settlement system in the lower Jequetepeque Valley.

The Paiján complex was a relatively long-lived archaeological phenomenon, lasting from ca. 10,800-9,000 B.P. (Chauchat et al. 2006; Dillehay 2000; Lavallée 2000). This broad complex can be separated into Early (ca. 10,800-9,500 B.P.) and Late (ca. 9,500-9,000 B.P.) periods that display subtle, yet significant, differences in tool form, toolkit composition, and number of domestic structures that have implications for understanding an evolving system of settlement organization and mobility (Dillehay et al. 2003; Stackelbeck 2008; also see discussions in Chapter Eight). The changes between the Early and Late Paiján periods will be discussed later in this section. Prior to outlining the changes in Paiján settlement over time, it is necessary to first discuss the regional settlement organization of the Paiján complex as a whole.

Paiján complex settlement in the lower Jequetepeque Valley (and across much of the larger north coast region) was apparently quite dense (Chauchat et al. 2006; Dillehay 2000; Gálvez 2004; Lavallée 2000). Any modeled reconstruction of the Paiján settlement system must account for both the range different site types that have been identified and the relatively high density of sites that have been documented in this study and previous studies (Becerra 1999; Chauchat 1998, 1988; Chauchat et al. 2006; Dillehay 2000: Dillehay et al. 2003; Gálvez 2004, 1999; Malpass 1983; Ossa 1978; Uceda 1992). As was noted in the previous discussions of site types in the QBT, contemporary sites that express clear functional differences are suggestive of a logistically organized system (Bettinger 1991; Binford 1983, 1980; Kelly 1995, 1992; Perlés and Phillips 1991).

In contrast to a residentially organized system (as has been suggested for the Fishtail), logistical settlement results in the generation of additional site types (other than the basecamp) (Binford 1983, 1980; Henry 1989a; Kelly 1992; Perlès and Phillips 1991). Logistically organized hunter-gatherers supply themselves with needed resources through task-specific groups that acquire resources at other locations, which are then transported back to the basecamp. Thus, resources are moved to the consumers (Kelly 1995: 117). The practice of provisioning a central location (basecamp) from task-specific resource extraction sites (field camps, processing stations, transitory stations, quarry/workshops) results in a pattern of sites that have distinct functional roles.

Paiján sites in the QBT, which include long- and short-term basecamps, long- and short-term field camps, transitory stations, and quarry/workshops, appear to fit this pattern. Based on the number of Paiján short-term basecamps, it appears that sites of this type likely served as the central locations from which task-groups made forays to acquire resources and/or gather information. Depending on the anticipated length of the task-specific foray, long- or short-term field camps could be occupied while away from the basecamp. Targeted resources were likely acquired at these locations (perhaps processed) and transported back to the basecamp. Information gathering forays (possibly performed by individuals or small parties) would also originate from the basecamp, but may also have originated from field camps when task-groups during resource collection forays.

Figure 9.9 depicts an idealized, dendritic model of the logistically organized Paiján regional settlement pattern. The basecamp is the central point of the settlement system, with the field camps representing resource collection sites. Encounter sites may originate from either the basecamp or the field camps and represent locations of information gathering (transitory stations) (Figure 9.9).

Quarry/workshop sites are not specifically depicted in this model. The reason for not depicting this site type is that they are likely to co-occur at or near the locations of other types of sites—the exploitation of those raw materials outcrops is likely embedded within other economic activities (Bamforth 1986; Binford 1980; Kelly 1995). For example, a field camp or encounter site may be situated at or near a lithic outcrop in order to provide access to those raw materials while accomplishing other activities.

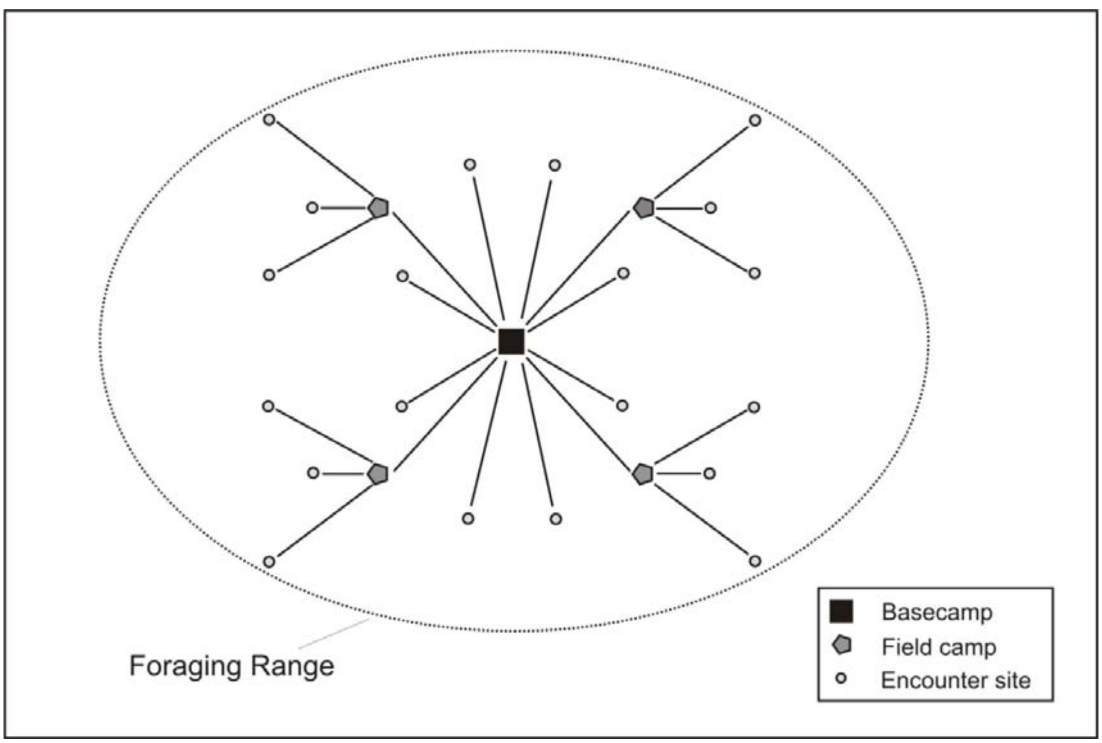

Figure 9.9. Idealized model of Paiján logistical settlement.

Each of these site types, and the activities that they represent, occur within a hypothetical foraging range (Binford 1990, 1983; Kelly 1995; Morgan 2008). The spatial extent of Paiján foraging ranges is unknown, although they likely included or encompassed parts of the low, western Andean flanks, higher elevation locations, the coastal plain, and perhaps the coast (based on the documented locations of Paiján sites) (Becerra 1999; Chauchat 1998; Chauchat et al. 2006; Dillehay 2000; Gálvez 2004; Malpass 1983; Uceda 1992). The representation of that range in this model is meant only to illustrate that *a maximum limit of movement away from the basecamp* (i.e., foraging radii) likely existed (Figure 9.9). The implication of the maximum foraging range is that the continued exploitation of resources from beyond the foraging range would be cost prohibitive and necessitate relocation of the basecamp (Kelly 1995; Morgan 2008). The range depicted in Figure 9.9 is hypothetical and does not reflect topographic factors, resource distributions, or social boundaries that may have influenced the size and directionality of the foraging range.

It is possible that resources from beyond the maximum foraging range were acquired through social interaction with neighboring groups (i.e., trade/exchange) (Anderson 1996; Cashdan 1983; Kelly 1995; Wiessner 1983; Yellen 1977). This does not necessarily imply that bounded territories (socially or geographically) existed among the Paiján, although some form of incipient social boundary development may have existed (Chauchat 1998: 159). Rather, the foraging range in this model is simply meant to represent the hypothetical functional limits (in terms of time and distance) of a logistically organized settlement system.

One of the striking features of excavated Paiján sites from different parts of the north coast of Perú is the similarity in subsistence resources. Combinations of various terrestrial mammals, lizards, birds, and terrestrial snails, along with several marine and freshwater resources (including several fish species) characterize the subsistence remains from sites excavated in different regions (Briceño 1999, 1997; Chauchat 1998; Chauchat et al. 2006; Dillehay et al. 2003; Gálvez 2004, 1999, 1992; Malpass 1983; Ossa 1978). Paiján sites excavated in the QBT yielded a similar diversity of faunal resources (see Chapter Seven and Appendix III). Paiján faunal materials in the QBT sites encompassed a range of terrestrial mammals, including Cervidae (deer), Tayassuidae (peccary), *Psuedalopex* sp. (South American fox), Mustelidae (weasels, skunks, and otters), *Sciurus* sp. (tree squirrel), and Sigmodontinae (New World rats and mice). Reptiles (Teiidae [whiptails and tegus] and *Dicrodon* sp. [desert tegu]) and birds (Passeriformes [indeterminate perching birds] and Columbidae [doves and pigeons]) were also recovered. Marine resources recovered include *Micropogonias* sp. (croaker), *Mugil* sp. (mullet), *Calamus brachysomus* (probably Pacific porgy), Haemulidae (grunts), Ariidae (sea catfish), Osteichthyes (indeterminate bony fish) (Appendix III).

In addition to the faunal resources, plant resources were probably equally important components of Paiján subsistence (Dillehay and Rossen 2002; Piperno and Dillehay 2008). Evidence (i.e., carbonized floral remains, phytoliths, pollen) for plant use and processing from Paiján contexts is relatively rare, but can be inferred based on non-plant evidence such as the presence of groundstone tools (Dillehay 2000; Dillehay and Rossen 2002; Stackelbeck 2008). Groundstone tools, including both *manos* and *batanes* (grinding slabs), were identified at nine sites in the QBT (see Appendix III). The sites containing groundstone in the QBT include five basecamps (n=1 long-term and n=4 short-term) and four field camps (n=1 long-term and n=3 short-term). The presence of groundstone at basecamps and field camps is suggestive of the importance of plant resources within Paiján subsistence.

The similarity in both (1) the specific kinds of subsistence resources and (2) the diversity of exploited resources suggests that Paiján sites from across different regions of the north coast display a similar use of the landscape and subsistence strategies. If Paiján settlement represents a logistically organized system, as is suggested by the QBT data, then basecamps (and by extension, foraging ranges) were likely occupied only seasonally based on the interpretation of short-term basecamps as the central loci of the system. How long individual seasonal occupations lasted is unknown, but probably did not exceed a few to several weeks (given the relatively few examples of site furniture, domestic structures, and storage pits identified at short-term basecamps). Minimally, however, seasonal occupation of short-term basecamps implies that a group resides—for at least part of the year—at one or more other basecamps (within different foraging ranges) (Bettinger 1991; Binford 1990; Kelly 1995; Morgan 2008).

Because Paiján resource use is highly similar across much of the north coast, basecamp relocations (i.e., new foraging range) likely were repeatedly positioned to provide access to the same wide diversity resources. The documented density of Paiján sites within the large *quebrada* systems of the western Andean foothills (ca. 200-600 masl and generally 15-35 km east of the Pacific coast), like the QBT study area, suggests that these areas were important in structuring Paiján settlement (Becerra 1999; Briceño 1999, 1997; Chauchat 1998; Chauchat et al. 2006; Dillehay 2000; Dillehay et al. 2003; Gálvez 2004, 1999, 1992; Malpass 1983; Ossa 1978; Ossa and Moseley 1972; Uceda 1992). As was discussed in Chapter Three, the paleoenvironment of the *quebrada* systems was one of mixed and juxtaposed micro-environmental zones where gradual to steep elevation changes would have provided access to numerous different kinds of resources. The lower western flanks of the Andes in the north coast region of Perú constituted a linear ecotonal 'belt' that offered access to a diversity of potential resources and other ecological zones (such as the highlands and coast) that has no modern analogue (see discussions in Chapter Three).

The density of Paiján sites within the *quebrada* systems suggest that the seasonal movement of basecamps may have occurred in a linear fashion that followed the ecotonal 'belt' along the lower western Andean flanks. Linear movement along the western Andean flanks suggests that when a Paiján seasonal basecamp was abandoned, a new basecamp would be established in essentially the same environment, just in a different location (or region). At present, the distance between relocations is unclear, but the density of sites found within *quebrada* systems—like the QBT—suggest that areas witnessed substantial re-occupations.

Figure 9.10 depicts an idealized pattern of linear movement within a logistically organized settlement system. Essentially, the model of the Paiján logistical settlement (see Figure 9.9) is repeated in a new location. Within this pattern of linear relocation, old (or previously occupied foraging ranges) are likely re-occupied relatively frequently, as resources were replenished. Thus, Paiján groups may have moved in a "back and forth" fashion between different, yet possibly nearby, foraging ranges. It should be noted that a "back and forth" pattern of linear movement along the western flanks is distinct from a transhumant pattern, which emphasizes vertical movement across different ecological

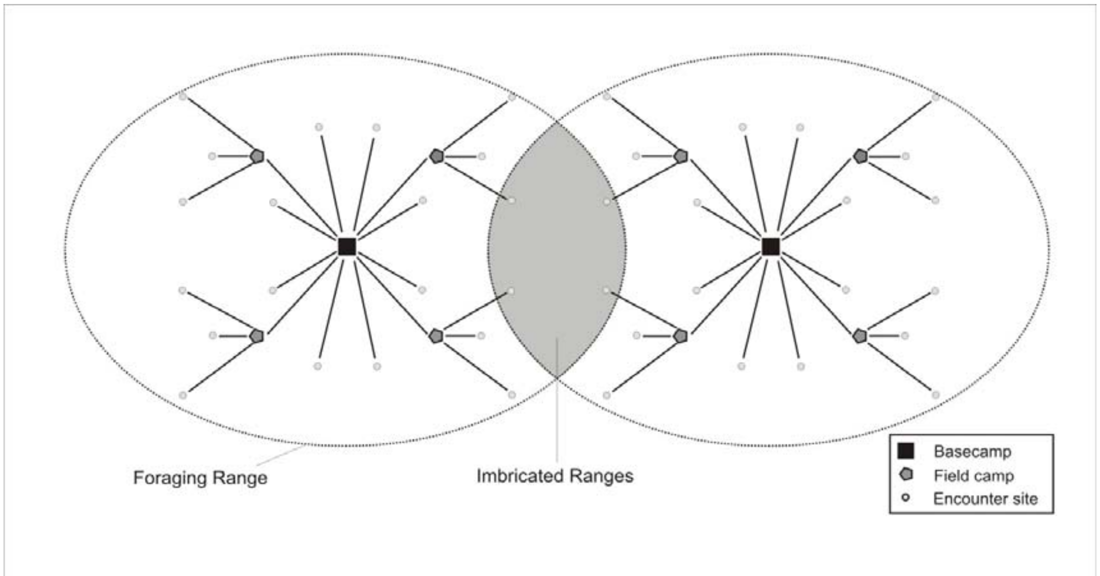

Figure 9.10. Idealized model of imbricated foraging ranges.

zones (*sensu* Lynch 1971; Sandweiss et al. 1989). It is impossible to estimate how many foraging ranges (and basecamp relocations) may have occurred within an annual cycle. However, given the logistical organization, seasonally occupied basecamps, and presence of domestic structures indicated by the QBT data, Paiján mobility was probably relatively low. Other studies have also suggested relatively low mobility for the Paiján (Gálvez 2004, 1990; Dillehay and Rossen 2002; Dillehay et al. 2003).

If Paiján mobility was relatively low, logistically organized, and based on seasonal relocations within similar environments of the lower Andean flanks, then it seems reasonable to assume that basecamps would be relocated as short a distance as possible from the current site (Binford 1990; Kelly 1995). Essentially, the new basecamp would likely be located at the minimum distance possible that would provide access to a new foraging range. Relocating basecamps at the minimum distance that provided a new foraging range would likely result in a pattern of overlapping, or imbricated, seasonal foraging ranges (Figure 9.10).

Imbricated seasonal foraging ranges would have allowed Paiján groups to assess conditions and resource availability in neighboring ranges (possible areas for relocation) while exploiting the resources of the foraging range they were occupying. Thus, when one seasonal basecamp/foraging range was abandoned, information regarding the conditions and resource availability in the new range likely would already have been gathered. In a logistical system with relatively low mobility, range imbrication serves to maximize information gathering and landscape knowledge by embedding it within other activities (Binford 1990, 1980; Kelly 1995; Kent 1992).

As noted previously, the size of Paiján foraging ranges and/or the frequency of relocation to new ranges is unknown. However, because it appears that Paiján settlement was centered in the *quebrada* systems of the low western Andean foothill, the frequent presence of marine resources (Chauchat et al. 2006) and occasional highland resources (non-local raw materials) (see Chapter Eight) may indicate that foraging ranges included portions of the coast and mountains. If this is the case, then Paiján foraging ranges may have encompassed relatively large territories. However, the idealized pattern depicted in Figure 9.10 is meant only to illustrate how foraging ranges can overlap and does not account for topographic constraints (like mountain ranges or rivers) and/or social boundaries that may have restricted the directionality or distance of camp relocations.

In sum, the logistical model of settlement put forth here provides us with a reconstruction of the organizational relationships that existed between the different types of Paiján sites that have been identified in the lower Jequetepeque Valley. This model accounts for the variability in size, number of artifacts, and ranges of activities that have been documented for the sites in the region and illustrates how these sites may have been linked, both spatially and economically.

However, there are important features of Paiján settlement within the lower Jequetepeque Valley that this idealized model, as it stands, does not explain. First, the model does not account for the presence of basecamps that evidence multiseasonal occupations (i.e., long-term basecamps). More significantly, the relatively large number of basecamps (n=23) (both long- and short-term) within the QBT study area is difficult to reconcile with a logistically organized settlement pattern—where the ratio of basecamps to other site types should be relatively low (Bettinger 1991; Binford 1980; Kelly 1995; Perlés and Phillips 1991).

Expanding the spatial and temporal applications of the idealized model of Paiján settlement provides insight into these problems. If we consider the implications of the "back and forth" relocation of a logistical settlement system over time, then the presence of multiple basecamps within a single foraging range can be more clearly understood. In contrast to the relatively ephemeral Fishtail occupation, Paiján occupation of the region extends from roughly 10,800-9,000 B.P. AMS dates suggest that the QBT region was probably continuously occupied throughout this period. Over this relatively length span, it is reasonable to expect the location of individual basecamps to shift (perhaps multiple times). It is possible that basecamp location may shift due to the availability of water, decreasing densities of nearby resources (e.g., fuel, food, stone), camp cleanliness and/or disease (Binford 1980; Dillehay 2000, 1997; Henry 1989a; Kelly 1995; Yellen 1977). Shifts in location could potentially be subtle (slightly relocated on the same landform or in the same general area) or more pronounced (relocated to an entirely new setting).

The point of this is that shifts in the locations of basecamps (and other types of sites), over a long period of time, should probably be expected in a "back and forth" mobility pattern. Shifts in location could result in a complex, palimpsest pattern of occupations across individual landforms, and more broadly, a palimpsest of logistical settlement within a region. Figure 9.11 depicts a hypothetical scenario in which the location of a Paiján basecamp at the center of a logistical system shifts over time. The logistical model is the same as that presented in Figure 9.9, but the basecamp undergoes a

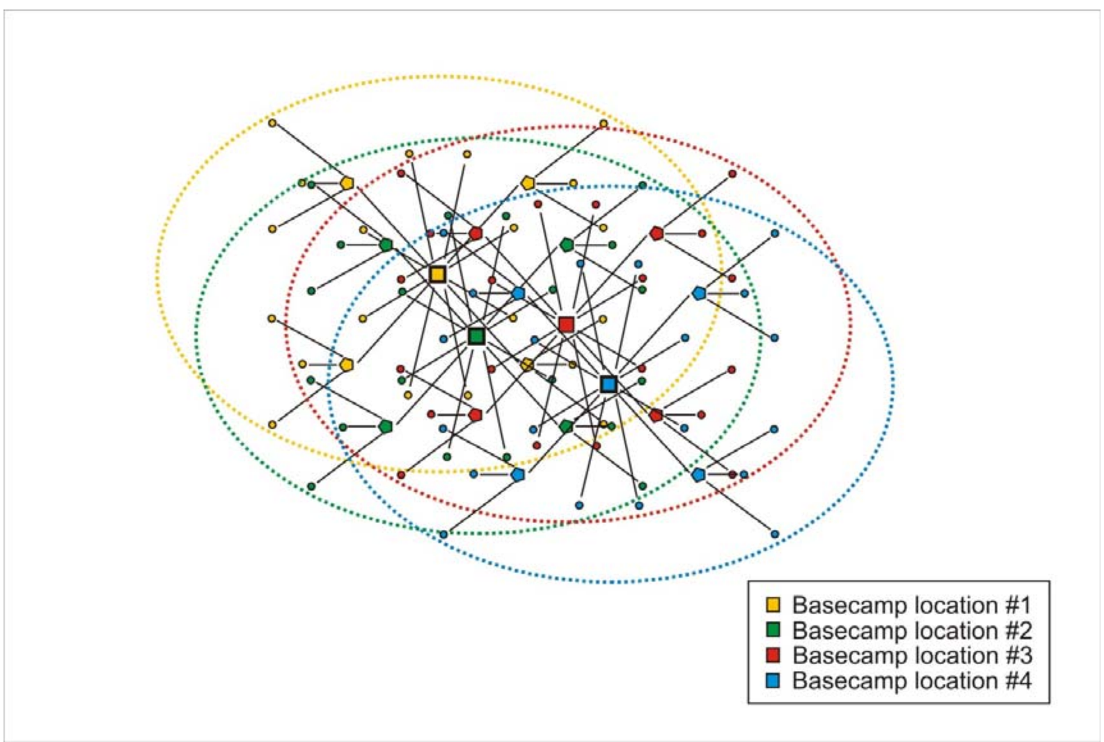

Figure 9.11. Model of palimpsest basecamp shifts.

series of locational shifts as a product of successive re-occupations (successive relocations are represented by different colors) (Figure 9.11). Over time, the extent of the foraging range is unchanged (or changes only slightly), while the density of archaeological sites grows dramatically. This scenario is, of course, idealized and over time it is likely that many of the same site locations would be reused. However, this model does serve to illustrate how a logistical settlement pattern can produce relatively high densities of sites and greater than expected numbers of basecamps within a single region over time.

This scenario of basecamp relocation over time explains the density of sites within the QBT that have been identified as basecamps. It also provides an explanation for the high number and density of Paiján sites that have been described in the QBT and other areas of the north coast (Chauchat 1998; Chauchat et al. 2006; Dillehay 2000; Gálvez 2004; Malpass 1983; Ossa 1978; Uceda 1992). Thus, it is likely that as Paiján groups moved "back and forth" between seasonal foraging ranges (discussed above), the location of basecamps probably shifted over time. If the pattern of shifts in the location of basecamps is expanded to include imbricated foraging ranges, we can begin to see how very dense regional settlement (with a high number of basecamps) could be produced by a logistically organized system over time (Fig 9.12).

Figure 9.12 suggests that the total number of sites within a region could potentially increase rather dramatically as a result of shifts in basecamp locations during "back and forth" cycles of movement. Although in need of further testing and comparison with other studies, this model predicts both the variability and density of Paiján sites that have been documented across much of the north coast region. If we compare the distribution of Paiján sites in the QBT by site type (Figure 9.8) to the idealized model of imbricated and palimpsest foraging ranges (Figure 9.12), the similarities are striking. Although the idealized "back and forth" model of logistical foraging does not include or account for any physical or social barriers to movement.

One aspect of the variability documented in the Paiján sites of the QBT that has not been explained by the "back and forth" model of logistical settlement is the presence of long-term basecamps. It has been suggested that short-term basecamps and seasonal relocations between imbricated foraging ranges were the probable focus of the Paiján

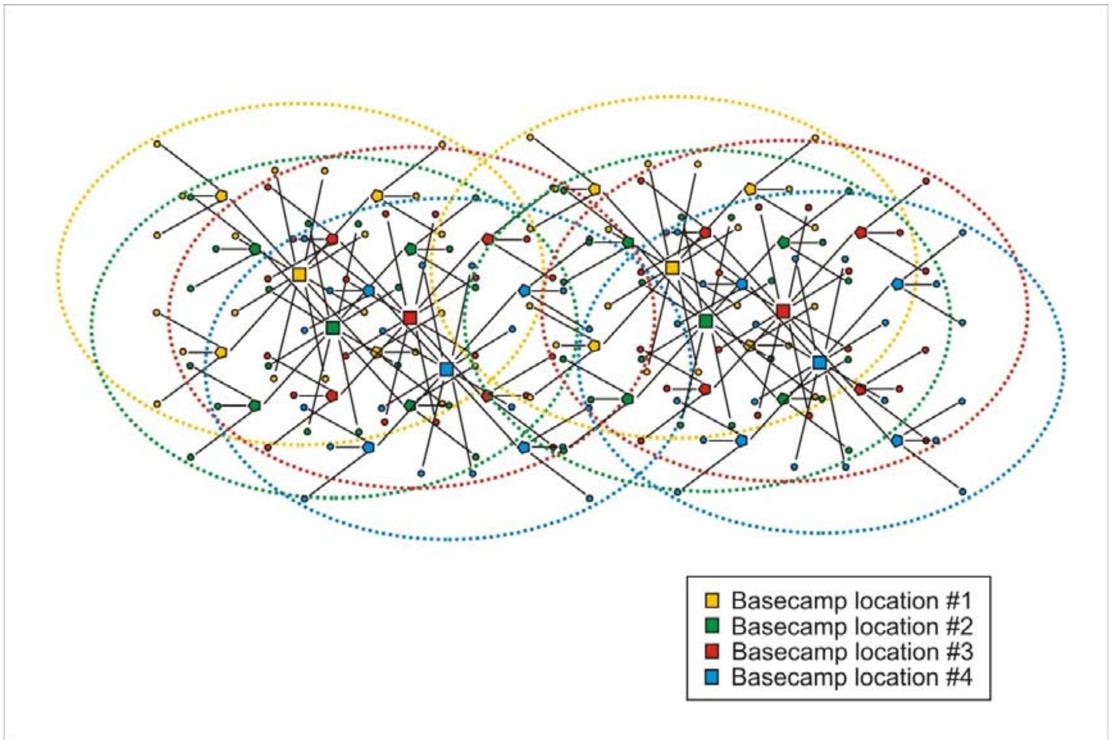

Figure 9.12. Model of imbricated palimpsest foraging ranges.

settlement strategy. However, one Paiján site type (long-term basecamp) does not appear fit this pattern. The long-term basecamp type is represented by two sites (Je 431 and 790). Both of these sites are very large, contain the highest number of lithic tools, and evidence the broadest range of activities in the entire site population. These two sites also contain the highest number of domestic structures (n=7 each) (see Table. 9.5). These sites have been interpreted as representing either relatively long-term, multiseasonal occupations or palimpsest deposits of multiple, successive re-occupations by Paiján groups.

Multiseasonal (long-term) occupations do not fit well with the proposed model of "back and forth" logistical mobility that has been proposed for the Paiján. However, as was discussed previously, it is likely that these two sites actually represent a dense palimpsest pattern of shorter-term occupations. If a specific landform (such as a large terrace) is sizeable enough to allow for small shifts in the location of a short-term basecamp over time, then a dense palimpsest occupational sequence may result through the "back and forth" movement. A process such as this could potentially inflate the both the frequency of artifacts and range of activities represented at the site (Binford 1983;

Dillehay 1997a; Kelly 1992), and may result in the presence of multiple domestic structures (which would likely not be contemporaneous)—giving a false impression of multiseasonal occupations.

It is also possible that site Je 431 and 790 do not represent multiseasonal, long-term occupations, but rather aggregation sites where larger groups of people (presumably with different foraging ranges) possibly came together for extended periods. Aggregation of different groups for communal hunts, intensive gathering, and/or social/ceremonial activities could potentially produce the large size, high numbers of tools, very broad range of activities, and the construction of a greater number domestic structures that mimic multiseasonal occupations by smaller groups (Conkey 1980; Kelly 1992; Robinson et al. 2009; Veth 2005). Specifically, larger numbers of individuals would result in larger sites, more dense deposits of artifacts, broad ranges of activities, and the construction of multiple domestic structures.

If a site was used as an aggregation location only one or a few times, then we may expect to see a relatively clear spatial segregation between features and artifacts that represent distinct activities (Binford 1983; Brooks and Yellen 1987; Dillehay 1997; Gargett and Hayden 1991; Hitchcock 1987; Whitelaw 1983; Yellen 1977). In addition, the domestic structures may be grouped together, or agglomerated, and would likely be of similar form (Dillehay 1997; Kent 1991; Kent and Vierich 1989).

At site Je 431, the domestic structures are of the same form (n=7; all circular in form), but are located in two spatially segregated groups of three structures, with one single structure separated from all the others. Site Je 790 evidences a slightly different pattern. This site also contained seven domestic structures (n=7), although the structures are of different forms (4 L-shaped; 3 semi-lunar). However, like Je 431, the structures at Je 790 are spatially separated into two distinct groups (one of four structures, one of two structures) with one single structure separated from all of the others. The largest cluster of structures (n=4) at Je 790 contains both semi-lunar (n=3) and L-shaped (n=1) forms. There is a substantial domestic midden (including hearth and pit features) associated with the cluster of four structures.

With the present data it is impossible to determine which of these processes (re-occupation or aggregation) may have produced the characteristics of sites Je 431 and 790.

These sites could be equally interpreted as aggregation sites or palimpsest deposits created by multiple re-occupations. It is also possible that both processes are represented at Je 431 and 790. Regardless of the specific process that resulted in the deposition of these sites, it is clear that they are distinct from other Paiján sites. If they represent palimpsest occupations of the same landform over time, then they may suggest that a local foraging range was centered at or around the intersection of the Río Chaman and the lower Jequetepeque Valley (which both of these sites overlook) (see Figure 9.3).

However, if the Je 431 and 790 represent aggregation sites, it is more likely that they would instead be located at the edge, or imbrication, of two distinct foraging ranges—where different groups could potentially come together. If this is the case, the intersection of the Río Chaman and the lower Jequetepeque Valley may represent the imbricated portion of one or more different group's foraging ranges. Further research is needed to gain additional insight into the likely function(s) sites and the probable processes that resulted in their deposition.

Early and Late Paiján Settlement

The preceding discussions have attempted to model the general characteristics of the Paiján complex settlement organization and likely mobility strategy within the lower Jequetepeque Valley based on the Early Preceramic QBT data. Although it is often broadly conceptualized, the Paiján complex encompasses two periods (Early and Late) that display slightly different patterns (Dillehay et al. 2003). In a general sense, the "back and forth" logistical settlement organization appears to have operated during both the Early and Late Paiján—based on the different site types that are present during each period.

However, subtle changes in the frequency of different types of sites are suggested between the Early and Late Paiján periods. These changes have been discussed in the previous sections detailing the individual site types. Based on the single component sites in the assemblage, however, there is a clear increase in the number of sites between the Early (n=7) and Late (n=18) period, suggesting either an increase in population or more extensive use of the QBT region. The increase in the number of sites also includes increases in the numbers of all site types (excluding quarry/workshops). Interestingly, the majority of the midden deposits at both long-term basecamps (Je 431 and 790) are associated with Late Paiján occupations (although both sites also contained Early Paiján diagnostic materials).

Aside from the site type data, it is also clear that domestic structures are more frequent (and occur in larger numbers) on Late Paiján sites, suggesting that the Late Paiján probably had a lower *anticipated* mobility than existed during the Early Paiján (Dillehay et al. 2003; Kent 1991; Kent and Vierich 1989). Changes in the composition of lithic toolkits—which included more informal tools—are also suggestive of reduced mobility (see discussions in Chapter Eight). In addition, the only single component site to contain groundstone (Je 449) is a Late Paiján short-term basecamp that also contains two circular domestic structures.

Thus, subtle changes pointing to reducing mobility and possibly longer occupations do exist between the Early and Late Paiján periods. However, when compared to other Early Preceramic complexes, such as the Fishtail complex, the Early and Late Paiján have more in common—in terms of subsistence practices, technology, and settlement/mobility—than separates them. The importance of these changes is that they represent the first trends toward sedentism, early village development, and horticulture that are known to have appeared during the following Middle Preceramic period around or after 9,000 B.P. (Dillehay and Rossen 2002; Dillehay et al. 2003; Piperno and Dillehay 2008; Rossen 1991; Stackelbeck 2008).

Conclusion

This chapter began with the discussion of the final two criteria used in to assess functional differences between Early Preceramic sites in the QBT (lithic tool frequency and amount of activities). These assessments were based on the materials recovered from individual sites and the activities indicated in those locations. Patterns identified in the tool frequencies and the amount of activities at single component Early Preceramic sites within the QBT were extrapolated to the entire assemblage of sites. These patterns were used to identify ranges in the frequency of tools and amounts of activities within the QBT site assemblage that formed the basis, along with location, size, and the presence of domestic structures, of the characterization of site function.

Six distinct site types—long-term basecamps, short-term basecamps, long- and short-term field camps, transitory stations, and quarry/workshops—were identified among the Early Preceramic sites in the QBT. Each of the 126 Early Preceramic sites was assigned to one of these six types. Fishtail sites (n=4) were all identified as short-term basecamps. Paiján sites, in contrast, displayed a greater amount of variability and represented each of six site types.

The site type assignment was used, in conjunction with other data from excavation and lithic analysis, to reconstruct/model the settlement organization and mobility strategies of the contemporary/overlapping Fishtail and Paiján complexes. Fishtail settlement in the QBT and lower Jequetepeque region appears to have been residentially organized and probably involved relatively high mobility with redundant use of the landscape. Paiján settlement, in contrast, appears to have been logistically organized and encompassed at least six distinct types of sites. Paiján mobility appears to have been lower than the Fishtail and may have involved a "back and forth" cycle of short-term basecamp occupation and abandonment between imbricated foraging ranges. These foraging ranges appear to have been centered on *quebrada* systems of the low, western Andean flanks that would have provided access to a diversity of potential resources and environmental zones.

A series of models have been used to present an idealized reconstruction of the "back and forth" Paiján logistical settlement pattern. Cyclical abandonment/re-occupation with shifts in the locations of basecamps is suggested to, at least in part, explain the density of Paiján settlement in areas of the north coast—as well as the presence of numerous sites identified as short-term basecamps.

Lastly, although the Paiján complex is often conceptualized as a single, broad entity, there exist significant differences between the Early and Late Paiján periods. These differences suggest a trend of reducing mobility (and possibly increased population) was occurring throughout the entire Paiján period, but is more visible during the Late Paiján. The trend of reducing mobility is likely directly related to changes in tool form, toolkit composition, and broadening subsistence (particularly with regard to plant exploitation) that are the precursors for later, significant developments during the following Middle Preceramic period—including sedentism, horticulture, and the development of village lifeways.

CHAPTER TEN

EARLY PRECERAMIC CULTURAL DIVERSITY AND THE PROCESSES OF COLONIZATION AND REGIONALIZATION IN NORTHERN PERÚ

It has long been recognized that the Early Preceramic Period (ca. 11,500-9,000 B.P.) in northern Perú (and across South America) contains a diversity of contemporary, and/or overlapping, early archaeological expressions, including at least two unifacial traditions (El Palto and Amotape) (ca. 11,600-11,200 B.P.) and the Fishtail (11,100-10,600 B.P.) and Paiján complexes (10,800-9,000 B.P.) (Dillehay 2000; Dillehay et al. 2004a; Dillehay et al. 1992; Lavallée 2000; Richardson 1978). In some cases, particularly with the Fishtail and Paiján, evidence for distinct complexes is frequently encountered in the same region, occasionally on the same sites (Briceño 1999, 1997; Chauchat 1998). Although distinct complexes have been documented, the specific attributes/characteristics and chronology of individual complexes are, in general, poorly understood. Equally poorly understood are the technological, economic, and social relationships that may have existed between these distinct complexes.

Because the Early Preceramic Period encompasses both the initial peopling of northern Perú and the first trends toward localization we can begin to diachronically examine colonization and regionalization across different scales and characterize the complex relationships and different strategies that existed. This is different from earlier models that emphasize specific rates and/or routes of migration, particularly with regard to specific cultural groups. Increased understanding of these relationships—and the specific characteristics of early complexes—is necessary in order to gain greater insight into the varied and disjointed processes (like colonization, regionalization, and localization) that comprise early peopling and settlement.

This chapter addresses these issues through a summary of the present study, providing new insights regarding the timing, technology, mobility, and settlement organization of the Fishtail and Paiján complexes within the lower Jequetepeque region. Interpretations of the local data, including technological, mobility, resource use patterns, and possible social interactions are presented. These are followed by discussions of the regional patterns with regard to the transient explorer-estate settler marine species were identified at site Je 1002 (albeit in very limited quantities) and it is possible that Fishtail subsistence also included marine resources—and that other sites may have been situated nearer to the coast (in locations that are likely now submerged).

Among the four Fishtail points in the QBT assemblage, two distinct types were identified (Fell and Santa Maria types) based on haft element morphology. These two types appear to be contemporaneous or overlapping (ca. 11,100-10,600 B.P.) based on associated AMS dates from excavation contexts. Comparisons with Fishtail points recovered on other sites across the Peruvian north coast and Central Andes suggest that these two types have similar geographic distributions and are occasionally found on the same site (Bell 2000; Briceño 1999; Cooke 1998; León C. et al. 2004; Nami 1989; Politis 1991; Ossa 1976; Suárez 2003). It is possible that these points are stylistic markers of different groups or time periods, but more likely were manufactured by the same groups and are related to different anticipated functions (Dillehay 2000; Politis 1991; Suárez 2003).

At present, a total of eight Fishtail sites (Laguna Negra, La Cumbre, two sites in the Q. Santa Maria, and the four new sites identified in the QBT region) have been documented in north coast region. Low numbers of sites and even lower numbers of points hinder a more comprehensive understanding of Fishtail technological organization. Although this study provides some new insights, very little is known regarding the relationships between Fishtail points in the Northern and Central Andes and those of the 'core' areas in the southern cone of South America. There is also a paucity of information regarding other tool forms that are associated with Fishtail projectile points—limiting insights into toolkit composition and subsistence practices. It appears that the Fishtail economy and use of the lower Jequetepeque (and broader north coast) region was a relatively short-lived phenomenon, primarily focused on terrestrial resources. Documentation of additional Fishtail sites in the Central Andes, along with studies of larger data sets, is necessary to more fully address these questions.

Relatively limited use of the region by Fishtail groups, redundant site types, limited resource exploitation, and frequent use of non-local lithic raw materials, are suggestive of a settlement strategy emphasizing residential organization. Residentially organized settlement is suggestive of high mobility and, probably, small group sizes model and the implications of these patterns for developing continental-scale models of colonization.

Characterizing the Fishtail and Paiján Complexes

Fishtail Mobility and Settlement

Four sites containing Fishtail cultural materials were identified in the QBT assemblage and each of these sites also contained Paiján materials. While low in number, these four sites with Fishtail components have nearly doubled the known Fishtail occupations in Perú. The dates from samples excavated in the QBT suggest that Fishtail occupation of the region initiated sometime after 11,500 B.P. and persisted until around 10,600 B.P. (approximate cal B.P. range of 13,100-12,400). Although the sample size is small when compared to the contemporary/overlapping Paiján complex occupations, differences between the individual sites attributed to these two complexes are apparent—and are suggestive of distinct settlement patterns.

The most significant characteristic of the Fishtail complex sites is their relative homogeneity. Fishtail sites typically consist of short-term basecamps, evidence a relatively broad range of activities, and also contain Paiján materials (Briceño 1999; Chauchat 1988; Ossa 1976). Sites are often located on terrace landforms near drainage intersections or in proximity to ancient spring locations. The low numbers of sites, combined with the similarity in site characteristics and location, suggest relatively ephemeral and redundant use of the landscape. Excavations conducted at sites Je 996 and 1002 in the QBT yielded low amounts of cultural materials in the levels associated with Fishtail occupations, primarily consisting of lithic debitage and a few retouched and utilized flakes (see Chapter Seven). No features or dense midden accumulations are associated with the Fishtail occupations. In general, these deposits appear to indicate relatively short-term, transient occupations and limited use of the region.

The location of Fishtail sites in the QBT, suggests that terrestrial resources available in the *quebrada* systems likely were the focus of subsistence. These locations provide excellent visibility of the surrounding *quebrada* floors and probably would have been prime locations for hunting a variety of game or collecting other potentially important resources (such as plants and select lithic raw materials). A few examples of

(Bettinger 1991; Binford 1990, 1980; Dillehay 2000, 1997; Gould 1991; Grove 2009; Kelly 1992; Yellen 1977). Basecamps appear to have been occupied only for short periods of time (with multiple re-occupations), as is suggested by the absence of features, site furniture, and domestic structures at Fishtail sites in the QBT.

At present, the possible frequency of and distance between individual moves is unknown. The relatively frequent occurrence of non-local raw materials used in the manufacture of lithic tools, combined with the presence of at least a few known Fishtail sites in upland settings, is minimally suggestive of periodic trips to the Andean highlands east of the project area. However, most of the known Fishtail sites in the Central Andean region are located in settings similar to those of the QBT sites (Briceño 2004, 1999; Chauchat 1998; Chauchat and Zevallos 1979; Dillehay 2000; Ossa and Moseley 1972). The similar positioning of these sites may indicate that movement was centered along the lower, western flanks of the Andes, but also involved periodic relocations into the highlands and/or to the coast. The QBT data are suggestive of a settlement pattern that likely involved only short-term use of a given location, but was redundantly practiced along the western Andean flanks.

In sum, four Fishtail sites were identified in the QBT region, which adds substantially to the few previously known sites in northern Perú. Data recovered from these sites are suggestive of probable periodic, short-term occupations of landforms that provided direct access to targeted terrestrial resources between ca. 11,000-10,600 B.P. (ca. 13,100-12,400 cal B.P.). Although the sample size is small, the QBT data, in conjunction with other known Fishtail sites, are suggestive of a residentially organized settlement strategy. This strategy likely involved relatively high mobility, frequent camp moves, and redundancy in terms of site types and subsistence practices along the lower, western Andean flanks. The regional implications of Fishtail settlement patterns within the transient explorer-estate settler model are discussed in following sections.

Paiján Mobility and Settlement

The Paiján complex (ca. 10,800-9,000 B.P.; ca. 12,900-9,925 cal B.P.) was a relatively long-lived archaeological phenomenon (Chauchat et al. 2006; Dillehay 2000; Lavallée 2000) that resulted in dense settlement in the lower Jequetepeque Valley and across much of the larger north coast region (Chauchat et al. 2006; Dillehay 2000; Gálvez 2004; Lavallée 2000). Although temporally and spatially overlapping, Paiján settlement in the lower Jequetepeque Valley contrasts sharply with that of the Fishtail. Unlike Fishtail sites, which are few in number and highly similar, Paiján sites encompass a range of types and functions, are much more numerous, and are more widely distributed throughout the region.

A significant amount of variability exists between different Paiján sites. Paiján sites are located on every type of habitable landform identified in the study area, contain low to high lithic tool densities, and express wide ranges in the amount and kind of activities. The important point of this observable diversity is that functional differences existed between individual Paiján sites.

Like the Fishtail, what has been traditionally known as the 'Paiján' also represents a range of distinct stemmed point types. It has been previously recognized that a wide range of variability existed among stemmed points in the north coast region (Gálvez 2004; Malpass 1983). This variability, although recognized, has typically been subsumed within the larger descriptive of 'Paiján' (Chauchat et al. 2006; Chauchat et a. 2004). As a result, the Paiján type has come to include virtually all stemmed projectile points found on the north coast. This 'lumping' together of stemmed points derives, in part, from s focus on blade attributes by earlier analyses (Chauchat et al. 2004; Chauchat et al. 1992; Malpass 1983; Ossa 1976, 1973; Ossa and Moseley 1972). The focus on blade attributes is understandable, given the distinctive needle-nose shape found on many Paiján points. This study, however, argues that the needle-nose shaping probably a byproduct of tool maintenance/blade resharpening that resulted from deeply hafted points and should not be used to characterize different types.

Analysis of stemmed points in the QBT assemblage centered on the haft element, and not attributes of the blade. As a result, four distinct types of stemmed points were identified within the broad 'Paiján' type. These four point types—Classic Paiján, Talambo, Contracting Narrow stem, and Contracting Broad stem—indicate that the Paiján complex was not a monolithic technological expression. Rather, what we have known as the Paiján is comprised of a complex set of interrelated expressions that are suggestive of economic and technological changes over time.

Most importantly, there is a clear change in point types over time. The Classic Paiján type is the earliest of the Paiján complex and is contemporary/overlapping with the Fishtail—ranging in age from ca. 10,800-9,500 B.P. (ca. 12,900-10,600 cal B.P.) based on associated AMS dates from excavation. Local raw materials were overwhelmingly used in the manufacture of Classic Paiján points, which stands in contrast to the contemporary Fishtail points that frequently made use of non-local materials. Needle-nose retouch of the blade is also common characteristic of the Classic Paiján type. Microwear indicators on two needle-nose fragments are suggestive of intensive butchering/hideworking activities and support the previously mentioned idea that repeated resharpening/tool maintenance probably resulted, at least in part, in the needle-nosed blade shape. Although blade shape may vary substantially, Classic Paiján points are overall relatively uniform in terms of haft element attributes.

The remaining three types (Talambo, Contracting Narrow stem, and Contracting Broad stem) are all believed to range in age between ca. 9,500-8,500 B.P. (ca. 11,100-9,500 cal B.P.) based on dated excavation contexts and associations with domestic structures (Dillehay et al. 2003; Stackelbeck 2008). Together, these point types have been interpreted in this study as the Late Paiján. The spatial distributions for these point types vary considerably, but they do occur on the same sites and are considered to be contemporaneous. These types are neither as internally consistent nor as long lasting as the earlier Classic Paiján type, but display a similar heavy reliance on locally available raw materials for point manufacture.

It is unclear, at present, if each of the Late Paiján types is technologically descended from the earlier Classic Paiján type. Talambo type points show clear affinities with the Classic Paiján and share the straight stem attribute. The relationship between the Classic Paiján and the Contracting Narrow and Contracting Broad stem points, however, is not as clear. The appearance of contracting stem forms after ca. 9,500 B.P. (ca. 11,000-10,600 cal B.P.) that are contemporary with straight stem forms is suggestive of the introduction of a new technological tradition into the region. It is possible that the contracting stem form is a legacy of the earlier Fishtail stem forms (some of which are contracting) and represents increased regionalization of Fishtail groups over time. It is also possible that the contracting form represents contact with or movement of highland groups into the coastal foothills sometime during the late Early Preceramic (many of the highland point forms display contracting stems). It may be that the Late Paiján, as it is defined here, represents two distinct technological traditions that operated coterminously within the QBT.

The presence of sites with different functions suggests that the Paiján settlement system was logistically organized, with resources acquired from throughout the foraging range and transported to a central location (e.g., basecamp). The spatial extent of Paiján foraging ranges is unknown, although they likely included or encompassed parts of the low, western Andean flanks, higher elevation locations, the coastal plain, and perhaps the coast—based on the subsistence indicators and raw material use patterns identified at sites in the QBT. It is possible that resources from beyond the maximum foraging range were acquired through social interaction with neighboring groups (i.e., trade/exchange) (Anderson 1996; Cashdan 1983; Kelly 1995; Morgan 2008; Wiessner 1983; Yellen 1977). Chauchat 1998: 159 has noted this possibility based on the uneven distribution of the crab *Platyxanthus orbignyi* among Paiján sites in the Cupisnique/Chicama region. It is unlikely that formal, bounded territories (socially or geographically) existed among the Paiján. However, it is possible that a 'soft' territories and incipient social boundaries may have existed or been developing—particularly during the Late Paiján period when suggestions of either rising populations or increasing social distances between groups appear.

Reconstruction of the toolkits associated with the different Paiján projectile point types appears to argue against the presence of different technological traditions. In general, the suite of tools associated with each of the four Paiján types on single component sites is relatively similar through time and across the region. This similarity in toolkits probably relates to the pursuit of relatively similar economic practices over time. However, similarities over time do not equate to unchanging practices. In fact, the frequencies of individual types over time are suggestive of important changes in mobility and subsistence. Early Paiján (Classic Paiján) toolkits were compared with the combined Late Paiján (Talambo, Contracting Narrow, Contracting Broad) toolkits and indicated that formal unifacial tool types comprised a greater percentage of Early Paiján toolkits, while informal retouched and utilized flake tool types comprised higher percentages in Late Paiján toolkits. This trend of reducing formality and increased expediency over time reflects the larger trend of reducing mobility and rising importance of plants as subsistence resources around or after 9,000 B.P. that is indicated by the QBT data—and has been documented by others (Dillehay et al. 1997; Dillehay and Piperno 2008; Dillehay and Rossen 2002; Rossen 1991; Stackelbeck 2008).

The toolkit of the Paiján complex, as a whole, reflects broad spectrum resource use through a wide range of individual tool types. However, based on the frequencies of tools associated with the different point types there does appear to be a gradual shift in the importance of plant resources between the Early and Late Paiján periods (Piperno and Dillehay 2008). A number of groundstone implements (including both *manos* and *batanes*) were identified in the QBT region, but only one example (a *mano*) was identified on a single component site (Je 449). Interestingly, this example was associated with a Late Paiján Contracting Narrow point, as well as a small, stone-lined structure (see discussions in Chapter Six and Chapter Eight). Associations like these suggest and strongly support a pattern of reduced mobility and changing subsistence between the Early and Late Paiján.

Because Paiján subsistence patterns are highly similar across much of the north coast and emphasized broad-spectrum resource use, basecamps likely were repeatedly positioned to provide access to a wide diversity of potential resources. The density of Paiján sites within the large *quebrada* systems of the western Andean foothills—like the QBT—suggests that these areas were important tethers for Paiján settlement and that the seasonal movement of basecamps may have occurred in a linear fashion that followed the ecotonal 'belt' along the lower Andean flanks.

Within this pattern of linear relocation, old/abandoned foraging ranges were likely re-occupied relatively frequently, as resources were replenished. This study argues that the movement of Paiján groups likely operated in a "back and forth" fashion between distinct, yet possibly nearby and/or imbricated, foraging ranges. At present, it is impossible to estimate how many foraging ranges (and basecamp relocations) may have occurred within an annual cycle. However, given the logistical organization, seasonally occupied basecamps, dense midden accumulations, and presence of domestic structures indicated by the QBT data, Paiján mobility was probably relatively low.

Other studies have also suggested relatively low mobility based on the presence of domestic structures and a rising importance of plant resources (including domesticated squash) at Late Paiján sites (Gálvez 2004, 1990; Dillehay et al. 2003; Dillehay and Rossen 2002; Piperno and Dillehay 2008).

In sum, the "back and forth" logistical model of Paiján settlement with low mobility, the presence of sites with different functional roles, broad spectrum resource use, and widespread use of landforms along the western Andean flanks stands in stark contrast to the relatively ephemeral occupations of the Fishtail. The data from this study indicate that at least two alternate, yet contemporary, systems of settlement organization were operating during the Early Preceramic period in the lower Jequetepeque Valley and likely across the larger north coast region. These data also provide the first regional reconstruction of Paiján settlement that has been integrated with the changes in lithic tool form and allow for tighter chronological understanding of changes in the broad Paiján complex. The regional implications of the Paiján settlement patterns within the transient explorer-estate settler model are discussed in following sections.

Early and Late Paiján Settlement

Although often broadly conceptualized, the Paiján complex encompasses two periods (Early [ca. 10,800-9,500 B.P.] and Late [ca. 9,500-9,000 B.P.]) that display slightly different patterns. In a general sense, the "back and forth" logistical settlement organization appears to have operated during both the Early and Late Paiján—based on the different site types that are present during each period. However, there appears to be an increase in the number of sites between the Early and Late periods, which may suggest either an increase in population during the Late Paiján or more extensive use of particular areas by smaller groups (e.g., increasing social distances). Interestingly, the majority of the midden deposits excavated in the QBT Paiján sites are associated with Late Paiján occupations.

Aside from the site type data, it is also clear that domestic structures are more frequent (and occur in larger numbers) on Late Paiján sites, suggesting that the Late Paiján probably had a lower *anticipated* mobility than existed during the Early Paiján

(Dillehay et al. 2003; Henry 1989a; Kent 1991; Kent and Vierich 1989). Changes in lithic toolkit composition over time—which include more informal tools and groundstone—also are suggestive of reducing mobility and broadening subsistence (particularly with regard to plant exploitation). For example, the only single component site in the QBT containing groundstone (site Je 449) was a Late Paiján short-term basecamp that also contains two circular domestic structures.

Thus, subtle changes pointing to reducing mobility and possibly longer occupations do exist between the Early and Late Paiján periods. However, when compared to other Early Preceramic complexes, such as the Fishtail complex, the Early and Late Paiján have more in common—in terms of subsistence practices, technology, and settlement/mobility—than separates them. The importance of these changes is that they represent the first trends toward sedentism, horticulture, and early village development that are known to have appeared in the following Middle Preceramic period around or after 9,000 B.P. (Dillehay and Rossen 2002; Dillehay et al. 2003; Piperno and Dillehay 2008; Rossen 1991; Stackelbeck 2008).

Regional Patterns and Continental Implications from the lower Jequetepeque Valley

Earlier in this study (Chapter Five), *Colonization* was defined as the process through which human groups enter, explore, and settle a given landscape or region. *Regionalization* was defined as the process in which colonizing groups and their offspring, within a broadly delimited geographic region begin to develop more intensive or specialized subsistence practices that are tailored to specific ecologies or environments. Regionalization is interrelated with colonization in that it initiates out of the exploration and settlement of new landscapes, but is a slower, more temporally and spatially confined process. Similarly, *Localization* represents the process of regionalization at an even more spatially and temporally confined scale. Like regionalization, groups develop more intensive and/or specialized subsistence and technological practices focused on the exploitation of local resources.

This study has argued that colonization was likely a disjointed process that involved alternative, perhaps competing, strategies at local and regional levels. Individual groups likely pursued distinct strategies and behaviors while settling new landscapes. These different strategies are reflected by the variability in technological, subsistence, and mobility patterns that can be documented at local and regional scales (like the QBT and lower Jequetepeque Valley). A scalar framework for conceptualizing and modeling variability in patterns of movement from local data to continental scales has been advocated. Within this framework, local-scale data are interpreted using the residential-logistical continuum (Anderson 1996; Anderson and Hanson 1988; Binford 1990, 1983, 1980; Grove 2009; Kelly 1995, 1992; Kent 1992; Morgan 2008; Surovell 2000). Data from the contemporary/overlapping early populations in the QBT have already been characterized with this model (see above discussions on mobility and settlement strategies) and suggest that the Fishtail were residentially organized, while the Paiján were logistically organized.

Within the larger framework, local mobility patterns can be used to characterize regional settlement strategies along the transient explorer-estate settler continuum (Beaton 1991; Dillehay 2000, 1997a; Dixon 1999). This model provides an opportunity to more broadly characterize the behavioral choices and organizational features of different groups as they migrated into and settled new regions. The archaeological correlates of the polar ends of the continuum were presented in Chapter Five (see Tables 5.2 and 5.3).

If we consider the contemporary Fishtail and Early Paiján complexes within the rubric of the transient explorer-estate settler continuum, it is clear that (at least) two relatively distinct strategies of regional settlement operated during the peopling of the north coast. The residentially organized Fishtail complex correlates well with the transient explorer end of the continuum—with small sites, relatively ephemeral and short-term occupations, redundant site structure and function within and between regions, a formal, curated technology with prevalent use of non-local raw materials, and probable low social connectivity. Regional migration and settlement under the transient explorer strategy is generally not characterized as the exploration of different environments, but rather is focused on acquiring sets of predictable food resources (Bettinger and Young 2004; Dillehay 2000).

The residentially organized movement of Fishtail groups along the lower western flanks of the Andes appears to reflect this pattern. Groups probably migrated relatively rapidly along the Andean flanks utilizing areas that offered access to specific sets of desired resources and ignoring others—which may explain why few Fishtail sites are encountered and are discontinuously present across the Central Andes. What these resources were remains unclear. However, the apparent focus on terrestrial resources, combined with the meager faunal remains recovered suggest that access to terrestrial mammals (like deer and peccary) may have been the driving force behind Fishtail migrations into new areas. Given the limited amount of information regarding Fishtail subsistence, it is possible that other resources may have played equally or more important roles in conditioning migration.

In contrast to the Fishtail, the Early Paiján correlates more closely with the estate settler end of the continuum. The logistical organization of Early Paiján settlement evidences sites with different functions, different occupational lengths, and evidence of activity areas and site furniture (including domestic structures). Lithic assemblages contain formal, curated bifacial and unifacial forms, as well as a range of expedient tool forms—which become more prevalent over time. Broad spectrum resource exploitation and the 'back and forth' relocation of sites between imbricated ranges within similar environments are suggestive of maximizing landscape knowledge and relatively slower movement between regions.

Estate settler migration is not organized around specific types of food resources, but rather on the slow exploration of regions to identify areas with specific sets of desired features (such as predictable water sources, access to diverse plant and animal resources, raw materials sources, and perhaps specific physical/geologic features that may have economic, ritual, or social significance [like open viewsheds, rivers, passes, or mountains]). Slow migration and broad spectrum resource exploitation lends itself to the development of more intensive and/or specialized subsistence practices that are tailored to specific local ecologies (i.e., regionalization). The evolution of Paiján complex from the Early to Late periods—with reducing mobility, possible rising populations, increasingly expedient toolkits, and more frequent plant processing tools—clearly demonstrates the subtle changes associated with increasing localization and regionalization. By around 9,500 B.P., the Paiján complex (Late Paiján) no longer represent a colonizing population, but rather have developed a fully local lifeway in the lower Jequetepeque Valley.

The regional settlement strategies of the Fishtail and Paiján provide examples, which can be compared with other regional studies, to inform our understanding of continental-scale patterns and processes. As discussed in Chapter Four, Andean South America was apparently colonized in two distinct pulses. Although each of these pulses resulted in the settlement of new landscapes, they are products of different large-scale processes. The first pulse, which was probably well underway by at least 15,000-13,000 B.P., represents the first peopling of South America and was likely the end episode of a relatively slow migration that originated in Northern Asia and progressed through North America. When this process initiated is not known, but it seems clear, given the low archaeological visibility, generalized economic and technological strategies, environmental selectivity, and relatively low mobility indicated at Monte Verde in southern Chile, that the earliest colonists shared many features with the estate settler strategy.

The second pulse (ca. 11,500-10,000 B.P.) primarily represents the expansion of rising populations into new or previously unoccupied regions across South America. The archaeological record indicates rapidly increasing cultural variability, in the form of distinct economic, technological, and mobility strategies that reflect increasingly regionalized behaviors and adaptations. Some of the early complexes that characterize the second pulse of colonization include the Amotape and El Palto sites, the Fishtail complex, the Paiján complex, the Central Andean Hunting Tradition sites, and early coastal sites in southern Perú and northern Chile. Although many of these complexes are the first known inhabitants of a region, the second pulse of colonization should probably be conceived of as the 'infilling' of regions by groups who were developing highly localized and regionalized adaptations.

What is important about the second pulse is that groups began to pursue distinct strategies for exploring and settling new or unknown regions. The wide range of cultural diversity that appears during the Late Pleistocene-Early Holocene in both South and North America is directly related to the strategic choices that different groups made in order to settle new regions. Some of these groups, like the Fishtail and Central

Andean Hunters, display relatively high mobility and developed semi-specialized economies. Other groups, like the Paiján and the early coastal traditions, maintained a relatively low mobility and developed generalized and broad-spectrum economic strategies. However, these are not mutually exclusive directional trends. Regionalizing populations may have continued to explore and settle new lands, while some highly-mobile explorers may have developed specialized regional settlement and subsistence practices.

In terms of continental-scale peopling models, the Late Pleistocene-Early Holocene archaeological record of the Andes is suggestive of a relatively slow pace of initial colonization (Dillehay 2000; 1997a; Dillehay et al. 2008). After ca. 11,500 B.P., the pace of colonization becomes more varied as groups begin to develop independent strategies for exploring, migrating, and settling new regions (like the Fishtail and Paiján). There is some evidence that 'niche-chasing' (*sensu* Bettinger and Young 2004) may have been central to the strategy of particular groups (like the Early Paiján), but did not result in rapid or long-distance migrations. The targeting specific sets of resources may also have been important for some groups (like the Fishtail), but did not result in a widespread distribution of sites or settlement. At present, there is little evidence in Andean South America to support either a 'string of pearls' or 'leap frog' migration pattern (Anderson and Gillam 2000) on a continental scale. However, these patterns may be useful in modeling the movement of individual early complexes.

In sum, continental-scale models that emphasize 'rapid' or 'slow' migration processes are too limited to account for the extreme variability that exists within the archaeological record of Andes (which likely represents a mixture of both), let alone the rest of South and North America. Colonization was not a temporally or spatially straightforward process. In order to more accurately model the known variability, the concept of colonization must be uncoupled from the ambiguous notions of First settlers, First peoples, and First Americans.

For example, the lower Jequetepeque Valley was independently colonized by both the Fishtail and Paiján (and possibly other groups). Fishtail colonization came first in this region (by ca. 300-400 years), but they were by no means the first settlers in the north coast region, much less South America (which occurred at least 1000 years earlier). The earliest evidence for settlement of the north coast region comes from the unifacial Amotape (ca. 11,200 RCYBP) and El Palto (ca. 11,600 RCYBP) sites that are both earlier and overlapping with the Fishtail migration (Richardson 1983; Dillehay 2000). It is likely that Fishtail peoples encountered, interacted, and perhaps competed with these populations as they entered and occupied the region over a period of 400-500 years. Although their cultural remains are not found in association with each other, it not unreasonable to assume that some interaction occurred—even if it was of a competitive nature.

How then do the Early Paiján populations enter this picture? Do they represent another example of 'infilling' by an outside group migrating from an unknown location? Or, could the Early Paiján (ca. 10,800-10,000 RCYBP)—who share technological and economic traits with both the Fishtail and unifacial groups—represent a regionalized product of the interaction between the Fishtail and earlier unifacial groups? The QBT data suggest that the Early Paiján may potentially represent a syncretization of distinct cultural traits; blending aspects of both the unifacial, 'slow-movers' with that of the bifacial, 'fast-movers' into something new and uniquely suited to regional social and environmental landscape. If this is the case, then the Early Paiján may have begun directly competing for resources and foraging ranges used by both the Fishtail and early unifacial populations. This scenario would potentially explain why Fishtail and Early Paiján cultural materials are frequently encountered on the same sites.

The Fishtail occupation of the lower Jequetepeque disappears shortly after (ca. 200-300 years) after the appearance of the Early Paiján, but continued in other parts of Central and South America (Borerro 2006; Nami 2007). It could be that the interaction of relatively 'fast moving' groups that covered large swaths of continents, such as the Fishtail (and perhaps Clovis in North America), with earlier, local traditions resulted in the development of widespread cultural heterogeneity as traits were blended and recast during the changing Late Pleistocene environmental conditions. Over time, local cultural developments (like the Early Paiján) likely intensified regional adaptations in response the onset of Holocene climate conditions and may have out-competed and/or incorporated parent traditions into a re-defined social landscape (which is represented by the varied Late Paiján groups in the QBT). Thus, migration and settlement may have been a much more socially dynamic process than typically considered. In the case of the Fishtail populations of the Andean region, it is possible that their success in widespread, rapid migration may also have been a contributing factor in their demise.

To return to the earlier question, whose strategies do we use to inform our continental models? Which 'First' is correct, the early unifacial or the Fishtail? The regional or the continental? The data presented here suggest that primacy of migration should not be requisite for inclusion in continental modeling. By focusing models of colonization only on the patterns associated with 'Firsts' we lose sight of the richness of alternative, perhaps competing, behaviors involved in the process—as well as those that may have developed as a result of the process. Colonization, as a concept for explaining continental phenomena, must abandon primacy in favor of a more temporally and spatially fluid process that can incorporate multi-directional and overlapping patterns of migrations with variable paces within a context of social interaction and potential elaboration.

Although this research has refined our understanding of the different strategies pursued by the Fishtail and Early and Late Paiján in the lower Jequetepeque, more local and regional studies are needed from across northern Perú, the Central Andes, and South America. Were similar strategies pursued in different locations? What is the extent of Fishtail and Paiján territories? What other early complexes (particularly those with unifacial traditions) may be present but have not been recognized? What kinds of social, economic, and technological relationships existed between different early complexes inhabiting the same region? Can we determine the direction or parent traditions of the Fishtail and/or Paiján migrations or development? How did the development or appearance of new groups impact or re-define existing social landscapes?

Final Thought

Sometime after 11,500 B.P. Fishtail groups migrated into the north coast of Perú. Somewhat later, around 10,800 B.P., Early Paiján sites begin appearing in the archaeological record of the region. For perhaps 200-300 years, these different groups made use of the same region, some of the same sites, and likely were in direct contact or competition with one another. Despite occupation of the same region and probable social interaction, these groups pursued markedly different strategies of colonization. These strategies are evident in the sites, tools, resources used, and patterns of settlement they left behind. Ultimately, it was the strategy of the Paiján—which blended traits of the Fishtail and earlier unifacial groups—that most readily adapted to and flourished in the changing Late Pleistocene-Early Holocene conditions of the lower Jequetepeque Valley. By 9,000 B.P., when the Late Paiján disappears from the archaeological record, these early occupants of the north coast had set in motion trends that would lead to the later developments of horticulture and village life—and laid the early foundation for later Andean cultural elaborations.

APPENDIX I

EARLY PRECERAMIC SITE DESCRIPTIONS

Site: Je-394
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0678654 Northing: 9196783
Site Location Description: This site is located on a long, sloping low terrace that extends to the west from the western base of the Cerros de Talambo.
Site Dimensions: East/West: 65 m North/South: 18 m
Surface Collections: 5 lithic artifacts.
Site Description: This site consists of a small, light to medium density scatter of lithics. The lithic scatter was concentrated on the western end of the site.
Surface Features: None observed.

Site: Je-395
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0679847 Northing: 9196051
Site Location Description: This site is located on a low terrace that extends to the northwest along the southern margin of Quebrada Talambo on the western edge of the Cerros de Talambo.
Site Dimensions: East/West: 5 m North/South: 20 m
Surface Collections: 2 lithic artifacts.
Site Description: This site consists of a small, light density scatter of lithics.
Surface Features: None observed.

Site: Je-397
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0679010 Northing: 9196763
Site Location Description: This site is located on a low, sloping terrace that extends to the west from the mouth of Quebrada Talambo out onto Pampa Talambo.
Site Dimensions: East/West: 15 m North/South: 10 m
Surface Collections: 9 lithic artifacts.
Site Description: This site consists of a very small, light density scatter of lithics. The lithic artifacts were primarily concentrated on the eastern and western ends of the site. Lithic tools recovered from the site included a single quartzite biface fragment.
Surface Features: None observed.

Site: Je-399
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0678673 Northing: 9196994
Site Location Description: This site is located on a high terrace within the central portion of the Quebrada Talambo. The terrace extends to the west from the central portion of the *quebrada* toward the *quebrada* mouth.
Site Dimensions: East/West: 44 m North/South: 26 m

Surface Collections: 20 lithic artifacts.
Site Description: This site consists of a light density lithic scatter located on a high terrace within the Quebrada Talambo. Lithic tools collected from the site include a single biface fragment.
Surface Features: None observed.

Site: Je-401
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0679783 Northing: 9196677
Site Location Description: This site is located on a high terrace within the central portion of the Quebrada Talambo that extends westward toward the mouth of the *quebrada*.
Site Dimensions: East/West: 23 m North/South: 20 m
Surface Collections: 35 lithic artifacts.
Site Description: This site consists of a light density scatter of lithics.
Surface Features: None observed.

Site: Je-425
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0680026 Northing: 9197998
Site Location Description: This site is located on the upper (southern) end of a long terrace that extends to the north from the Cerros de Talambo toward the Quebrada Talambo drainage.
Site Dimensions: East/West: 22 m North/South: 50 m
Surface Collections: 8 lithic artifacts.
Site Description: This site consists of a small, light density scatter of lithics.
Surface Features: None observed.

Site: Je-430
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0680785 Northing: 9198877
Site Location Description: This site is located on a high terrace along the southern margin of the Quebrada Talambo on the western edge of the Cerros de Talambo. The terrace extends to the northeast from the base of the Cerros de Talambo into the Quebrada Talambo and is bordered on the northern edge by the *quebrada* drainage.
Site Dimensions: East/West: 30 m North/South: 25 m
Surface Collections: 7 lithic artifacts.
Site Description: This site consists of a small, light density scatter of lithics. A single biface fragment was recovered from the site.
Surface Features: None observed.

Site: Je-431 (also discussed in Stackelbeck 2008)
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0680613 Northing: 9199107
Site Location Description: This site is located on a large, long, dissected high terrace system that extends westward from the base of Cerro de Talambo along the southern margin of the Quebrada Talambo. The terrace is highest on the eastern end and slopes

gradually westward until it contacts the Pampa de Talambo at the mouth of the *quebrada* drainage.

Site Dimensions: East/West: 1566 m North/South: 330 m

Surface Collections: 130 lithics; 7 ceramics; 5 faunal fragments; 1 coral fragment.

Site Description: Je-431 is distinctive from all other Early Preceramic sites identified in the Quebradas del Batán and Talambo. It is by far the largest site in terms of area and contains the densest concentrations of surface materials and features. The site is extensive and multicomponent, indicating occupation from the Early Preceramic (Paiján) through Chimú—based on the surface artifacts and features. The Early Preceramic occupation is evidenced by a light to high density scatter of lithics that extends across the entirety of the site. Lithic tools identified and collected from the surface include numerous Paiján projectile points and point fragments, bifaces and biface fragments, *limaces*, various unifacial and flake tools, and groundstone (mano-like grinding stone and three *batanes*). In addition to the lithic tools and debris, 39 lithic knapping features were also identified (discussed below). The stone-lined foundations of seven circular structures (Structures 2-4 and 6-9) believed to be associated with the Early to Late Early Preceramic period were also recorded.

Later occupations of the site are indicated by the presence of Cupisnique, Moche, and Chimú ceramics that were observed and/or collected in various parts of the site, and by three additional structures (Structures 1, 5, and 10) that appear to date to the Formative or later periods. These structures included: a 'B-shaped', stone-lined form (Structure 1); a possible *pirca* (Structure 5); and a partially-disturbed rectangular, stone-lined form with interior portioning (Structure 10). In addition to these structures, a large and long rock wall that has been heavily disturbed bisects the site on a roughly N/S axis (this wall continues across the entire *quebrada*).

Surface Features: A total of 58 features were recorded at Je-431, including: 39 knapping features; three large land snail shell middens; three rock piles; ten stone-lined structures of various forms; two rock walls; and one subsurface hearth recorded in Test Unit 5. These features are identified and briefly described in the table below. The knapping features, the seven roughly circular structures (Structure 2-4 and 6-9), and the land snail middens are considered to likely be Preceramic based on associated materials (e.g., lithic tools and debitage, carbon samples that yielded Preceramic dates) and, in the case of the structures, their forms (which compare well with other Preceramic structures documented elsewhere in the Central Andes [Malpass and Stothert 1992; Stackelbeck 2008]). Test Unit 5 was excavated within a land snail midden (Feature 41). A hearth feature (Feature 54) in TU 5 was identified at the base of Level 2; a carbon sample from this level yielded a radiocarbon date from the Early Preceramic period (9983±93 RCYBP [11,951-11,221 cal BP]; AA57963). This date and other associated materials supported an interpretation of Early Preceramic cultural affiliation for the midden and hearth feature. Excavation Block A, which was excavated within another land snail midden (Feature 42), yielded three AMS dates around 9000 RCYBP (see below), also indicating an Early to Late Early Preceramic age (see Appendix II).

Excavations in Structure 1 (Feature 46) yielded data suggesting that this structure was occupied by later Cupisnique (based on recovered ceramics) or Moche peoples (based on an AMS date [1521 ± 40 ^{14}C BP; AA57962]). The cultural affiliation of the rock piles (Features 43-45), Structure 5, Structure 10, and the rock walls (Features 57 and

58) is uncertain, although they are considered to likely relate to the Ceramic Period occupation of the site (based on similarities with other reported sites [Chauchat 1998]).

Feature #	**Description**	**Dimensions**	**Cultural Affiliation**
1	Lithic knapping feature (*toba*)	90 cm E/W x 220 cm N/S	Preceramic
2	Lithic knapping feature (*toba*)	1.2 m N/S x 1.4 m E/W	Preceramic
3	Lithic knapping feature (*toba*, quartz, quartz crystal)	16 m E/W x 4 m N/S	Preceramic
4	Lithic knapping feature (*toba*)	3.3 m N/S x 7 m E/W	Preceramic
5	Lithic knapping feature (*toba*)	1.8 m N/S x 2.3 m E/W	Preceramic
6	Lithic knapping feature (*toba*)	1.5 m N/S x 80 cm E/W	Preceramic
7	Lithic knapping feature (*toba*)	4.7 m N/S x 3.5 m E/W	Preceramic
8	Lithic knapping feature (*toba*)	1.9 m N/S x 2.2 m E/W	Preceramic
9	Lithic knapping feature (*toba*)	2.6 m E/W x 4.5 m N/S	Preceramic
10	Lithic knapping feature (*toba*); includes three conjoining fragments of a Paiján point	4 m N/S x 3.2 m E/W	Early Preceramic
11	Lithic knapping feature (*toba*)	1.9 m N/S x 2.7 m E/W	Preceramic
12	Lithic knapping feature (*toba*, coarser-grained quartzite); includes various different tools/preforms such as bifaces, unifaces, retouched and utilized flakes	1.2 m E/W x 1.0 m N/S	Early Preceramic
13	Lithic knapping feature (*toba*)	4.5 m E/W x 4.0 m N/S	Preceramic
14	Lithic knapping feature (quartzite)	2.5 m N/S x 1.0 m E/W	Preceramic
15	Lithic knapping feature (*toba*)	4.0 m N/S x 4.0 m E/W	Preceramic
16	Lithic knapping feature (*toba*)	3.0 m N/S x 3.0 m E/W	Preceramic
17	Lithic knapping feature (*toba*)	50 cm N/S x 2.0 m E/W	Preceramic
18	Lithic knapping feature (*toba*)	2.0 m N/S x 1.5 m E/W	Preceramic
19	Lithic knapping feature (*toba*)	1.0 m N/S x 2.0 m E/W	Preceramic
20	Lithic knapping feature (*toba*)	2.0 m N/S x 3.0 m E/W	Preceramic
21	Lithic knapping feature (*toba*)	1.0 m E/W x 3.0 m N/S	Preceramic
22	Lithic knapping feature (*toba*)	2.5 m E/W x 2.0 m N/S	Preceramic
23	Lithic knapping feature (*toba*)	4.0 m E/W x 5.0 m N/S	Preceramic
24	Lithic knapping feature (*toba*)	3.0 m E/W x 2.5 m N/S	Preceramic
25	Lithic knapping feature (*toba*)	1.0 m N/S x 3.0 m E/W	Preceramic
26	Lithic knapping feature (*toba*)	3.5 m N/S x 3.0 m E/W	Preceramic
27	Lithic knapping feature (*toba*)	2.0 m E/W x 2.2 m N/S	Preceramic
28	Lithic knapping feature (*toba*)	1.7 m E/W x 2.4 m N/S	Preceramic
29	Lithic knapping feature (*toba*)	4.0 m E/W x 3.5 m N/S	Preceramic
30	Lithic knapping feature (*toba*)	4.0 m E/W x 2.0 m N/S	Preceramic
31	Lithic knapping feature (*toba*)	3.2 m N/S x 4.0 m E/W	Preceramic
32	Lithic knapping feature (*toba*)	2.0 m N/S x 2.0 m E/W	Preceramic
33	Lithic knapping feature (*toba*)	10 m E/W x 12 m N/S	Preceramic
34	Lithic knapping feature (*toba*)	1.2 m N/S x 3.3 m E/W	Preceramic
35	Lithic knapping feature (*toba*); includes a secondary biface	2.4m N/S x 2.7 m E/W	Early Preceramic
36	Lithic knapping feature (*toba*)	2.1 m N/S x 3.0 m E/W	Preceramic
37	Lithic knapping feature (*toba*)	5.5 m N/S x 9.5 m E/W	Preceramic

38	Lithic knapping feature (*toba*)	2.4 m N/S x 2.2 m E/W	Preceramic
39	Lithic knapping feature (*toba*)	2.1 m N/S x 2.8 m E/W	Preceramic
40	Land snail shell midden	7 m N/S x 6 m E/W	Preceramic
41	Land snail shell midden	13 m E/W x 12 m N/S	Preceramic
42	Land snail shell midden	32 m E/W x 46 m N/S	LE/M Preceramic
43	Rock pile	1.8 m N/S x 1.3 m E/W	?
44	Rock pile	1.0 m E/W x 80 cm N/S	?
45	Rock pile	1.0 m E/W x 80 cm N/S	?
46	(Structure 1) 'b'-shaped, stone-lined structure	6 m E/W x 4 m N/S	Cupisnique / Moche
47	(Structure 2) roughly circular, stone-lined structure; the base consists of larger boulders with smaller stones filling the gaps between to complete the form	1.5 m E/W x 1.5 m N/S	Early Preceramic
48	(Structure 3) roughly circular, stone-lined structure; the base consists of larger boulders with smaller stones filling the gaps between to complete the form	1.8 m E/W x 2.3 m N/W	Early Preceramic
49	(Structure 4) roughly circular, stone-lined structure; the base consists of larger boulders with smaller stones filling the gaps between to complete the form	2.8 m E/W x 2.4 m N/S	Early Preceramic
50	(Structure 5) possible *pirca*	3 m N/S	?
51	(Structure 6) roughly circular, stone-lined structure; the base consists of larger boulders with smaller stones filling the gaps between to complete the form	3.8 m N/S x 2.8 m E/W	Early Preceramic
52	(Structure 7) roughly circular, stone-lined structure; the base consists of larger boulders with smaller stones filling the gaps between to complete the form	4.0 m N/S x 5.0 m E/W	Early Preceramic
53	(Structure 8) roughly circular, stone-lined structure; the base consists of larger boulders with smaller stones filling the gaps between to complete the form	2.5 m N/S x 4.0 m E/W	Early Preceramic
54	Subsurface hearth feature, Test Unit 5	40 cm E/W x 60+ cm N/S (5 cm deep)	Early Preceramic
55	(Structure 9) roughly circular, stone-lined structure; the base consists of larger boulders with smaller stones filling the gaps between to complete the form; agglutinated with Structure 8	2.0 m N/S x 3.5 m E/W	Early Preceramic
56	(Structure 10) rectangular, stone-lined structure with an interior partition; east end has been disturbed	2.5 m E/W x 1.0 m N/S	?
57	'L'-shaped rock wall	11 m N/S x 11 m E/W	?
58	Long rock wall that extends roughly N/S across the width of the site; it continues on the other side of the Q2 drainage on site Je-470; it has been heavily disturbed through systematic removal of constituent rocks	275 m N/S	Chimu?

Site: Je-432
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0672472 Northing: 9216397
Site Location Description: This site is located on a paleodune on the northwestern slope of Cerro Arena. Cerro Arena is located directly to the southwest of the mouth of the Quebrada del Batán drainage.
Site Dimensions: East/West: 50 m North/South: 30 m
Surface Collections: 29 lithic artifacts.
Site Description: This site consists of a light density scatter of lithics. Lithic tools identified and collected from the site included two biface fragments and two retouched flakes.
Surface Features: None observed.

Site: Je-433
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0674828 Northing: 9217810
Site Location Description: This site is located on a low terrace in the lower (southwestern) portion of the Quebrada del Batán drainage near the mouth of the Quebrada Organos.
Site Dimensions: East/West: 25 m North/South: 7 m
Surface Collections: 24 lithic artifacts.
Site Description: This site consists of a light density lithic scatter located on a low terrace in the Quebrada del Batán drainage. Lithic tools identified and collected from the site included several biface fragments and retouched/utilized flakes.
Surface Features: None observed.

Site: Je-435
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0675615 Northing: 9217252
Site Location Description: This site is located on a low terrace along the southern margin of the mouth of Quebrada Organos. The terrace extends northwest from the northern base of Cerro Blanco into the Quebrada Organos and overlooks the lower portion/mouth of the Quebrada del Batán.
Site Dimensions: East/West: 50 m North/South: 125 m
Surface Collections: 26 lithic artifacts.
Site Description: This site consists of a light density lithic scatter. Lithic tools identified and collected from the site included a Paiján projectile point fragment and a biface fragment.
Surface Features: None observed.

Site: Je-436
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676073 Northing: 9217967
Site Location Description: This site is located on a low terrace that is situated along the southern margin of the mouth of Quebrada Colorado and overlooks the lower Quebrada del Batán drainage.

Site Dimensions: East/West: 20 m North/South: 55 m
Surface Collections: 26 lithic artifacts.
Site Description: This site consists of a light density lithic scatter. Lithic tools identified and collected from this site included a Paiján projectile point proximal fragment, a limace, and two biface fragments.
Surface Features: None observed

Site: Je-439 (also discussed in Stackelbeck 2008)
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0675245 Northing: 9218190
Site Location Description: This site is located on a low, flat terrace that extends to the west from the base of Cerro Organos into the lower Quebrada del Batán drainage. The terrace is situated directly to the north of the mouth of Quebrada Organos.
Site Dimensions: East/West: 206 m North/South: 170 m
Surface Collections: 169 lithics; 3 ceramics; 27 bones.
Site Description: This large site is comprised of a generally medium to high density lithic scatter with areas of very high density concentrations. A large number of lithic tools were identified and collected from this site, including numerous Paiján projectile points, an unidentified projectile point, limaces, unifaces, bifaces, and retouched/utilized flakes. Several groundstone tools were also identified and recorded at the site, including several *batanes* and smaller grinding stones. At least five large, very dense clusters of lithic tools and debitage were identified at the site. These large clusters likely relate to individual occupations of the site or reoccupations of the same landform over time and were predominantly located along the northern end of the site. Several smaller clusters of tools were also observed across the surface of the site, including a cluster of grinding slabs and grinding stones in the northwest portion of the site that may represent a distinct activity area related to plant processing. Three small, surface bone scatters were also identified on the western end of the site. Two distinct lithic knapping stations were also identified at the site, along with a small, circular rock hearth and a semi-rectangular rock-lined structures. This site has a commanding view of the lower Quebrada del Batán drainage and nearby *pampa*.
Surface Features: Two distinct lithic knapping stations were identified and recorded at the site. Knapping station 1 (1/4 m N/S x 2.4 m E/W) was comprised entirely of quartz debitage and was located on the eastern end of the site. Knapping station 2 (3 m E/W x 2.5 m N/S) was comprised entirely of quartzite debitage and was located on the northeastern portion of the site. A small circular rock hearth was identified and recorded on the western end of the site and measured 1.2 m E/W x 1.5 m N/S. The hearth feature was located within a very high density cluster of tools and debitage. In addition, a small, semi-rectangular structure (Structure 1) was located on the western end of the site as well. Structure 1 appears to represent the stone foundation or support for a perishable superstructure. Several lithic tools and the cluster of grinding stones were located in close proximity to Structure 1.

Site: Je-440
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0673421 Northing: 9218416

Site Location Description: This site is located on a low terrace in the floor of the Quebrada del Batán. The terrace is located near the mouth of Quebrada Colorado and overlooks the mouth of the Quebrada del Batán.
Site Dimensions: East/West: 90 m North/South: 40 m
Surface Collections: 30 lithic artifacts.
Site Description: This site consists of a light density scatter of lithics with areas of medium to high density concentrations. The lithic artifacts were densest on the western end of the site. Lithic tools identified and collected from the surface of the site included a Paiján projectile point, several biface fragments, and two retouched/utilized flakes.
Surface Features: None observed.

Site: Je-441
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0672972 Northing: 9218401
Site Location Description: This site is located on a low terrace near the base of Cerro Colorado in the Quebrada del Batán drainage. The terrace is located on the *quebrada* floor and overlooks the mouth of Quebrada del Batán.
Site Dimensions: East/West: 20 m North/South: 40 m
Surface Collections: 8 lithic artifacts.
Site Description: This small site consists of a light density lithic scatter. A single limace was the only lithic tools identified or collected at the site.
Surface Features: None observed.

Site: Je-442
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0672876 Northing: 9218466
Site Location Description: This site is located on a low terrace near the base of Cerro Colorado in the Quebrada del Batán drainage. The terrace is located adjacent to the northern margin of the Quebrada del Batán drainage and overlooks the mouth of the *quebrada*.
Site Dimensions: East/West: 280 m North/South: 60 m
Surface Collections: 15 lithic artifacts.
Site Description: This site consists of a large, light to medium density scatter of lithics. Lithic tools identified and collected from the site included two biface fragments, a uniface, and a retouched/utilized flake.
Surface Features: None observed.

Site: Je-443
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0672826 Northing: 9218837
Site Location Description: This site is located on a long, low terrace that extends to the southeast from the base of Cerro Colorado, near Quebrada Colorado, into the Quebrada del Batán drainage.
Site Dimensions: East/West: 20 m North/South: 330 m
Surface Collections: 21 lithic artifacts.

Site Description: This site consists of a long, thin light to medium density scatter of lithics. Lithic tools identified and collected from the site include a biface, two biface fragments, and several retouched/utilized flakes.
Surface Features: None observed.

Site: Je-447
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0674284 Northing: 9218010
Site Location Description: This site is located on a long, low terrace that extends to the southeast from the base of Cerro Colorado, near Quebrada Colorado, to the western margin of the main Quebrada del Batán drainage.
Site Dimensions: East/West: 30 m North/South: 90 m
Surface Collections: 18 lithic artifacts.
Site Description: This site consists of a light density scatter of lithics across the lower end of the terrace. Lithic tools identified and collected from the site included one biface fragment.

Site: Je-449 (also discussed in Stackelbeck 2008)
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0674372 Northing: 9218880
Site Location Description: This site is located on a low, flat terrace that is bordered to the southeast by the main Quebrada del Batán drainage. The low terrace extends to the southeast from the eastern base of the Cerro Colorado and overlooks the main *quebrada* floor and mouth of the Quebrada del Batán.
Site Dimensions: East/West: 40 m North/South: 200 m
Surface Collections: 30 lithics; 3 ceramics.
Site Description: This site consists of a long, medium density lithic scatter that is located on a low terrace that parallels the main *quebrada* drainage. A small, roughly oval, stone structure (Structure 1) was identified and recorded near the center of the site. Two distinct concentrations of lithic materials were identified at the site, although the densest concentration was located within and around Structure 1. In addition, four stone *pirca* structures (Structures 2-5) and a low stone wall were recorded on the very eastern end of the site. The lithic artifacts collected from the surface of the site include one Paiján projectile point (proximal fragment) manufactured of quartzite, one limace (basalt), one uniface (toba volcanica), one grinding stone fragment (quartzite), two cores (toba volcanica), and 24 flakes and flake fragments. The Paiján point was found in the dense concentration of lithics around Structure 1.
Surface Features: A small, roughly oval, stone structure (Structure 1)(1.7 m N/S x 2.5 m E/W) was identified and recorded near the center of the site. A dense concentration of lithic materials, including a Paiján projectile point, was located within and around Structure 1. Two flotation samples were collected from the interior western end of Structure 1, although the sediments appear to be heavily deflated.

Site: Je-458
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0674400 Northing: 9219161

Site Location Description: This site is located on a low, sloping terrace that is situated along the southwestern margin of the Quebrada Colorado and overlooks the Quebrada del Batán drainage.
Site Dimensions: East/West: 40 m North/South: 45 m
Surface Collections: 3 lithics; 2 ceramics.
Site Description: This site consists of a very light density lithic scatter. Although several flakes were observed on the site, a single limace was the only lithic tool identified and collected.
Surface Features: None observed.

Site: Je-459
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0674272 Northing: 9219237
Site Location Description: This site is located on a low terrace that extends to the east from the base of Cerro Colorado toward the mouth of the Quebrada del Batán.
Site Dimensions: East/West: 55 m North/South: 20 m
Surface Collections: 16 lithic artifacts.
Site Description: This site consists of a light density lithic scatter. A single biface fragment was the only lithic tool identified and collected from the site.
Surface Features: None observed.

Site: Je-470 (also discussed in Stackelbeck 2008)
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0680704 Northing: 9199453
Site Location Description: This site is located on a heavily dissected low terrace along the northern margin of the Quebrada Talambo at the western base of the Cerros de Talambo. The surface of the terrace is uneven and contains both higher and lower areas. The main *quebrada* drainage borders the site to the south.
Site Dimensions: East/West: 400 m North/South: 260 m
Surface Collections: Zone A—1 lithic, 3 ceramics; Zone B—33 lithics, 3 ceramics; Zone C—5 ceramic artifacts.
Site Description: This site consists of a large, light to medium density scatter of lithics and ceramics that are clustered in three distinct zones (labeled A, B, and C). Zone A is located on the eastern end of the site and is characterized by a very light scatter of ceramic sherds and flakes. Zone B is located on the western end of the site and consisted of a medium density scatter of lithic debris. The lithics collected from Zone B included four bifaces and biface fragments (including one midsection of a Paiján point), one limace, five unifacial tools (likely scrapers), four utilized flakes, and 19 flakes and flake fragments. A very light scatter of ceramic sherds was also present in Zone B, three of which were collected. Zone C was located on the lowest portion of the terrace along the southern margin of the site and consisted of a cluster of five *pirca* structures and a very light scatter of ceramics. Five ceramic sherds were collected from Zone C.
Surface Features: Zone B—A circular, stone structure was identified and recorded in Zone B. The structure measured 3.9 m E/W x 4.6 m N/S in size. Areas of dense lithic debris concentrations were located within and around the structure, and included one medial fragment of a Paiján point.

Zone C—Five small, stone *pirca* structures were identified and recorded in this area of the site. The were associated with a large stone wall that bisected the site. The wall measured 65-75 cm high and 170-200 cm wide. GPS recordings were taken in three locations along the wall.

Site: Je-471
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0679895 Northing: 9200014
Site Location Description: This site is located on a low terrace that extends southwest from the base of Cerros de Talambo and overlooks the Pampa de Talambo. The site is bordered to the north and south by erosional cuts that drain out onto the *pampa*.
Site Dimensions: Northeast/Southwest: 70 m Northwest/Southeast: 20 m
Surface Collections: 11 lithics; 4 ceramics.
Site Description: This site consists of a light lithic scatter located on a low terrace. Both Preceramic and Ceramic period components are present on the site. The Preceramic artifacts consist of ten flakes (toba volcanica and quartz crystal) and one biface fragment (medial section of toba volcanica). The Ceramic period component is represented by a scatter of sherds (4 collected) and a low wall/foundation constructed of adobe bricks.
Surface Features: A low wall/foundation constructed of adobe bricks was identified and recorded at the site. The wall was mapped and photographed.

Site: Je-474
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0679619 Northing: 9200620
Site Location Description: This site is located to the north of Quebrada Talambo on a low terrace that extends to the west from the base of the Cerros de Talambo and overlooks the Pampa de Talambo. The terrace is bisected by a small drainage.
Site Dimensions: East/West: 95 m North/South: 80 m
Surface Collections: 19 lithic artifacts.
Site Description: This site consists of a light lithic scatter located on a low terrace that overlooks the Pampa de Talambo. Several lithic tools were collected from the site, including one limace and a limace fragment, two finely retouched unifaces, and one medial section of a biface. In addition to the tools, one core and 13 flakes and flake fragments were collected.
Surface Features: None observed.

Site: Je-475
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0679606 Northing: 9200833
Site Location Description: This site is located to the north of the mouth of Quebrada Talambo and is situated on the southern edge of a high terrace that extends to the west from the base of the Cerros de Talambo and overlooks the Pampa de Talambo. The terrace is bordered along the southern margin by a steep drainage cut.
Site Dimensions: East/West: 280 m North/South: 165 m
Surface Collections: 15 lithics; 1 ceramic.

Site Description: This site consists of a light density scatter of lithics with an area of higher (medium) density on the southern margin of the site. Lithic artifacts collected from the site include two biface fragments (one medial and one distal fragment), one uniface (perforator or cutter), and 12 flakes and flake fragments. All of the lithic tools were recovered from the area of higher density concentration on the southern margin of the site.
Surface Features: A small alignment of rough stones (like a low wall) was noted in the center of the eastern margin of the site, near the *cerro*.

Site: Je-478
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0679274 Northing: 9201446
Site Location Description: This site is located to the north of the mouth of Quebrada de Talambo along the western base of the Cerros de Talambo. The site is situated on a series of heavily dissected low terraces that extend to the west from the base of the Cerros de Talambo and overlook the Pampa de Talambo.
Site Dimensions: East/West: 130 m North/South: 190 m
Surface Collections: 27 lithics; 8 ceramics.
Site Description: This site consists of a large, light density scatter of lithics and ceramics that was located on the lower (western) end of several highly dissected, adjacent terraces. The lithic artifact scatter was continuous across the lower end of the terraces, while the ceramic scatter was intermittent. Lithic artifacts collected from the site include three biface fragments (including one medial section of a Paiján point manufactured from rhyolite), one grinding stone fragment (quartzite), three utilized flakes, one core, and 19 flakes and flake fragments.
Surface Features: None observed.

Site: Je-481
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0679282 Northing: 9202226
Site Location Description: This site is located to the north of the mouth of the Quebrada Talambo along the western base of the Cerros del Talambo. The site is situated on a low terrace in the Pampa de Talambo and is bordered to the east by higher terraces that extend out (westward) from the Cerros de Talambo. The terrace is bordered to the west by a small drainage.
Site Dimensions: East/West: 25 m North/South: 15 m
Surface Collections: 18 lithic artifacts.
Site Description: This site consists of a light to medium density scatter of lithics on a low terrace in the Pampa de Talambo. Lithic artifacts recovered from the site include two biface fragments that conjoin to form a bifacial perform (manufactured of quartzite) and 16 flakes and flake fragments.
Surface Features: None observed.

Site: Je-484
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0679907 Northing: 9203179

Site Location Description: This site is located on a low, gently sloping terrace that is situated between the northwestern base of the Cerros de Talambo and a smaller outlying *cerro* on the edge of Pampa Talambo and Pampa Larga.
Site Dimensions: Northeast/Southwest: 170 m Northwest/Southeast: 50 m
Surface Collections: 48 lithic artifacts.
Site Description: This site consists of a light to medium density scatter of lithics. Lithic tools identified and collected from the site include several Paiján projectile points (primarily manufactured of rhyolite, which outcrops near the site) and late-stage bifaces. A total of four features were identified on the surface of Je-484.
Surface Features: Two structures (Structures 1 and 2) were identified at Je-484. Structure 1 (2.3 m E/W x 1.15 m N/S) is a stone-lined, semi-lunar form. Structure 2 (2.8 m E/W x 2.2 m N/S) is a stone-lined, circular form. A Paiján projectile point was recorded between the two structures, suggesting an Early Preceramic cultural affiliation. In addition to the two structures, a linear arrangement of stones was also documented (Feature 3). These stones may represent a *pirca*-like structure or some other kind of stone feature. Lastly, a rectangular, stone-lined hearth (Feature 4)(1.42 m E/W x 1.46 m N/S) was documented in the northeastern portion of the site. A 50-cm^2 test unit was excavated in the interior of Feature 4 and resulted in the collection of a carbon sample that yielded an AMS date of 1578±33 RCYBP (AA57954), indicating a Moche-aged occupation/use of this portion of the site.

Site: Je-766
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0681472 Northing: 9203622
Site Location Description: This site is located on a long, low terrace that parallels the northern base of the Cerros de Talambo and overlooks Pampa Larga.
Site Dimensions: East/West: 40 m North/South: 40 m
Surface Collections: 50 lithic artifacts.
Site Description: This small site consists of a medium density lithic scatter. An area of higher density concentration of lithics was identified on the northern end of the site. This concentration included two Paiján projectile points. Other lithic tools collected from the site include several bifaces, a uniface, and a retouched flake.
Surface Features: None observed.

Site: Je-769
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0681729 Northing: 9203115
Site Location Description: This site is located on a high, flat saddle that overlooks the mouth of the first large *quebrada* east of the Cerros de Talambo in the Río Chamán drainage. The terrace has a commanding view over the *quebrada* mouth and northward out onto Pampa Larga.
Site Dimensions: East/West: 25 m North/South: 30 m
Surface Collections: 16 lithic artifacts.
Site Description: This site consists of a small, generally light density lithic scatter with areas of medium density concentrations. The lithic raw material *toba volcanica* outcrops at this site and was apparently a source/quarry location. Lithic materials from the site

include primary bifaces, numerous cortical flakes, and cores, which also suggest early stage lithic reduction and are consistent with a quarry location.
Surface Features: None observed.

Site: Je-770
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0681956 Northing: 9203206
Site Location Description: This site is located along the western margin of the first large *quebrada* east of the Cerros de Talambo in the Río Chamán drainage. The site is situated on a long, high terrace that extends northward from the mouth of a small, side *quebrada* toward the main *quebrada* drainage.
Site Dimensions: East/West: 10 m North/South: 37 m
Surface Collections: 14 lithic artifacts.
Site Description: This site consists of a small, light density scatter of lithics. A higher density concentration of quartz flakes was identified and recorded on the southern end of the site.
Surface Features: None observed.

Site: Je-772 (also discussed in Stackelbeck 2008)
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682052 Northing: 9203067
Site Location Description: This site is located in the mouth of a small, side *quebrada* that opens into the southern margin of the first large *quebrada* east of the Cerros del Talambo in the Río de Chamán drainage. The site is situated on a long, gently sloping high terrace that extends to the north from the mouth of the side *quebrada* into the main *quebrada* drainage. The terrace is bordered on the eastern and western sides by deep drainages.
Site Dimensions: East/West: 140 m North/South: 205 m
Surface Collections: 59 lithic artifacts.
Site Description: This site consists of a medium to high density scatter of lithics. The highest density of artifacts was noted on the southern (upslope) end of the site. Lithic tools identified and recovered from the site include several Paiján points, a groundstone fragment, bifaces, and several retouched/utilized flakes. A light to medium density scatter of land snails was present across the surface of the site, but appeared to be more concentrated on the southern end of the site.
Surface Features: None observed.

Site: Je-777
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682466 Northing: 9203075
Site Location Description: This site is located on a high terrace along the southwestern margin of the first large *quebrada* east of the Cerros de Talambo in the Río de Chamán drainage. The terrace extends to the north from the base of the Cerros de Talambo into the main *quebrada* drainage.
Site Dimensions: East/West: 35 m North/South: 40 m
Surface Collections: 13 lithic artifacts.

Site Description: This small site consists of a light density lithic scatter. A Paiján projectile point and a limace fragment were collected from the site.
Surface Features: None observed.

Site: Je-778
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682549 Northing: 9203149
Site Location Description: This site is located on a low (northern) end of a long terrace that extends to the northwest from the low northern slopes of the Cerros de Talambo into the main *quebrada* drainage. The site is bordered on the northern end by the main *quebrada* drainage. This terrace is located in the first large *quebrada* east of the Cerros de Talambo in the Río de Chamán drainage.
Site Dimensions: East/West: 27 m North/South: 48 m
Surface Collections: 37 lithic artifacts.
Site Description: This site consists of a small, medium density scatter of lithics. There is a concentration of very large boulders on the southern end of the site. Lithic artifacts were noted within and around these boulders. Tools recovered from the site included a single Paiján projectile point and several utilized flakes.
Surface Features: None observed.

Site: Je-780 (also discussed in Stackelbeck 2008)
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682944 Northing: 9203179
Site location description: This site is located on a long high terrace that extends westward from the low northern slope of the Cerros de Talambo near the head of *quebrada* drainage. The terrace landform parallels the drainage, and is dissected by smaller drainages.
Site dimensions: East/West: 290 m North/South: 180 m
Surface Collections: 57 lithics, 2 ceramics.
Site description: This is a large site that was arbitrarily separated into three zones for the purposes of recording. Zone 1 comprises the upper, easternmost portion of the site; Zone 2 represents the central portion of the site; and Zone 3 is the lower, westernmost portion of the site. Within each of the three zones there was a light to medium density of lithic artifacts—predominantly comprised of manufacturing debris, with a few unifacial and flake tools. A single biface was observed and collected.
Surface features recorded: Two circular stone-lined structures (1.75 x 3.5 m and 2.0 x 2.5 m), two oval, stone-lined features (1.2 x 2.15 m and 64 cm x 1 m), and one small stone-lined roughly square feature (possible hearth, measures 80 x 94 cm) were recorded on the surface of the site.

Site: Je-785
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682558 Northing: 9204359
Site Location Description: This site is located along the eastern margin of the first large *quebrada* east of the Cerros de Talambo in the Río Chamán drainage. The site is situated

on a low saddle between two small *cerros* and overlooks the main *quebrada* floor to the south.
Site Dimensions: East/West: 20 m North/South: 35 m
Surface Collections: 23 lithic artifacts.
Site Description: This site consists of a small, medium density scatter of lithics. The lithic debitage and tools recovered from this site are indicative of early stage bifacial reduction and include bifaces, a core, and several cortical flakes.
Surface Features: None observed.

Site: Je-789
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0681786 Northing: 9204379
Site Location Description: This site is located along the eastern margin of the first large *quebrada* east of the Cerros de Talambo in the Río Chamán drainage. The site is situated on a long, low terrace that extends to the north/northwest from the mouth of the *quebrada* toward Pampa Larga.
Site Dimensions: East/West: 16 m North/South: 30 m
Surface Collections: 27 lithic artifacts.
Site Description: This site consists of a small, light density scatter of lithics.
Surface Features: None observed.

Site: Je-790 (also discussed in Stackelbeck 2008)
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682380 Northing: 9203520
Site Location Description: This site is located in the central-southern portion of the first *quebrada* east of the Cerros del Talambo in the Río de Chamán drainage. The site is situated on an ancient paleodune and high, sloping terrace that extends to the southeast toward the mouth of the *quebrada*. At some point in the past (likely during the mid- to late-Pleistocene), the paleodune stabilized on the surface of the high terrace landform, creating a 'hill-like' high spot on the surface of the terrace. Artifacts were recovered and recorded from atop the paleodune and across the surface of the high terrace. The northern boundary of the site is marked by a steep drainage.
Site Dimensions: East/West: 414 m North/South: 240 m
Surface Collections: 198 lithic artifacts.
Site Description: This very large site consists of areas of light to high density scatters of lithics located on both the paleodune and terrace surfaces. A continuous light density scatter of lithics was present across the entirety of the site, but distinct areas with higher densities of surface artifacts were also noted. Lithics from the site included Paiján projectile points, bifaces, a variety of unifacial and flake tools, and groundstone implements. Due to the large size and varying surface densities of artifacts, the site was originally recorded and collected in four zones (Zones I-IV). Zone I was located on a low rise that comprised the northwestern boundary of the site and contained a light to medium density of lithic tools and debris, along with a single "L-shaped" structure (Structure 7)(discussed below). Zone II comprises the surface of the paleodune in the central portion of the site. Zone II contained a medium to high density concentration of lithic tools and debris. In addition, four structures (Structures 1-4) were also recorded in

Zone II. Zone III comprises a low rise on the northeastern portion of the site and contained a continuous light density scatter of lithic artifacts. Zone IV comprises the southern portion of the site and contained a light to medium density scatter of lithic artifacts, with restricted areas of high density concentrations. In addition to the lithic tools and debris, two structures were recorded in Zone IV (Structures 5 and 6).
Surface Features: A total of seven structures were recorded at Je-790. Structure forms included "L-shaped" (n=4) and semi-lunar (n=3). Four of the structures (Structures 1-4) were recorded in close association with one another near the top of the paleodune (Zone II). Structures 5 and 6 also were recorded in close association with one another along the southern site boundary. Structure 7 was located in the northwestern portion of the site (Zone I) and was not associated with any of the other structures.

Site: Je-791
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682772 Northing: 9203459
Site Location Description: This site is located in the central-southern portion of the first *quebrada* east of the Cerros de Talambo in the Río de Chamán drainage. The site is situated on a high, sloping terrace that extends to the southeast toward the mouth of the *quebrada*. The terrace is covered on the southern (upper) end by large boulders.
Site Dimensions: East/West: 105 m North/South: 25 m
Surface Collections: 19 lithic artifacts.
Site Description: This site consists of a light density scatter of lithics. The lithics are confined to the upper (southern) end of the terrace and are located around and between the large boulders on this end of the site. There appear to be cleared, open areas within the boulder mass that contain flakes and may have served as shelter locations.
Surface Features: None observed.

Site: Je-793
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682841 Northing: 9203407
Site Location Description: This site is located in the central-southern portion of the first *quebrada* east of the Cerros de Talambo in the Río de Chamán drainage. The site is situated on a low, sloping terrace that extends to the southeast and overlooks the deep, upper portion of the main *quebrada* drainage.
Site Dimensions: East/West: 45 m North/South: 20 m
Surface Collections: 22 lithic artifacts.
Site Description: This site consists of a small, light density scatter of lithics. Lithic tools identified and collected from the site include a biface fragment, a uniface fragment, a groundstone fragment, and several utilized flakes.
Surface Features: None observed.

Site: Je-795
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0683307 Northing: 9203058
Site Location Description: This site is located in central-southeastern portion of the first *quebrada* east of the Cerros de Talambo in the Río de Chamán drainage. The site is

situated on a high, sloping terrace that extends from the *cerro* northward toward the main *quebrada* drainage.
Site Dimensions: East/West: 78 m North/South: 48 m
Surface Collections: 22 lithics; 7 ceramics.
Site Description: This site consists of a small, light density scatter of lithics. The lone lithic tool identified and collected from this site was a limace fragment. Several ceramics were also noted across the surface of the site, including both Moche and Chimú sherds. Quartz, quartz crystal, and quartzite all outcrop on the high *cerro* immediately south of the site.
Surface Features: None observed.

Site: Je-798
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0683916 Northing: 9202741
Site Location Description: This site is located in the extreme southeastern portion of the first *quebrada* east of the Cerros de Talambo in the Río de Chamán drainage. The site is situated on a high, gently sloping terrace that directly overlooks the intersection of the main *quebrada* drainage and a small side drainage.
Site Dimensions: East/West: 48 m North/South: 22 m
Surface Collections: 33 lithic artifacts.
Site Description: This site consists of a light density scatter of lithics located on a high terrace near the back of the *quebrada*. Lithic tools collected from the site included a uniface, a primary biface, and utilized flakes.
Surface Features: None observed.

Site: Je-800
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682276 Northing: 9204749
Site Location Description: This site is located along the eastern margin of the first *quebrada* east of the Cerros de Talambo in the Río de Chamán drainage. The site is situated on a low, gently sloping terrace that extends to the northwest from the base of the *cerros* toward Pampa Larga.
Site Dimensions: East/West: 38 m North/South: 44 m
Surface Collections: 62 lithic artifacts.
Site Description: This site consists of a small, high density scatter of lithics. Lithics tools identified and collected from this site include two Paiján projectile points, a limace, and several bifaces. Several cores and tested cobbles (*toba volcanica* and basalt) were also observed on the surface of the site, but were not collected.
Surface Features: None observed.

Site: Je-803
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0683111 Northing: 9205210
Site Location Description: This site is located on the northern edge of the *cerros* that separate the first and second large *quebradas* east of the Cerros de Talambo in the Río de

Chamán drainage. The site is situated on a low, flat terrace that is located between two small *cerros*. The terrace extends westward toward Pampa Larga.
Site Dimensions: East/West: 114 m North/South: 32 m
Surface Collections: 24 lithic artifacts.
Site Description: This site consists of a light density lithic scatter located across the surface of this long, thin terrace.
Surface Features: None observed.

Site: Je-804 (also discussed in Stackelbeck 2008)
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682971 Northing: 9205341
Site Location Description: This site is located on the northern edge of the *cerros* that separate the first and second large *quebradas* east of the Cerros de Talambo in the Río de Chamán drainage. The site is situated on a low, gently sloping terrace that extends to the west from the base of a low *cerro* toward Pampa Larga. The site has a commanding view of Pampa Larga and the Río Chamán drainage.
Site Dimensions: East/West: 450 m North/South: 140 m
Surface Collections: 90 lithics; 2 ceramics.
Site Description: This site consists of a long, narrow scatter of lithics with generally medium to high density concentrations, although areas with very high density concentrations of lithics were observed. An abundance of lithic tools were recovered from this site including numerous Paiján projectile points, limaces, broken bifaces, and retouched/utilized flakes. The overall distribution of artifacts, although continuous, was denser on the eastern (upslope) end of the site. Seven distinct lithic knapping stations were identified across the surface of the site. In addition, a single, "L-shaped" structure (stone lined foundation) was recorded along the northern border of the site (see site map in Chapter 7).
Surface Features: Seven distinct lithic knapping stations were identified and recorded at the site. These features are detailed below.
Knapping Station 1 (1.3 m E/W x 1.4 m N/S)—consisted entirely of *toba volcanica* debitage. Also contained a single hammerstone.
Knapping Station 2 (2 m N/S x 1.6 m E/W)—consisted of a core and debitage of *toba volcanica*.
Knapping Station 3 (1 m N/S x 1.2 m E/W)—consisted entirely of *toba volcanica* debitage.
Knapping Station 4 (3.3 m N/S x 2.8 m E/W)—predominantly consisted of *toba volcanica* debitage, but also contained some quartzite.
Knapping Station 5 (6 m N/S x 4.5 m E/W)—consisted entirely of quartzite debitage.
Knapping Station 6 (3 m N/S x 1 m E/W)—consisted of several tested cobbles and debitage of *toba volcanica*.
Knapping Station 7 (2.5 m N/S x 3 m E/W)—consisted of debitage of quartzite and *toba volcanica*.

Site: Je-805
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0683255 Northing: 9205431

Site Location Description: This site is located along the western margin of the mouth of the second large *quebrada* east of the Cerros de Talambo in the Río de Chamán drainage. The site is situated on a low terrace that extends to the northwest from the base of the *cerro* into the mouth the *quebrada*.
Site Dimensions: East/West: 485 m North/South: 60 m
Surface Collections: 36 lithic artifacts.
Site Description: This site consists of a large, light to medium density scatter of lithics. There are numerous large boulders on the southeast portion of the site and the lithic scatter is densest in this area. These boulders may have provided temporary or expedient shelters for the site occupants.
Surface Features: None observed.

Site: Je-812
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0684254 Northing: 9204964
Site Location Description: This site is located along the southeastern margin of the second large *quebrada* east of the Cerros de Talambo in the Río de Chamán drainage. This site is situated on a high, flat terrace that extends to the southwest from the base of Cerro Horcón toward the main *quebrada* drainage.
Site Dimensions: East/West: 190 m North/South: 80 m
Surface Collections: 50 lithic artifacts.
Site Description: This site consists of a large, light to medium density scatter of lithics. The density of artifacts is greatest on the eastern end of the site. A light density scatter of land snails was present across the surface of the site. Lithic tools identified and collected from the site include an unidentified projectile point manufactured from quartz crystal and retouched flakes.
Surface Features: None observed.

Site: Je-814
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0683578 Northing: 9205371
Site Location Description: This site is located in the mouth of the large *quebrada* west of Cerro Horcón in the Río de Chamán drainage. The site is situated on a long, high terrace that extends northwest toward Pampa Larga.
Site Dimensions: East/West: 250 m North/South: 65 m
Surface Collections: 33 lithic artifacts.
Site Description: This site consists of a large, generally light density scatter of lithics with areas of medium density concentration. Areas of higher density artifact concentrations were most common on the western end of the site. Lithic tools identified and collected from the site include a Paiján projectile point and several biface fragments.
Surface Features: None observed.

Site: Je-817
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0683839 Northing: 9205246

Site Location Description: This site is located along the eastern margin of the large *quebrada* directly west of Cerro Horcón in the Río de Chamán drainage. The site is situated on a high terrace that extends to the west from the base of Cerro Horcón. The terrace is bordered on the eastern edge by the deep main *quebrada* drainage.
Site Dimensions: East/West: 76 m North/South: 98 m
Surface Collections: 45 lithic artifacts.
Site Description: This site consists of a continuous medium density scatter of lithics. Lithic tools identified and collected from the site included two Paiján projectile points, a uniface, and several bifaces.
Surface Features: None observed.

Site: Je-818
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0683958 Northing: 9205187
Site Location Description: This site is located along the eastern margin of the large *quebrada* directly west of Cerro Horcón in the Río de Chamán drainage. The site is situated on a low hillslope and adjacent flat area that sit at the western base of Cerro Horcón. The flat area is bordered on the northern and southern edges by small side drainages that run into the main *quebrada* drainage.
Site Dimensions: East/West: 90 m North/South: 108 m
Surface Collections: 42 lithic artifacts.
Site Description: This site consists of a light to medium density scatter of lithics. Several bifaces and a hammerstone fragment were collected from this site.
Surface Features: None observed.

Site: Je-820
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0683062 Northing: 9206490
Site Location Description: This site is located along the eastern margin of the mouth of the first *quebrada* directly west of Cerro Horcón in the Río de Chamán drainage. The site is situated on a low, sloping terrace on the *pampa* adjacent to the extreme northwest portion of Cerro Horcón.
Site Dimensions: East/West: 11 m North/South: 14 m
Surface Collections: 12 lithic artifacts.
Site Description: This site consists of a small, light density scatter of several quartzite flakes and a biface fragment.
Surface Features: None observed.

Site: Je-825
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682764 Northing: 9205903
Site Location Description: This site is located on the western side of the mouth of the first *quebrada* directly west of Cerro Horcón in the Río de Chamán drainage. The site is situated on a low, sloping terrace that extends northwest from the edge of the *quebrada* mouth out onto Pampa Larga. This site has an excellent view of the Río de Chamán drainage.

Site Dimensions: East/West: 49 m North/South: 67 m
Surface Collections: 15 lithic artifacts.
Site Description: This site consists of a small, light to medium density scatter of lithics. A core, a primary biface, and several flakes were collected from this site.
Surface Features: None observed.

Site: Je-827
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682993 Northing: 9205553
Site Location Description: This site is located on the western side of the mouth of the first large *quebrada* directly west of Cerro Horcón in the Río de Chamán drainage. The site is situated on a low, sloping terrace that extends to the west from the edge of the mouth of the *quebrada* out onto Pampa Larga. This site has an excellent view of the *pampa* and Río de Chamán drainage.
Site Dimensions: East/West: 93 m North/South: 63 m
Surface Collections: 19 lithic artifacts.
Site Description: This small site consists of a medium density scatter of lithics that included two biface fragments and retouched/utilized flakes.
Surface Features: None observed.

Site: Je-829
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682396 Northing: 9205364
Site Location Description: This site is located on the edge of the *pampa* in between the first and second large *quebradas* east of the Cerros de Talambo in the Río de Chamán drainage. The site is situated on a low terrace that extends to the west from the base of the nearby *cerro* out onto Pampa Larga and is adjacent to a small drainage.
Site Dimensions: East/West: 138 m North/South: 55 m
Surface Collections: 26 lithic artifacts.
Site Description: This site consists of a light density scatter of lithics that included a Paiján projectile point and several bifaces.
Surface Features: None observed.

Site: Je-832
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0681933 Northing: 9205435
Site Location Description: This site is located on the edge of the *pampa* in between the first and second large *quebradas* east of the Cerro de Talambo in the Río de Chamán drainage. The site is situated on a low, sloping terrace that extends to the west from the nearby *cerro* out onto Pampa Larga and is adjacent to a low, dry side drainage.
Site Dimensions: East/West: 50 m North/South: 99 m
Surface Collections: 9 lithic artifacts.
Site Description: This site consists of a small, very light density lithic scatter that included a primary biface fragment and a retouched flake.
Surface Features: None observed.

Site: Je-834
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0682132 Northing: 9204951
Site Location Description: This site is located on the edge of the *pampa* in between the first and second large *quebradas* east of the Cerros de Talambo in the Río de Chamán drainage. The site is situated on a low, sloping terrace that extends northwest from the base of the nearby *cerros* out onto Pampa Larga.
Site Dimensions: East/West: 11 m North/South: 29 m
Surface Collections: 35 lithic artifacts.
Site Description: This site consists of a small, light density scatter of lithics. A single biface fragment was recovered from the site and the observed and collected lithics indicate primarily late stage reduction.
Surface Features: None observed.

Site: Je-841
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0681672 Northing: 9204060
Site Location Description: This site is located on a low terrace on Pampa Larga north of the mouth of the first large *quebrada* east of the Cerros de Talambo in the Río de Chamán drainage. The terrace extends to the northwest from the mouth of the *quebrada* out onto Pampa Larga.
Site Dimensions: East/West: 13 m North/South: 50 m
Surface Collections: 22 lithic artifacts.
Site Description: This small site consists of a light density lithic scatter. A biface fragment, a retouched flake, and several flakes comprise the lithics collected from this site.
Surface Features: None observed.

Site: Je-843
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0680022 Northing: 9203443
Site Location Description: This site is located on the *pampa* to the north of the northwestern margin of the Cerros de Talambo. This site is situated on a low terrace that extends northward from the base of the *cerro* out into Pampa Larga and Pampa Talambo.
Site Dimensions: East/West: 35 m North/South: 17 m
Surface Collections: 38 lithic artifacts.
Site Description: This site consists of a small, light density scatter of lithics. A single biface fragment and several flakes were recovered from this site.
Surface Features: None observed.

Site: Je-844
Subarea: Quebrada Talambo Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0679917 Northing: 9203440
Site Location Description: This site is located on the *pampa* to the north of the northwestern margin of the Cerros de Talambo. This site is situated on a low terrace that extends to the west/northwest from the base of the *cerro* out into Pampa Larga and

Pampa Talambo. The terrace is bordered on the northern and southern edges by small, dry drainages.
Site Dimensions: East/West: 53 m North/South: 18 m
Surface Collections: 14 lithic artifacts.
Site Description: This small site consists of a very light density scatter of lithics. Two biface fragments, a core, and several flakes were collected from the site.
Surface Features: None observed.

Site: Je-849
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0674887 Northing: 9220101
Site Location Description: This site is located on a low, dissected terrace extending south from Cerro Colorado near the northern edge of the mouth of Quebrada Colorado.
Site Dimensions: East/West: 27 m North/South: 191 m
Surface Collections: 35 lithic artifacts.
Site Description: This site was a long, medium density lithic scatter consisting of flakes, a limace, and a uniface. Surface debitage appears to include both early and late stage reduction materials. A biface fragment and two unifacial tools were collected from this site.
Surface Features: None observed.

Site: Je-850
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0674714 Northing: 9219822
Site Location Description: This site is located on a long and high remnant terrace that is situated in the central portion of the mouth of Quebrada Colorado.
Site Dimensions: East/West: 70 m North/South: 218 m
Surface Collections: 33 lithic artifacts.
Site Description: This is a large, continuous medium density lithic scatter with areas of high density artifact concentrations. The hillslope to the east/northeast of the site evidence outcrops of quartzite and may have been a source location for raw materials at this site. Observed lithic artifacts included cores, flakes from early and late stage reduction and bifacial performs. The southern and central portions of the site contained the highest density of lithic artifacts, particularly late stage quartzite flakes. Several bifaces, a projectile point midsection, and a limace were collected from this site.
Surface Features: None observed.

Site: Je-851
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0674728 Northing: 9219347
Site Location Description: This site is located on a low terrace that extends southward from the mouth of Quebrada Colorado toward the Quebrada del Batán drainage.
Site Dimensions: East/West: 52 m North/South: 112 m
Surface Collections: 35 lithic artifacts.
Site Description: This site is characterized as a medium to high density lithic scatter with areas of very dense flake scatters that appear to represent lithic knapping stations.

Numerous bifaces and early and late stage reduction debris (primarily of quartzite) were the most prevalent artifacts. A grinding slab (*batan*) was recorded at the western edge of the site. A light scatter of land snails was also noted on the surface. Several bifacial and unifacial tools were collected from this site.
Surface Features: None observed.

Site: Je-852
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0675179 Northing: 9219738
Site Location Description: This site is located on a low terrace adjacent to the southeastern edge of Cerro Colorado along the western edge of the Quebrada del Batán drainage.
Site Dimensions: East/West: 24 m North/South: 39 m
Surface Collections: 23 lithic artifacts.
Site Description: This site is a small, light density lithic scatter. The site appears heavily deflated.
Surface Features: None observed.

Site: Je-853
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0675688 Northing: 9220101
Site Location Description: This site is located on a heavily dissected high terrace that extends southward from Cerro Colorado and is situated inside of a small side canyon on the western margin of the Quebrada del Batán drainage.
Site Dimensions: East/West: 22 m North/South: 35 m
Surface Collections: 13 lithic artifacts.
Site Description: This site is a small, light density lithic scatter with a few land snails present on the surface. The site has been dissected by small, relict tributary channels and appears deflated. The proximal end of a Paiján point was collected from the surface of this site.
Surface Features: None observed.

Site: Je-855
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676465 Northing: 9222325
Site Location Description: This site is located on a high terrace extending to the east from Cerro Colorado toward the Quebrada del Batán drainage.
Site Dimensions: East/West: 105 m North/South: 68 m
Surface Collections: 32 lithic artifacts.
Site Description: This site consists of a discontinuous, light density lithic scatter.
Surface Features: None observed.

Site: Je-856
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676510 Northing: 9222439

Site Location Description: This site is located on the low (eastern) end of a long, high terrace that extends eastward from Cerro Colorado toward the Quebrada del Batán drainage. The terrace directly overlooks the Quebrada del Batán drainage and is approximately 10 m above the floor of the *quebrada*.
Site Dimensions: East/West: 89 m North/South: 81 m
Surface Collections: 27 lithic artifacts.
Site Description: This site is a large, light to medium density lithic scatter. Numerous land snails are present on the surface of the site. Many of the land snails and several lithics were found in small erosion cuts into the site surface and suggest that they have eroded out of intact deposits at the site.
Surface Features: None observed.

Site: Je-858
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676178 Northing: 9222513
Site Location Description: This site is situated on the upper portion of a high terrace that extends east/northeast from the eastern slopes of Cerro Colorado toward the floor of Quebrada del Batán.
Site Dimensions: East/West: 16 m North/South: 56 m
Surface Collections: 13 lithic artifacts.
Site Description: This site is a small, light density lithic scatter with a concentration of quartz and quartz crystal flakes near the center of the site. Numerous land snails were also observed on the surface of the site. A Paiján projectile point was also recovered from this site.
Surface Features: None observed.

Site: Je-859
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676320 Northing: 9222505
Site Location Description: This site is located on the middle and upper end of a long, high terrace that extends eastward from Cerro Colorado toward the Quebrada del Batán drainage.
Site Dimensions: East/West: 161 m North/South: 59 m
Surface Collections: 45 lithic artifacts.
Site Description: This site is a large, light density lithic scatter located on a side terrace overlooking the main *quebrada* drainage. Several bifacial and unifacial tools were recovered from the surface of the site. Numerous land snails were observed on the surface of the site.
Surface Features: None observed.

Site: Je-866
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676435 Northing: 9223394
Site Location Description: This site is located on a high terrace extending southeast from the eastern slopes of Cerro Colorado toward the Quebrada del Batán drainage.
Site Dimensions: Northeast/Southwest: 45 m Northwest/Southeast: 186 m

Surface Collections: 31 lithic artifacts.
Site Description: This site consists of a large, light density lithic scatter.
Surface Features: None observed.

Site: Je-868
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676903 Northing: 9223262
Site Location Description: This site is located on a dissected, high terrace that extends eastward from Cerro Colorado toward the floor of the Quebrada del Batán drainage.
Site Dimensions: East/West: 55 m North/South: 27 m
Surface Collections: 23 lithic artifacts.
Site Description: This site consists of a small, light density lithic scatter.
Surface Features: None observed.

Site: Je-870
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676538 Northing: 9223523
Site Location Description: This site is located in a saddle between Cerro Colorado and a smaller *cerro* that extends east toward the floor of Quebrada del Batán. This landform acts as a pass into the northernmost end of the Quebrada del Batán drainage.
Site Dimensions: East/West: 108 m North/South: 119 m
Surface Collections: 36 lithic artifacts.
Site Description: This site consists of a large, light to medium density lithic scatter. Quartz and quartz crystal flakes were scattered across the northwest and central portions of the site. Land snails were noted on the site surface, but not in great abundance.
Surface Features: None observed.

Site: Je-873
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676300 Northing: 9224281
Site Location Description: This site is located on a heavily dissected, low terrace formation adjacent to the eastern edge of Cerro Colorado and borders a low, dry drainage that runs east to the floor of the Quebrada del Batán.
Site Dimensions: East/West: 54 m North/South: 72 m
Surface Collections: 24 lithics; 1 marine shell fragment.
Site Description: This site consists of a light to medium density lithic scatter that extends across a large terrace formation that has been heavily dissected by drainage erosion. Several lithic tools and flakes were collected from the site surface, including a Paiján projectile point. A few land snails were also noted on the surface of the site. There appear to be two ancient, dry springs located to the west and southwest of the site on the lower slopes of Cerro Colorado.
Surface Features: None observed.

Site: Je-875
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676400 Northing: 9224502

Site Location Description: This site is located on a heavily dissected, low terrace that extends east from the base of Cerro Colorado toward the floor of the Quebrada del Batán drainage.
Site Dimensions: East/West: 93 m North/South: 58 m
Surface Collections: 20 lithic artifacts.
Site Description: This site consists of a large, light density lithic scatter.
Surface Features: None observed.

Site: Je-879
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676372 Northing: 9225089
Site Location Description: This site is located on a low dissected terrace that extends to the southeast from the base of Cerro Colorado toward the floor of Quebrada del Batán.
Site Dimensions: East/West: 44 m North/South: 32 m
Surface Collections: 15 lithic artifacts.
Site Description: This site consists of a small, very light density lithic scatter across the terrace surface.
Surface Features: None observed.

Site: Je-881
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676422 Northing: 9225303
Site Location Description: This site is located in a small side canyon along the western margin of the Quebrada del Batán drainage and along the eastern base of Cerro Colorado. The site is situated on a low flat terrace that extends eastward toward the floor of Quebrada del Batán. The site also extends partially up the neighboring hillslope to the northwest and encompasses a small rockshelter on the hillslope.
Site Dimensions: East/West: 107 m North/South: 102 m
Surface Collections: 28 lithic artifacts.
Site Description: This site consists of a light density lithic scatter across the surface of the terrace. The lithic scatter also continues up the neighboring hillslope to the location of a small rockshelter, which overlooks the site. The rockshelter, which measures 6 m x 2.5 m, contained little to no sediment and no artifacts. A very light scatter of flakes was encountered on the slope in front of the rockshelter. Land snails were present across the surface of the site, including the slope in front of the rockshelter.
Surface Features: None observed.

Site: Je-888
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677941 Northing: 9225960
Site Location Description: This site is located on a low dissected terrace that extends southward from the northern margin of the Quebrada del Batán toward the main *quebrada* drainage.
Site Dimensions: East/West: 42 m North/South: 48 m
Surface Collections: 15 lithic artifacts.

Site Description: This site consists of a light density scatter of lithics. Several bifaces and flakes were concentrated in the northwest portion of the site. All were manufactured of quartz and quartz crystal and this area may represent a small knapping station.
Surface Features: None observed.

Site: Je-897 (also discussed in Stackelbeck 2008)
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677859 Northing: 9223477
Site Location Description: This site is located in the central portion of a long, high terrace that extends to the west/southwest from Cerro del Examén toward the eastern margin of the Quebrada del Batán drainage. The terrace is bordered on either site by deeply entrenched erosional drainages.
Site Dimensions: East/West: 31 m North/South: 109 m
Surface Collections: 28 lithic artifacts.
Site Description: This site consists of a very light, but continuous, scatter of lithics across the surface of the terrace. A circular, rock structure was also recorded on the west end of the site.
Surface Features: Circular structure (1.9 m N/S x 1.9 m E/W). Lithic debitage was also recorded around the structure.

Site: Je-899
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0678245 Northing: 9223369
Site Location Description: This site is located on the top and slopes of a low hill/ridge within a system of highly dissected terraces on the east side of a small drainage adjacent to the base of Cerro del Examén.
Site Dimensions: East/West: 19 m North/South: 22 m
Surface Collections: 20 lithic artifacts.
Site Description: This site is a very small, medium density lithic scatter that is located on a small hill/ridge that has been heavily eroded. The majority of the lithics were recovered from the slopes of the hill and included a small, unidentified basally-notched projectile point manufactured of quartz crystal and the distal end of a Paiján point. Lithic debitage observed on the surface of the site was indicative of late stage reduction and bifacial thinning or retouch. Land snails were also observed on the surface of the site.
Surface Features: None observed.

Site: Je-900
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0678164 Northing: 9223286
Site Location Description: This site is located on the southern slope of a low hill in an area of highly dissected terraces that are situated adjacent to the base of Cerro del Examén.
Site Dimensions: East/West: 20 m North/South: 37 m
Surface Collections: 12 lithic artifacts.
Site Description: This site is a small, light density scatter of lithics located on a low hillslope that extends south/southwest away from a small hill. A small, unidentified

stemmed projectile point manufactured of quartz crystal was found near the center of the site.
Surface Features: None observed.

Site: Je-901 (also discussed in Stackelbeck 2008)
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677864 Northing: 9223128
Site Location Description: This site is located on the upper end of a long, gently sloping low terrace that extends west/southwest from the base of Cerro del Examén toward the eastern margin of Quebrada del Batán. The terrace is bordered by a low, dry drainage to the north.
Site Dimensions: East/West: 405 m North/South: 63 m
Surface Collections: 53 lithic artifacts.
Site Description: This site is a large, generally light density lithic scatter with areas of high density concentrations of lithics. The east end of the site contains the highest concentration of lithics. Numerous lithic tools were identified and collected from the surface of the site including several Paiján points, late stage bifaces, and limaces. Several different varieties of raw material were also present. A very small scatter of non-diagnostic ceramics was also noted on the eastern end of the site, although none were collected. Several concentrations of land snails were also noted on the surface of the site.
Surface Features: A small ditch/canal was observed on the eastern end of the site. Near the upslope end, on either side of the ditch, was a collection of three large, flat stones that had been positioned to stand upright. Although the function or age of this feature could not be determined, it is clearly non-natural.

Site: Je-906
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0678072 Northing: 9222797
Site Location Description: This site is located around and between several large granite boulders on the low hillslope at the base of Cerro del Examén. The site extends onto an adjacent terrace that continues southwest from the *cerro* toward a large drainage that feeds into the Quebrada del Batán. The large boulders apparently tumbled downslope from the *cerro* sometime in the distant past and were later used as shelter.
Site Dimensions: East/West: 100 m North/South: 95 m
Surface Collections: 27 lithic artifacts.
Site Description: This complex site consists of a large, medium density lithic scatter that is situated among several large boulders and extends onto an adjacent terrace. The site has a commanding view over much of the Quebrada del Batán drainage. Several lithic tools were identified and recovered from the surface of the site, including several biface and uniface fragments, and the distal and medial sections of Paiján projectile points.
Surface Features: Three long and thin exfoliated slabs of rock had been placed on end (upright position) to form a 'box-like' feature that I interpreted as a hearth. The hearth was filled with sediment and only about one-half of the rock was visible from the surface. A flotation sample from within the hearth was collected.

Site: Je-914
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677316 Northing: 9221835
Site Location Description: This site is located on the western edge of a dissected, low terrace that extends westward from the low slopes of Cerro del Examén toward the eastern margin of the Quebrada del Batán drainage.
Site Dimensions: East/West: 15 m North/South: 7 m
Surface Collections: 5 lithic artifacts.
Site Description: This site consists of a very small, light density scatter of lithics.
Surface Features: None observed.

Site: Je-915
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677258 Northing: 9221646
Site Location Description: This site is located on the lower (west) end of a long, dissected, high terrace that extends to the west from the mouth of Quebrada Higuerón toward the intersection with Quebrada del Batán.
Site Dimensions: East/West: 158 m North/South: 93 m
Surface Collections: 28 lithics; 1 ceramic.
Site Description: This site consists of a general light density lithic scatter across the surface of the terrace, with areas of medium density concentrations. Several lithic tools were recovered from the surface of the site. Also, a light scatter of ceramics was present along the eastern margin of the site. A single jar spout and attached handle (Chimú) was collected.
Surface Features: None observed.

Site: Je-919
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0678012 Northing: 9220741
Site Location Description: This site is located on a long, flat, low terrace that parallels the northern edge of the mouth of Quebrada Higuerón and extends out toward the intersection with Quebrada del Batán. The site is crossed on the southern and western ends by the small dirt road that runs through Quebrada del Batán.
Site Dimensions: East/West: 720 m North/South: 260 m
Surface Collections: 70 lithics; 2 ceramics.
Site Description: This very large site is characterized by series of light to heavy density scatters of lithics across the surface of a large, flat terrace. Five distinct lithic knapping features were also documented at the site. In addition, numerous lithic tools, including several Paiján points, were recovered from the surface of the site. This site is multicomponent, as evidenced by the presence of a four *pirca* structures and an associated pile of stones. A few ceramics (Moche) were present in the area of the *pirca* structures.
Surface Features: Four *pirca* structures and an associated pile of stones. Also, five distinct lithic knapping features were identified at the site.

Site: Je-925
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0679198 Northing: 9220956
Site Location Description: This site is located on a series of adjacent, dissected, low terraces that extend southeast from Cerro del Examén toward the northern margin of Quebrada Higuerón.
Site Dimensions: East/West: 124 m North/South: 60 m
Surface Collections: 27 lithic artifacts.
Site Description: This site consists of a large, dispersed light density scatter of lithics. A few non-diagnostic ceramics were noted on the surface, but none were collected. A large amount of land snails were present across the surface of the site as well.
Surface Features: None observed.

Site: Je-929
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0678890 Northing: 9220930
Site Location Description: This site is located near the mouth of Quebrada Higuerón on a low terrace just above the *quebrada* drainage. The site is crossed on the southern end by a horse trail that passes through Quebrada Higuerón.
Site Dimensions: East/West: 130 m North/South: 62 m
Surface Collections: 28 lithic artifacts.
Site Description: This site consists of a large, light density lithic scatter across the surface of the low terrace bordering the Quebrada Higuerón drainage. Numerous land snails were also present on the surface of the site.
Surface Features: None observed.

Site: Je-930
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0679213 Northing: 9220804
Site Location Description: This site is located on a low terrace that extends to the west along the northern margin of the Quebrada Higuerón drainage.
Site Dimensions: East/West: 42 m North/South: 23 m
Surface Collections: 13 lithic artifacts.
Site Description: This small site consists of a very light density lithic scatter.
Surface Features: None observed.

Site: Je-936
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0680890 Northing: 9220424
Site Location Description: This site is located on the lower (southern) end of a long, sloping, high terrace that extends south from the southern base of Cerro del Examén toward the floor of Quebrada Higuerón.
Site Dimensions: East/West: 35 m North/South: 156 m
Surface Collections: 15 lithic artifacts.

Site Description: This site consists of a large, light density lithic scatter. The only lithic tools identified and collected from this site included a limace and a retouched flake. There is a light scatter of land snails on the southern end of the site.
Surface Features: A single semi-rectangular, rock structure (Structure 1) (1.7 m NW/SE x 1.9 m NE/SW) was found on the northern end of the site. Several flakes were found immediately around the structure.

Site: Je-945
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0681289 Northing: 9219845
Site Location Description: This site is located on the lower (northern) portion of a low terrace that extends to the northwest toward the margin of the Quebrada Higuerón. The terrace is situated near the intersection where a small, side *quebrada* joins Quebrada Higuerón drainage.
Site Dimensions: East/West: 36 m North/South: 16 m
Surface Collections: 10 lithics; 1 ceramic.
Site Description: This small site consists of a light density lithic scatter. A single ceramic (rim and neck of a large jar) was also recovered. Numerous land snails were also present on the surface of the site.
Surface Features: None observed.

Site: Je-954 (also discussed in Stackelbeck 2008)
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0679614 Northing: 9220122
Site Location Description: This site is located on a low, dissected terrace that extends westward and is situated between Cerro Organos and the southern margin of Quebrada Higuerón.
Site Dimensions: East/West: 105 m North/South: 37 m
Surface Collections: 16 lithic artifacts.
Site Description: This site consists of a light to medium density scatter of lithics across the surface of a low terrace. Numerous land snails were also present on the surface of the site.
Surface Features: One small *pirca* structure was identified near the center of the site.

Site: Je-955
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0679529 Northing: 9220208
Site Location Description: This site is located on a low, dissected terrace extending to the west and is situated between Cerro Organos and the southern margin of Quebrada Higuerón.
Site Dimensions: East/West: 122 m North/South: 33 m
Surface Collections: 20 lithic artifacts.
Site Description: This site consists of a light to medium density scatter of lithics. One Paiján projectile point was recovered from the site. Several cores and large flakes were noted on the surface and appear to indicate an area of primary lithic reduction. A few dense concentrations of land snails were also noted on the surface of the site.

Surface Features: None observed.

Site: Je-960
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677109 Northing: 9220874
Site Location Description: This site is located on a low, dissected terrace that extends west along the southern margin of Quebrada Higuerón toward the intersection with Quebrada del Batán.
Site Dimensions: East/West: 124 m North/South: 100 m
Surface Collections: 43 lithic artifacts.
Site Description: This site is characterized by a large, light density lithic scatter with an area of high concentration of debitage in the southeastern portion of the site. Two distinct knapping stations were recorded on the surface of the site. Several cores and early stage reduction debitage were also noted.
Surface Features: Two distinct knapping stations were recorded on the surface of the site.

Site: Je-964
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676861 Northing: 9220915
Site Location Description: This site is situated on a low terrace that extends to the west along the southern margin of the Quebrada Higuerón. The terrace is situated at the intersection of Quebrada Higuerón and Quebrada del Batán.
Site Dimensions: East/West: 20 m North/South: 29 m
Surface Collections: 16 lithic artifacts.
Site Description: This site consists of a generally light density lithic scatter, with an area of denser (medium) concentration on the north end of the site. The distal end of a Paiján point was found in the denser concentration on the north end of the site.
Surface Features: None observed.

Site: Je-969
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676853 Northing: 9220836
Site Location Description: This site is located on a low terrace that extends to the west from the southern margin of Quebrada Higuerón toward the intersection with Quebrada del Batán.
Site Dimensions: East/West: 29 m North/South: 41 m
Surface Collections: 18 lithic artifacts.
Site Description: This site consists of a small, medium density scatter of lithics across the surface of the terrace.
Surface Features: None observed.

Site: Je-970 (also discussed in Stackelbeck 2008)
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677148 Northing: 9220717

Site Location Description: This site is located on the lower (western) end of a long, dissected, low terrace that extends west from the base of Cerro Organos into the Quebrada del Batán drainage.
Site Dimensions: East/West: 158 m North/South: 91 m
Surface Collections: 48 lithics; 1 ceramic.
Site Description: This site consists of a large, and generally, light density scatter of lithics, with areas of medium to high density artifact concentration. One fragment of a Paiján projectile point and the proximal end of a Fishtail projectile point were collected at the site.
Surface Features: Two circular rock structures were identified and recorded at the site. Structure 1 is located in the north-central portion of the site and Structure 2 is located in the eastern end of the site.

Site: Je-971 (also discussed in Stackelbeck 2008)
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677432 Northing: 9220705
Site Location Description: This site is located on a gently sloping low terrace that extends to the west from the mouth of Quebrada Higuerón into the Quebrada del Batán drainage.
Site Dimensions: East/West: North/South:
Surface Collections: 50 lithics; 15 ceramics; 1 piece of shell.
Site Description: This large site consists of a light to medium density lithic scatter. Lithic tools collected from the site including two Paiján projectile points, an unidentified small, stemmed projectile point, unifaces, and retouched flakes. Several ceramic sherds were collected from the site and most of these consist of fragments of a single late Chimú vessel. Several structures were also identified and recorded on the surface of the site.
Surface Features: Five semi-lunar rock *pirca* structures were identified on the northwest end of the site. Each of the *pircas* is oriented toward the southwest. A large circular rock structure (Structure 5) (5 m N/S x 5 m E/W) was identified on the western end of the site. Several lithics (all flakes) were found in association with this structure. Two additional circular structures (Structures 7 and 8) were identified and recorded on the eastern end of the site. Each of these structures was very well constructed and measured 1.7 m N/S x 2 m E/W. Several flakes and a small hammerstone were found within and around Structures 7 and 8.

Site: Je-972
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677703 Northing: 9220563
Site Location Description: This site is located on the southern side of the upper slope of a large, long, low alluvial fan terrace system that is situated at the intersection of Quebrada Higuerón and Quebrada del Batán.
Site Dimensions: East/West: 186 m North/South: 71 m
Surface Collections: 35 lithic artifacts.
Site Description: This site consists of a large, light density lithic scatter. Several lithic tools including a Paiján projectile point, a limace, and retouched flakes were identified and collected. Two lithic knapping stations were identified on the surface of the site,

along with a single *pirca* structure (3 m N/S x 1 m E/W). No artifacts were found in association with the pirca.
Surface Features: Two lithic knapping stations were identified on the surface of the site. In addition, a single *pirca* structure was also identified.

Site: Je-973
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677710 Northing: 9220511
Site Location Description: This site is located on a low terrace that extends westward along the base of Cerro Organos, near the intersection of Quebrada Higuerón and Quebrada del Batán. The site is bisected by a small drainage. The western portion of the site is called Je-793, while the eastern portion has been designated Je-793 Zone B.
Site Dimensions: East/West: 120 m North/South: 40 m
Surface Collections: Je-973: 9 lithics; 1 ceramic. Je-973B: 14 lithics; 2 ceramics.
Site Description: Both areas of this site (Je-973 and Je-973B) consist of a very light density scatters of lithics and a few ceramics.
Surface Features:

Site: Je-976
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676677 Northing: 9220563
Site Location Description: This site is located on the lower (western) portion of a low, dissected terrace that extends west/southwest from Cerro Organos and terminates at the eastern margin of Quebrada del Batán. The terrace is situated directly to the south of the intersection of Quebrada Higuerón and Quebrada del Batán.
Site Dimensions: East/West: 24 m North/South: 32 m
Surface Collections: 23 lithic artifacts.
Site Description: This site consists of a small, high density concentration of lithic artifacts. Several lithic tools, both bifacial and unifacial, were identified and collected from the surface of the site, including two Paiján projectile points and a limace. The lithic debitage observed on the site surface was overwhelmingly comprised of quartz flakes.
Surface Features: None observed.

Site: Je-979
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677191 Northing: 9220493
Site Location Description: This site is located on the upper (eastern) end of a long, dissected, low terrace that extends west/southwest from Cerro Organos toward the Quebrada del Batán drainage.
Site Dimensions: East/West: 130 m North/South: 246 m
Surface Collections: 40 lithics; 1 ceramic.
Site Description: This very large site consists of a generally light density scatter of lithics with areas of medium to high density concentrations of lithic artifacts. There are concentrations of land snails scattered across the site as well. Numerous bifacial and unifacial tools were identified and collected from the surface of the site, including the

proximal end of a Fishtail projectile point and several retouched flakes. A light scatter of ceramics was also present across the southern end of the site and a single rim sherd (Chimú jar) was collected. Ten *pirca* structures were also identified on the southern end of the site.
Surface Features: Ten semi-lunar shaped *pirca* structures were identified on the southern end of the site and are believed to be associated with the ceramic period use of the site. A few of the *pirca* structures were heavily disturbed and their form and orientation were difficult to ascertain.

Site: Je-980
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677321 Northing: 9220496
Site Location Description: This site is located on the upper (eastern) end of a long, dissected, low terrace that extends west/southwest from Cerro Organos toward the Quebrada del Batán drainage.
Site Dimensions: East/West: 205 m North/South: 108 m
Surface Collections: 18 lithics; 11 ceramics.
Site Description: This site is characterized by a very large, light density scatter of lithics and ceramics. A single Paiján projectile point was found on the surface of the site. Most of the ceramics that were observed and collected were found in the northwest portion of the site and appear to date to the Chimú period. A total of 26 structures were identified and recorded on the surface of this site. Structure 1 (approximately 3 m N/S x 3 m E/W) is a circular stone structure, while Structures 2-26 are all stone *pirca* structures. All of the structures are located across the southern and eastern portions of the site. The *pircas* are predominantly semi-lunar in form, although a few appear to be straight alignments of rock, but are clearly distinct in form from Structure 1. In addition, all of the *pircas* appear to be oriented (facing) toward the southwest. Most of the structures did not have any artifacts in clear association, though a small flake scatter was found in association with Structure 20 and a single ceramic sherd was found with Structure 23. Also, several flakes were found in association with Structure 1.
Surface Features: Twenty-six structures were identified on the surface of this site. Structure 1 is a circular rock structure and Structures 2-26 are semi-lunar or straight rock *pircas*. All of the structures are located on the southern and eastern portions of the site.

Site: Je-981
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677747 Northing: 9220338
Site Location Description: This site is located on a low terrace that extends westward from the base of the northern edge of Cerro Organos toward the Quebrada del Batán drainage.
Site Dimensions: East/West: 193 m North/South: 42 m
Surface Collections: 21 lithics; 4 ceramics.
Site Description: This site consists of a light to medium density scatter of lithics. A few ceramic sherds were found on the west end of the site. There is also a light scatter of land snails across the surface of the site. There is an outcropping of *toba volcanica* along the

east end of the site that may have been a source areas for this raw material. A lithic knapping station was identified and recorded on the west end of the site.
Surface Features: One lithic knapping station (2 m E/W x 3 m N/S), which consisted of a high density concentration of *toba volcanica* flakes, was recorded on the west end of the site.

Site: Je-982
Subarea: Quebrada del Batán   Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677772   Northing: 9220271
Site Location Description: This site is located on a high, flat terrace that extends to the north from the base of Cerro Organos and overlooks a small, side *quebrada*. The terrace is bounded to the north and west by steep drainages. Directly to the south and visible from the site is the location of an ancient waterfall along the northern slopes of Cerro Organos.
Site Dimensions: East/West: 55 m   North/South: 81 m
Surface Collections: 28 lithic artifacts.
Site Description: This site is characterized by a light to medium density scatter of lithics and a very few ceramic sherds. A continuous scatter of land snails was also present on the site. Several tools were also identified and include unifaces, biface fragments, and two projectile point distal ends. A single lithic knapping station was identified and recorded.
Surface Features: One lithic knapping station was identified and recorded. The feature consists of a high density concentration of small, tertiary flakes of quartzite. The feature measured 1 m N/S x 1 E/W.

Site: Je-983
Subarea: Quebrada del Batán   Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677655   Northing: 9220380
Site Location Description: This site is located on a low, dissected terrace that extends to the west/southwest from the base of Cerro Organos toward a small side *quebrada* that overlooks the intersection of Quebrada Higuerón and Quebrada del Batán. This terrace is divided into a flat upper (northern) portion (Je-983 Zone B) and a gently sloping lower (southern) portion (Je-983 Zone A).
Site Dimensions: East/West: 150 m   North/South: 110 m
Surface Collections: Je-983A 6 lithics; 5 ceramics; 1 bone. Je-983B 20 lithics; 15 ceramics.
Site Description: Je-983 Zone A consists of a light to medium density scatter of lithics and ceramics. The only lithic tool recovered from Zone A was a large retouched flake. Five diagnostic ceramic were collected and were later identified as two Cupisnique sherds, two Moche sherds, and a single Chimú sherd. Eleven structures were identified on the surface of Zone A. These included 10 semi-lunar rock *pircas* and a rectangular stone structure.

Je-983 Zone B consists of a large, light to medium density scatter of lithics and ceramics. Fifteen small rock structures were identified in Zone B, including semi-lunar and straight-aligned *pircas*, along with two non-natural rock piles. Both lithics and ceramics were associated with the structures, as the artifact scatter is continuous across the site. Lithic tools collected from Zone B included a Paiján projectile point, a limace, and two biface fragments. There were also several small areas of medium density caracole concentrations at the site. Several diagnostic ceramics were collected from Zone B and all were later identified as Chimú.

Surface Features: Eleven structures were identified on the surface of Zone A. These included 10 semi-lunar rock *pircas* and one rectangular stone structure. The ten *pircas* were scattered across the site and all were oriented toward the southwest. Structure 11, the rectangular structure, was located on the western end of the site and was associated with both lithic and ceramic artifacts. Fifteen small rock structures were identified in Zone B, including semi-lunar and straight-aligned *pircas*, along with two non-natural rock piles. Although located across the site, a majority of the *pirca* structures were concentrated on the eastern end of Je-983 Zone B.

Site: Je-984
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677605 Northing: 9220246
Site Location Description: This site is located on a low terrace that extends north/northwest between the northwest base of Cerro Organos and a small, unnamed side *quebrada*.
Site Dimensions: East/West: 30 m North/South: 84 m
Surface Collections: 20 lithic artifacts.
Site Description: This site consists of a light to medium density scatter of lithics across the northern and central portions of the terrace.
Surface Features: None observed.

Site: Je-986
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677658 Northing: 9220048
Site Location Description: This site is located on a high, dissected terrace on the edge of northern slopes of Cerro Organos. The terrace overlooks site Je-984 and is bordered on the northern and eastern edges by a very steep slope into a side drainage.
Site Dimensions: East/West: 59 m North/South: 25 m
Surface Collections: 17 lithic artifacts.
Site Description: This site consists of a small, light density scatter of lithics. A few land snails were also noted on the surface of the site.
Surface Features: None observed.

Site: Je-988
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677110 Northing: 9220273
Site Location Description: This site is located on a large, gently sloping low terrace that extends westward from the base of Cerro Organos into the Quebrada del Batán drainage. The terrace is bounded on the northern and southern margins by deep, side drainages that feed into the Quebrada del Batán drainage.

Site Dimensions: East/West: 213 m North/South: 83 m
Surface Collections: 24 lithics; 1 ceramic; 2 pieces of shell.
Site Description: This very large site consists of a generally light density scatter of lithics with areas of medium density concentrations of lithics. A light scatter of land snails was present across the site, but there were also areas of very high density concentrations of land snails present. A few small marine shells (*Donax* sp.) were observed on the eastern end of the site. Several tools were identified and collected from the site surface, including an unfinished Paiján projectile point that was found in a lithic knapping station on the southern edge of the site.
Surface Features: One lithic knapping station was identified and recorded. The feature measured 1 m N/S x 3 m E/W and consisted entirely of quartzite flakes. An unfinished Paiján point was located in the center of the knapping station and is manufactured of the same quartzite.

Site: Je-989
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676844 Northing: 9220227
Site Location Description: This site is located on a long, gently sloping low terrace that extends west/southwest from the base of Cerro Organos into the Quebrada del Batán drainage. The terrace is bordered to the west by the Quebrada del Batán drainage and to the south by a deep, side drainage. Large *sapote* bushes and small trees cover much of the surface of the terrace.
Site Dimensions: East/West: 630 m North/South: 150 m
Surface Collections: 22 lithics; 1 ceramic; 1 piece of coral.
Site Description: This very large site is characterized by areas of light and medium density scatters of lithics. There is a continuous light scatter of land snails across the site and there are areas of very high density concentrations. The western end of the site contains a high number of these dense caracole concentrations. Several lithic tools, including bifaces and unifaces, were identified and collected from the site surface.
Surface Features: None observed.

Site: Je-990
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676261 Northing: 9219895
Site Location Description: This site is located on a long, high terrace that extends to the west/southwest from the base of Cerro Organos toward the floor of the Quebrada del Batán drainage. The terrace is bordered on the north by a deep side drainage that runs into the Quebrada del Batán drainage.
Site Dimensions: East/West: 732 m North/South: 200 m
Surface Collections: 35 lithics; 12 ceramics; 1 marine shell fragment.
Site Description: This very large site is characterized by a generally light density lithic scatter with areas of medium density concentrations of lithics. There are a few small scatters of ceramics locate on the site as well, and several diagnostic sherds were collected (all are Chimú). Three Paiján projectile points were recovered from the site. However, the lithic artifacts predominantly consisted of debitage and very few tools were identified.

Surface Features: A circular rock structure (4 m E/W x 4 m N/S) was identified and recorded on the northeastern portion of the site. No artifacts were found in association with the structure.

Site: Je-991

Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677028 Northing: 9220172
Site Location Description: This site is located on the southern edge of a long, flat, low terrace that extends west/southwest from the base of Cerro Organos into the Quebrada del Batán drainage. The terrace is bordered on the north by a deep, side drainage that runs into the Quebrada del Batán drainage.
Site Dimensions: East/West: 66 m North/South: 19 m
Surface Collections: 22 lithic artifacts.
Site Description: This site consists of a relatively small, light to medium density lithic scatter located on the edge of a low terrace that parallels a side drainage. A light scatter of land snails was present across the surface of the site.
Surface Features: None observed.

Site: Je-993

Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676634 Northing: 9219768
Site Location Description: This site is located on a long, gently sloping high terrace that extends west/southwest from the base of Cerro Organos into the Quebrada del Batán drainage. The terrace is bordered on the northern and southern edges by deep side drainages that run into the Quebrada del Batán drainage.
Site Dimensions:
Surface Collections: 98 lithics; 6 ceramics; 21 bones; 1 piece of coral.
Site Description: The very large site consists of areas of light, medium, high density lithic scatters. The western (downslope) end of the site is, in general, a light density lithic scatter with very few lithic tools. Artifacts are much denser on the eastern (upslope) end of the site, which contains several areas of very high density concentrations of lithic debitage and tools. Several concentrations of land snails were identified and recorded on the eastern end of the site. Several small bones, including one fossilized antler tine, were also collected from the site. Numerous lithic tools were identified and collected, including 17 Paiján projectile points, limaces, bifaces, unifaces, and retouched or utilized flakes. Two of the Paiján points were proximal ends that refit with distal fragments also found at the site. At least three distinct, high density clusters of tools and debitage were recorded on the eastern end of the site. These clusters of tools and debitage likely indicate long-term occupation or reoccupation of the landform over time. Three lithic knapping stations were also identified and recorded, one of which was a large, very dense cluster of quartz and quartz crystal debitage. There is a commanding view of the lower Quebrada del Batán and out onto the *pampa* from this site.
Surface Features: Three lithic knapping stations were recorded on the eastern end of the site.

Site: Je-995
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677067 Northing: 9219385
Site Location Description: This site is located on a high terrace in small, side *quebrada* at the western base of Cerro Organos. The terrace extends westward and is bordered on the south by a deep side drainage that runs into the Quebrada del Batán.
Site Dimensions: East/West: 86 m North/South: 50 m
Surface Collections: 16 lithic artifacts.
Site Description: This site consists of a small, light to medium density lithic scatter. A few lithic tools, including a Paiján point and a limace, were recorded and collected. A light scatter of land snails was present across the site surface. A lithic knapping station was also identified and recorded on the surface of the site.
Surface Features: A single lithic knapping station (2 m N/S x 2 m E/W) of quartz debitage was recorded on the site.

Site: Je-996
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677098 Northing: 9219454
Site Location Description: This site is located on a long, high terrace situated in a small, side *quebrada* at the western base of Cerro Organos. The terrace extends to the west/northwest and is bordered on the southern and eastern ends by a deep side drainage that runs into the Quebrada del Batán.
Site Dimensions: Northwest/Southeast: 250 m Northeast/Southwest: 50 m
Surface Collections: 30 lithics; 2 pieces of coral.
Site Description: This long, narrow site is characterized by a generally light density scatter of lithics with areas of high density concentrations. Several lithic tools were identified and collected from the surface of the site, including a Fishtail projectile point, a Paiján projectile point, a limace, and several retouched flakes. The majority of the tools were located in two clusters of artifacts that were located in the central portion of the site and on the northwestern end of the site. These clusters may represent different occupations of the site. A light scatter of land snails was also found across the surface of the site.
Surface Features: None observed.

Site: Je-997
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676855 Northing: 9219735
Site Location Description: This site is located on a high, gently sloping terrace that extends westward from the base of Cerro Organos toward the Quebrada del Batán.
Site Dimensions: East/West: 142 m North/South: 66 m
Surface Collections: 19 lithics; 4 ceramics; 1 piece of shell.
Site Description: This site consists of a small, light density lithic scatter. The lithic tools include Paiján projectile point and a uniface. A light scatter of ceramics was identified on the eastern end of the site and a small sample was collected (all are Chimú). A light scatter of land snails was present across the site and one dense concentration was identified and recorded.

Surface Features: None observed.

Site: Je-998
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0677369 Northing: 9219269
Site Location Description: This site is located on a high terrace situated on the southern margin of a small, side *quebrada* along the western edge of Cerro Organos. The terrace extends to the west and is bordered on the northern side by the deep drainage that drains out of this *quebrada* into the Quebrada del Batán.
Site Dimensions: East/West: 210 m North/South: 83 m
Surface Collections: 16 lithics; 1 ceramic.
Site Description: This site consists of a large, light density lithic scatter. A large grinding slab (*batan*) was identified and recorded on the eastern end of the site. A light scatter of land snails was also present across the site. A single incised Cupisnique sherd was collected from this site.
Surface Features: None observed.

Site: Je-1001
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676216 Northing: 9219410
Site Location Description: This site extends across adjacent dissected low terraces that extend to the west from the mouth of a small side *quebrada* along the western base of Cerro Organos. The small side *quebrada* drains into the larger Quebrada del Batán.
Site Dimensions:
Surface Collections: 39 lithics; 4 ceramics; 1 piece of shell.
Site Description: This site consists of a large, but light density lithic scatter located across the lower end of two adjacent dissected terraces that extend westward into the Quebrada del Batán. Lithic tools collected from the site include Paiján projectile points, bifaces, and retouched flakes. A few dense concentrations of land snails were also identified and recorded at the site. A small scatter of Chimú ceramics were observed, with a few examples collected. A lithic knapping station and a large *pirca* structure were identified and recorded.
Surface Features: A single lithic knapping station (1.8 m E/W x 1.4 m N/S) comprised of a quartzite core and debitage was identified and recorded on the eastern end of the site. Also, a large, rock *pirca* structure (6 m NW/SE x 3 m NE/SW) was identified and recorded. The *pirca* was oriented toward the southwest.

Site: Je-1002 (also discussed in Stackelbeck 2008)
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676737 Northing: 9219424
Site Location Description: This site is located on a high, gently sloping high terrace that extends westward into the Quebrada del Batán drainage. The terrace is situated on the southern margin of the mouth of a small, side *quebrada* that is located along the western base of Cerro Organos. The terrace is bordered on the northern edge by a deep side drainage. The terrace has a commanding view of the side *quebrada* and the Quebrada del Batán drainage.

Site Dimensions: East/West: 166 m North/South: 104 m
Surface Collections: 55 lithics; 4 ceramics; 80 bones; 3 pieces of coral.
Site Description: This site consists of a light to medium density scatter of lithics, with areas of high density concentrations. The highest concentrations of artifacts are located on the eastern (upslope) end of the terrace. Numerous lithic tools were identified and collected from the surface of the site, including a Fishtail projectile point, seven Paiján projectile points, several biface fragments and retouched flakes. A large *batan* was recorded near the center of the site. There was a fairly continuous medium density scatter of land snails across the site and a few areas of very high density concentrations. The density and concentration of lithic tools at this site appear to indicate that this site likely witnessed long-term or repeated occupations/reoccupations. There was a light scatter of ceramics across the site and a few diagnostic examples were collected (all are Chimú). A small circular rock structure was identified and recorded near the center of the site. The remains of a human burial were also identified and recorded on the surface of the site.
Surface Features: A single circular rock structure (3 m N/S x 3 m E/W) was identified near the center of the site. In addition, the remains of a human burial (Feature 1) were identified and recorded near the center of the site. The bones were eroding onto the surface and some of the smaller bones had been dispersed over a 2.5 x 2 m area. However, the majority of the bones were concentrated in a single location. The bones were photographed, mapped, and individually numbered and bagged for later analysis. Preliminary field identification indicated the presence of tarsals, metatarsals, femur fragments, tibia fragments, illium fragments, and vertebrae fragments. None of the skeletal elements appeared to be articulated. There were several artifacts, mostly flakes, in fairly close association with the bone concentration. These associations may be fortuitous, but they may also represent the cultural affiliation of the human remains. Of particular note is the proximity of the circular rock structure identified at the site, along with a Paiján proximal fragment of quartz and a limace fragment of toba, which were both located directly to the east of the bone concentration.

Site: Je-1003
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0676099 Northing: 9219169
Site Location Description: This site is located on the upper (eastern) end of a high terrace that slopes westward from the base of Cerro Organos toward the Quebrada del Batán drainage.
Site Dimensions: East/West: 40 m North/South: 12 m
Surface Collections: 10 lithic artifacts.
Site Description: This site consists of a small, light density lithic scatter. All of the lithic materials observed on this site (except two flakes) are manufactured of quartzite, including the conjoining distal and medial sections of an unfinished projectile point. This small site is likely a large knapping station. The site has an excellent view of the Quebrada del Batán drainage.
Surface Features: None observed.

Site: Je-1004
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén

UTM Coordinates: Easting: 0676006 Northing: 9219177
Site Location Description: This site is located across the lower (western) ends of two low terraces that slope to the west from the base of Cerro Organos toward the Quebrada del Batán drainage.
Site Dimensions: East/West: 118 m North/South: 100 m
Surface Collections: 38 lithics; 18 ceramics; 5 pieces of shell.
Site Description: This site consists of a large, light density scatter of lithics and ceramics. The majority of the lithic tools, which include a Paiján projectile point fragment, several limaces, and retouched flakes, were located on the eastern end of the site. In contrast, most of the ceramic artifacts were clustered in the northwest portion of the site. The ceramic artifacts, which include Cupisnique and Chimú sherds, were associated with a scatter of spondylus shell and a small rock pile. The rock pile appears to be of recent construction and overlies some ceramic sherds.
Surface Features: A small circular rock pile, which appears to be of recent construction, was identified in the northwestern portion of the site.

Site: Je-1006
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0675531 Northing: 9218870
Site Location Description: This site is located on a low terrace that extends to the southwest from the western base of Cerro Organos into the Quebrada del Batán.
Site Dimensions: East/West: 54 m North/South: 131 m
Surface Collections: 15 lithics; 8 ceramics; 1 bone; 2 pieces of shell.
Site Description: This site consists of a light density scatter of lithics and ceramics. Lithic tools collected from the site include bifaces and retouched flakes. Several diagnostic ceramics (Chimú period) were also collected.
Surface Features: Three rock piles were identified on the surface of the site.

Site: Je-1007
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0675682 Northing: 9218793
Site Location Description: This site is located on a low terrace that extends southwest from the western base of Cerro Organos into the Quebrada del Batán drainage.
Site Dimensions: East/West: 97 m North/South: 82 m
Surface Collections: 33 lithics; 2 ceramics; 6 bones.
Site Description: This site consists of a light density lithic scatter. Lithic tools collected from the site include a Paiján projectile point, a limace, biface fragments, and retouched/utilized flakes. A small scatter of fossilized bones were also found on the western end of the site. Two conjoining Chimú sherds were also collected.
Surface Features: None observed.

Site: Je-1008
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0675748 Northing: 9218860
Site Location Description: This site is located on a low terrace that extends to the southwest from the western base of Cerro Organos into the Quebrada del Batán drainage.

Site Dimensions: East/West: 83 m North/South: 39 m
Surface Collections: 16 lithic artifacts.
Site Description: This site consists of a very light density lithic scatter. Lithic tools identified and collected from the site include two limaces and the medial fragment of a Paiján projectile point.
Surface Features: None observed.

Site: Je-1010
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0675605 Northing: 9219679
Site Location Description: This site is located on a long, low terrace that extends west from the western base of Cerro Organos into the Quebrada del Batán.
Site Dimensions: East/West: 196 m North/South: 79 m
Surface Collections: 39 lithic artifacts.
Site Description: This site is characterized by a generally light density scatter of lithics with areas of medium to high density concentrations. Numerous lithic tools were identified and collected from the surface of this site, including several limaces, the proximal end of a Fishtail projectile point, a Paiján projectile point, and retouched flakes. There was a small cluster of limaces and limace fragments in the western portion of the site and may indicate a production locus or some other kind of activity area. Most of the lithic tools observed were located on the northern and western portions of the site.
Surface Features: Two distinct lithic knapping stations were identified and recorded in the southern portion of the site. Taller 1 (1.7 m NE/SW x 1.8 NW/SE) consisted entirely of quartzite debitage. Taller 2 (1.5 m NE/SW x 1.4 NW/SE) consisted entirely of quartz debitage.

Site: Je-1011
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0675582 Northing: 9218542
Site Location Description: This site is located on a low terrace that extends west from the base of Cerro Organos into the Quebrada del Batán drainage.
Site Dimensions:
Surface Collections: 49 lithics; 1 ceramic.
Site Description: This site is characterized by a generally light density scatter of lithics with areas of medium to high density concentrations. The eastern and western ends of this site both contained high density clusters of lithic artifacts and tools. The central portion of the site between these clusters contained a much lower density, but continuous, scatter of artifacts. Lithic tools collected from the surface of this site include several Paiján projectile points, limaces, and retouched flakes. A large and dense concentration of land snails was identified and recorded on the eastern end of the site. A lithic knapping station was also recorded on the eastern end of the site.
Surface Features: A single lithic knapping station (1 m N/S x 1 m E/W) was identified and recorded on the eastern end of the site and consisted entirely of quartz crystal debitage.

Site: Je-1012
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0675272 Northing: 9218560
Site Location Description: This site is located on a low, flat terrace that extends to the southwest and parallels the eastern margin of the Quebrada del Batán drainage.
Site Dimensions:
Surface Collections: 26 lithics; 29 ceramics; 7 pieces of shell.
Site Description: This large site is characterized by a light density scatter of lithics and a medium to high density scatter of ceramics. Lithic tools collected from the site include two Paiján projectile points and several other bifaces. Numerous diagnostic ceramics were also collected. Most of the ceramics are Cupisnique, with a few Chimú sherds as well. Three rock structures and three rock piles were also recorded on the site.
Surface Features: Three non-natural piles of rock were identified and recorded on the eastern end of the site. In addition, three structures were also recorded at the site. Structure 1 (3 m E/W x 1 m N/S) is a semi-lunar shaped *pirca* that is oriented to the south/southwest. Structure 2 (2.7 m N/S x 3.5 m E/W) is a semi-rectangular rock structure that is located on the north-central portion of the site. Structure 3 (15 m NE/SW x 3 m NW/SE) is a very large, semi-lunar shaped *pirca* structure that was located on the western end of the site. Several ceramic sherds were located within the component rocks of this structure.

Site: Je-1013
Subarea: Quebrada del Batán Topographic Quadrangle: Chepén
UTM Coordinates: Easting: 0675300 Northing: 9218440
Site Location Description: This site is located on a low, flat terrace that extends to the southwest from Cerro Organos along the eastern margin of the Quebrada del Batán drainage.
Site Dimensions: East/West: 90 m North/South: 31 m
Surface Collections: 23 lithic artifacts.
Site Description: This site consists of a light density scatter of lithics. Several tools, including a Paiján projectile point, retouched/utilized flakes, and several bifaces, were collected from the surface of the site.
Surface Features: A small, non-natural rock pile (1.6 m N/S x 1 m E/W) was identified and recorded in the central portion of the site. It is unclear if this pile is of recent construction.

Appendix II. Early Preceramic Carbon Samples from the QBT collected during the 2002-2003 Fieldseasons.

FS #	Site	Test Unit	Feature	Level	cmbd	PP #	AMS date	Error	Cal BP (2 σ)*	Lab #	Material
389.2.1	Je-431	1		2	8	3	>15,600		uncalibrated	AA57957	Wood Charcoal
457.2.1	Je-996	5		3	13	1	12260	570	15881-13082	AA57944	Wood Charcoal
297.2.1	Je-439	1		4	20	3	11380	240	13714-12881	AA57951	Wood Charcoal
703.2.1	Je-790	6	9	2	5-10	gen	11220	700	14975-11207	AA57961	Wood Charcoal
499.2.1	Je-1002	3		9	43	2	11014	64	13073-12860	AA57942	Wood Charcoal
458.2.1	Je-996	5		4	15-20	gen	10650	50	12822-12413	Beta 185074	Wood Charcoal
466.2.1	Je-996	7		5	21	5	10353	58	12571-11986	AA57948	Wood Charcoal
463.2.1	Je-996	7		2	8	1	10230	59	12230-11653	AA57946	Wood Charcoal
464.2.2	Je-996	7		3	14.5	3	10113	76	12037-11360	AA57947	Wood Charcoal
752.2.1	Je-439	3	2		4	2	10056	67	11962-11309	AA57950	Wood Charcoal
751.2.1	Je-439	3		3	12	3	9851	58	11587-11171	AA57949	Wood Charcoal
736.2.1	Je-790	12	11		10	gen	9334	50	10697-10306	AA57958	Wood Charcoal
718.2.3	Je-790	9		2	10	3	9530	70	11131-10600	Beta 185076	Wood Charcoal
625.2.1	Je-431	5		2	8	1	9983	93	11951-11221	AA57963	Wood Charcoal
653.2.1	Je-431	13		2	10	1	9041	48	10282-10043	AA57964	Wood Charcoal
394.2.1	Je-431	1		7	30-35	gen	9032	50	10270-9939	AA57955	Wood Charcoal
391.2.2	Je-431	1		4	20	9	8983	65	10244-9912	AA57956	Wood Charcoal
514.2.1	Je-1002	4	3	5	24	4	8854	62	10176-9704	AA57943	Wood Charcoal

- calibrated with CALIB V.5.0.2 (Stuiver and Reimer 1993)

Appendix III. Faunal samples from Early Preceramic assemblages in the QBT (as analyzed and discussed in Pavao-Zuckerman 2004).

Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-431	398.4.1	3		1	0-5	1	UID Bone	bone		fragment		
Je-431	625.4.1	5		2	5-10	7	Dicrodon sp.	vertebra		complete		
Je-431	625.4.2	5		2	5-10		Dicrodon sp.	dentary	L	complete with teeth		
Je-431	625.4.3	5		2	5-10		Dicrodon sp.	dentary	L	complete with teeth		
Je-431	625.4.4	5		2	5-10		Dicrodon sp.	ischium	L	complete		burned
Je-431	625.4.5	5		2	5-10		Dicrodon sp.	humerus	L	proximal 1/2		burned
Je-431	625.4.6	5		2	5-10		Dicrodon sp.	radius		complete		
Je-431	625.4.7	5		2	5-10		Dicrodon sp.	metatarsal		complete		
Je-431	625.4.8	5		2	5-10	1	Mugil sp.	vertebra		almost complete centrum		
Je-431	625.4.9	5		2	5-10	2	Vertebra			misc. frag.		
Je-431	625.4.10	5		2	5-10		Vertebra			misc. frag.		
Je-431	626.4.2	5		3	10-15	11	Dicrodon sp.	articular	R	fragment		
Je-431	626.4.3	5		3	10-15		Dicrodon sp.	metatarsal		complete		
Je-431	626.4.4	5		3	10-15		Dicrodon sp.	dentary	L	almost complete with teeth		
Je-431	626.4.5	5		3	10-15		Dicrodon sp.	vertebra		atlas frag.		
Je-431	626.4.6	5		3	10-15		Dicrodon sp.	vertebra		axis		
Je-431	626.4.7	5		3	10-15		Dicrodon sp.	vertebra		vert (articulated)		
Je-431	626.4.8	5		3	10-15		Dicrodon sp.	vertebra		vert (articulated)		
Je-431	626.4.9	5		3	10-15		Dicrodon sp.	vertebra		vert (articulated)		
Je-431	626.4.10	5		3	10-15		Dicrodon sp.	vertebra		loose vert		burned
Je-431	626.4.11	5		3	10-15		Dicrodon sp.	vertebra		loose vert		burned
Je-431	626.4.12	5		3	10-15		Dicrodon sp.	vertebra		loose vert		burned
Je-431	626.4.13	5		3	10-15	1	Mammalia	rib		proximal 1/2	F	burned
Je-431	626.4.1	5		3	10-15	1	Osteichthyes	vertebra		complete centrum		
Je-431	626.4.14	5		3	10-15	8	UID Bone	bone		fragment		
Je-431	626.4.15	5		3	10-15		UID Bone	bone		fragment		

Appendix III (con't.).

Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-431	626.4.16	5		3	10-15		UID Bone	bone		fragment		
Je-431	626.4.17	5		3	10-15		UID Bone	bone		fragment		
Je-431	626.4.18	5		3	10-15		UID Bone	bone		fragment		
Je-431	626.4.19	5		3	10-15		UID Bone	bone		fragment		
Je-431	626.4.20	5		3	10-15		UID Bone	bone		fragment		
Je-431	626.4.21	5		3	10-15		UID Bone	bone		fragment		
Je-431	629.4.1	5	54	4	15-20	1	Osteichthyes	vertebra		complete centrum		
Je-431	627.4.1	5		4	15-20	1	Teiidae	femur	L	complete		
Je-431	627.4.3	5		4	15-20	1	UID Bone	bone		fragment		
Je-431	627.4.2	5		4	15-20		UID Bone					
Je-431	B6			Surface	0	3	Cervidae	scapula	L	distal frag. at glenoid fossa and portion of spine; in 3 mending pieces		
Je-431	B7			Surface	0		Cervidae	scapula	L			
Je-431	B8			Surface	0		Cervidae	scapula	L			
Je-431	B1			Surface	0	1	Mammalia			Misc. long bone shaft frag.		fossilized
Je-431	B2			Surface	0	4	Mammalia			Fragment		fossilized; possibly burned
Je-431	B3			Surface	0		Mammalia			Fragment		fossilized; possibly burned
Je-431	B4			Surface	0		Mammalia			Fragment		fossilized; possibly burned
Je-431	B5			Surface	0		Mammalia			Fragment		fossilized; possibly burned
Je-431	B9			Surface	0	2	UID Mammal			Fragment		fossilized; may be calcined
JE 431	B10			Surface	0		UID Mammal			Fragment		fossilized
Je-439	B1				surface	1	Mammalia			misc. frag., probably skull		
Je-439	B2				surface	2	UID Mammal	bone		bone fragments		fossilized

Appendix III (con't.).

Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-439	B3				surface		UID Mammal	bone		bone fragments		
Je-439	B4				surface	3	Cervidae	humerus	L	proximal 1/5		partly fossilized
Je-439	B5				surface		Cervidae	humerus	R	distal shaft frag		partly fossilized
Je-439	B6				surface		Cervidae	sacrum		frag, prox. sacral vertebra		partly fossilized
Je-439	B7				surface	6	UID Mammal	bone		long bone fragments		burned/fossilized
Je-439	B8				surface		UID Mammal	bone		long bone fragments		burned/fossilized
Je-439	B9				surface		UID Mammal	bone		long bone fragments		burned/fossilized
Je-439	B10				surface		UID Mammal	bone		long bone fragments		burned/fossilized
Je-439	B11				surface		UID Mammal	bone		long bone fragments		burned/fossilized
Je-439	B12				surface		UID Mammal	bone		long bone fragments		burned/fossilized
Je-439	B13				surface	12	Artiodactyla (cow?)	tooth		misc. frag		
Je-439	B14				surface		Artiodactyla (cow?)	tooth		misc. frag		
Je-439	B15				surface		Artiodactyla (cow?)	tooth		misc. frag		
Je-439	B16				surface		Artiodactyla (cow?)	tooth		misc. frag		
Je-439	B17				surface		Artiodactyla (cow?)	tooth		misc. frag		
Je-439	B18				surface		Artiodactyla (cow?)	tooth		misc. frag		
Je-439	B19				surface		Artiodactyla (cow?)	tooth		misc. frag		
Je-439	B20				surface		Artiodactyla (cow?)	tooth		misc. frag		
Je-439	B21				surface		Artiodactyla (cow?)	tooth		misc. frag		
Je-439	B22				surface		Artiodactyla (cow?)	tooth		misc. frag		
Je-439	B23				surface		Artiodactyla (cow?)	tooth		misc. frag		
Je-439	B24				surface		Artiodactyla (cow?)	tooth		misc. frag		
Je-439	B25				surface	2	Mammalia			misc. long bone shaft frag		fossilized
Je-439	B26				surface		Mammalia			misc. long bone shaft frag		
Je-439	B27				surface	1	Tayassidae	calcaneus	R	almost complete		partly fossilized

Appendix III (con't.).

Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-439	286.4.1	1		1a		6	UID Bone	bone		fragments		
Je-439	286.4.2	1		1a			UID Bone	bone		fragments		
Je-439	286.4.3	1		1a			UID Bone	bone		fragments		
Je-439	286.4.4	1		1a			UID Bone	bone		fragments		
Je-439	286.4.5	1		1a			UID Bone	bone		fragments		
Je-439	286.4.6	1		1a			UID Bone	bone		fragments		
Je-439	286.4.7	1		1a		1	UID Mammal	bone		trabecular fragment		
Je-439	286.4.8	1		1a		1	UID Mammal	caudal vert.		fragments		
Je-439	286.4.9	1		1a		1	Sciurus sp.	calcareus	R	proximal 1/2		
Je-439	286.4.10	1		1a		1	Columbidae	coracoid	R	missing anterior tip		
Je-439	286.4.11	1		1a		1	Lacertilia (Sauria)	vertebra		small		
Je-439	286.4.12	1		1a		1	Osteichthyes	vertebra				
Je-439	286.4.13	1		1a		1	Cervidae cf. mazama?	patella	R	missing prox. Tip		
Je-439	287.4.1	1		1b		1	UID Mammal	bone		long bone fragments		
Je-439	287.4.2	1		1b		1	Dicrodon sp.	dentarx		complete		
Je-439	287.4.3	1		1b		3	Vertebrata			misc. frag		
Je-439	287.4.4	1		1b			Vertebrata			misc. frag		
Je-439	487.4.5	1		1b			Vertebrata			misc. frag		
Je-439	288.4.1	1		1	0-5	3	UID Bone	bone		fragments		
Je-439	288.4.2	1		1	0-5		UID Bone	bone		fragments		
Je-439	288.4.3	1		1	0-5		UID Bone	bone		fragments		
Je-439	288.4.4	1		1	0-5	1	Osteichthyes	pterygiophore		proximal fragment		
Je-439	290.4.1	1		1	0-5	5	UID Bone	bone		fragments		
Je-439	290.4.2	1		1	0-5		UID Bone	bone		fragments		
Je-439	290.4.3	1		1	0-5		UID Bone	bone		fragments		
Je-439	290.4.4	1		1	0-5		UID Bone	bone		fragments		
Je-439	290.4.5	1		1	0-5		UID Bone	bone		fragments		
Je-439	290.4.6	1		1	0-5	1	Mollusca	misc.		misc. shell fragment		

Appendix III (con't.).

Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-439	291.4.1	1		2	5-10	6	UID Bone	bone		fragments		
Je-439	291.4.2	1		2	5-10		UID Bone	bone		fragments		
Je-439	291.4.3	1		2	5-10		UID Bone	bone		fragments		
Je-439	291.4.4	1		2	5-10		UID Bone	bone		fragments		
Je-439	291.4.5	1		2	5-10		UID Bone	bone		fragments		
Je-439	291.4.6	1		2	5-10		UID Bone	bone		fragments		
Je-439	291.4.7	1		2	5-10	1	Artiodactyla	tooth		misc. frag		
Je-439	291.4.8	1		2	5-10	1	Mustelidae	maxilla		frag with possible foramina		
Je-439	292.4.1	1		2	5-10	3	Lacertilia (Sauria)	vertebrae		frags. Complete centra		
Je-439	292.4.2	1		2	5-10		Lacertilia (Sauria)	vertebrae		frags. Complete centra		
Je-439	292.4.3	1		2	5-10		Lacertilia (Sauria)	vertebrae		frags. Complete centra		
Je-439	292.4.4	1		2	5-10	1	Mammalia			misc. shaft frag.		
Je-439	292.4.5	1		2	5-10	1	Rodentia	phalanx		distal 3/4		
Je-439	292.4.6	1		2	5-10	1	Sigmodontinae	maxilla		fragments		
Je-439	293.4.1	1		2	5-10	4	UID Bone	bone		fragments		
Je-439	293.4.2	1		2	5-10		UID Bone	bone		fragments		
Je-439	293.4.3	1		2	5-10		UID Bone	bone		fragments		
Je-439	293.4.4	1		2	5-10		UID Bone	bone		fragments		
Je-439	293.4.5	1		2	5-10	5	Mammalia			misc. frag		
Je-439	293.4.6	1		2	5-10		Mammalia			misc. frag		
Je-439	293.4.7	1		2	5-10		Mammalia			misc. frag		
Je-439	293.4.8	1		2	5-10		Mammalia			misc. frag		
Je-439	293.4.9	1		2	5-10		Mammalia			misc. frag		
Je-439	293.4.10	1		2	5-10	1	Sciurus sp.	astrogalus	R	1/2 frag. At "head"	F	
Je-439	293.4.11	1		2	5-10	1	Carnivora	2nd phalanx		complete		
Je-439	293.4.12	1		2	5-10	1	Dicrodon sp.	mandible/maxilla		fragment		

Appendix III (con't.).

Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-439	296.4.1	1		3	10-15	1	Dicrodon sp.	dentarx	L	missing ascending ramus; teeth intact		
Je-439	748.4.1	3			surface	1	Mammalia	bone		fragments		fossilized
Je-439	749.4.1	3		1	0-5	2	Mammalia			misc. frag		burned/fossilized
Je-439	749.4.2	3		1	0-5		Mammalia			misc. frag		burned
Je-439	749.4.3	3		1	0-5	1	Cervidae	humerus	R	distal frag.; lateral epicondyle and trochlca	F	
Je-439	749.4.4	3		1	0-5	1	Vertebrata			misc. frag		
Je-439	750.4.1	3		2	5-10	1	Mammalia			long bone shaft frag.		
Je-439	751.4.1	3		3	10-15	1	Dicrodon sp.	mandible/maxilla		misc. frag with teeth		
Je-439	752.4.1	3	2			1	Mammalia	caudal vert.		complete		
Je-439	754.4.1	4		1	0-5	2	Mugil sp.	cervical vertebrae		complete (minus processes)		
Je-439	754.4.2	4		1	0-5		Mugil sp.	cervical vertebrae		complete (minus processes)		
Je-439	754.4.3	4		1	0-5	1	Dicrodon sp.	dentarx	L	frag. In two mending pieces		
Je-439	754.4.4	4		1	0-5	1	Cervidae	scapula	L	glenoid fossa frag.		fossilized; mineralized on surface but not trabeculae
Je-439	754.4.5	4		1	0-5	2	Vertebrata			misc. frag		burned
Je-439	754.4.6	4		1	0-5		Vertebrata			misc. frag		
Je-439	755.4.1	4		2	5-10	1	Osteichthyes	vertebra				burned
Je-439	755.4.2	4		2	5-10	1	Dicrodon sp.	dentarx	L	frag. with teeth		
Je-439	755.4.3	4		2	5-10	1	Dicrodon sp.	dentarx	R	frag. with teeth		
Je-439	755.4.4	4		2	5-10	5	Vertebrata			misc. frag		

Appendix III (con't.).

Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-439	755.4.5	4		2	5-10		Vertebrata			misc. frag		
Je-439	755.4.6	4		2	5-10		Vertebrata			misc. frag		
Je-439	755.4.7	4		2	5-10		Vertebrata			misc. frag		
Je-439	755.4.8	4		2	5-10		Vertebrata			misc. frag		
Je-439	756.4.1	4		3	10-15	1	Dicrodon sp.	vertebra		complete-large		
Je-439	756.4.2	4		3	10-15	1	Columbidae	sternum		anterior frag. at corocoid articulation		
Je-439	756.4.3	4		3	10-15	1	cf. Calamus brachysomus	articular	R	almost complete		
Je-439	757.4.1	4	2			1	Mugil sp.	cervical vertebra		almost complete		
Je-439	759.4.1	5		1	0-5	1	Mammalia			long bone fragments		
Je-439	759.4.2	5		1	0-5	1	Osteichthyes	vertebra				
Je-439	760.4.1	5		2	5-10	6	UID Bone	bone		long bone fragments		
Je-439	760.4.2	5		2	5-10		UID Bone	bone		long bone fragments		
Je-439	760.4.3	5		2	5-10		UID Bone	bone		long bone fragments		
Je-439	760.4.4	5		2	5-10		UID Bone	bone		long bone fragments		
Je-439	760.4.5	5		2	5-10		UID Bone	bone		long bone fragments		
Je-439	760.4.6	5		2	5-10		UID Bone	bone		long bone fragments		
Je-439	761.4.1	5		3	10-15	5	UID Bone	bone		fragments		
Je-439	761.4.2	5		3	10-15		UID Bone	bone		fragments		
Je-439	761.4.3	5		3	10-15		UID Bone	bone		fragments		
Je-439	761.4.4	5		3	10-15		UID Bone	bone		fragments		
Je-439	761.4.5	5		3	10-15		UID Bone	bone		fragments		
Je-439	761.4.6	5		3	10-15	1	Sigmodontinae	mandible	R	horizontal ramus		
Je-439	761.4.7	5		3	10-15	1	Sigmodontinae	incisor (upper)	L	fragment		

Appendix III (con't.).

Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-439	761.4.8	5		3	10-15	1	Sigmodontinae	incisor		fragment		
Je-439	761.4.9	5		3	10-15	1	Aves	sternum		anterior frag. at corocoid articulation		
Je-439	761.4.10	5		3	10-15	1	Mugil sp.	basioccipital		fragment		
Je-439	762.4.1	6			surface	1	Cervidae	ulna	L	at notch		
Je-439	763.4.1	6		1	0-5	4	UID Bone	bone		fragments		
Je-439	763.4.2	6		1	0-5		UID Bone	bone		fragments		
Je-439	763.4.3	6		1	0-5		UID Bone	bone		fragments		
Je-439	763.4.4	6		1	0-5		UID Bone	phalanx		fragments		
Je-439	763.4.5	6		1	0-5	8	UID Mammal	bone		fragments		burned
Je-439	763.4.6	6		1	0-5		UID Mammal	bone		fragments		
Je-439	763.4.7	6		1	0-5		UID Mammal	bone		fragments		
Je-439	763.4.8	6		1	0-5		UID Mammal	bone		fragments		
Je-439	763.4.9	6		1	0-5		UID Mammal	bone		fragments		
Je-439	763.4.10	6		1	0-5		UID Mammal	bone		fragments		
Je-439	763.4.11	6		1	0-5		UID Mammal	bone		fragments		
Je-439	763.4.12	6		1	0-5		UID Mammal	bone		fragments		
Je-439	763.4.13	6		1	0-5	3	Sigmodontinae	mandible	R	all horizonatal ramus		
Je-439	763.4.14	6		1	0-5		Sigmodontinae	mandible	R	all horizonatal ramus		
Je-439	763.4.15	6		1	0-5		Sigmodontinae	mandible	R	all horizonatal ramus		
Je-439	763.4.16	6		1	0-5	1	Sigmodontinae	mandible	L	horizontal ramus with all teeth		
Je-439	763.4.17	6		1	0-5	1	Dicrodon sp.	vertebra		fragment		
Je-439	763.4.18	6		1	0-5	2	Dicrodon sp.	dentarx	L	horizontal ramus with teeth		
Je-439	763.4.19	6		1	0-5		Dicrodon sp.	dentarx	L	horizontal ramus with teeth		

Appendix III (con't.).

Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-439	763.4.20	6		1	0-5	1	Artiodactyla	cervical vertebra		frag. at zygopohysis		
Je-439	763.4.21	6		1	0-5	1	Pseudalopex sp.	calcaneus	L	almost complete	F	
Je-439	764.4.1	6		2	5-10	4	UID Mammal	bone		fragments		burned
Je-439	764.4.2	6		2	5-10		UID Mammal	bone		fragments		
Je-439	764.4.3	6		2	5-10		UID Mammal	bone		fragments		
Je-439	764.4.4	6		2	5-10		UID Mammal	bone		fragments		
Je-439	764.4.5	6		2	5-10	14	UID Bone	bone		fragments		
Je-439	764.4.6	6		2	5-10		UID Bone	bone		fragments		
Je-439	764.4.7	6		2	5-10		UID Bone	bone		fragments		
Je-439	764.4.8	6		2	5-10		UID Bone	bone		fragments		
Je-439	764.4.9	6		2	5-10		UID Bone	bone		fragments		
Je-439	764.4.10	6		2	5-10		UID Bone	bone		fragments		
Je-439	764.4.11	6		2	5-10		UID Bone	bone		fragments		
Je-439	764.4.12	6		2	5-10		UID Bone	bone		fragments		
Je-439	764.4.13	6		2	5-10		UID Bone	bone		fragments		
Je-439	764.4.14	6		2	5-10		UID Bone	bone		fragments		
Je-439	764.4.15	6		2	5-10		UID Bone	bone		fragments		
Je-439	764.4.16	6		2	5-10		UID Bone	bone		fragments		
Je-439	764.4.17	6		2	5-10		UID Bone	bone		fragments		
Je-439	764.4.18	6		2	5-10		UID Bone	bone		fragments		
Je-439	764.4.19	6		2	5-10	1	Dicrodon sp.	dentarx	R	horizontal ramus with teeth		
Je-439	764.4.20	6		2	5-10	2	Dicrodon sp.	dentarx	L	horizontal ramus with teeth		
Je-439	764.4.21	6		2	5-10		Dicrodon sp.	dentarx	L	horizontal ramus with teeth		
Je-439	764.4.22	6		2	5-10	3	Dicrodon sp.	dentarx/maxilla		misc. frag. with teeth		
Je-439	764.4.23	6		2	5-10		Dicrodon sp.	dentarx/maxilla		misc. frag. with teeth		

Appendix III (con't.).

Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-439	764.4.24	6		2	5-10		Dicrodon sp.	dentarx/maxilla		misc. frag. with teeth		
Je-439	764.4.25	6		2	5-10	1	Sigmodontinae	scapula		glenoid fossa frag.		
Je-439	764.4.26	6		2	5-10	7	Sigmodontinae	incisor				
Je-439	764.4.27	6		2	5-10		Sigmodontinae	incisor				
Je-439	764.4.28	6		2	5-10		Sigmodontinae	incisor				
Je-439	764.4.29	6		2	5-10		Sigmodontinae	incisor				
Je-439	764.4.30	6		2	5-10		Sigmodontinae	incisor				
Je-439	764.4.31	6		2	5-10		Sigmodontinae	incisor				
Je-439	764.4.32	6		2	5-10		Sigmodontinae	incisor				
Je-439	764.4.33	6		2	5-10	3	Sigmodontinae	mandible	R			
Je-439	764.4.34	6		2	5-10		Sigmodontinae	mandible	R			
Je-439	764.4.35	6		2	5-10		Sigmodontinae	mandible	R			
Je-439	764.4.36	6		2	5-10	4	Sigmodontinae	mandible	L			
Je-439	764.4.37	6		2	5-10		Sigmodontinae	mandible	L			
Je-439	764.4.38	6		2	5-10		Sigmodontinae	mandible	L			
Je-439	764.4.39	6		2	5-10		Sigmodontinae	mandible	L			
Je-439	764.4.40	6		2	5-10	1	Cervidae	metapodial		condyle (distal) frag		
Je-439	764.4.41	6		2	5-10	1	Passeriformes	humerus	L	distal end only		burned
Je-439	764.4.42	6		2	5-10	2	Aves			misc. shaft frag.		
Je-439	764.4.43	6		2	5-10		Aves			misc. shaft frag.		
Je-439	765.4.1	6		3	10-15	2	Dicrodon sp.	vertebra				
Je-439	765.4.2	6		3	10-15		Dicrodon sp.	vertebra				
Je-439	765.4.3	6		3	10-15	1	Dicrodon sp.	cranial		misc. frag		
Je-439	765.4.4	6		3	10-15	1	Dicrodon sp.	dentarx	R	horizontal ramus with teeth		
Je-439	765.4.5	6		3	10-15	1	Vertebrata			misc. frag		
Je-439	766.4.1	6		4	15-20	3	UID Bone	bone		fragments		
Je-439	766.4.2	6		4	15-20		UID Bone	bone		fragments		

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Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-439	766.4.3	6		4	15-20		UID Bone	bone		fragments		
Je-439	766.4.4	6		4	15-20	1	Passeriformes	femur	R	missing prox. End	unfused	
Je-439	766.4.5	6		4	15-20	1	Mammalia			misc. frag		
Je-439	766.4.6	6		4	15-20	1	Vertebrata			misc. shaft frag.		
Je-439	768.4.1	7		1	0-5	2	UID Bone	bone		fragments		
Je-439	768.4.2	7		1	0-5		UID Bone	bone		fragments		
Je-439	768.4.3	7		1	0-5	2	Mammalia			misc. frag		
Je-439	768.4.4	7		1	0-5		Mammalia			misc. frag		
Je-439	768.4.5	7		1	0-5	1	Cervidae	metacarpal	L	proximal end, medial 1/3		fossilized, burned?
Je-439	768.4.6	7		1	0-5	1	Cervidae	lumbar vertebra		zygopophysis frag		fossilized, burned?
Je-439	769.4.1	7		2	5-10	1	UID Bone	bone		fragments		
Je-439	769.4.2	7		2	5-10	1	Cervidae	1st tarsal	L	fragment		fossilized
Je-439	769.4.3	7		2	5-10	3	Dicrodon sp.	dentarx/maxilla		misc. tooth-bearing frag		
Je-439	769.4.4	7		2	5-10		Dicrodon sp.	dentarx/maxilla		misc. tooth-bearing frag		
Je-439	769.4.5	7		2	5-10		Dicrodon sp.	dentarx/maxilla		misc. tooth-bearing frag		
Je-439	769.4.6	7		2	5-10	1	Pseudalopex sp.	astrogalus	L	fragment		
Je-439	769.4.7	7		2	5-10	2	Sigmodontinae	mandible	R	small horizontal ramus		
Je-439	769.4.8	7		2	5-10		Sigmodontinae	mandible	R	small horizontal ramus		
Je-439	769.4.9	7		2	5-10	1	Sigmodontinae	mandible	R	molar with attached bone		
Je-439	769.4.10	7		2	5-10	5	Sigmodontinae	tooth		incisor frag		
Je-439	769.4.11	7		2	5-10		Sigmodontinae	tooth		incisor frag		
Je-439	769.4.12	7		2	5-10		Sigmodontinae	tooth		incisor frag		
Je-439	769.4.13	7		2	5-10		Sigmodontinae	tooth		incisor frag		

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Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-439	769.4.14	7		2	5-10		Sigmodontinae	tooth		incisor frag		
Je-439	769.4.15	7		2	5-10	1	Sigmodontinae	mandible		molar with attached bone		
Je-439	769.4.16	7		2	5-10	1	Mammalia			misc. frag		calcined
Je-439	770.4.1	8		1	0-5	1	UID Bone	bone		fragments		
Je-439	770.4.2	8		1	0-5	3	Mammalia			misc. frag		
Je-439	770.4.3	8		1	0-5		Mammalia			misc. frag		
Je-439	770.4.4	8		1	0-5		Mammalia			misc. frag		
Je-439	770.4.5	8		1	0-5	1	Mammalia	scapula		blade at spine frag		burned
Je-439	771.4.1	8		2	5-10	1	Cervidae	lumbar vertebra		zygopophysis frag		fossilized
Je-439	771.4.2	8		2	5-10	1	Cervidae	pubis		frag		fossilized
Je-439	772.4.1	8		3	10-15	4	UID Bone	bone		fragments		
Je-439	772.4.2	8		3	10-15		UID Bone	bone		fragments		
Je-439	772.4.3	8		3	10-15		UID Bone	bone		fragments		
Je-439	772.4.4	8		3	10-15		UID Bone	bone		fragments		
Je-439	772.4.5	8		3	10-15	1	Pseudalopex sp.	humerus	L	distal 1/5	F	burned
Je-439	772.4.6	8		3	10-15	1	Osteichthyes	vertebra		complete		
Je-439	772.4.7	8		3	10-15	1	Sigmodontinae	tooth	L	incisor		
Je-439	772.4.8	8		3	10-15	1	Sigmodontinae	mandible	L	fragment		
Je-439	775.4.1	9		1	0-5	1	Vertebrata			misc. frag		
Je-439	776.4.1	9		2	5-10	2	Dicrodon sp.	vertebra		sacral		
Je-439	776.4.2	9		2	5-10		Dicrodon sp.	vertebra		lumbar (fused with sacral)		
Je-439	776.4.3	9		2	5-10	1	Cervidae	tibia	L	prox. diaphysis frag.	unfused	partly fossilized
Je-439	776.4.4	9		2	5-10	1	Vertebrata			misc. frag		
Je-439	777.4.1	9		3	10-15	1	UID Bone	bone		fragments		
Je-439	780.4.1	10		1	0-5	1	UID Bone	bone		fragments		
Je-439	780.4.2	10		1	0-5	3	Mammalia			misc. frag		
Je-439	780.4.3	10		1	0-5		Mammalia			misc. frag		
Je-439	780.4.4	10		1	0-5		Mammalia			misc. frag		burned

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Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-439	780.4.5	10		1	0-5	1	Dicrodon sp.	mandible	R	almost complete		
Je-439	781.4.1	10		2	5-10	8	UID Bone	bone		fragments		
Je-439	781.4.2	10		2	5-10		UID Bone	bone		fragments		
Je-439	781.4.3	10		2	5-10		UID Bone	bone		fragments		
Je-439	781.4.4	10		2	5-10		UID Bone	bone		fragments		
Je-439	781.4.5	10		2	5-10		UID Bone	bone		fragments		
Je-439	781.4.6	10		2	5-10		UID Bone	bone		fragments		
Je-439	781.4.7	10		2	5-10		UID Bone	bone		fragments		
Je-439	781.4.8	10		2	5-10		UID Bone	bone		fragments		
Je-439	781.4.9	10		2	5-10	5	Mammalia			misc. frag		
Je-439	781.4.10	10		2	5-10		Mammalia			misc. frag		
Je-439	781.4.11	10		2	5-10		Mammalia			misc. frag		
Je-439	781.4.12	10		2	5-10		Mammalia			misc. frag		burned
Je-439	781.4.13	10		2	5-10		Mammalia			misc. frag		burned
Je-439	781.4.14	10		2	5-10	1	Dicrodon sp.	maxilla	L	anterior portion		
Je-439	782.4.1	10		3	10-15	1	UID Bone	bone		fragments		
Je-439	782.4.2	10		3	10-15	3	Mammalia			misc. frag		
Je-439	782.4.3	10		3	10-15		Mammalia			misc. frag		
Je-439	782.4.4	10		3	10-15		Mammalia			misc. frag		
Je-439	782.4.5	10		3	10-15	2	Dicrodon sp.	mandible	R	horizontal ramus		
Je-439	782.4.6	10		3	10-15		Dicrodon sp.	mandible	R	horizontal ramus		
Je-439	782.4.7	10		3	10-15	1	Dicrodon sp.	cranial		skull frag		
Je-439	782.4.8	10		3	10-15	1	Dicrodon sp.	vertebra		fragment		
Je-439	783.4.1	10		4	15-20	1	Vertebrata			misc. frag		
Je-772	420.4.1	1		1	0-5	1	Dicrodon sp.	vertebra		fragment		
Je-790	698.4.1	5		2	5-10	1	Dicrodon sp.	bone		misc. long bone fragment		
Je-790	704.4.1	6	10			1	Rodentia	incisor		misc. incisor frag. (lower)		

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Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-790	703.4.1	6	9			1	Sigmodontinae	femur	L	almost complete diaphysis		
Je-790	706.4.1	7		1	0-5	6	Mugil sp.	vertebra		complete centrum		
Je-790	706.4.2	7		1	0-5		Mugil sp.	vertebra		complete centrum		
Je-790	706.4.3	7		1	0-5		Mugil sp.	vertebra		complete centrum		
Je-790	706.4.4	7		1	0-5		Mugil sp.	vertebra		complete centrum		
Je-790	706.4.5	7		1	0-5		Mugil sp.	vertebra		complete centrum		
Je-790	706.4.6	7		1	0-5		Mugil sp.	basioccipital		fragment		
Je-790	706.4.7	7		1	0-5	2	Vertebrata	bone		misc. fragment		
Je-790	706.4.8	7		1	0-5		Vertebrata	bone		misc. fragment		
Je-790	707.4.1	7		2	5-10	1	Dicrodon sp.	mandible/dentary	R	horizontal ramus		
Je-790	707.4.2	7		2	5-10	3	Mugil sp.	basioccipital		fragment		
Je-790	707.4.3	7		2	5-10		Mugil sp.	vertebra		fragment		
Je-790	707.4.4	7		2	5-10		Mugil sp.	hyomandibular		fragment		
Je-790	707.4.5	7		2	5-10	9	Osteichthyes	rib		fragment		
Je-790	707.4.6	7		2	5-10		Osteichthyes	rib		fragment		
Je-790	707.4.7	7		2	5-10		Osteichthyes	rib		fragment		
Je-790	707.4.8	7		2	5-10		Osteichthyes	pterygiophore		fragment		
Je-790	707.4.9	7		2	5-10		Osteichthyes	bone		misc. fragment		
Je-790	707.4.10	7		2	5-10		Osteichthyes	bone		misc. fragment		
Je-790	707.4.11	7		2	5-10		Osteichthyes	bone		misc. fragment		
Je-790	707.4.12	7		2	5-10		Osteichthyes	bone		misc. fragment		
Je-790	707.4.13	7		2	5-10		Osteichthyes	bone		misc. fragment		
Je-790	707.4.14	7		2	5-10	7	UID Bone	rib		fragment		
Je-790	707.4.15	7		2	5-10		UID Bone	rib		fragment		
Je-790	707.4.16	7		2	5-10		UID Bone	rib		fragment		
Je-790	707.4.17	7		2	5-10		UID Bone	rib		fragment		
Je-790	707.4.18	7		2	5-10		UID Bone	bone		fragment		

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Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-790	707.4.19	7		2	5-10		UID Bone	bone		fragment		
Je-790	707.4.20	7		2	5-10		UID Bone	bone		fragment		
Je-790	708.4.1	7		3	10-15	1	Rodentia	incisor		lower right, fragment		
Je-790	713.4.1	8		2	5-10	1	Mugil sp.	cervical vertebra		complete centrum		
Je-790	718.4.2	9		2	5-10	1	Dicrodon sp.	bone		misc. long bone		
Je-790	718.4.1	9		2	5-10	1	Sigmodontinae	mandible	R	in 3 mending pieces; horizontal ramus with I, M1, M2, M3		
Je-790	718.4.3	9		2	5-10	17	UID Mammal	bone		fragment		burned
Je-790	718.4.4	9		2	5-10		UID Mammal	bone		fragment		burned
Je-790	718.4.5	9		2	5-10		UID Mammal	bone		fragment		burned
Je-790	718.4.6	9		2	5-10		UID Mammal	bone		fragment		burned
Je-790	718.4.7	9		2	5-10		UID Mammal	bone		fragment		burned
Je-790	718.4.8	9		2	5-10		UID Mammal	bone		fragment		
Je-790	718.4.9	9		2	5-10		UID Mammal	bone		fragment		
Je-790	718.4.10	9		2	5-10		UID Mammal	bone		fragment		
Je-790	718.4.11	9		2	5-10		UID Mammal	bone		fragment		
Je-790	718.4.12	9		2	5-10		UID Mammal	bone		fragment		
Je-790	718.4.13	9		2	5-10		UID Mammal	bone		fragment		
Je-790	718.4.14	9		2	5-10		UID Mammal	bone		fragment		
Je-790	718.4.15	9		2	5-10		UID Mammal	bone		fragment		
Je-790	718.4.16	9		2	5-10		UID Mammal	bone		fragment		
Je-790	718.4.17	9		2	5-10		UID Mammal	bone		fragment		
Je-790	718.4.18	9		2	5-10		UID Mammal	bone		fragment		
Je-790	718.4.19	9		2	5-10		UID Mammal	bone		fragment		
Je-790	719.4.1	9		3	10-15	1	UID Mammal	bone		fragment		
Je-790	720.4.1	9		4	15-20	2	Osteichthyes	vertebra		fragment		
Je-790	720.4.2	9		4	15-20		Osteichthyes	pterygiophore		fragment		
Je-790	724.4.1	10		2	5-10	8	Osteichthyes	vertebra		complete centrum		2 stuck together

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Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-790	724.4.2	10		2	5-10		Osteichthyes	vertebra		complete centrum		
Je-790	724.4.3	10		2	5-10		Osteichthyes	vertebra		complete centrum		
Je-790	724.4.4	10		2	5-10		Osteichthyes	vertebra		complete centrum		
Je-790	724.4.5	10		2	5-10		Osteichthyes	vertebra		complete centrum		
Je-790	724.4.6	10		2	5-10		Osteichthyes	bone		misc. fragment		
Je-790	724.4.7	10		2	5-10		Osteichthyes	bone		misc. fragment		
Je-790	724.4.8	10		2	5-10		Osteichthyes	bone		misc. fragment		
Je-790	733.4.7	12		2	5-10	1	Mugil sp.	hyomandibular	L	proximal fragment		
Je-790	736.4.1	12	11	2	5-10	4	Mugil sp.	vertebra		complete centrum		burned
Je-790	736.4.2	12	11	2	5-10		Mugil sp.	vertebra		complete centrum		burned
Je-790	736.4.3	12	11	2	5-10		Mugil sp.	vertebra		complete centrum		burned
Je-790	736.4.4	12	11	2	5-10		Mugil sp.	vertebra		complete centrum		burned
Je-790	733.4.1	12		2	5-10	6	Osteichthyes	bone		misc. fragment		
Je-790	733.4.2	12		2	5-10		Osteichthyes	bone		misc. fragment		
Je-790	733.4.3	12		2	5-10		Osteichthyes	bone		misc. fragment		
Je-790	733.4.4	12		2	5-10		Osteichthyes	bone		misc. fragment		
Je-790	733.4.5	12		2	5-10		Osteichthyes	bone		misc. fragment		
Je-790	733.4.6	12		2	5-10		Osteichthyes	bone		misc. fragment		
Je-790	736.4.7	12	11	2	5-10	13	UID Bone	bone		fragment		burned
Je-790	736.4.8	12	11	2	5-10		UID Bone	bone		fragment		burned
Je-790	736.4.9	12	11	2	5-10		UID Bone	bone		fragment		burned
Je-790	736.4.10	12	11	2	5-10		UID Bone	bone		fragment		burned
Je-790	736.4.11	12	11	2	5-10		UID Bone	bone		fragment		burned
Je-790	736.4.12	12	11	2	5-10		UID Bone	bone		fragment		burned
Je-790	736.4.13	12	11	2	5-10		UID Bone	bone		fragment		burned
Je-790	736.4.14	12	11	2	5-10		UID Bone	bone		fragment		burned

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Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-790	736.4.15	12	11	2	5-10		UID Bone	bone		fragment		burned
Je-790	736.4.16	12	11	2	5-10		UID Bone	bone		fragment		burned
Je-790	736.4.17	12	11	2	5-10		UID Bone	bone		fragment		burned
Je-790	736.4.18	12	11	2	5-10		UID Bone	bone		fragment		burned
Je-790	736.4.19	12	11	2	5-10		UID Bone	bone		fragment		burned
Je-790	736.4.5	12	11	flot.		1	Dicrodon sp.	mandible	L	horizontal ramus		
Je-790	736.4.6	12	11	flot.		1	Mugil sp.	trunk vertebra		complete centrum		
Je-804	B1			Surface	0	1	Mammalia	femur?		head epiphysis frag?		fossilized; may be modified
Je-901	375.4.7	1		1	0-5	1	Mammalia	bone		misc. shaft fragment		
Je-901	375.4.1	1		1	2.5-3	4	Mammalia	bone		misc. fragment		burned
Je-901	375.4.2	1		1	2.5-3		Mammalia	bone		misc. fragment		burned
Je-901	375.4.3	1		1	2.5-3		Mammalia	bone		misc. fragment		burned
Je-901	375.4.4	1		1	2.5-3		Mammalia	bone		misc. fragment		burned
Je-901	375.4.5	1		1	0-5	1	Mugil sp.	vertebra		complete centrum		
Je-901	375.4.6	1		1	0-5	1	Osteichthyes	vertebra		centrum fragment in 2 mending pieces		
Je-901	376.4.1	1		2	5-10	1	Mugil sp.	vertebra		centrum fragment in 7 mending pieces		
Je-936	360.4.1	1		2	5-10	1	Vertebrata	bone		misc. fragment		
Je-1002	303.4.1	1		1	0-5	1	Ariidae	pterygiophore		proximal end (first)		
Je-1002	303.4.2	1		1	0-5	1	Dicrodon sp.	mandible	R	horizontal ramus fragment		
Je-1002	303.4.3	1		1	0-5	2	Vertebrata	bone		misc. fragment		
Je-1002	303.4.4	1		1	0-5		Vertebrata	bone		misc. fragment		
Je-1002	304.4.2	1		2	5-10	2	Ariidae	parashaoid		fragment		
Je-1002	304.4.3	1		2	5-10		Ariidae	ethmmoid	L	complete		

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Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-1002	304.4.1	1		2	5-10	1	Haemulidae	hyomandibular	R	proximal fragment		
Je-1002	304.4.4	1		2	5-10	3	Osteichthyes	vertebra		fragment		
Je-1002	304.4.5	1		2	5-10		Osteichthyes	bone		misc. fragment		
Je-1002	304.4.6	1		2	5-10		Osteichthyes	bone		misc. fragment		
Je-1002	304.4.7	1		2	5-10	1	Vertebrata	bone		misc. fragment		
Je-1002	305.4.1	1		3	10-15	1	Ariidae	coracoid	R	proximal fragment at spine articulation		
Je-1002	305.4.9	1		3	10-15	1	Dicrodon sp.	maxilla		fragment		
Je-1002	305.4.8	1		3	10-15	1	Mammalia	zygomatic		fragment		
Je-1002	305.4.2	1		3	10-15	6	Osteichthyes	terminal vertebra		fragment		
Je-1002	305.4.3	1		3	10-15		Osteichthyes	hyomandibular		fragment		
Je-1002	305.4.4	1		3	10-15		Osteichthyes	bone		misc. fragment		
Je-1002	305.4.5	1		3	10-15		Osteichthyes	bone		misc. fragment		
Je-1002	305.4.6	1		3	10-15		Osteichthyes	bone		misc. fragment		
Je-1002	305.4.7	1		3	10-15		Osteichthyes	bone		misc. fragment		
Je-1002	311.4.1	1	2	4		1	Pseudalopex sp.	metapodial		distal 1/2-2/3	F	burned
Je-1002	312.4.1	1	2	5		1	Micropogonias sp.	otolith	R	complete		
Je-1002	308.4.1	1		6	25-30	1	Mammalia	bone		misc. fragment		
Je-1002	308.4.2	1		6	25-30	1	Osteichthyes	basioccipital		fragment		
Je-1002	472.4.1	1		10	40-45	1	Decapoda (crab)	claw		fragment		
Je-1002	481.4.1	2		9	40-45	1	Rajiformes	vertebra		complete centrum		
Je-1002	493.4.1	3		3	10-15	2	UID Bone	bone		fragment		
Je-1002	493.4.2	3		3	10-15		UID Bone	bone		fragment		
Je-1002	494.4.5	3		4	15-20	1	Lacertilia (Sauria)	vertebra		complete, small		
Je-1002	494.4.6	3		4	15-20	1	Pseudalopex sp.	cervical vertebra		centrum fragment		
Je-1002	494.4.1	3		4	15-20	4	UID Bone	bone		fragment		
Je-1002	494.4.2	3		4	15-20		UID Bone	bone		fragment		
Je-1002	494.4.3	3		4	15-20		UID Bone	bone		fragment		

Appendix III (con't.).

Site	Artifact	Unit	Feature	Level	Depth	N	Species	Element	Side	Portion	Fusion	Modifications
Je-1002	494.4.4	3		4	15-20		UID Bone	rib		fragment		
Je-1002	495.4.3	3		5	20-25	1	Mugil sp.	hyomandibular	R	proximal fragment		
Je-1002	495.4.1	3		5	20-25	2	Osteichthyes	vertebra		centrum fragment		
Je-1002	495.4.2	3		5	20-25		Osteichthyes	vertebra		centrum fragment		
Je-1002	496.4.1	3		6	25-30	1	Mugil sp.	vertebra		centrum fragment		
Je-1002	497.4.4	3		7	30-35	1	Mammalia	vertebra		fragment at base of spinous process		
Je-1002	497.4.3	3		7	30-35	1	Osteichthyes	vertebra		centrum fragment		
Je-1002	497.4.1	3		7	30-35	2	UID Bone	bone		fragment		
Je-1002	497.4.2	3		7	30-35		UID Bone	bone		fragment		
Je-1002	503.4.1	4		1	0-5	1	Aves	tarsometatarses		proximal fragment		burned
Je-1002	506.4.1	4		4	15-20	7	Lacertilia (Sauria)	vertebra		fragment		
Je-1002	506.4.2	4		4	15-20		Lacertilia (Sauria)	vertebra		fragment		
Je-1002	506.4.3	4		4	15-20		Lacertilia (Sauria)	vertebra		fragment		
Je-1002	506.4.4	4		4	15-20		Lacertilia (Sauria)	vertebra		fragment		
Je-1002	506.4.5	4		4	15-20		Lacertilia (Sauria)	vertebra		fragment		
Je-1002	506.4.6	4		4	15-20		Lacertilia (Sauria)	vertebra		fragment		
Je-1002	506.4.7	4		4	15-20		Lacertilia (Sauria)	vertebra		fragment		
Je-1002	515.4.1	4	3	6	26.5		PP5-bone bead					
Je-1002	511.4.1	4		9	40-45	3	Lacertilia (Sauria)	femur		complete		
Je-1002	511.4.2	4		9	40-45		Lacertilia (Sauria)	innominate	L	complete		
Je-1002	511.4.3	4		9	40-45		Lacertilia (Sauria)	innominate	R	missing part of pubis		
Je-1002	511.4.4	4		9	40-45	1	Vertebrata	bone		misc. shaft fragment worked into a bead		

Appendix IV. Material correlates of activities and number of activities represented at each Early Preceramic site in the QBT.

Site #	Hammer-stone	Lithic Debris	Primary Biface	Secondary Biface	PPK	Limace	Uniface	Retouched / Utilized Flake	Groundstone	Knapping Station	Faunal Material	Land Snails	Floral Material	Midden	Hearth	Pit	Human Remains	Adornments / Decoration	Non-local Material	**Total Activities**
Je-394		x		x																2
Je-395		x																		1
Je-397		x		x																2
Je-399		x																		1
Je-401		x																		1
Je-425		x																		1
Je-430		x		x																2
Je-431		x	x	x	x	x	x	x	x	x	x	x	x	x	x				x	15
Je-432		x					x													2
Je-433		x						x												2
Je-435		x		x																2
Je-436		x			x	x														3
Je-439		x	x	x	x	x	x	x	x	x	x	x	x	x	x				x	15
Je-440		x		x	x			x												4
Je-441		x				x														2
Je-442		x					x	x												3
Je-443		x		x				x												3
Je-447		x																		1
Je-449		x			x	x	x		x											5
Je-458		x				x														2
Je-459		x																		1
Je-470		x		x		x	x	x												5
Je-471		x																		1
Je-474		x		x		x	x													4
Je-475		x					x													2
Je-478		x					x	x	x											4
Je-481		x		x																2
Je-484		x		x	x	x		x												5
Je-766		x		x	x		x	x												5
Je-769		x	x					x												3
Je-770		x				x		x												3
Je-772		x			x		x	x	x		x	x								7
Je-777		x			x	x														3
Je-778		x	x		x		x	x												5
Je-780		x			x	x	x	x												5
Je-785		x	x					x												3
Je-789		x																		1

Appendix IV (con't.).

Site #	Hammer-stone	Lithic Debris	Primary Biface	Secondary Biface	PPK	Limace	Uniface	Retouched / Utilized Flake	Groundstone	Knapping Station	Faunal Material	Land Snails	Floral Material	Midden	Hearth	Pit	Human Remains	Adornments / Decoration	Non-local Material	**Total Activities**
Je-790		x	x	x	x	x	x	x			x	x	x	x	x	x				13
Je-791		x		x				x												3
Je-793		x	x					x	x											4
Je-795		x				x														2
Je-798		x	x				x	x												4
Je-800		x	x	x	x	x		x												6
Je-803		x		x																2
Je-804		x	x	x	x	x	x	x		x	x	x								10
Je-805		x						x												2
Je-812		x			x			x				x								4
Je-814		x	x		x	x														4
Je-817		x	x		x		x	x												5
Je-818	x	x	x	x			x	x												6
Je-820		x	x																	2
Je-825		x	x																	2
Je-827		x		x				x												3
Je-829		x	x	x	x															4
Je-832		x	x					x												3
Je-834		x																		1
Je-841		x		x				x												3
Je-843		x	x																	2
Je-844		x	x	x																3
Je-849		x		x			x													3
Je-850		x	x	x				x												4
Je-851		x		x		x	x	x	x	x		x								8
Je-852		x																		1
Je-853		x		x	x							x								4
Je-855		x				x														2
Je-856		x				x		x				x								4
Je-858		x			x							x								3
Je-859		x		x		x	x	x				x								6
Je-866		x																		1
Je-868		x				x														2
Je-870		x					x	x				x								4
Je-873		x			x			x				x							x	5
Je-875		x	x					x												3
Je-879		x																		1
Je-881		x										x								2

Appendix IV (con't.).

Site #	Hammer-stone	Lithic Debris	Primary Biface	Secondary Biface	PPK	Limace	Uniface	Retouched / Utilized Flake	Groundstone	Knapping Station	Faunal Material	Land Snails	Floral Material	Midden	Hearth	Pit	Human Remains	Adornments / Decoration	Non-local Material	**Total Activities**
Je-888		x	x	x																3
Je-897		x						x												2
Je-899		x			x							x								3
Je-900		x			x		x	x												4
Je-901		x		x	x	x	x	x			x	x								8
Je-906		x		x		x	x	x							x					6
Je-914		x		x																2
Je-915		x	x					x												3
Je-919		x		x	x	x	x	x		x	x	x								9
Je-925		x		x			x					x								4
Je-929		x					x	x				x								4
Je-930		x				x														2
Je-936		x				x		x			x	x								5
Je-945		x	x					x				x								4
Je-954		x	x					x				x								4
Je-955		x			x							x								3
Je-960		x	x					x		x										4
Je-964		x	x	x				x												4
Je-969		x				x		x												3
Je-970		x			x		x	x												4
Je-971		x			x	x	x	x											x	6
Je-972		x					x	x		x										4
Je-973		x				x		x												3
Je-976		x			x	x	x	x												5
Je-979		x		x	x	x	x	x			x	x		x						9
Je-980		x			x		x													3
Je-981		x		x						x		x								4
Je-982		x				x	x	x		x		x								6
Je-983		x		x	x	x		x			x	x								7
Je-984		x	x																	2
Je-986		x						x				x								3
Je-988		x	x	x	x		x	x		x		x								8
Je-989		x				x	x	x				x							x	6
Je-990		x			x			x											x	4
Je-991		x										x								2
Je-993		x		x	x	x	x	x		x	x	x							x	10
Je-995		x			x	x		x		x		x								6
Je-996		x			x	x	x	x			x	x							x	8

Appendix IV (con't.).

Site #	Hammer-stone	Lithic Debris	Primary Biface	Secondary Biface	PPK	Limace	Uniface	Retouched / Utilized Flake	Groundstone	Knapping Station	Faunal Material	Land Snails	Floral Material	Midden	Hearth	Pit	Human Remains	Adornments / Decoration	Non-local Material	**Total Activities**
Je-997		x			x		x	x				x							x	6
Je-998		x				x			x			x								4
Je-1001	x	x		x	x		x	x		x		x							x	9
Je-1002		x		x	x	x	x	x	x		x	x	x	x			x	x	x	14
Je-1003		x																		1
Je-1004		x			x	x	x	x											x	6
Je-1006		x		x				x			x								x	5
Je-1007		x	x	x	x		x	x			x									7
Je-1008		x					x													2
Je-1010		x		x	x	x	x	x		x										7
Je-1011		x	x	x	x	x	x	x		x		x								9
Je-1012		x		x	x			x											x	5
Je-1013		x		x	x		x	x												5

Appendix V. Number and types of lithic tools recovered from Early Preceramic sites in the QBT.

Site	Primary Bifaces	Secondary Bifaces			Fishtail		Paiján				Unstemmed Points		Unidentified Biface Fragments	Limaces				
		Ovate	Lenticular	Unidentified Fragments	Concavo-convex	Contracting	Classic Paijan	Talambo	Contracting Narrow	Contracting Broad	Unstemmed Paijan	Laurel-leaf		Lenticular	Rounded	Bi-pointed	Variants	Unidentified Fragments
Je-394				1														
Je-395													1					
Je-397				1														
Je-399													1					
Je-401													1					
Je-425													1					
Je-430				1														
Je-431	4	5		11			5	4	2	5			11	2	1	1		2
Je-432													2					
Je-433													3					
Je-435				1									1					
Je-436										1			2	1				
Je-439	1	1	1	7			7	2	6	4			14	5	1	1		
Je-440				2						1			7					
Je-441																1		
Je-442													2					
Je-443		1											2					
Je-447													1					
Je-449									1					1				
Je-458														1				
Je-459													1					
Je-470				1									3	1	1			
Je-471													1					
Je-474				1										1				1
Je-475													3					
Je-478													3					
Je-481				1														
Je-484				6			4		1	2			8					1
Je-766		1		1				1		1			4					
Je-769	2																	
Je-770																		1
Je-772							1	1		3			10					
Je-777										1			1					1
Je-778	1							1					3					
Je-780													1					1
Je-785	1												1					

Appendix V (con’t.).

Site	Primary Bifaces	Secondary Bifaces			Fishtail		Paiján				Unstemmed Points		Unidentified Biface Fragments	Limaces				
		Ovate	Lenticular	Unidentified Fragments	Concavo-convex	Contracting	Classic Paijan	Talambo	Contracting Narrow	Contracting Broad	Unstemmed Paijan	Laurel-leaf		Lenticular	Rounded	Bi-pointed	Variants	Unidentified Fragments
Je-789													2					
Je-790	7	1	4	31			10	2	3	1			7	3				2
Je-791				1														
Je-793	1																	
Je-795																		1
Je-798	1																	
Je-800	1		1	2			2						3				1	
Je-803		2																
Je-804	2	1		12			6	1	1			1	7	2				4
Je-805													1					
Je-812							1						1					
Je-814	1									1			3	1				
Je-817	2									2			3					
Je-818	1			1									1					
Je-820	1																	
Je-825	1																	
Je-827			1	1														
Je-829	4			1				1					1					
Je-832	1																	
Je-834													1					
Je-841				1														
Je-843	1																	
Je-844	1			1														
Je-849				1														
Je-850	2			3									1					
Je-851				1									5					1
Je-852													1					
Je-853				1			1		1									
Je-855													1					1
Je-856																		1
Je-858										1								
Je-859				5												1		
Je-866													1					
Je-868																		1
Je-870													1					
Je-873									1									
Je-875	1																	

Appendix V (con't.).

Site	Primary Bifaces	Secondary Bifaces: Ovate	Secondary Bifaces: Lenticular	Secondary Bifaces: Unidentified Fragments	Fishtail: Concavo-convex	Fishtail: Contracting	Paiján: Classic Paijan	Paiján: Talambo	Paiján: Contracting Narrow	Paiján: Contracting Broad	Unstemmed Points: Unstemmed Paijan	Unstemmed Points: Laurel-leaf	Unidentified Biface Fragments	Limaces: Lenticular	Limaces: Rounded	Limaces: Bi-pointed	Limaces: Variants	Limaces: Unidentified Fragments
Je-875	1																	
Je-879													1					
Je-881													2					
Je-888	2			2														
Je-897													1					
Je-899									1				1					
Je-900							1											
Je-901		1		4					2	1	1		3	1				
Je-906				1									2					1
Je-914				1														
Je-915	1																	
Je-919		1	1	1			3	1	3	1			1	4				1
Je-925		1	1															
Je-929													1					
Je-930													1			1		
Je-936														1				
Je-945	1																	
Je-954	1																	
Je-955										1								
Je-960	1																	
Je-964	1			1									1					
Je-969																1		
Je-970									1				1					
Je-971									2	1			1					2
Je-972													1					
Je-973													1					1
Je-976									3				1					2
Je-979				4		1			1				1				1	
Je-980							1											
Je-981		2											1					
Je-982													2	1				
Je-983				1			1						2	1				
Je-984	1																	
Je-986													1					
Je-988	1			1						1			2					
Je-989													2	1				
Je-990							2			1			3					

Appendix V (con't.).

Site	Primary Bifaces	Secondary Bifaces			Fishtail		Paiján				Unstemmed Points		Unidentified Biface Fragments	Limaces				
		Ovate	Lenticular	Unidentified Fragments	Concavo-convex	Contracting	Classic Paijan	Talambo	Contracting Narrow	Contracting Broad	Unstemmed Paijan	Laurel-leaf		Lenticular	Rounded	Bi-pointed	Variants	Unidentified Fragments
Je-991													2					
Je-993			1	2			10	1	6				5	1				3
Je-995									1				2	1				
Je-996					1					1			1			1		
Je-997							1											
Je-998														1				
Je-1001		1		1			1			1			2					
Je-1002		1				1	3		2	2			12				1	
Je-1003													2					
Je-1004										1			1	1		1		
Je-1006				2														
Je-1007	1			1			1						2					
Je-1008													1					
Je-1010		1	1		1				2	1			1					2
Je-1011	1			1			2	1		4			7	1				
Je-1012			1	1					1	1			3					
Je-1013				4					1				1					

Appendix V (con't.).

Site	Unifaces							Retouched Flakes					Utilized Flakes				Groundstone		
	Ovate	Tear-drop	Adze	Non-parallel	Bi-pointed	Triangular	Unidentified Uniface Fragments	One Margin	Two Margin	Multiple Margin	Notched	Unidentified	One Margin	Two Margin	Multiple Margin	Unidentified	Batan	Mano	Hammerstone
Je-394																			
Je-395																			
Je-397																			
Je-399																			
Je-401																			
Je-425																			
Je-430																			
Je-431	3	2					6	3	4	3			13	1			3	5	
Je-432	1																		
Je-433												3							
Je-435																			
Je-436																			
Je-439	1	4		1			3	6	2				8	4			4	2	
Je-440								2											
Je-441																			
Je-442	1												1						
Je-443												4							
Je-447																			
Je-449		1																1	
Je-458																			
Je-459																			
Je-470	2		1									3				3			
Je-471																			
Je-474							2												
Je-475		1																	
Je-478	1	1							1			1				2		1	
Je-481																			
Je-484												1				2			
Je-766							1					1	1						
Je-769													1						
Je-770														1					
Je-772							1	3		1			1	1				1	
Je-777																			
Je-778	1							1					4						
Je-780	1	1							1				3	1					
Je-785									1										
Je-789																			
Je-790		1					3	4	4				14	3	1				
Je-791														1					

Appendix V (con't.).

Site	Unifaces							Retouched Flakes					Utilized Flakes				Groundstone		
	Ovate	Tear-drop	Adze	Non-parallel	Bi-pointed	Triangular	Unidentified Uniface Fragments	One Margin	Two Margin	Multiple Margin	Notched	Unidentified	One Margin	Two Margin	Multiple Margin	Unidentified	Batan	Mano	Hammerstone
Je-793							1						2	1				1	
Je-795																			
Je-798							1		1				1	1					
Je-800														1					
Je-803																			
Je-804							6	2	3		1		5	2					
Je-805								3						1					
Je-812								1											
Je-814																			
Je-817							1						1						
Je-818							1		1										1
Je-820																			
Je-825																			
Je-827													1						
Je-829																			
Je-832								1											
Je-834																			
Je-841								1											
Je-843																			
Je-844																			
Je-849	2																		
Je-850															1				
Je-851					1		2	1									1		
Je-852																			
Je-853																			
Je-855																			
Je-856								1	1				1						
Je-858																			
Je-859	1						1	1					3						
Je-866																			
Je-868																			
Je-870		1											1						
Je-873								1	1				1	1					
Je-875									1										
Je-879																			
Je-881																			
Je-888																			
Je-897														1					
Je-899																			

Appendix V (con't.).

Site	Unifaces							Retouched Flakes					Utilized Flakes				Groundstone		
	Ovate	Tear-drop	Adze	Non-parallel	Bi-pointed	Triangular	Unidentified Uniface Fragments	One Margin	Two Margin	Multiple Margin	Notched	Unidentified	One Margin	Two Margin	Multiple Margin	Unidentified	Batan	Mano	Hammerstone
Je-900		1						1											
Je-901	1	1					1		2				2						
Je-906	1							1											
Je-914																			
Je-915													3	1					
Je-919	4						1		2				4	4	1				
Je-925	1																		
Je-929			1										1						
Je-930																			
Je-936													1						
Je-945									1										
Je-954														1					
Je-955																			
Je-960								1											
Je-964									1										
Je-969									1				1						
Je-970	1						1		1				1						
Je-971	1								1										
Je-972			1				2		2				1	1					
Je-973														1					
Je-976							1		1	1									
Je-979		1							4				2						
Je-980		1																	
Je-981																			
Je-982	1												1						
Je-983									1										
Je-984																			
Je-986									1		1								
Je-988				1					1	1			2						
Je-989	1												2						
Je-990														1					
Je-991																			
Je-993	2	2	2			2	1	5	4				2	2					
Je-995													1						
Je-996	1						1	2	3				2	1					
Je-997	1												1						
Je-998																	1		
Je-1001	1							1					1						1
Je-1002	1						1	1		1			3				1		

Appendix V (con't.).

Site	Unifaces							Retouched Flakes					Utilized Flakes				Groundstone		
	Ovate	Tear-drop	Adze	Non-parallel	Bi-pointed	Triangular	Unidentified Uniface Fragments	One Margin	Two Margin	Multiple Margin	Notched	Unidentified	One Margin	Two Margin	Multiple Margin	Unidentified	Batan	Mano	Hammerstone
Je-1003																			
Je-1004					1				2										
Je-1006								1	1										
Je-1007				1			1	1					2						
Je-1008		1		1															
Je-1010		1							3				1	2					
Je-1011							2	1	1		1								
Je-1012										1									
Je-1013	1									1			1						

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