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# An Analysis of Lithic Materials and Morphology from the Late Maritime Woodland and Protohistoric Periods at the Devil's Head site in the Maine Quoddy Region

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An Analysis of Lithic Materials and Morphology from the Late Maritime Woodland and  
Protohistoric Periods at the Devil's Head site in the Maine Quoddy Region

An Honors Thesis

Presented to

The Faculty of the Department of Anthropology

Bates College

In partial fulfillment of the requirements for the

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By

Christopher Elliott Shaw

Lewiston, Maine

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## Abstract

Archaeologists have reached ~~different~~ various conclusions about hunter-gatherer settlement-subsistence strategies during the Maritime Woodland period (3150-550BP) in Maine and New Brunswick's Quoddy Region. These debates hinge on questions of how seasonal ~~migration~~ transhumance, resource exploitation, and trading relationships evolved both spatially and temporally during this period. The subsequent Protohistoric period is little known archaeologically. The Devil's Head site in Calais, Maine, is germane to this discussion because it contains three spatially discrete and structurally distinct areas with radiocarbon dates spanning from the Late Maritime Woodland (1350-550BP) to the Protohistoric period (550-350BP). This provides opportunities for both inter-site comparisons with Maritime Woodland artifact assemblages elsewhere, as well as intra-site diachronic comparisons between dated features.

The lithic assemblage from the 2014 excavations at Devil's Head consists of 45 formal tools and 3274 pieces of debitage among three features. Using simplified regional petrographic seriation schemes, the artifacts were sorted by material type with the purpose of distinguishing between materials obtainable from local outcrops and materials only obtainable outside the Quoddy Region—mostly red and yellow cherts. The proportions of these materials by weight and flake count, as well as the proportions and morphologies of formal tools in each feature, serve as a proxy for hunter-gatherer settlement or interaction strategies. Tool morphology is also reported and compared. These results are useful in that they both establish a baseline of Late Maritime Woodland to Protohistoric period site structure and composition in the Quoddy Region, and contribute to broader questions of regional change.

# Chapter 1: Introduction and Objectives

## Introduction

In this thesis, I analyze the lithic assemblage from the Devil's Head archaeological site (ME 97.10) in Calais, Maine, in order to contribute to settlement-subsistence debates during the Late Maritime Woodland and Protohistoric periods on the Maritime Peninsula (Table 1). To do this, I categorize and source lithic materials from spatially and temporally discrete site components to understand diachronic changes in hunter-gatherer mobility, interaction spheres and land use. I compare the composition and morphology of formal tools and debitage at Devil's Head with nearby Passamaquoddy Bay sites to report similarities and differences. Using changes in lithic material use as a proxy, I speculate about the dynamics of sporadic early European contact while also considering how canoe travel may have factored into regional mobility and interaction. Patterns of increasing varieties and proportions of culturally exotic lithic materials have been reported at regional sites with Late Maritime Woodland components compared to Middle Maritime Woodland. I conclude that this pattern continued, and may have even amplified, during the transition between the Late Maritime Woodland to Protohistoric at Devil's Head.

Using *ArcMap*, *Photoshop*, and *Autocad* software, I create visual representations of the site and its associated lithic materials and analyze each of the excavated formal tools (Appendix I). Finally, I offer multiple hypotheses for the presence of large quantities of culturally exotic lithic materials at the Devil's Head site and at nearby Passamaquoddy Bay sites, restating the possibility of a trade network spanning major aggregation sites such as Melanson and Goddard. I recommend chemical analysis and thin sectioning to further divide lithic materials at Devil's



Head into increasingly specific sources, as well as reiterate the necessity of additional sites with Protohistoric components in the Quoddy Region for gaining an understanding of this transition.

## History of Quoddy Region Archaeology

The Quoddy Region (Figure 1) is a maritime environment in coastal Charlotte County, New Brunswick and Washington County, Maine (Thomas 1983). It includes the traditional territory of the Passamaquoddy people, and is located within the Maritime Peninsula, the Wabanaki homeland (Hoffman 1955). There has been sustained interest in Quoddy Region archaeology since the 19<sup>th</sup> century, with Matthew's (1884) excavation of the Bobcabec Village site in the Saint Andrews area representing the first substantial archaeological study in the vicinity of Devil's Head (Matthew 1884; see Hrynck and Black 2012; Trigger 1986). Following a period of little archaeological research (see Spiess 1985), the next major projects were the excavations of the Holt's Point site in the 1950s, and a series of sites in the 1960s around the Saint Andrews area (e.g., Hammon 1984, Pearson 1970).

David Sanger initiated a long-term study of coastal sites in the St. Croix River watershed and Passamaquoddy Bay area in the mid-1960s, with the goal of assessing Maritime Woodland settlement-subsistence patterns in the Quoddy Region (Sanger 1987). On the basis of "site locations, the artifact assemblages, and the associated fauna," he sought to understand issues of seasonality and ~~migration~~transhumance, as well as how Quoddy Region coastal sites compared to similar sites in interior Maine and New Brunswick (Sanger 1987:iv-v). Beginning in the 1980s, David Black and his colleagues expanded this research into the insular Quoddy Region

with excavations at Partridge Island, Deer Island, Campobollo Island, Rouen Island, and the Bliss Islands (Black 1986:400). Later and ongoing work in the insular Quoddy Region by Black and others focused on high-resolution stratigraphic and economic studies (Black 2004, Black 2002, Bishop and Black 1988).

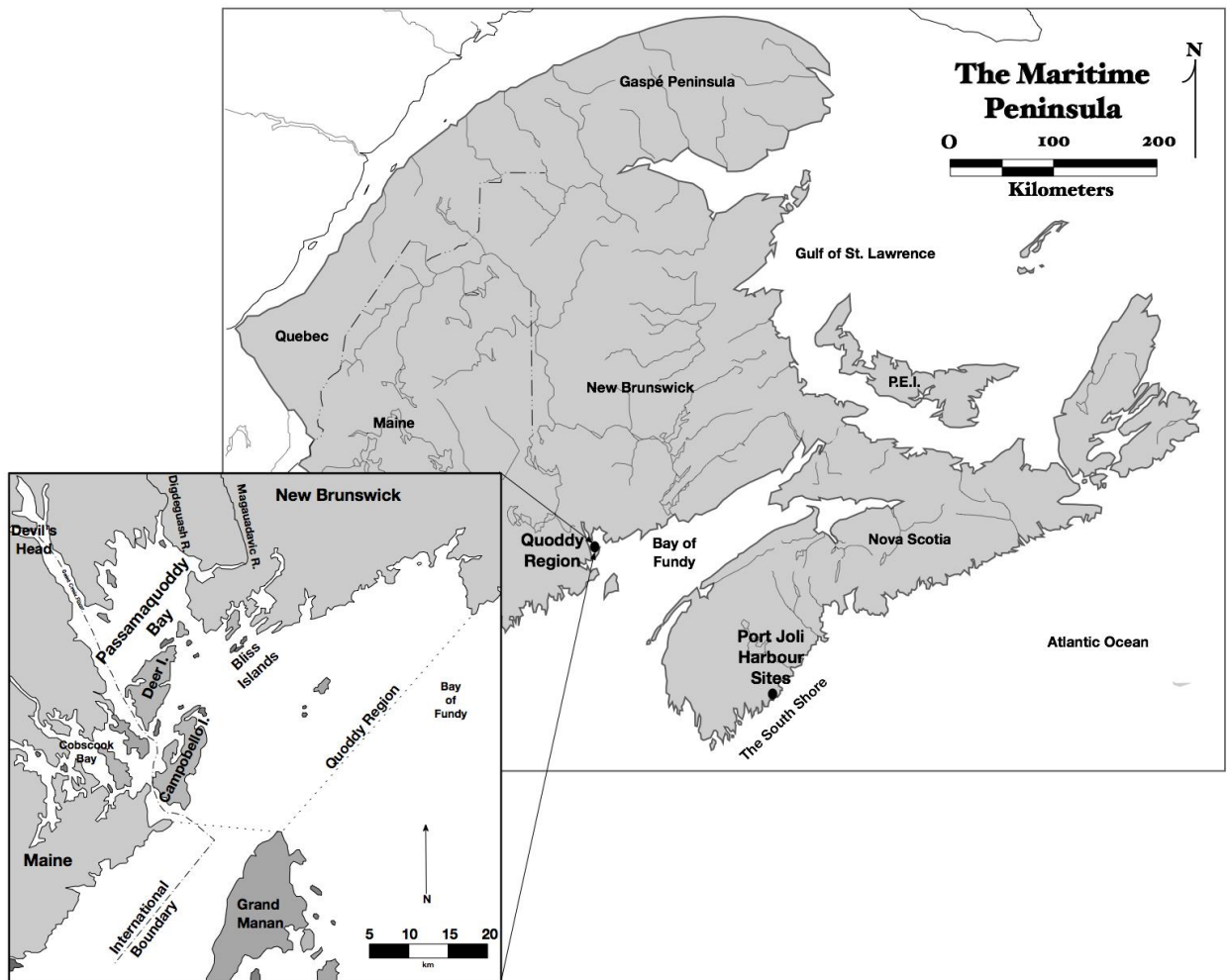


Figure 1. Map of the Maine Maritimes with the Quoddy Region inset (after Hrynck et al. 2015).

## Settlement-Subsistence Debate

Based on this work, archaeologists in the Quoddy Region have reached ~~different~~ various conclusions regarding the level of dynamism in settlement-subsistence during the Maritime Woodland period (3150-550 BP; see Table 1). To what extent did mobility, resource procurement, and interaction among Native groups in the Quoddy Region remain consistent or change during the Late Maritime Woodland period (ca. 950-550BP)? This question centers on ~~different~~ interpretations of site seasonality through the composition of faunal assemblages, interpretations of lithic procurement strategies, and the stratigraphic integrity of shell middens (e.g., Black 1993, 2002; Sanger 1987; 2003). Although this thesis considers only lithics, the present study is contextualized within and informs upon these broad debates.

A related question that has received less attention, but is worth examining in the context of this study, is how relationships between hunter-gatherers developed during the Late Maritime Woodland period evolved into the Protohistoric period (ca. 350 BP). This requires that we consider early instances of sporadic European contact (see Bourque and Whitehead 1985) and the possibility that trade dynamics established before the Protohistoric period may have been both impacted and ~~been~~ amplified by the early fur trade (MacDonald 1991; Bourque and Whitehead 1985). Ambiguity surrounding the Late Maritime Woodland to Protohistoric period transition is likely due to a dearth of known sites from 1000-400BP (MacDonald 1991: 126). The Devil's Head archaeological site is advantageous for addressing these questions as it contains spatially and temporally distinct site components spanning the Late Maritime Woodland to Protohistoric periods which have been securely radiocarbon dated (Hrynicky et al. 2015). At

present, Devil’s Head is one of the only such sites, and so stands to help develop further research models and questions.

***Arguments Supporting Consistency in Settlement Subsistence (the “Quoddy Tradition”)***

Interpretations of change at the time of European contact rely on varying theories about prehistoric lifeways immediately preceding sustained contact. What was the nature of seasonal ~~migration~~transhumance patterns? Did Native groups become more sedentary and their mobility more logistical over time? Sanger (1987:87-88) argues that settlement-subsistence strategies throughout the Maritime Woodland period were relatively homogenous, with highly mobile cold-weather foragers pursuing similar seasonal ~~migration~~transhumance patterns and

| Petersen and Sanger (1993)   | Approximate Range of Dates | Black (2002)                   | Approximate Range of Dates |
|------------------------------|----------------------------|--------------------------------|----------------------------|
| CP-1 (Early Ceramic)         | 3050–2150 BP               | Early Maritime Woodland        | 3150–2200 BP               |
| CP-2 (early Middle Ceramic)  | 2150–1650 BP               | Middle Maritime Woodland       | 2200–1350 BP               |
| CP-3 (middle Middle Ceramic) | 1650–1350 BP               |                                |                            |
| CP-4 late Middle Ceramic     | 1350–950 BP                | earlier Late Maritime Woodland | 1350–950 BP                |
| CP-5 (early Late Ceramic)    | 950–650 BP                 | later Late Maritime Woodland   | 950–550 BP                 |
| CP-6 (late Late Ceramic)     | 650–400 BP                 | Protohistoric                  | 550–350 BP                 |
| CP-7 (Contact)               | 400–200 BP                 | Historic                       | 350 BP–Present             |

procurement strategies.

**Table 1. Temporal Components**

Ceramic Period correlates are provided to facilitate regional integration.

Sanger uses the term “Quoddy Tradition” to refer to a way of life beginning at the onset of clam and mussel shell middens around 2200BP that was closely tied to terrestrial and marine resources available in the Quoddy Region (Sanger 1987:136). For Sanger, stylistic evolution in artifact types such as ceramic motifs and projectile point morphologies during the Late Maritime Woodland period are a sign of cultural change, but do not necessarily provide evidence of subsistence change (Sanger 1987: 136; see Bourque 1995).

Seasonality indicators for site occupation in the Maine Maritimes include the presence of seasonally available animal bones such as migratory bird fauna, as well as bivalve season of death analysis, and developing stable isotope studies. Sanger (1987, 2012: 256) interpreted no significant differences between the compositions of faunal assemblages in ~~different~~ Maritime Woodland temporal components, leading him to argue that seasonal movement and sedentism was relatively consistent over time. He supports this argument using ethnohistoric records of early 17<sup>th</sup> century European visitors to the area, contending that no credible descriptions of permanent villages exist (Sanger 2012: 257). In brief, this view holds that the region’s inhabitants were highly mobile, cold weather foragers (*sensu* Binford 1980) for the entire Maritime Woodland (or Ceramic) period (Sanger 1996).

The traditional model for seasonal ~~migration~~transhumance in the Maritime Woodland period in Maine had been that a single population spent summers along the coast and winters in the interior (Speck 1940). However, it now appears that this patterning was a late development, likely due to interactions with Europeans. Faunal assemblages from these two regions do not reveal such clear-cut seasonal patterns, with seasonality indicators such as soft shell clam growth rings demonstrating both summer and winter occupation along the coastline (Sanger 1996: 55-

56). Sanger argues that there were two adaptively distinct populations during the Maritime Woodland period, with one group inhabiting the coast and the other inhabiting the interior (Sanger 1996; 2003). These groups ~~migrated~~moved seasonally within these spheres in order to exploit available resources.

Sanger posits a cultural difference between these two groups which manifested through their differential treatment of faunal remains; although he hesitates to call it an ethnic distinction, this patterning would appear to have ethnic implications (Sanger 2003: 35). While the interior population ~~ritually obliterated~~calcined faunal remains, assemblages from the coastal population reveals no such practice; in contrast, dogs were allowed to chew on faunal bones (Sanger 2003: 32-33). Ethnohistorical accounts among Penobscot peoples reveal a taboo against allowing dogs to chew bones, as this could possibly offend the animal spirits who accepted their ordained deaths in a sacred hunting relationship (Sanger 2003: 35; see, e.g., Tanner 1979). Sanger's two-population model has been generally accepted, but the nature of the coastal occupation is not yet fully understood.

### ***Arguments Supporting Settlement-Subsistence Change in the Maritime Woodland period***

David Black (2002, 2004), in contrast, argues that Quoddy Region hunter-gatherers increasingly shifted towards logistical mobility (sensu Binford 1980) strategies during the Late Maritime Woodland Period. Accordingly, aggregation and trade may have intensified during the latter part of the Late Maritime Woodland, which was possibly concurrent with increasing sedentism (Black 2002: 314). This is supported, perhaps, by evidence from similarly dated sites

in Nova Scotia such as Melanson (Nash and Stewart 1990). In the archaeological record, Black observes evidence for this change in the form of faunal assemblages indicating more year-round occupation leading into the Late Maritime Woodland period. (2002: 312-313). Further evidence is found in Late Maritime Woodland lithic assemblages, which Black and his students argue increase in variety and proportion of culturally exotic materials compared to Early and Middle Maritime Woodland components (MacDonald 1994; Black 2004; Gilbert 2011).

Black's interpretation of faunal assemblages differs from Sanger's in that he observed variable indicators of seasonality at some Quoddy Region sites, rather than sites that appear to be discretely occupied during a single season over time. At the Partridge Island site (BgDr48), codfish (*Gadidae*) and herring (*Clupeidae*) bones in the Late Maritime Woodland component suggest warm season occupation (Black 1992; 2002:307). Harbor seal, fish, and migratory bird remains in the Late Maritime Woodland component of the Weir site (BgDq6), also suggest warm season occupation (Black 1992, 2002: 307). While Sanger is correct that the faunal assemblages in these sites are primarily indicative of cold season occupations, the fact that warm season faunal remains are also present throughout various Maritime Woodland temporal components complicates the notion that hunter-gatherers throughout this entire period utilized the environment similarly.

Black also suggests that excavation techniques at these sites likely led to the mixing of materials from later components into Early Maritime Woodland assemblages, concealing diachronic change (Black 2002: 307). This assertion about excavation practices should be contextualized within a broader debate focusing on the identification of stratification within shell middens and the degree of temporal control possible in excavating shell middens (Black 1993; Brennan 1977; Sanger 1981). Black's interpretations of faunal assemblages leads him to

characterize the Maritime Woodland period as a temporal mosaic of variability, rather than a static continuation of cold weather forager strategies (Black 2002: 306).

Black's interpretation of the ethnohistorical baseline also differs from Sanger's. He argues for a model using 17<sup>th</sup> century data concerning the Wolastoqiyik (Maliseet) people living in the St. John's river drainage. According to this argument, "Native peoples occupied relatively permanent main villages at the heads of tide on river systems, moving seasonally to exploit littoral and marine resources on the coast during the warm seasons and terrestrial resources in the interior during the cold seasons" (Black 2002: 305). The plurality of interpretations of the ethnohistorical record demonstrates the complexity of these records in this region. The major issue is the reliability of the accounts of early European visitors, with their ambiguous descriptions of Native groups, factual inaccuracies, and the difficulty of aligning historic descriptions with modern geographical locations (Bourque and Whitehead 1985).

With these issues in mind, Sanger and others have questioned the appropriateness of the direct-historical approach in addressing the issue of settlement-subsistence in the Quoddy Region, instead suggesting that European contact altered seasonal settlement patterns among coastal and interior populations (Black 2002: 305; Bourque 1989; Sanger 1982). Testing whether seasonal movement and subsistence altered the coastal-interior division is challenging, however, because few interior sites are known from Charlotte and Washington counties, which are rural and thus undergo little cultural resource management work (Black 2002: 306; see Brigham et al. 2006). This reality indicates that Black's interpretations are not mutually exclusive with the two-population aspect of Sanger's argument, but this could be due to a lack of interior site data in areas adjacent to the Quoddy Region, rather than an accurate representation of prehistoric populations.



## **The Maritime Woodland to Protohistoric Transition**

In the following chapters, I situate lithic materials from the Devil's Head site in terms of what may have been occurring elsewhere in the region and—despite my narrow technological focus—take an expansive view of inter-site comparison. In the following section I outline some of this evidence. One key contribution of the Devil's Head site is that it offers rare examples of securely dated protohistoric components. This may require that the lithic assemblage be considered within the context of changing regional interaction engendered by sporadic European contact. Some archaeologists working in the Quoddy Region have articulated a link between trade in the Late Maritime Woodland period and the early European fur trade (Bourque and Whitehead 1985; Bourque 1994; Cox and Kopec 1998; MacDonald 1994; Nash and Stewart 1990; Sanger 1991). They argue that trade relationships developed during the Late Maritime Woodland may have influenced trade in beaver pelts during the Protohistoric. As it is possible that middlemen from cultures surrounding the Maine Maritimes may have introduced European goods preceding direct European trade in the 17<sup>th</sup> century, regional interaction spheres during the Protohistoric are important to understanding the development of early trade dynamics (Bourque and Whitehead 1985).

This issue has received relatively scant attention in the literature. One reason for this could be the tendency for archaeologists to view the Maritime Woodland period as a homogenous temporal unit, rather than a period of dynamism and change leading into the Protohistoric (Black 2002). Another reason is undoubtedly the lack of known sites containing a distinguishable Protohistoric component, which are necessary to establish this link (MacDonald 1991: 124). The lack of temporal control at most sites with a Maritime Woodland component

complicates matters further, as it is possible that some lithic materials excavated from upper levels could actually be Protohistoric or historic in age (MacDonald 1991: 124).

Bourque and Whitehead (1985) suggest that the presence of “Souriquois” (probably Mi’kmaq) and “Etchemin” (probably Maliseet-Passamaquoddy) middlemen could have expanded the reach of the early fur trade to the Gulf of Maine, a coastal segment of the Northeast spanning from Cape Cod, Massachusetts to Cape Sable, Nova Scotia and including the Maritime Peninsula. This would explain the presence of European manufactured goods in the hands of Native groups along the New England coastline between 1602 and 1610, as noted in the ethnohistoric record by the first European voyagers to the region (Bourque and Whitehead 1985: 327). The traditional explanation for these manufactured goods is that native groups in the Gulf of Maine traded with ~~nondescript~~ European fishermen who ventured south from Nova Scotia. This does not align with Champlain’s observations during his 1605 voyage down the St. Lawrence River, however, where he asserted that there was no evidence of prior European visitation (Bourque and Whitehead 1985: 331). Bourque and Whitehead convincingly demonstrate that there were very few European visitors to the Gulf of Maine in the 16<sup>th</sup> century, suggesting that middlemen were the likely culprits for the importation of European manufactured goods.

Archaeologists have used possible regional and extra-regional aggregation sites such as the Goddard site and the Watson site in Maine and the Melanson site in Nova Scotia to begin to infer networks of trade relationships in the Maine Maritimes during the Late Maritime Woodland period (Bourque and Cox 1981; Cox and Kopec 1988; Nash and Stewart 1990; Sanger 1991). The Goddard site, located at the eastern limit of the Penobscot Bay, Maine, is a shell free or “black soil” (Black 2002) site with components from the Morehead phase, Susquehanna

tradition, and Maritime Woodland period (Bourque and Cox 1981). Especially pertinent to this discussion is the abundance of lithic materials in the Late Maritime Woodland component that are exotic to both the Gulf of Maine and the Quoddy Region. These materials include Munsungun chert from northern interior Maine, Minas Basin chert/chalcedony from Nova Scotia and the Bay of Fundy, and Ramah chert from Labrador (Bourque and Cox 1981: 15). As Munsungun and Minas Basin materials are also present at the Devil's Head site, it is possible that Native peoples occupying the Goddard site could have been linked in a broader regional exchange network. Goddard is further notable for the discovery of a Norse penny there dating to the 11<sup>th</sup> century, providing further evidence of long distance trade (Bourque and Cox 1981).

The Watson site located in the Frenchman Bay complex, Maine, is similar to Goddard, and contains Moorehead, Susquehanna, and Late Maritime Woodland components (Cox and Kopec 1998). The lithic assemblage includes Munsungun chert, Minas Basin chert, and Ramah chert (Cox and Kopec 1988), representing a similar composition to Goddard. Like Goddard, the middens consist of black, shell free soil. Cox and Kopec (1998) hypothesize that the Late Maritime Woodland components of the Goddard and Watson sites represent warm season villages. The faunal assemblages of both sites contain considerable seal and sturgeon, which were primarily harvested in the warm season (Cox and Kopec 1998: 42). The lack of shell at these sites also supports this assertion, and may suggest shell fish were not a major part of the diet during the summer months (Cox and Kopec 1988: 44). At the same time, it is possible that both sites once contained shell middens that have since eroded (Cox and Kopec 1988: 40). While erosion is a major issue in Maine coastal sites, it is unlikely that the shell at these sites would have eroded completely (Cox and Kopec 1988: 40).

Melanson is a Maritime Woodland site located along the Gaspereau River in King's County, Nova Scotia (Nash and Stewart 1990). The Bay of Fundy marine zone is located 8-10km down the river, making Melanson a transitional, ecotonal environment (Nash 1990: 188). Melanson is also located reasonably close to the Scots Bay lithic quarries; a source outcrop of the Minas Basin chalcedonies found at Goddard, Watson, and Devil's Head (Nash 1990: 197). Nash describes the growth of the site as potentially non-linear, with a "quantum leap" in the Late Maritime Woodland period (Nash 1990: 201). He suggests that the site could have been involved in a regional trade network spurred by social changes during the Late Maritime Woodland, such as increasing specialization and consolidation of power (Nash 1990: 204). The increasing distribution of Minas Basin chert throughout sites located on the Passamaquoddy Bay and Penobscot Bay in Late Maritime Woodland components provides evidence for this (Nash 1990: 205). Nash (1990:206) speculates that the Mi'kmaq chiefdom system (Nietfield 1981) could have begun to develop during this period, and hypothesizes a situation in which chiefs controlled trade in lithic materials as well as other resources.

Sanger (1991) argues for an exchange network throughout the Maritime Woodland connecting the Native peoples of Penobscot Bay, Maine, with Native peoples in Nova Scotia. He uses the widespread presence of Minas Basin cherts throughout the Maine Maritimes as evidence for this, observing that the entrance of these materials into Maine intensified at around 1000BP (Sanger 1991: 59). While point morphologies exhibit variability in these two regions, Sanger is hesitant to infer cultural differences from stylistic elements of artifacts alone (Sanger 1991: 59).

The Devil's Head site is well positioned to contribute to questions relating to regional trade during the Late Maritime Woodland and Protohistoric periods. Geographically, it is located between the major outcrops of exotic lithic materials, including Munsungun chert to the south,

and Minas Basin chalcedony and Ramah chert to the north. Its structure of three spatially and temporally distinct ~~activity areas~~components spanning the Late Maritime Woodland to Protohistoric periods provides opportunities for assessing diachronic change in terms of lithic trade and procurement. Analyzing protohistoric lithic assemblages is pertinent to the question of the protohistoric fur trade because the proportion and types of culturally exotic materials provides evidence for regional interaction. As additional sites with protohistoric components are discovered, it will be possible to ascertain links between trade in the Late Maritime Woodland period and the Protohistoric fur trade.

## **Lithic Analysis**

Lithic material procurement, use, and deposition represents ~~an~~ additional forms of evidence that ~~is~~are integral to the settlement-subsistence debate. As rocks are far more resistant to destruction than organic artifacts in the presence of acidic soil and are used to make tools, lithics represent the most abundant artifact class in Northeast sites. By tracing lithic types in archaeological assemblages to their source outcrops, it is possible to deduce the movement and interaction of prehistoric peoples using lithic materials types as a proxy (Andrefsky 1998).

Petrology is a branch of geology that is pertinent to this task, as it divides rock types into families based upon common attributes (Andrefsky 1998). Using petrographic schemes, it is possible to create both broad and increasingly specific divisions of lithic materials. Lithic material categories can then be sourced to geographic locations, which reveals: 1) The distance prehistoric people traveled to acquire certain lithic materials, and/or; 2) The extent of interaction

spheres allowing for long distance trade in lithics (Andrefsky 1998; Sanger 1991; Bourque 1994).

I use the lithic assemblage from the 2014 excavations at the Devil's Head site in Calais, Maine, as a case study for assessing an aspect of the settlement-subsistence debate in the Late Maritime Woodland and Protohistoric period. The Devil's Head site is particularly well suited to an examination of diachronic change throughout these periods due to its spatially and temporally distinct Protohistoric and Late Maritime Woodland components. When considering a possible shift to logistical mobility, I am specifically interested in whether changing mobility and interaction spheres are evidenced by the proportions of culturally exotic lithic material types present at the site. I define *culturally exotic* as lithic materials whose sources are probably located outside of the Quoddy Region that were likely intentionally transported into the Quoddy Region by humans (see methods). Before addressing the details of the Devil's Head site, I will provide a brief context for past lithic studies conducted in the Quoddy Region.

### ***Past Lithic Studies***

The first major geoarchaeological study focusing on lithic materials in the Quoddy Region was conducted by Crotts (1984), Sanger's graduate student. Crotts developed a petrographic series for classifying lithic artifacts at six Passamaquoddy Bay sites with Maritime Woodland Components, and designated lithic categories as either culturally local or culturally exotic. Materials considered local contained source outcrops within Passamaquoddy Bay, while the source outcrops of exotic materials were outside of Passamaquoddy Bay (Crotts 1984: 38).

Crotts (1984: 38-47) defined local materials as white quartz, grey quartzite, porphyritic tuffs/rhyolites, black siltstone and black volcanics. Culturally exotic categories are colored cryptocrystalline quartz, red and green mudstones, green volcanics, ferro-manganese metasedimentary rock, and white spotted metasedimentary rock (1984: 48-59). Crotts was not able to source culturally exotic materials; rather, she focused on identifying which materials could not be found in Passamaquoddy Bay, either in the form of outcrops or deposited cobbles (Crotts 1984: 37-38). Crotts's conclusions relating to settlement-subsistence change during the Late Maritime Woodland period support those of Sanger's. Based on her analysis of unifaces and bifaces from the Orr's Point (BgDr7) and McAleenan (BhDr1) sites, she concluded that: "There is no evidence supporting a significant change in dependence on local and distant Passamaquoddy Bay resources, or on foreign materials through time" (Crotts 1984: 105).

Lithic research continued with work by Wilson (1983, 1991, 1994), who reformulated and expanded Crotts's petrographic series for Black's excavations of the Bliss Islands. MacDonald (1994), David Black's graduate student, further refined this series during her analysis of the Weir and Partridge Island sites in the Insular Quoddy Region. She expanded Crotts's original 10 rock types to 50 types, and altered some of Crotts's initial designations. Especially pertinent to the Devil's Head site is her discovery that fine-grained green mudstone is present in high quantities as beach cobbles on the Bliss Islands (1994: 62).

MacDonald reached an opposing conclusion to Crotts regarding changes in lithic material use in the Late Maritime Woodland. In contrast to unpatterned variable lithic use throughout the entire Maritime Woodland, MacDonald observed an increasing proportion of exotic material in Late Maritime Woodland components at the Weir and Partridge Island sites (MacDonald 1994: 106). She attributed her opposing results to a few factors, including: 1) Shell midden excavation

techniques that lead to mixing of components on the part of Crotts and Sanger; 2) Use of broad petrographic categories and the treatment of all “local” and “exotic” materials as the same, and; 3) Crotts’s use of only formal tools for her analysis, leading to the overrepresentation of exotic materials compared to if she had included debitage (MacDonald 1991: 63, 116).

Gilbert (2011) continued in a similar vein as Crotts and MacDonald, further refining the regional petrographic series during his analysis of the Deer Island Point (BfDr5) site. With Black, he created two manuscripts summarizing the most common local and exotic lithic material types discovered in the Quoddy Region (Black and Gilbert 2006 a, b). These broad, lumped categories and their accompanying criteria represent a synthesis of past lithic studies focused on sourcing raw materials. Among the distinctive local material types Gilbert identified is Hinkley Point Metasediment (Gilbert 2011: 175), found in sites throughout the Passamaquoddy Bay as well as in Area C of the Devil’s Head site, one of the Protohistoric components.

Gilbert excavated the majority of culturally exotic lithic materials from the upper stratigraphic levels of the Deer Island Point site, likely indicating Late Maritime Woodland or Protohistoric occupation (Gilbert 2011: 185). On a grand scale, the site is located between the Munsungun chert and Ramah Bay Quartzite source outcrops in Northern Maine and Labrador respectively, which are two culturally exotic material types found at the site (Pollack et al. 1999; Loring 2002). Gilbert suggests that these materials were deposited there over the course of more expansive procurement and trade routes (Gilbert 2011: 185). These conclusions are aligned with MacDonald’s study of the Weir and Partridge Island sites in that the proportions of culturally exotic materials observed at the Deer Island Point site ~~are higher during their~~ Late Maritime Woodland samples compared to those of the Middle and Early Woodland periods.



### *Late Maritime Woodland Tool Morphology*

Bourque (1971) describes Maritime Woodland period projectile points as side-to-corner-notched. Although subsequent work has also identified stemmed points from the Maritime Woodland, these are rarer. Corner-notched points have a high degree of variability, and have been discovered throughout the Gulf of Maine and Passamaquoddy Bay (Bourque 1971: 170; Sanger 1987; Black 2002) and in Woodland period assemblages from throughout the Northeast (Ritchie 1971). These points are thin with straight to concave bases, excurvate blades, and deep corner notches. They ~~are~~were most commonly manufactured ~~by~~from local varieties of quartzite and volcanic materials. Side-notched points are also common, and are narrower than corner-notched points. They are defined by straight to slightly excurvate blades, with straight to convex bases and side notches near their stem (Bourque 1971: 170).

In the coastal regions of the Maine Maritimes, Holyoke noted that there was a sequential transition from side-notched to corner-notched points during the Late Maritime Woodland period (Holyoke 2012: 43). This pattern is due to the ~~presence~~greater number of side-notched points in older stratigraphic components than corner-notched points at sites such as Melanson, in Nova Scotia, and Newton's Point and Skull Island in southeastern New Brunswick (Holyoke 2012: 43). Broad similarities between point styles throughout the region are useful as temporally diagnostic artifacts, but cannot necessarily be used to substantiate cultural similarities or differences due to their wide geographic and temporal spread (Sanger 1991). In the context of this study, I investigate the degree of similarities and differences between point styles within the Devil's Head assemblage toward establishing affinities outside (e.g., Ritchie 1971) and within the region, and considering the technology of the relatively lesser known Protohistoric period.

## **Devil's Head Site**

The Devil's Head site is situated on a parcel of public land located on the south shore of the Saint Croix River in Calais, Maine (Spiess and Cranmer 2003). The Passamaquoddy place name for Devil's Head is "Gagocuhs," which roughly translates to "Dirty Mountain" (Soctomah 2004). This is in reference to a hill ~350 m in elevation that lies directly south of the study area, which appears dirty because of erosion. The site was first identified and excavated in 2003 by Spiess and Cranmer as part of the Land for Maine's Future program, which necessitated a combined Phase I and II research project following the acquisition of state land (Spiess and Cranmer 2003). Along the eroding bank of the site, they identified what they considered to be at least four to five distinct loci, spanning from the Early Maritime Woodland to historic period (Spiess and Cranmer 2005: 54). They made this assessment based upon diagnostic artifacts such as projectile points, cord-wrapped pottery, and historic period pipe-stems.

Spiess and Cranmer identified a concentrated prehistoric activity area consisting of discrete deposits of manuport gravel, which is often associated with dwelling features in the Quoddy Region (see Hrynich and Black in press; Sanger 1987, 2010). Hrynich and Webb's 2013 excavations focused on re-identifying and recording possible dwelling features in this activity area, as well as assessing the impacts of erosion at the site. The archaeologists found that one of the shell middens reported by Spiess and Cranmer in his original assessment had completely

eroded, and noted the site remained at risk. Hrynicky and Webb (Hrynicky et al. 2015)<sup>1</sup> conducted a more extensive field season in 2014, where they completely excavated one of the possible dwelling features and tested the margin of two others. The lithic materials from the 2014 excavations comprise the sample for my analysis in this thesis. Their study suggests three remaining loci (see figure 2).

Area A contains the southernmost feature, and likely represents the remnants of a dwelling on the basis of a manuport gravel floor, which articulates with a midden (2015: 14-15). Area B lies just to the north, consists of a midden, and lacks an associated dwelling feature (2015: 15-16). Area C is the northernmost as well as the largest of the three features, and contains evidence of a dwelling (2015: 17). Subsequent radiocarbon dating for each of the site areas (see Table 2) placed Area A in the Late Maritime Woodland period, and Areas B and C in the Protohistoric. These dates align with the cord-wrapped pottery excavated from the site, which is diagnostic of the Maritime Woodland period (Petersen and Sanger 1993). Although Areas B and C have overlapping radiocarbon dates, it cannot be stated conclusively that they were occupied contemporaneously at a cultural time scale.

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<sup>1</sup> Excavations at Devil's Head were conducted with the generous support of a National Science Foundation Grant (1436296).

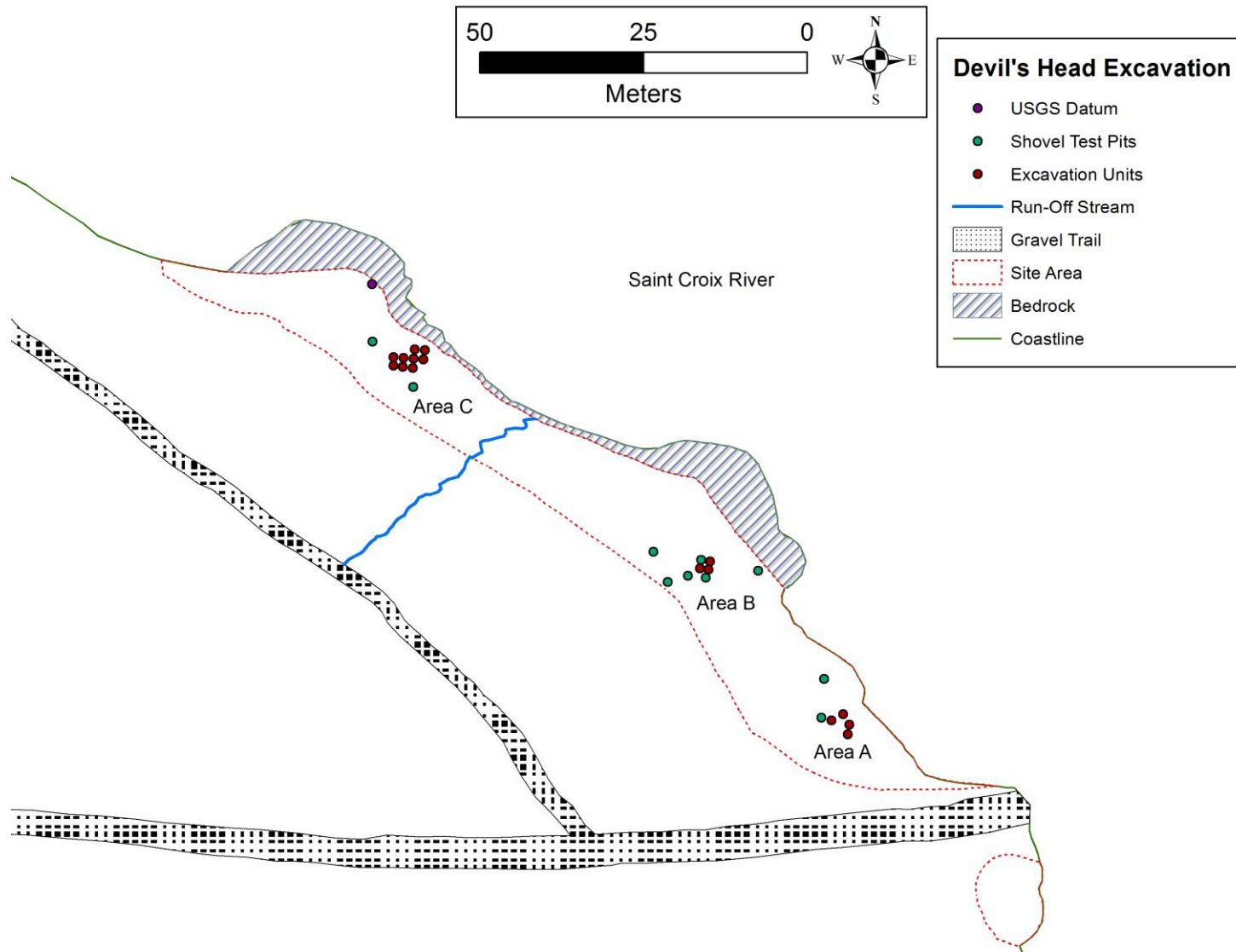


Figure 2. Devil's Head site map.  
 Map of the three site areas. Dave Leslie after Spiess and Cramner (2005).

**Table 2. Radiocarbon Dating Results from the Devil's Head site.**

|       | Site Name    | Date BP | Error | Material                | Lab No. | 2 $\sigma$ cal AD      | 1 $\sigma$ cal AD | Associations/Notes  |
|-------|--------------|---------|-------|-------------------------|---------|------------------------|-------------------|---|
| 97.10 | Devil's Head | 394     | 50    | <i>Alces alces</i> bone | X-28821 | AD1432-1635            | AD1441-1620       | The bone was identified as a burned portion of a moose ( <i>Alces alces</i> ) right medial phalanx, and weighed 14.7 g in total. The bone was recovered in Area B in unit N126 E25 Level 3A, within which it was at coordinates N34 W65 and a depth of 27 cm below surface. (Devil's Head #1) |
| 97.10 | Devil's Head | 446     | 34    | <i>Wood charcoal</i>    | X-29226 | AD1411-1494, 1602-1613 |                   | Associated with Fea. 3 in Area C. Date run on cat #2014.285—wood charcoal-- in N180E7 NE Quad, Level 3A (Devil's Head #2).  |
| 97.10 | Devil's Head | 801     | 29    | <i>Alces alces</i> bone | X-29223 | AD1183-1275            |                   | Area A, <i>Alces alces</i> distal phalanx. 9600 mg. N126E25 NE Quad LVL 4 (Devil's Head #3)   |

## **Objectives**

### **Analyze Devil's Head Site Structure**

The Devil's Head site has a unique structure in that it contains three spatially distinct activity areas with separate radiocarbon dates, two of which fall squarely in the Protohistoric period. This helps to obviate issues of temporal mixing (Sanger 1981, Black 1993, MacDonald 1994). I will analyze morphological attributes of formal tool forms from a diachronic perspective to suggest changes in site function over time. Additionally, I will analyze the composition of material types in the three site areas using both formal tools and debitage. I hope to understand the ways in which lithic material procurement changed over time, especially in relation to materials that are culturally exotic to the Quoddy Region.

### **Make Intra-Site Comparisons and Contribute to Settlement-Subsistence Debate**

I will examine how formal tool morphologies and proportions of lithic materials at Devil's Head compare to other Quoddy Region sites. By comparing the tool forms and lithic materials excavated from Devil's Head with these related sites, I seek to understand the Devil's Head site's relationships to other sites on the Maritime Peninsula. I will also use data from Devil's Head to contribute to the settlement-subsistence debate by testing whether later temporal components contain a higher proportion of culturally exotic lithic materials compared to earlier

components. This will enable me to ascertain whether Devil's Head provides evidence of diachronic changes in mobility, procurement, and regional interaction.

This study also contributes to our archaeological understanding of the little known Protohistoric period by presenting analysis of a lithic assemblage with a Protohistoric component. Through analysis of the unique site structure at Devil's Head, I seek to examine the transition between the Late Maritime Woodland to Protohistoric periods in order to assess continuity and change. This study will serve as a comparative tool for future researchers as additional sites with Protohistoric components in the Quoddy Region are identified.

### **Explore New Approaches to Visual Data Presentation for the Quoddy Region**

Project goals relating to site structure and diachronic change are partially permitted by the application of Geographic Information System (GIS) software. GIS applications allow archaeologists to display large amounts of site data in a way that is highly visual. GIS is especially well suited to the Devil's Head site structure because it allows me to visually display diachronic change. By integrating high resolution images of formal tools from different site areas, GIS serves as an excellent visual aid for site structure analysis. I seek to demonstrate the usefulness of GIS in approaching spatial issues in Quoddy Region archaeology.

Another traditional lithic analysis issue that I seek to address visually is the difficulty of replicability when recording metrics on formal tools (Beck 1989). Tools such as stemmed bifaces rarely conform to generic models for recording measurements (ie. neck width), which may cause different archaeologists to arrive at different measurements for the same metric. These errors can

become quite meaningful when comparing tool morphology proportions derived from various metrics. To remedy this issue, I use *Autocad* software to create architectural-style dimensions of formal tools in order to visually present the exact locations that I am measuring from. By presenting my measurements visually in this way, I hope to minimize common types of human error in lithic analysis.



## **Chapter 2: Methods and Results**

### **Methods**

#### **Formal Tools**

Formal tools were weighed with a Meddler Toledo model AB104-S balance with a 110 g capacity (Tolerance=0.0003 g). The precision of this instrument is probably excessive, but was used because it was conveniently available. Tools were then sorted using a modified version of Black and Gilbert's (2006 a, b) petrographic series for the Quoddy Region, which I describe below. Digital scans of each formal tool were recorded (600 dpi resolution) and used for the creation of dimensional images in *Autocad*. The tools were then qualitatively analyzed drawing on Spiess's (2005) classification scheme for tools at the Devil's Head site, as well as Davis's (1975: 40) dissertation focusing on a nearby Quoddy Region site, Teacher's Cove. Metrics, images, and morphology of formal tools are provided in Appendix I.

#### **Debitage**

The site was excavated in 1 × 1 m units broken into 50 cm quadrants across three areas and screened using 3mm (1/8") mesh screens (Hrynich et al. 2015). The lithic assemblage was organized during excavation through a combination of morphology and provenience. Formal tools were each given their own catalog number and piece-plotted when possible, whiledebitage was lumped together and organized by unit and level. For identifying proportions of material

types in this study, it was necessary to reassign a unique catalog number to each artifact in the assemblage. A relational database was created using *Microsoft Access* to accommodate separate entries for each piece of debitage, which were bagged and labeled separately. Each piece of debitage was weighed with the Meddler Toledo high precision balance. The few flakes that surpassed the weight tolerance for that instrument (n=7) were weighed with an Ohaus Scout Pro model SP401 (Tolerance=0.1 g). Flakes were then sorted using the modified version of Black and Gilbert's petrographic series for the Quoddy Region (see below), and divided broadly between materials local vs. exotic to the Quoddy Region. Flakes were viewed under a Cole Palmer Stereo Microscope (1x-3x magnification).

## **Petrographic Series**

The Petrographic Series used in this study is largely adapted from Gilbert, Gamblin, and Black's (2006) *Usual Suspects*. Due to limitations in time and availability of analytic techniques such as thin sectioning, some broader categories were introduced. These rely on macroscopic examination of samples with relatively few, easily recognizable characteristics by which to assign them to probable categories. This does not preclude later, more intensive work, but rather forms a necessary first step for those studies. The approach I take here is also of analytical value, but its limitations should be kept in mind. Rather than dividing lithic artifacts into a large number of narrow categories with varying degrees of likelihood concerning their local or exotic origins, three categories were used: local, exotic, and unknown. This simplifies the process of discerning between local and exotic materials by only dividing artifacts into a few categories with a higher degree of confidence, rather than making a series of increasingly specific, error-prone divisions.

The salient geologic characteristics used to sort each tool and piece of debitage are listed within each petrographic category, alongside a digital scan (1200dpi resolution) of representative materials from the Devil's Head assemblage.

Exotic materials are defined as lithic materials with source outcrops that have been identified outside of the Quoddy Region or which likely are from outside the Quoddy Region (see fig. 1). Conversely, local materials are defined as lithic materials with source outcrops probably located within the Quoddy Region, or else likely deposited as cobbles through glacial or alluvial transport. Culturally exotic lithic materials would have had to be transported to Quoddy Region archaeological sites through: 1) Direct procurement by the inhabitants of Passamaquoddy Bay; 2) Delivery by Native groups outside of the Quoddy Region, or; 3) Down-the-line transport, meaning exotic lithic materials would have been exchanged by groups within cultural boundaries, rather than direct procurement or deposition (Sanger 1991; MacDonald 1994). Any of these options, or a combination of them, indicates hunter-gatherer integration into a broader regional sphere of mobility and/or interaction and trade. I am interested in diachronic changes in the proportion and variety of culturally exotic material types in order to deduce changes in the nature of this integration over time.

*Description of Probable Local Materials (after Gilbert et al. 2006)*

Name: Grey Chert or Volcanic

Origin: Local

Description: Grey to green, fine to coarse-grained lithic material comprised of local chert and igneous varieties (MacDonald 1994). Likely includes flow-banded rhyolites. Some darker black material is present, as well as bleached material. Contains conchoidal fracture and dull luster. Some of these materials likely derive from the “coastal volcanic belt” in Washington County, Maine (Brockman and Georgiady 2005).



Figure 3. Local chert and volcanic varieties.

Name: Quartz

Origin: Local

Description: A range of quartz types are local to the Quoddy Region, including bull quartz from veins in bedrock outcrops and likely some smoky quartz. Quartz occurs in veins in the Early Silurian Mascarene Formation volcanics, as clasts in the Perry Formation, as well as deposited beach cobbles (MacDonald 1994; Gilbert and Black 2006). Cobble varieties contain reddish-pink cortex and sub-conchoidal fracture. Quartz exhibits vitreous luster and is semi-translucent to opaque.



Figure 4. Local quartz varieties.

Name: Hinkley Point Metasediment

Origin: Local

Description: White grey/green material with white patches (Crotts 1984). Boundaries of white spots in this material appear partially dissolved, possibly in response to silicification (Crotts 1984: 57). It is not observed in glacial till, and exhibits concoidal fracture and dull to vitreous luster.



Figure 5. Local Hinkley Point metasediment varieties.

Name: White Spotted Translucent Chert

Origin: Local

Description: Semi-translucent microcrystalline chalcedony with amorphous white spots and dark brown cortex (MacDonald 1994: 144). This may derive from carboniferous-associated source in southern New Brunswick (Gilbert and Black 2006). It exhibits waxy luster and conchoidal fracture.



Figure 6. Local white-spotted translucent chert varieties.

## *Exotic Materials*

Name: Munsungun chert

Origin: Exotic

Description: Fine grained red to green chert associated with the Ordovician bedrock at Munsungun Lake in Aroostook County, Maine (Black and Gilbert 2006). Munsungun chert exhibits considerable diversity in its varieties, including blackish red, and mottled red and greenish materials (Pollack et al. 1999: 275-276). Difficulties in distinguishing among red-colored cherts in Maine are described by Doyle (1995). Chemical weathering produces a light tan to grey appearance. Exhibits Conchoidal fracture and dull to waxy luster. This material has received inordinate attention by researchers due to its frequency in Paleoindian assemblages (Pollack et al. 1999).



Figure 7. Exotic Munsungun/red mudstone varieties.



Name: Minas Basin Chert or Chalcedony (Also known as Scots Bay Chalcedony)

Origin: Exotic

Description: A broad category including the fibrous sub varieties of cryptocrystalline quartz derived from Scots Bay and the Blomidon peninsula, Nova Scotia (Deal 2005). Includes sedimentary microcrystalline silicates known as cherts, as well as agates and jaspers (Deal 2005). The vast majority of the Minas Basin Chalcedony in the Devil's Head Assemblage consists of yellow to red jaspers with drusy quartz mosaics (Black and Gilbert 2006). Occurs in both outcrops and as glacially deposited beach nodules (Deal 2005). There is a variegated appearance in some artifacts as well as conchoidal fracture and waxy luster. Its translucency is patchy to opaque.



Figure 8. Exotic Minas Basin chert varieties.

Name: Washademoak Multi-Colored Chert

Origin: Exotic

Description: Occurs as lens and nodules in impure limestones at the confluence of the Washademoak Lake and Saint John River (Black and Wilson 1999). This material exhibits high variability in color, luster, and translucency. Prehistoric people tended to favor red, orange-red, and grey blue translucent pieces (Black and Wilson 1999: 96).



Figure 9. Exotic Washademoak multi-colored chert varieties.

## Results

### Analysis of Formal Tools

In the following section, I outline the morphology of stone tools excavated from the three distinct areas of the Devil's Head site. These excavations are shown in Figure 12 along with their temporal affiliations. Photographs, metrics, and descriptions of each stone tool are provided in Appendix I.

Formal lithic tools and utilized flakes are distributed throughout all three areas of the site. I classify these artifact types using Spiess and Cranmer's (2005) morphological categories used in the initial Devil's Head excavations for the purpose of making comparisons with that assemblage, as well as with regional Maritime Woodland assemblages that were classified using similar schemes. These morphological categories are: *bifaces*, *retouched and utilized flakes*, *endscrapers* and *pieces esquillee* (wedges). Local grey chert and volcanics represent the predominant material type for tools, although there is a notable presence of exotics, especially Minas Basin chalcedony in Area C.

There are 45 formal tools across the three site areas. Proportionally, bifaces—including fragments, preforms, and stemmed projectile points—are the dominant tool type (n=30). Each of the bifaces in Areas A and B are preforms; only Area C contains finished bifaces. The high proportion of bifaces is in contrast to the much smaller lithic assemblage excavated by Spiess and Cranmer (2005) from Devil's Head, which included a relatively even proportion of bifaces, retouched and utilized flakes, and pieces esquilles, as well as a single endscraper.

## Area A

Most of the tools recovered from Area A (fig. 11) were excavated from unit N126 E25, which is a shell midden with abundant fire-cracked rock (Hrynich et al. 2015). A small, triangular scraper or wedge represents the only tool from this area made from an exotic material type, likely Washademoak chert. Compared to the other two areas, Area A contains a higher number of scrapers ( $n = 7$ ).

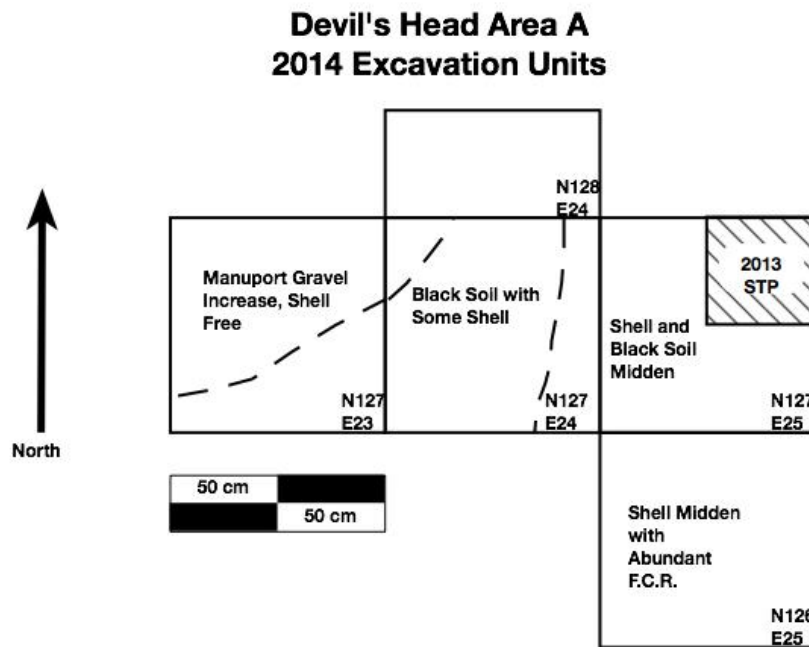


Figure 10. Map of Area A excavation units.

# Devil's Head Site (97.10 ME) Tools

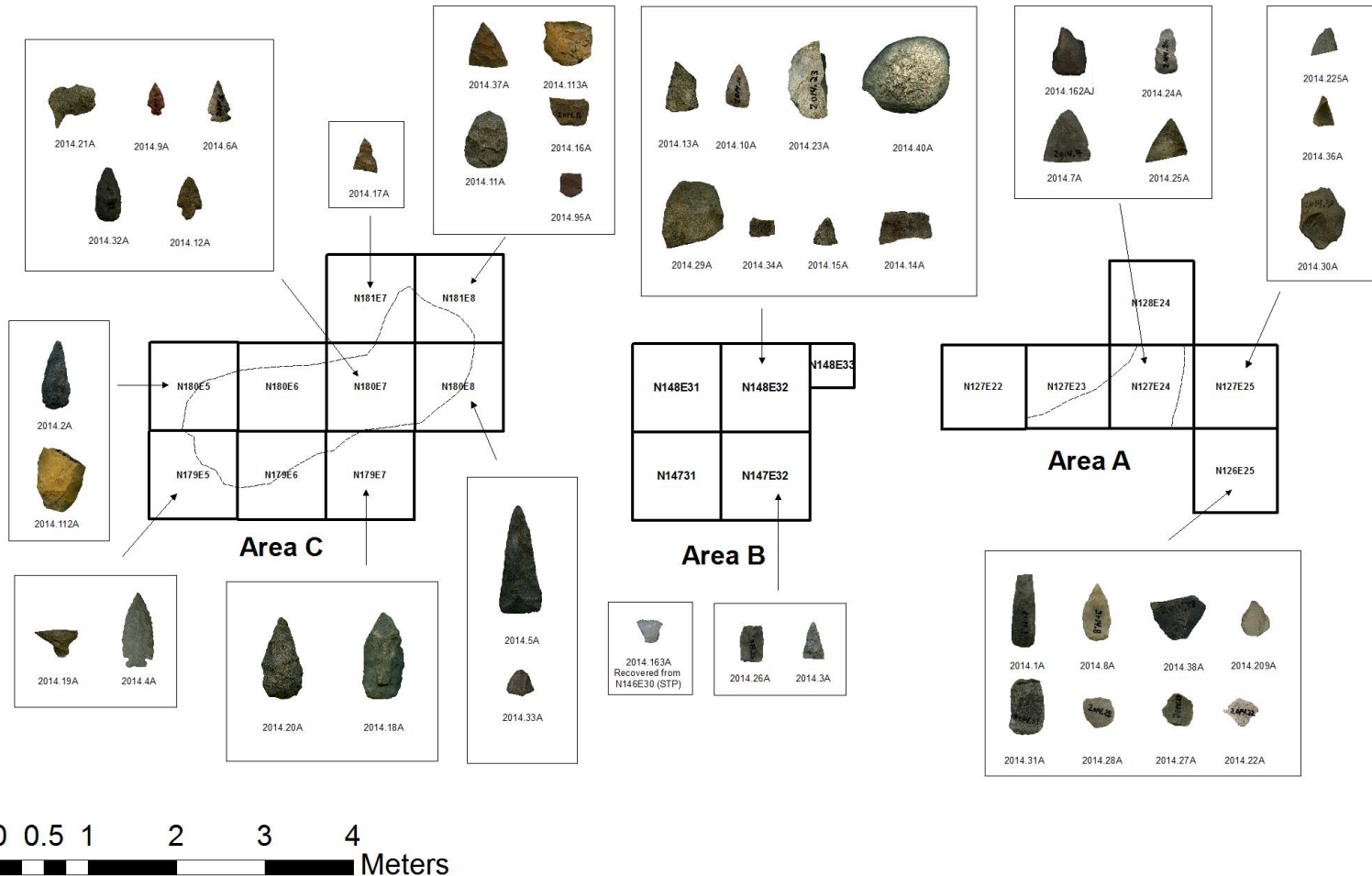
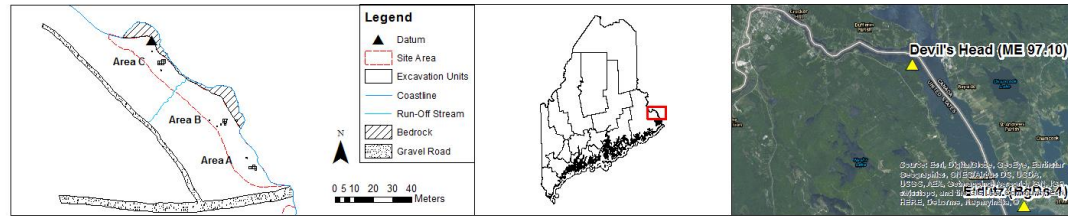


Figure 11. Map of Devil's Head activity areas with tool images. Dotted lines represent dwelling features.



**Figure 12. Photograph, facing east, over excavated Area A. The likely gravel living floor is in the unit at bottom.**

## **Bifaces**

Area A (Figures 11 and 13)—which dates to the Late Maritime Woodland period—contains the proximal end of a biface blade (2014.1A) that is morphologically distinct in this assemblage. It appears to be made of local grey chert, appearing weathered at its distal end. This same excavation unit contains a complete biface preform (2014.8A) with a concave ventral surface comprised of local grey chert. Excavation unit N127 E25 contains two biface tips, also comprised of local grey chert or volcanic material (2014.7A) including grey quartzite, possibly from the Perry Formation (2014.255A). Unit N127 E24 contains an additional biface tip (2014.25A), as well as a small complete preform (2014.24A).

## **Unifaces**

Excavation unit N126 E25 in Area A contains six scrapers, including an endscraper (2014.31A) made of grey quartzite. Three utilized flake scrapers (2014.27A, 2014.28A, 2014.209A) are made of probably local grey-green chert and are of similar “thumbnail” or “fingernail” morphologies, with macroscopically evident use-wear along their radial edges. Artifact 2014.22A is an additional scraper that is similar in size but has a more rectangular morphology. Artifact 2014.38A is larger, has a roughly triangular morphology with a convex distal edge, and is comprised of darker grey chert. Each was excavated from the same unit notable for the presence of fire-cracked rock. Artifact 2014.36A is the only scraper from Area A not associated with unit N126 E25. Morphologically it is unique for its straight, smooth, triangular faces, and is made of Washademoak Chert.

## **Cores**

A single core from Area A was excavated from unit N127 E24. It is plano-convex in form, with a single flake scar on one of its surfaces. It is comprised of a dark grey chert or volcanic material.

## ***Area B***

Area B (Figures 12 and 13)—dating to the Protohistoric period and peri-contemporaneous with Area C—is dominated by bifaces and biface fragments; indeed, the only non-bifacial tools recovered were a core and a hammerstone. The majority of the tools were recovered from unit N148 E32. This area could loosely be glossed as a “processing midden” and is characterized by shell with black soil and well preserved faunal remains.

## **Bifaces**

Artifact 2014.10A is the only complete biface recovered from Area B, and is comprised of translucent chert. This is the only artifact represented by this material in the assemblage, and



**Figure 13. Photograph, facing east, of Taylor Testa excavating Area B.**



## Devil's Head Area B 2014 Excavation Units

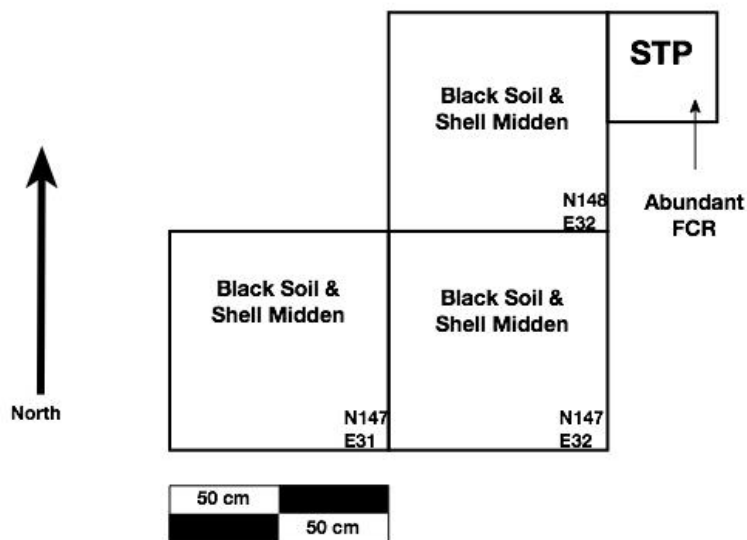


Figure 14 Map of Area B excavation units.

is nearly morphologically identical to a point excavated by Spiess and Cranmer (2005:41). Spiess identified this material as Ramah chert, which is found along the Northern coast of Labrador (2005:41). If artifact 2014.10A consists of the same material, this would further indicate the presence of long-distance trade.

The seven remaining bifaces in Area B are fragments comprised of local grey/green chert and/or volcanics. Five of these (2014.13A, 2014.14A, 2014.15A, 2014.29A, and 2014.34A) were recovered in the same unit as the complete biface, unit N148 E32. The other two (2014.3A and 2014.26A) were recovered from an adjacent unit, N147 E32. Artifact 2014.3A is distinctive for its black and white speckled inclusions.

## **Cores**

A single core was excavated from unit N148 E32, comprised of grey/green chert or volcanic material. Based on the presence of cortex, it appears to be from a nodule, and contains a nearly flat, weathered surface.

## **Hammerstone**

The only hammerstone in the assemblage was excavated from unit N148N32. It is comprised of granular volcanic material, is roughly pyramidal in morphology, and is distinctly battered on one edge.

## ***Area C***

Area C—dating to the protohistoric period and peri-contemporaneous with Area B—contains the largest feature, a dwelling (Hrynick and Black 2016), with the highest proportion of exotic lithic materials by count and artifact density. It is also the only area to contain stemmed bifaces, as the bifaces recovered from Areas A and B are unstemmed preforms. Like in the other two areas, local grey/green chert and/or volcanics are the dominant material type.

## **Bifaces**

Area C contains four complete stemmed bifaces (2014.4A, 2014.6A, 2014.9A, 2014.12A) and the proximal end of a stemmed biface fragment (2014.12A). It is the only site area to contain complete stemmed bifaces. The complete bifaces each contain side-to-corner notching, which is morphologically consistent with other Late Maritime Woodland assemblages (see Holyoke 2012). At the same time, the four points display morphological variability in their profiles, necks, and stems. Each is made of a different lithic material, and there is also variability in size.

Artifact 2014.9A is a small projectile point comprised of deep red colored chert, likely Minas Basin chert/chalcedony material. It is the only complete stemmed projectile point made of an exotic material. Two Minas Basin yellow chert/chalcedony preform proximal fragments (2014.112A and 2014.113A) form a refit, and were recovered from Area C, as well as the tip of a finished biface, also Minas Basin material. Artifact 2014.5A is a morphologically unique triangular bifacial blade with noticeable basal thinning. The remainder of the biface preforms and fragments recovered from Area C are similar in morphology and material type to the other two areas of the site.

## **Unifaces**

Area C contains a scraper that is morphologically unique in this assemblage (2014.21A), distinctive for a triangular extrusion along one of its lateral edges that results in an asymmetrical

appearance. Ken Holyoke (personal communication) suggests that it is possibly a graver tool and could be associated with birchbark canoe repair or manufacture. The material is a local flow-banded volcanic. It was recovered from the same unit as three of the four complete stemmed projectile points. Two other scrapers were recovered from Area C. A utilized flake of thumbnail morphology (2014.95A) that appears to be made of Munsungun chert was recovered from Unit N181 E8. A scraper of similar size and appearance (2014.33A) was recovered from the adjacent unit, N180 E8. It is made of an unknown material, and is characterized by a patchy appearance.

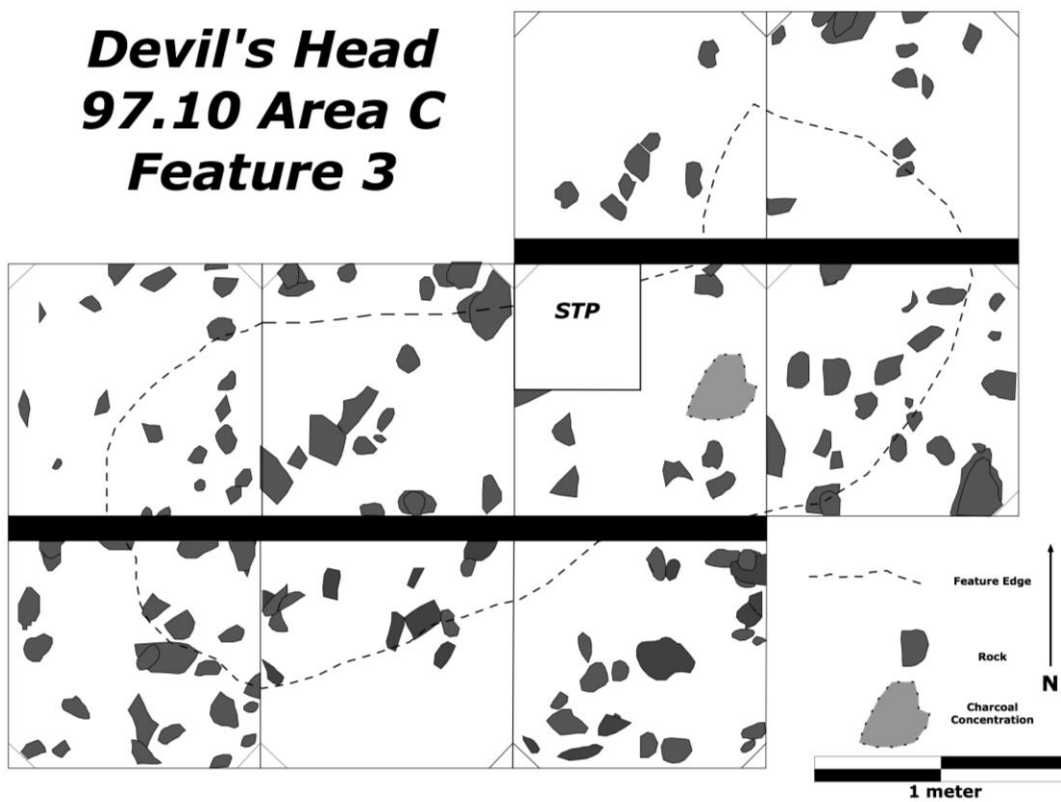


Figure 15. Map of Devil's Head Area 3 excavation units

## Debitage and Site Patterning

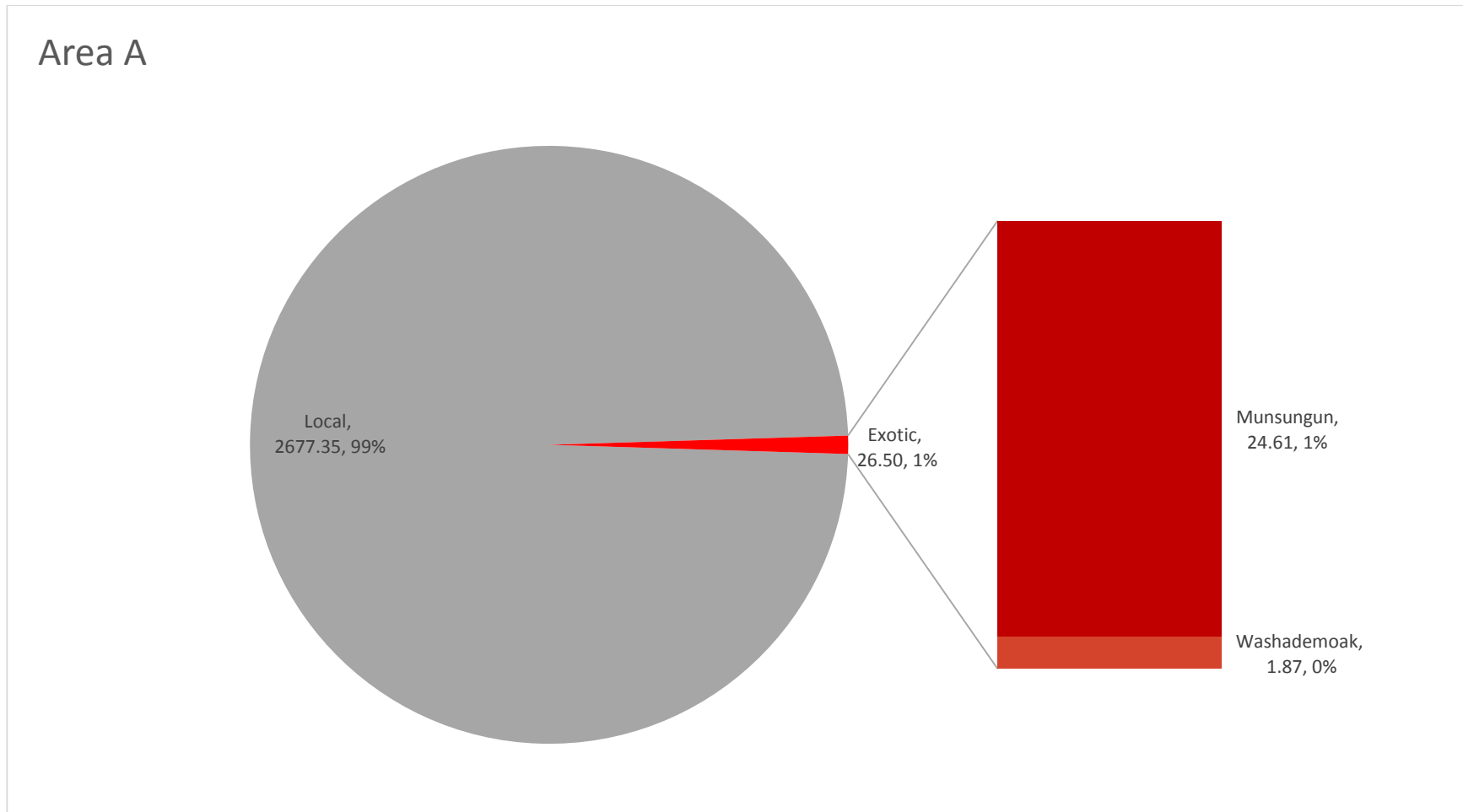
A series of two proportion Z-tests failed to reveal statistically significant similarities in local vs. exotic materials by flake count between Areas A and B ( $p=0.0$ ), Areas A and C ( $p=0.0$ ), or Areas B and C ( $p=0.0$ ). Comparing material types by cumulative mass follows a similar pattern to the statistical tests, with Area A containing the lowest proportion of exotic materials, and Areas B and C containing an increasing proportion of exotics. These patterns align with the composition of formal tools throughout the three site areas, with no exotic formal tools recovered from Area A, and an increasing proportion of formal tools made from exotic lithic materials in Areas B and C. The differences between Areas B and C, which were occupied peri-contemporaneously, may be indicative of site structure differences. Area C includes manuport gravel, associated with dwelling features, while Area B is a midden with no associated dwelling feature.

The overwhelming majority of materials are comprised of the large lumped category of local grey/green cherts or volcanics. Quartz is the second most common local material in each area, with a minority of Hinkley Point metasediment, White-Spotted Translucent chert, and Perry Formation grey quartzite. Only Area C contains Hinkley Point metasediment. For exotic materials, Munsungun chert is the overall dominant type, followed by Minas Basin and Washademoak cherts.

Minas Basin chert/chalcedony is not present at all in Area A and is only present in small quantities in Area B ( $N=3$ ). The overwhelming majority is from Area C, representing a drastic change in the presence of this material type over time. The Minas Basin material in Area C is almost entirely of yellow jasperoid variety, and is the only Area that contains this variety. A

large lump of this material containing cortex is also present (2014.97A), indicating that it was deposited from a primary reduction context.

*Cumulative Mass by Area*



**Figure 16. Cumulative weight (g) of local and exotic materials in Area A.**

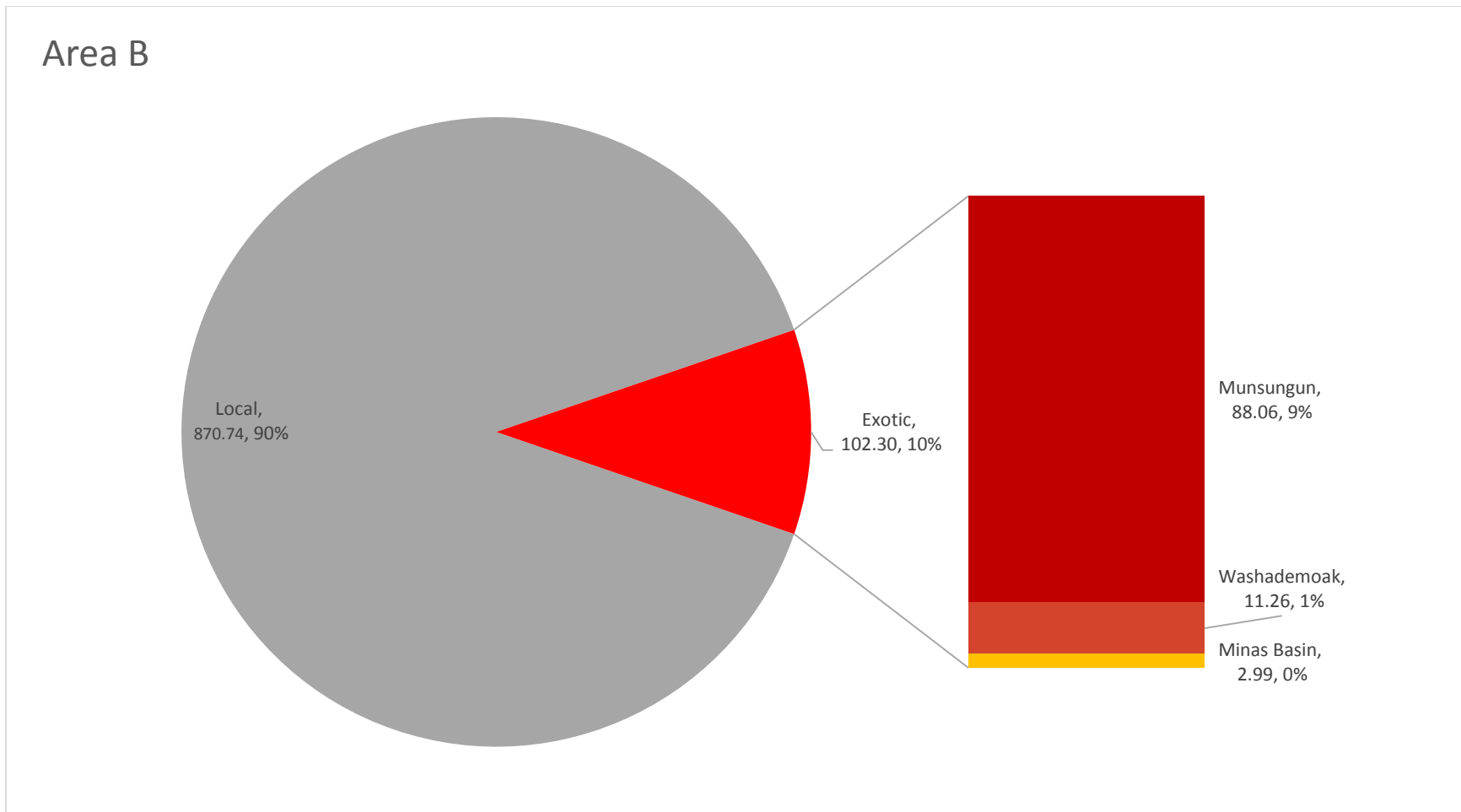


Figure 17. Cumulative weight (g) of local and exotic material in Area B.



# Area C

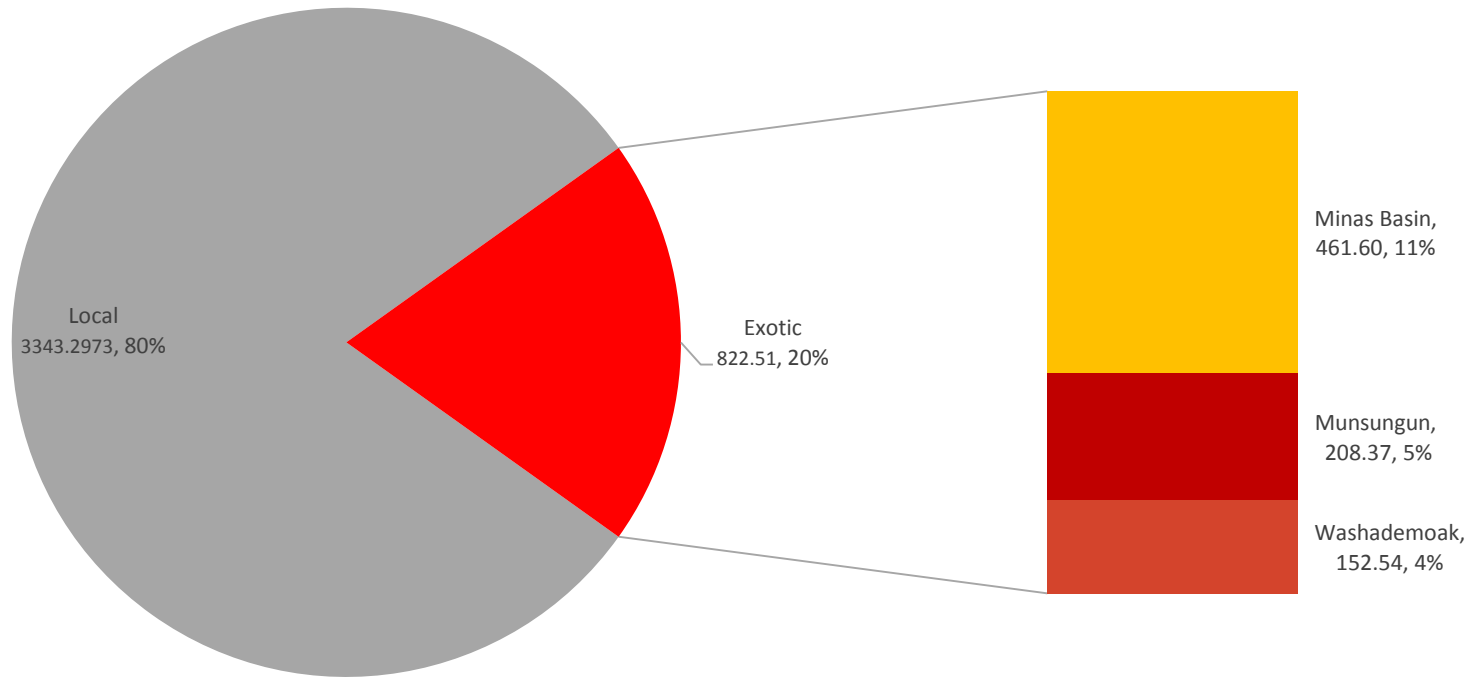
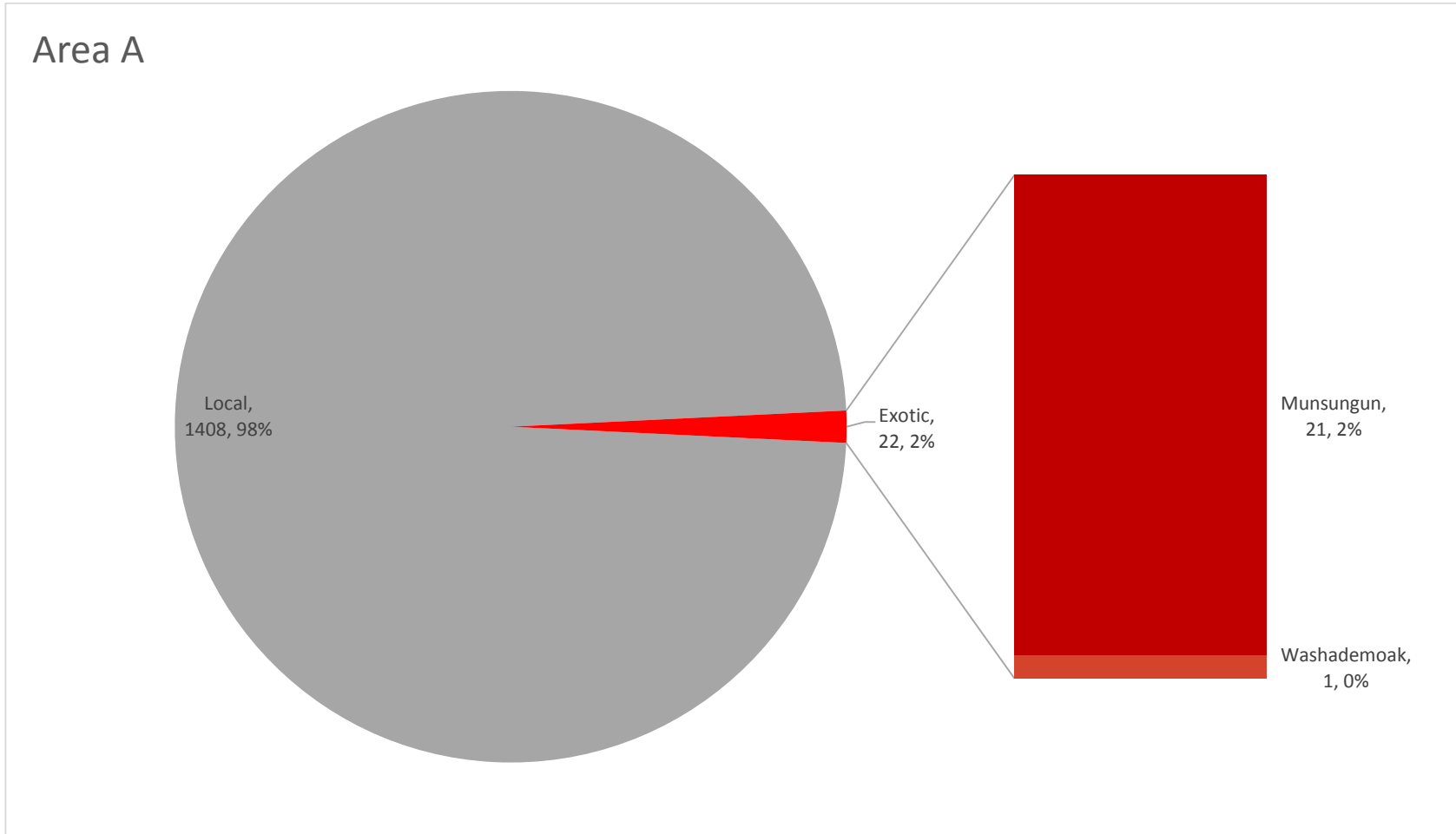


Figure 18. Cumulative weight (g) of local and exotic materials in Area C.

**Flake Count by Area**



**Figure 19. Flake count of local and exotic materials in Area A.**

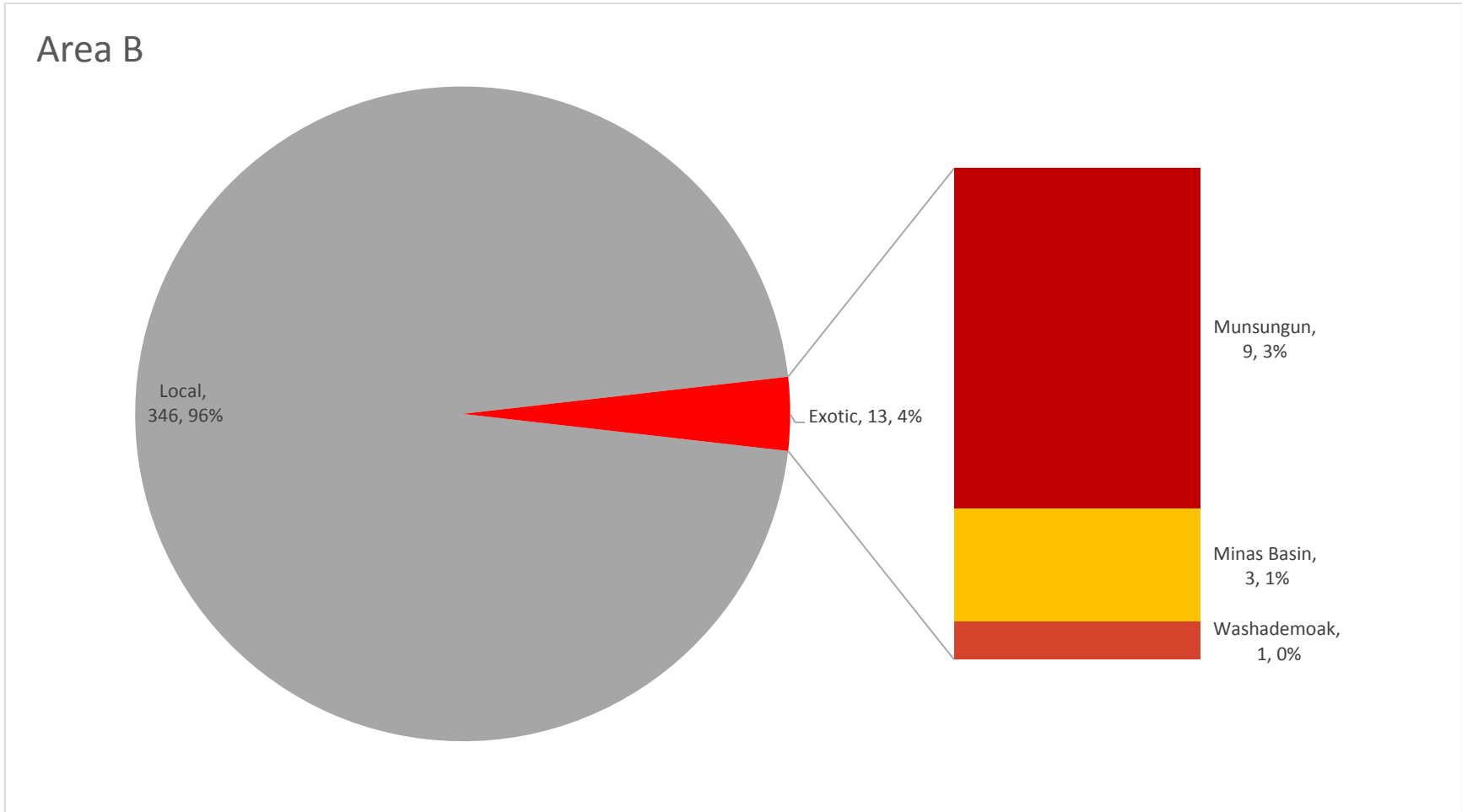


Figure 20. Flake count of local and exotic materials in Area B.

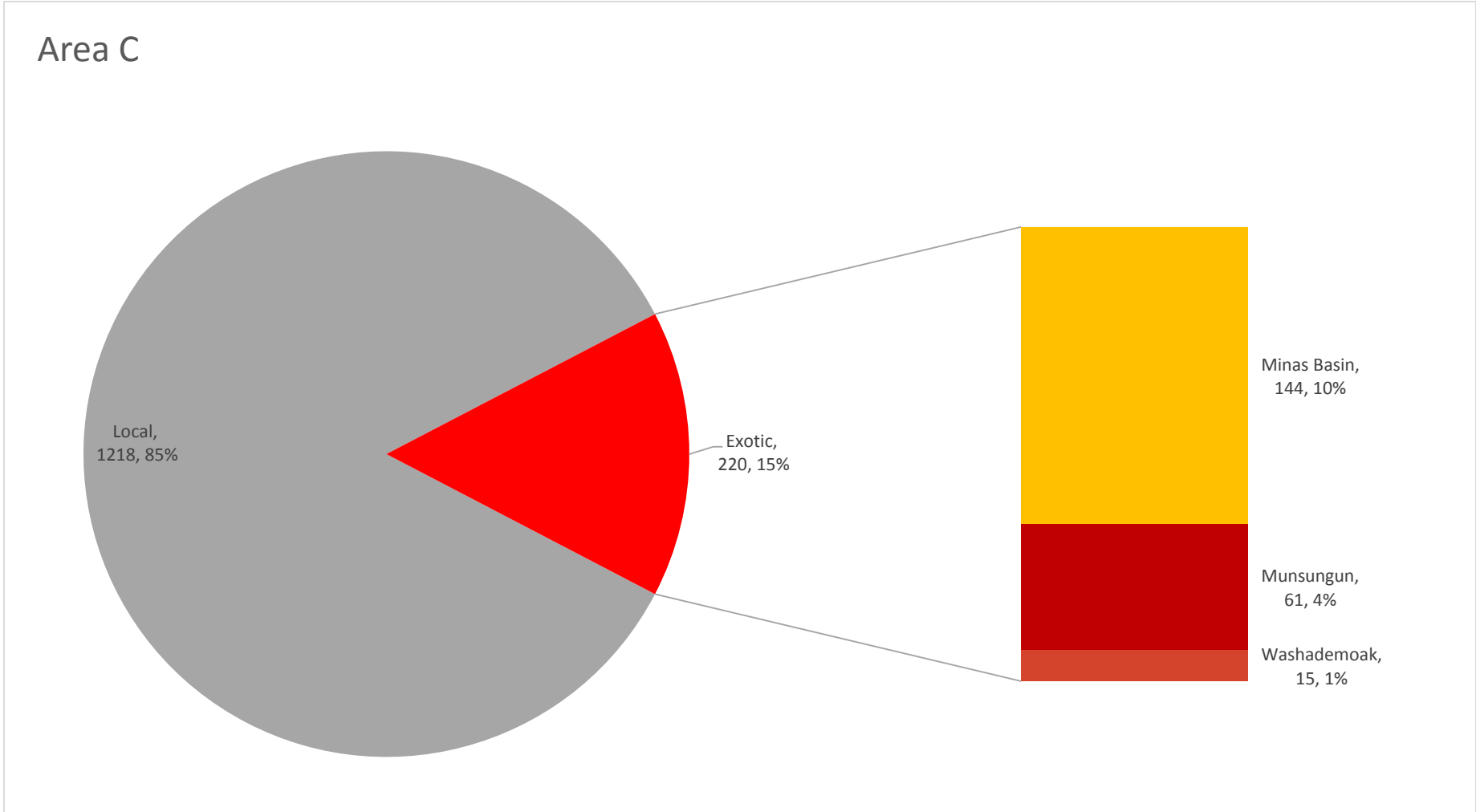


Figure 21. Flake count of local and exotic materials in Area C.

## Material Types

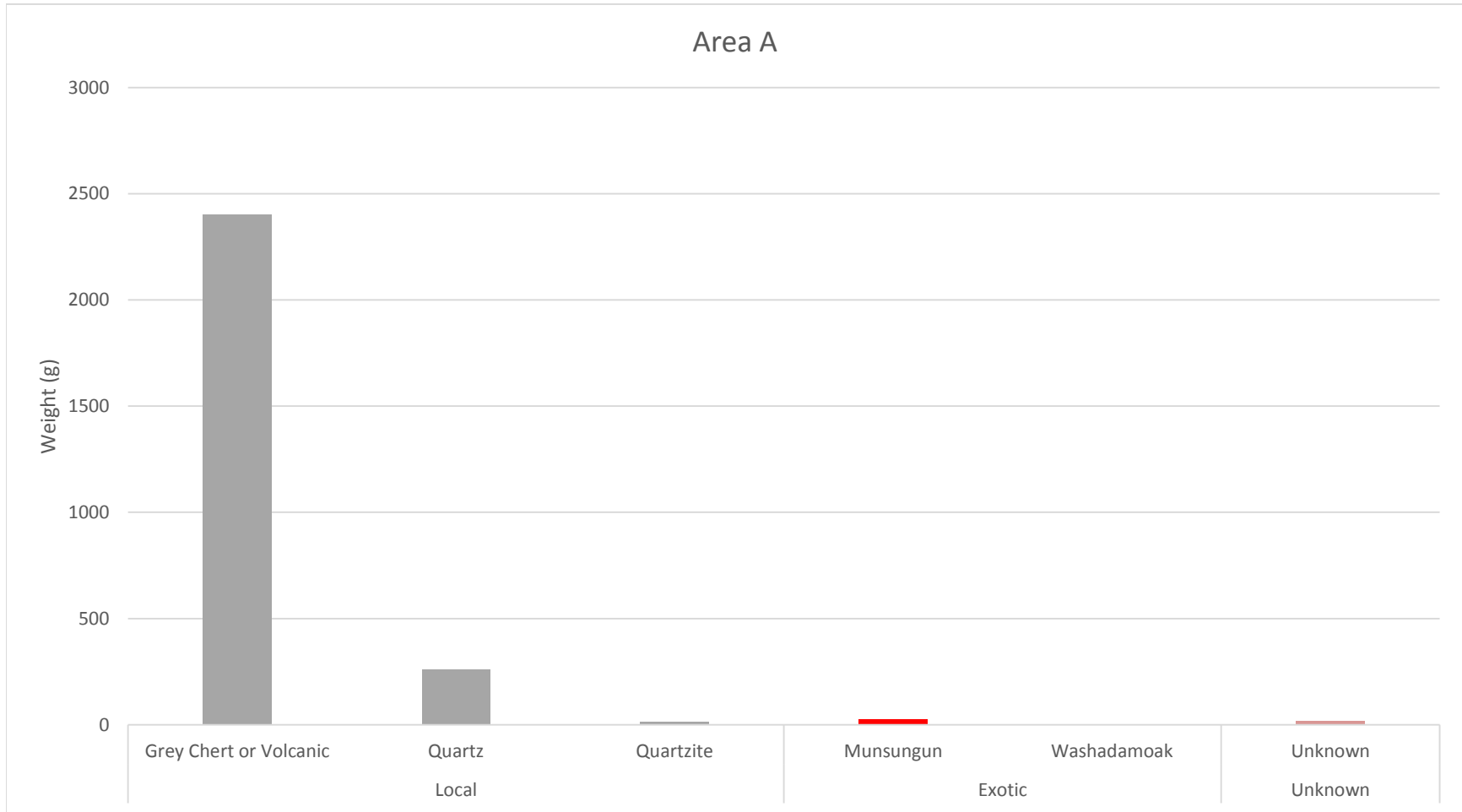
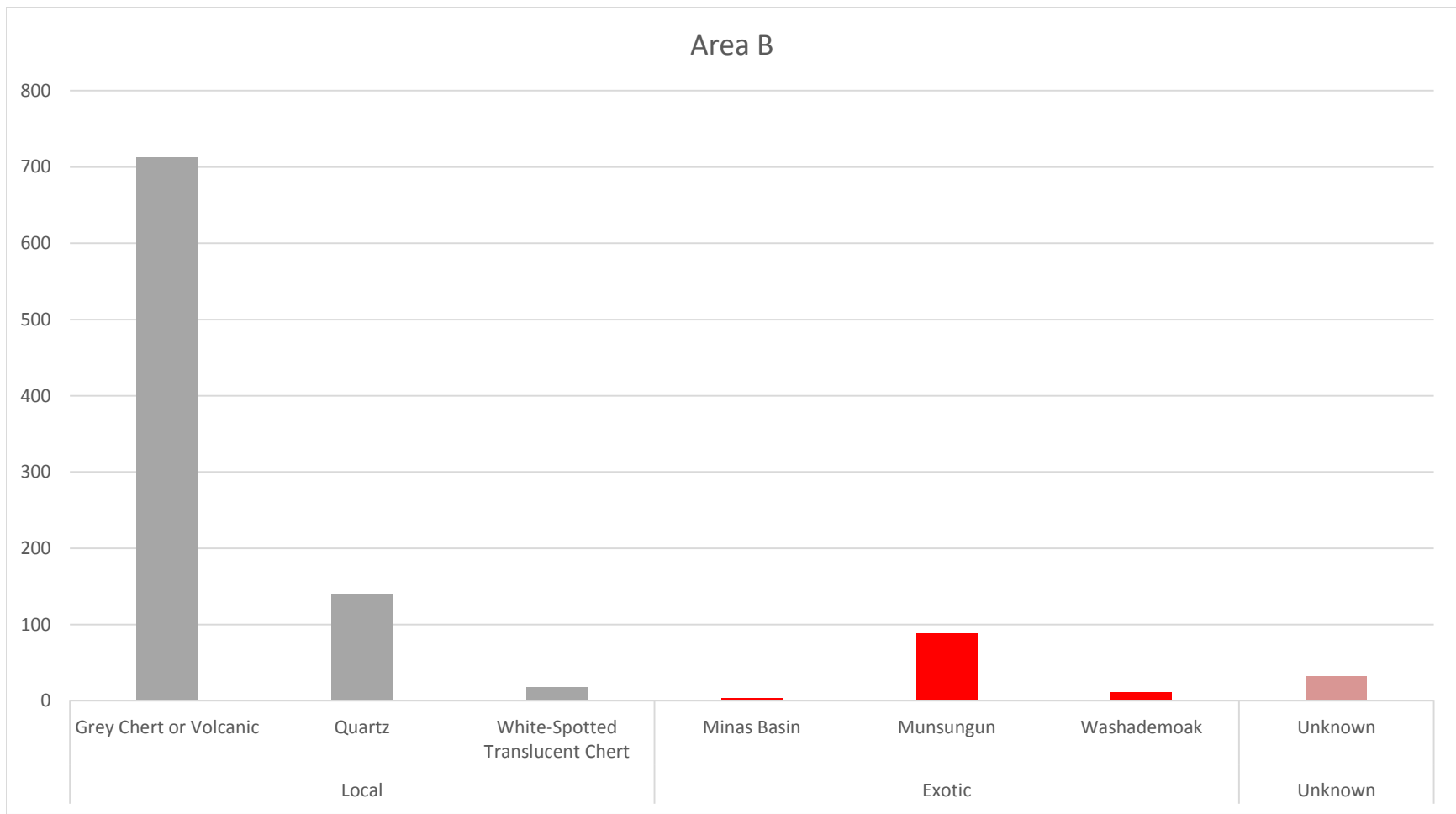
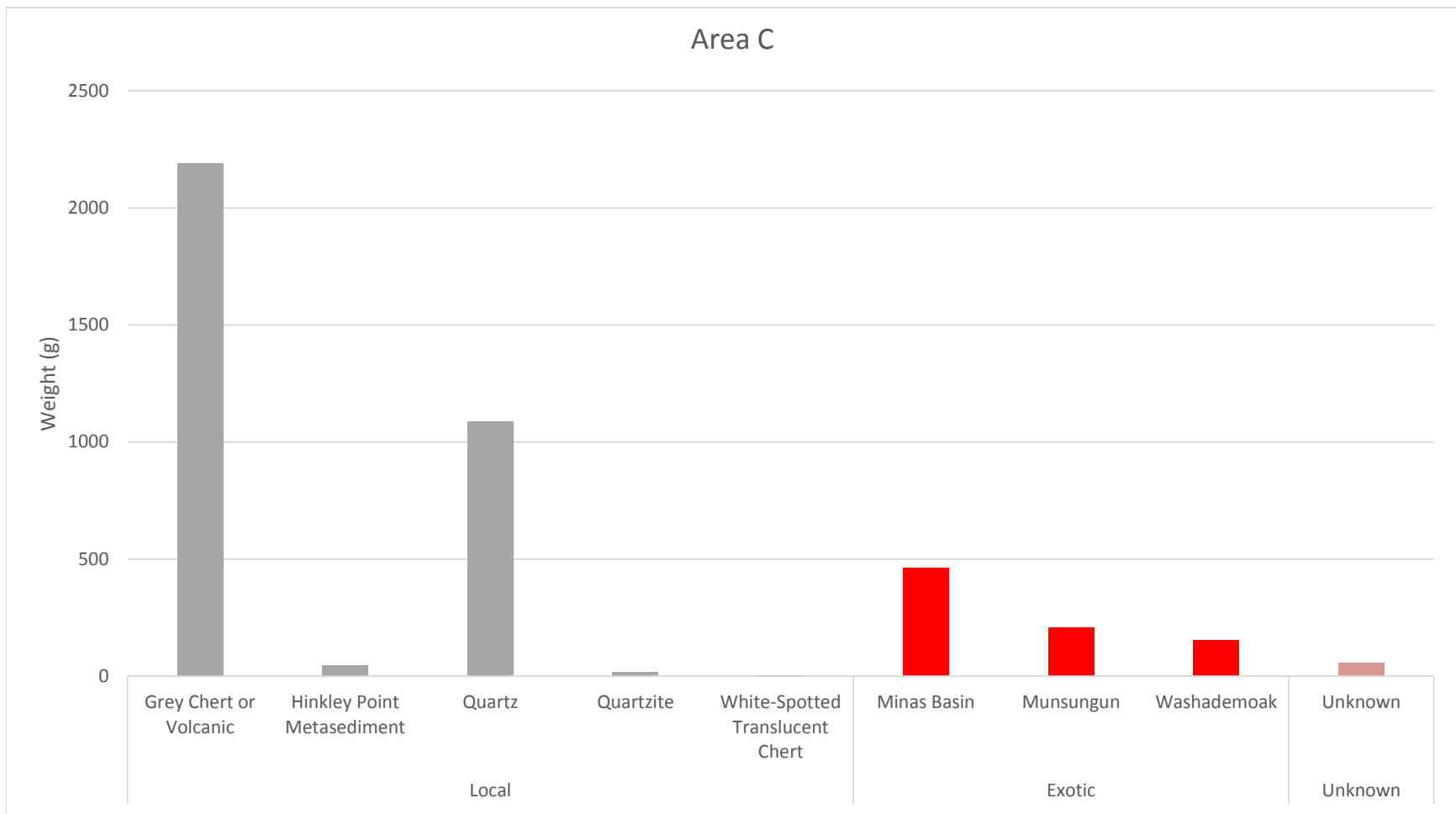


Figure 22. Cumulative weight (g) of material types in Area A.

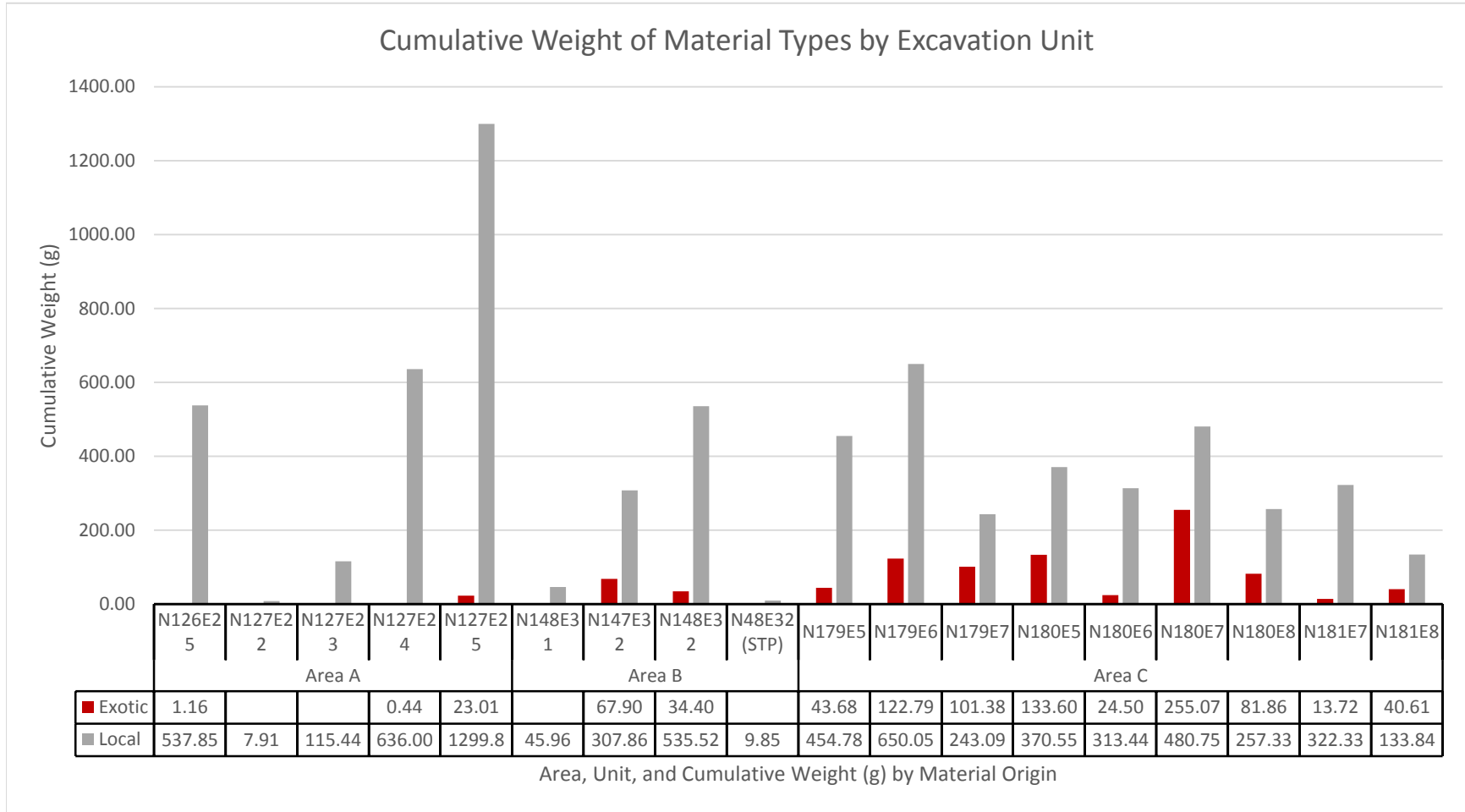


**Figure 23. Cumulative weight (g) of material types in Area B.**



**Figure 24. Cumulative weight (g) of material types in Area C.**

**Cumulative Weight by Unit**



**Figure 25. Cumulative weight of local and exotic material types by excavation unit in the three activity areas. STP units are omitted from this figure.**



Debitage by Unit

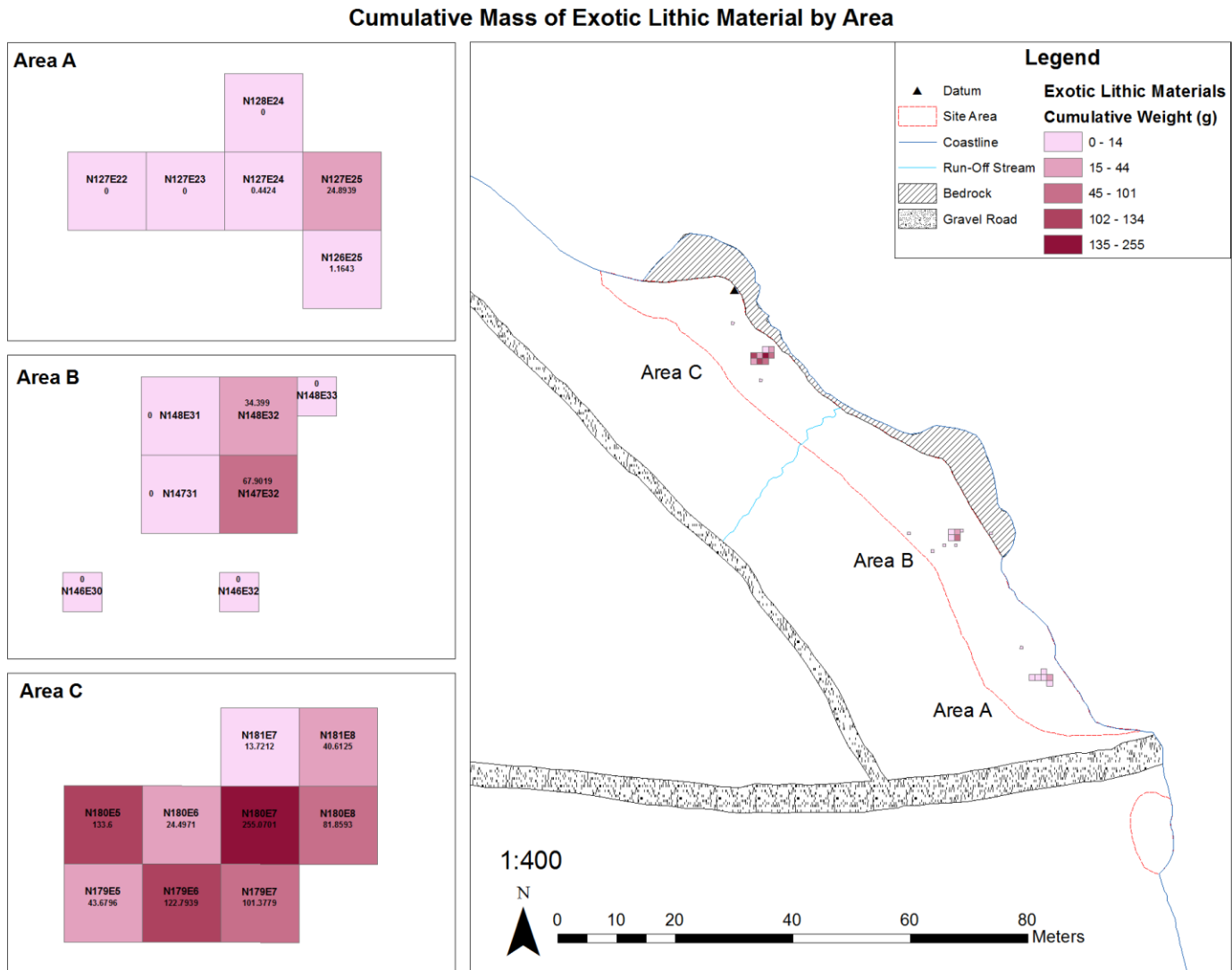


Figure 26. Map of cumulative weight of exotic materials by excavation unit in the three activity areas. Cumulative weight bins determined by natural jenks method.

## **Chapter 3: Discussion**

### **Devil's Head Site Structure**

Considering lithic material patterning alongside radiocarbon dates from the three discrete areas reveals diachronic change and may point to differing use of the areas. I begin this discussion from the premise that the differential reduction of stone tools and stone tool morphologies may reflect temporal differences (e.g., Ritchie 1971), or it may reflect different stages of reduction (Andrefsky 1998). For instance, dwelling features may be the preferred location for retouching tools, resulting in more finished tools and tertiary debitage in the archaeological record (Hrynick et al. 2012), while processing areas may feature more primary reduction.

The lithic material recovered from Area A, a dwelling feature edge and midden, dated 801 BP, is from the Late Maritime Woodland period. Conversely, Area B, a midden dated 394 BP, as well as Area C, a dwelling feature dated 446 BP, are in the Protohistoric period. Inter-site comparisons between these dated features suggests an increased shift towards the use of exotic lithic materials over time, with a greater emphasis on exotics during the Protohistoric (see figures 25 and 26). The yellow jasperoid variety of Minas Basin chalcedony as well as Hinkley Point metasediment lithic materials appear exclusively in Area C, suggesting that they were introduced to the site during the Protohistoric period.

The presence of a greater proportion and higher variety of exotic lithic materials may indicate intensified extra-regional trade relationships among hunter-gatherers leading into the

Protohistoric period, as well as pursuit of mobility strategies that were increasingly logistical rather than residential (Black 2002). This supports Black's hypothesis relating to settlement-subsistence in the Late Maritime Woodland period, as well as the patterns observed by MacDonald at the Weir and Partridge Island sites (MacDonald 1994).

The Protohistoric component adds an additional dimension to this. It is possible that the trend of increasing proportions and types of lithic materials continued into the early period of European contact. Another possibility is that some regional site components that were originally designated as Late Maritime Woodland could actually be mixed Protohistoric and Late Woodland components. This question hinges partially on the degree of temporal control exhibited by shell middens (Black 1991). However, MacDonald's (1994) argument that the Protohistoric period may be obscured because of a combination of excavation strategy and temporal mixing in the archaeological record seems likely.

The varying composition of lithic materials between the peri-contemporaneous Areas B and C also suggests site structure questions within the Protohistoric component. The fact that these two areas possess no statistical similarities in terms of flake count by local and exotic material types suggests the possible delineation of activity areas. What does it mean that a greater proportion of exotic materials by both weight and flake count was excavated from a housing feature as opposed to a midden? It is probable that different types of lithic reduction occurred in a domestic context. This assertion is supported by the fact that Area C contains more formal tools made from exotic materials.

The four stemmed bifaces excavated from Area C demonstrate variability in both material type and morphology (see Appendix A). Projectile point stylistic seriation is less

developed in the Quoddy Region than in other regions of the Northeast. Whether this is due to a lack of data, lack of temporal control at known sites, or actual high level of stylistic variation prehistorically is unclear (Holyoke 2012).

The diversity in stemmed point morphology could indicate a high degree of mobility and/or interaction among the group or groups who used the Devil's Head site. It is possible that this diversity indicates functional differences within the toolkit, with a diverse toolkit suggesting highly mobile populations with specialized formal tools to perform various tasks. Another explanation would be cultural diffusion, in that it is possible that interaction with extra-regional groups could have fostered the spread of point technologies.

These possibilities are compatible with the interpretation that Devil's Head may have served as a temporary campsite during long distance travel. This is further supported by the diversity of material types represented in Area C, with source outcrops in Maine, New Brunswick, and Nova Scotia. Area A has comparatively lower diversity in tool morphology and material type, but is consistent with other Late Maritime Woodland assemblages.

### **Artifact and Debitage Comparisons with Other Quoddy Region Sites**

The Devil's Head site is advantageous for making inter-site comparisons because each of its activity areas is spatially discrete, stratigraphically intact, and represents a narrow period of occupation. Additionally, the diachronic comparisons between Late Maritime Woodland and Protohistoric components within the site gain new meaning when integrated into regional site data. When comparing the composition of lithic materials in Area A with lithic data from

Quoddy Region sites with a Late Maritime Woodland component, it is important to also consider how this pattern relates to the increased proportion of exotic lithics in Areas B and C.

I will now turn to individual Quoddy Region sites (Figure 26) to make intra-site comparisons with the Devil's Head assemblage. Due to the privileging of formal tools in most site reports, I will focus on the quantities and morphologies of tools recovered from Devil's Head, incorporating debitage data when possible. It is important to consider the temporal differences in site components when making these comparisons, as only Area A of Devil's Head can be confidently placed within the Late Maritime Woodland period. Comparing material proportions and tool morphology from Areas B and C with regional Late Maritime Woodland sites is interesting in that it permits diachronic comparison with the Protohistoric.

The Teacher's Cove site is located approximately 12.5km east of Devil's Head along the southern coast of the Passamaquoddy Bay, and also contains a Late Maritime Woodland component, with a charcoal radiocarbon date of  $1170\pm 100$ BP excavated from a dwelling (Davis 1975). The Teacher's Cove lithic assemblage includes artifacts that are similar to Devil's Head. Diagnostic corner-to-side-notched projectile points, a collection of biface preforms, as well as "thumbnail" scrapers are all morphologically similar to artifacts from Devil's Head. A biface that Davis describes as an "expanding stemmed projectile point" (BgDr: 11-670) shown on a plate in the appendix (Davis 1975: 132) recalls a similar artifact in the Devil's Head assemblage (2014.4A) from Area C.

Crotts (1984) isolated the Maritime Woodland Period lithics from the Teacher's Cove site and calculated a 50.80% local and 49.40% exotic composition. There are problems with comparing these results to Devil's Head, however. As Macdonald (1994) demonstrates, Crotts's

methods were limited in that she only examined formal tools by artifact count. This introduces a problem in that “flakes of fine, cryptocrystalline, imported rocks that make up nearly 50% of finished tools, are very rare by comparison [to flakes of lithic materials found in Passamaquoddy Bay]” (Sanger 1987: 46). Furthermore, there were issues stratigraphically isolating the Late Maritime Woodland period lithics from the surrounding matrix, as well as variability in radiocarbon dates from shell and charcoal (Macdonald 1991: 122-23). Replicating this method with the Devil’s Head assemblage would not necessarily result in appropriate comparisons. With these limitations in mind, there are patterns concerning the material types of formal tools from Devil’s Head that are pertinent to this discussion.

Area A of Devil’s Head, the Late Maritime Woodland component, contains 15 formal tools. Of these, only one is made of exotic material—a triangular unifacial scraper or wedge made of Washademoak chert. Adding the debitage extends this pattern, with only 22 exotic artifacts (~2%), out of a total of 1430. Besides the scraper, the exotic flakes are all made of Munsungun chert (n=21). The composition of formal tools in Areas B and C, the Protohistoric components, mirror the Teacher’s Cove site more closely with their higher proportions and varieties of exotic materials, including the yellow jasperoid variety of Minas Basin chalcedony. These observations could be used to support multiple interpretations of the relationship between Devil’s Head and Teacher’s Cove. Perhaps Devil’s Head was initially a satellite of the Passamaquoddy Bay site cluster during the Late Maritime Woodland period, and became increasingly integrated leading into the Protohistoric. Conversely, it is possible that earlier or later exotic cultural material from Teacher’s Cove intermixed into layers with Late Maritime Woodland radiocarbon dates, thus over-representing exotic material within the Late Maritime Woodland component.

Minister's Island (BgDs-10) is another nearby site with a Late Maritime Woodland component located approximately 10 km east of Devil's Head. This site was plowed heavily, and therefore exhibits poor temporal control. Initial testing returned a charcoal radiocarbon date of  $2370\pm 80\text{BP}$ , while charcoal excavated from a dwelling feature returned a date of  $1060\pm 140\text{BP}$ . These dates span the entire Maritime Woodland period. Crotts observed 37.8% exotic lithic material in the formal tool assemblage of the Maritime Woodland component. This figure is in closer alignment with Area C of Devil's Head, one of the Protohistoric components.

The Carson site is situated along the eastern shore of Digdeguash Harbor. It contains two loci and ten hearth features, and includes Late Maritime Woodland components with three charcoal radiocarbon dates:  $925\pm 80\text{BP}$ ;  $1120\pm 65\text{BP}$ ; and  $420\pm 90\text{BP}$  (Sanger 1987). The presence of glass beads and metal artifacts also raises the possibility of a protohistoric occupation (Sanger 1987: 55). Crotts (1984) calculated that 47.70% of the late Maritime Woodland tool assemblage was manufactured from exotic materials. Diagnostic side-to-corner-notched projectile points are reminiscent of the bifaces in the Devil's Head assemblage (Sanger 1987: 38). A number of unifacial scrapers with similar morphologies as at Devil's Head were also excavated (Sanger 1987: 38).

The McAleenan site is located near the Carson site along the eastern shore of Digdeguash Harbor, and also contains a Late Maritime Woodland component. A charcoal sample yielded a radiocarbon date of  $680\pm 160\text{BP}$  while clam shells yielded a date of  $450\pm 130\text{BP}$ , although the association and marine correction of this date are dubious. According to Crotts (1984), McAleenan contains a higher proportion of tools made from exotic materials, with 69% local material for unifaces, and 75% for bifaces. As noted by Sanger (1987), stemmed bifaces from this site appear similar to Carson. Orr's Point is a site on the western shore of Digdeguash

Harbor, and also contains a Late Maritime Woodland component with a similar composition of lithic materials. Crotts (1984) describes similar corner-to-side-notched bifaces here as well.

Debitage analysis would be a useful comparative tool for characterizing Passamaquoddy Bay sites. In lieu of this data, however, morphological similarities between projectile points, as well as similarities in material composition, support the conclusion that the Devil's Head site was occupied peri-contemporaneously with the Passamaquoddy Bay sites described by Crotts. Projectile point morphologies from the Protohistoric components at Devil's Head are also similar, suggesting either that there was continuity over time, or that some Late Maritime Woodland points discovered at Quoddy Region sites could be from a later period.

The Weir and Partridge Island sites (Bishop and Black 1988; Black 2002, 2004) are located in the Bliss Islands, and were analyzed by MacDonald (1994). These sites are islands in Passamaquoddy Bay, but would have been accessible from the mainland by canoe. Both are multicomponent sites exhibiting good temporal control. Charcoal from the earliest stratigraphic component yielded Early Maritime Woodland radiocarbon dates:  $2360\pm 80$ BP and  $2270\pm 70$ BP; charcoal from later middens yielded dates in the Late Maritime Maritime Woodland period:  $1150\pm 80$ BP and  $1310\pm 60$ BP (MacDonald 1994: 45-48). At the Weir site, MacDonald observed an increase in the proportion of exotic lithic materials in stratigraphic component 4, representing the Middle-Late Maritime Woodland component, compared to stratigraphic components 1 and 2, representing the Early to Middle Maritime Woodland periods.

MacDonald observed a similar pattern at Partridge Island. Compared to the Early Maritime Woodland, which contained almost no exotic lithics, the Late Maritime Woodland occupation showed a marked increase in exotics. The Camp site is another Bliss Islands site with



a Late Maritime Woodland component. Although this was not one of the sites analyzed in her study, MacDonald estimates that up to 50% of the Late Maritime Woodland lithics may have been comprised of exotic materials. The patterns observed by MacDonald of diachronic changes in lithic material compositions in Early-Middle to Middle-Late Maritime Woodland components are mirrored in the Devil's Head assemblage. At Devil's Head, however, this pattern extends into the Protohistoric period.

These intra-site comparisons demonstrate both the similarities and individualities of Devil's Head among regional sites with Maritime Woodland components. Further division of lithic artifacts within the Devil's Head assemblage is necessary before making comparisons of specific materials. Speaking broadly, however, it is interesting that exotic translucent cherts are absent from the Late Maritime component of Devil's Head (Area A). The predominant exotic material at Devil's Head is Munsungun chert (Gilbert and Black 2006), while Minas Basin only appears in Areas B and C. Only a single formal tool in Area A, a small unifacial scraper comprised of Washademoak chert, can be characterized as exotic translucent chert.

In closing, the Protohistoric lithic assemblages at Devil's Head closely mirror Late Maritime Woodland assemblages at nearby Passamaquoddy Bay sites, especially Weir and Partridge Island. The Late Maritime Woodland lithic assemblage at Devil's Head also contains culturally exotic material types, but of a lower diversity and amount compared to the Protohistoric component.

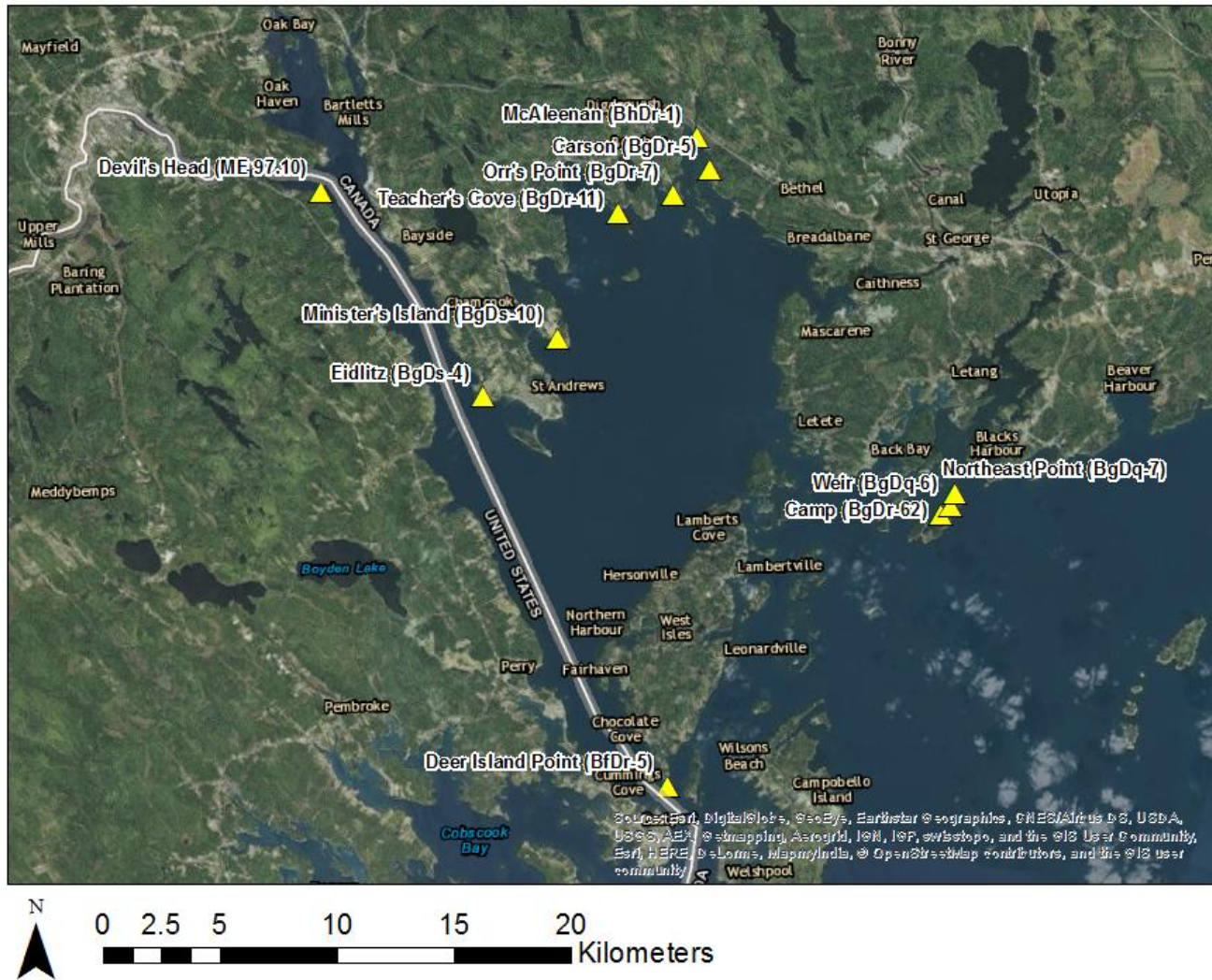


Figure 27. Selected Quoddy Region sites in the vicinity of Devil's Head.

## **Chapter 4: Conclusions and Future Directions**

In the following section of this thesis, I offer conclusions from the patterning described above, including that intra-site diachronic change in lithic material use at Devil's Head supports a dynamic view of the Maritime Woodland and Protohistoric periods. This also supports the intensification of watercraft for procurement—potentially direct procurement (see Blair 2010)—of exotic lithic materials. Recognizing the limitations of this study, I offer the Devil's Head patterning to be tested by future studies, and offer suggestions for future research directions at Devil's Head and in the Quoddy Region more generally.

### **Settlement-Subsistence Patterns Changed Over Time**

The Devil's Head lithic assemblage is consistent with David Black's theory that settlement-subsistence patterns in the Quoddy Region changed over time during the Maritime Woodland period, as evidenced by the increasing presence of exotic lithic materials when compared to earlier sites from elsewhere in the region, and permits us to extend our thinking about this change over time to the Protohistoric period. Area A, the Late Maritime Woodland component, contains a sizable minority of culturally exotic Munsungun chert. Areas B and C, the Protohistoric components, contain a higher proportion and variety of culturally exotic materials, most notably Minas Basin chalcedony. This site structure demonstrates that the pattern observed by Black and MacDonald continued into the Protohistoric period at the Devil's Head site, and may have been amplified in the Protohistoric period. If the consistency of this trend is

demonstrated in the Quoddy Region through the identification of additional sites with Protohistoric components, it will lend credence to the theory that increasing regional interaction and integration during the Late Maritime Woodland contributed to the shape of the Protohistoric fur trade. Conversely, it is possible that the stimulus of European trade during the 16<sup>th</sup> century in cultures surrounding the Quoddy Region and the subsequent development of Native American middlemen could have led to the increase in exotic materials during this time period. This theory supports the assumption that some Late Maritime Woodland site components with high proportions of exotic lithic materials might actually date to the Protohistoric period, and were misattributed due to temporal control issues (MacDonald 1994). Additional sites with protohistoric components in the Quoddy Region are necessary to test these hypotheses. Work in New Brunswick, such as in recent excavations at the nearby Birch Cove site, may offer a valuable future comparison (Susan Blair, personal communication).

The exact cultural mechanisms responsible for this change in procurement cannot be deduced from the lithic data alone; only that the change was occurring, and that Late Maritime Woodland transportation technology and/or interaction spheres enabled prehistoric peoples to gain access to culturally exotic lithic materials. Integrating ethnohistorical work as well as archaeological data on early historic sites may help illuminate the cultural mechanisms responsible for this change. Additional sites with Protohistoric components are needed to establish a link with material culture trends observed in the Late Maritime Woodland. Establishing this link will clarify the possible connection between documented cultural interaction spheres in the Protohistoric and their precursors in the Late Maritime Woodland. The possible connection between lithic trade and the early European fur trade would be a gainful area to pursue this question.

## **Use of Watercraft for Lithic Procurement**

It is necessary to examine how the maritime environment of the Quoddy Region impacted the procurement and use of exotic lithic materials at the Devil's Head site. This site function question relates to how prehistoric peoples used the Devil's Head site in relation to the Passamaquoddy Bay site cluster and Minister's Island sites, and how this relationship may have evolved over time; such questions are among the most challenging of hunter-gatherer settlement archaeology (Dewar and McBride 1992). Hrynick and Webb (2015) suggest that Devil's Head would have been an ideal location for canoeists to stop and wait for the tide to turn—a use for the site which modern Passamaquoddy peoples maintain (D. Soctomah, personal communication to G. Hrynick 2014). The presence of Minas Basin chert and other varieties of translucent multi-colored exotic cherts in Areas B and C of Devil's Head may indicate a change in site use over time. What it does definitely indicate is an increase in the use of this exotic chert over time, or at least between temporally distinct periods of occupation.

Considering these issues of lithic procurement in terms of coastal technological adaptations suggests a related interpretation for Devil's Head. Blair (2010) complicates traditional views of lithic material procurement by situating the discussion in terms of the use of waterways: “The use of birch-bark canoes by hunter-gatherers has the potential to reconfigure space, requiring us to recalculate distance in complex ways” (Blair 2010: 43). Blair explains the complexity of Quoddy Region lithic assemblages across time periods by arguing that the birch bark canoe allowed for bulk procurement and long-distance transport. Hunter-gatherers could

have expediently collected large quantities of materials and transported them to a temporary base camp for further reduction (Blair 2010). It is possible that Devil's Head represents this type of site. The presence of cortex on large chunks of yellow jasperoid Minas Basin chalcedony lends support to this argument, as it demonstrates that early-stage reduction materials were deposited at Devil's Head. By using canoe travel, it would have been possible for the peoples of Passamaquoddy Bay to travel directly to Nova Scotia and procure large quantities of Minas Basin material. This activity was likely embedded in other types of trade, procurement, and social relations, and may have been amplified by the Protohistoric fur trade, or provided routes onto which the fur trade could be mapped (see Bourque and Whitehead 1985).

## **The Protohistoric Period and the European Fur Trade**

The existence of a regional trade network leading into the Protohistoric is a related issue raised by MacDonald (1994). Within the subject of this thesis, the broader context of Protohistoric social interactions must be addressed. In short, apparent amplification of Late Maritime Woodland patterning may represent a strictly aboriginal development, in which case it set the stage for subsequent exchange with Europeans. Conversely, it may have been a response to early European-Native interactions.

Some archaeologists have speculated that trade relationships developed during the Late Maritime Woodland period influenced the European fur trade. They argue that the same cultural mechanisms responsible for the deposition of exotic material types such as Minas Basin chalcedony in Quoddy Region and other coastal and interior Maine sites may have also had a

bearing on patterns of fur exchange. MacDonald (1994:26) has this to say about this possible link:

What is needed to evaluate the hypothesis of an exchange network spanning the Late Maritime Woodland and Protohistoric periods is an undisturbed site, or a series of undisturbed sites, dating between 1000BP and 400BP. In this hypothetical site or sites, the appearance of significant quantities of exotic lithic materials spanning the Late Prehistoric and Protohistoric periods would support a connection between Late Maritime Woodland exchange and the early fur trade.

Devil's Head would appear to be such a site, with some caveats. The structure of Devil's Head is unique in that its Late Maritime Woodland and Protohistoric components are spatially distinct. It is unclear exactly what type of site—functionally—Devil's Head represents; making such an assessment is all the more difficult by a lack of temporally similar comparisons. Furthermore, the excavation of historic artifacts such as European ceramics would have bolstered the fur trade argument. Nevertheless, the Devil's Head lithic assemblage provides compelling data for addressing this question. What the site structure does suggest is that Native peoples in the Quoddy Region interacted with their neighbors in Maine and Nova Scotia leading into the Protohistoric period, as evidenced by the proportion and diversity of exotic lithic materials in the Protohistoric site components. Evidence for this interaction increases within the Devils Head site in the Protohistoric period when compared to the Late Maritime Woodland period.

Bourque and Whitehead (1985) discuss the possibility of Souriquois (likely Mi'kmaq) and Etchemin (likely Passanaquoddy-Maliseet) middlemen in the Protohistoric fur trade influencing the circulation of European manufactured goods through the Gulf of Maine. This

may explain the presence of abundant quantities of European manufactured trade goods, yet otherwise scant evidence of European visitors prior to the arrival of Champlain in the early 16<sup>th</sup> century (Bourque and Whitehead 1985: 328); in short, European materials had been exchanged down the line, likely especially for furs, such that European goods preceded Europeans in many parts of the Gulf of Maine. Some archaeologists suggest that increasing proportions and varieties of culturally exotic lithic materials and the introduction of European trade goods during the Protohistoric are linked. These arguments posit that trade patterns observed during the Late Maritime Woodland created systems of interaction that laid the framework for the trade dynamics that unfolded during the Protohistoric (Nash and Stewart 1990; Sanger 1991; MacDonald 1994; Bourque 1994; Cox and Kopec 1998).

I suggest that while interaction among Native groups in the Quoddy Region may have increased prior to the arrival of Europeans, the relatively high proportion and diversity of culturally exotic lithic materials in the Protohistoric components at Devil's Head raises some interesting possibilities relating to the timing of this change. It is important to consider not only the effects of existing trade relationships on the fur trade, but also how the fur trade would have impacted these relationships. If middlemen from outside of the Quoddy Region and Gulf of Maine acted as a stimulus for participation in a broader network of Northeast exchange, it is probable that interaction among Native groups in these regions would have intensified in response. There would have been an incentive for every group involved in trade to expand its geographic reach, both to exploit additional resources as well as benefit from additional trading opportunities.

It is possible that Native groups in the Quoddy Region and Gulf of Maine were not only trading with middlemen, but became middlemen themselves through participation in this



regional exchange. A network connecting the Native groups in the vicinity of the Goddard site, Passamaquoddy Bay cluster, and Melanson site seems probable. This intensification of interaction might have occurred very rapidly in the 16<sup>th</sup> century, leading to the deposition of abundant culturally exotic lithic materials at these sites. This idea is aligned with Nash's (1990) argument that the Melanson site experienced a rapid deposition of lithic materials during the Late Maritime Woodland period, as opposed to more gradual growth. Due to historic plowing and other disturbances at these aggregation sites, as well as controversy in the stratigraphic integrity of shell midden deposits, it is possible that the phenomenon of high proportions and diversity of culturally exotic materials occurred mostly in the Protohistoric period. The discovery of additional sites with temporally discrete Protohistoric components in the Quoddy Region will be necessary for addressing these questions.

### **Lithic Materials at Devil's Head Should be More Precisely Sourced**

The petrographic categories used to sort materials at Devil's Head were broad and potentially limited due to the time constraints of this project and the size of the assemblage. Categories established by MacDonald and Gilbert, for instance, provide a greater degree of precision in assessing the variety and spatial location of lithic material sources, and could help move beyond the simple local/exotic dichotomy I used in this thesis. Creating further divisions in conversation with regional geologists would contribute to a more nuanced understanding of where certain materials were likely derived from than the local and exotic dichotomy allows.

These studies should include both attempts to locate sources and to further distinguish among lithic materials.

The most substantial opportunity for additional division is in the local grey chert/volcanic category. By far the most abundant material in all three site areas, this includes local rock types with a range of grain sizes, lusters, and color variations. X-ray fluorescence (XRF) is a geochemical technique that can show the elemental composition of rock types (Andrefsky 1998). Proportions of certain elements can then be matched to known outcrops in order to source a rock sample with a high degree of accuracy. Additionally, thin sectioning is a laboratory tool that reveals the optical properties of the minerals within a rock, and also allows samples to be subjected to analysis by an electron scanning microscope or electron microprobe (Andrefsky 1998). Both of these techniques would be useful in making divisions that are impossible using only macroscopic analysis.

The red chert varieties which comprise a large part the exotic components excavated from Devil's Head would also benefit from further analysis. It is highly likely that each of the red cherts excavated from the site are derived from exotic sources (see Doyle 1995 for challenges sorting red chert varieties on the Maritime Peninsula). Knowing the locations of these sources to a higher degree of accuracy than macroscopic analysis reveals, however, would facilitate greater nuance in our understanding diachronic settlement-subsistence. Dividing all materials into a local and exotic dichotomy is potentially misleading, as it fails to take into account the variety of materials as well as their spatial distribution. It is possible for the proportions of exotic and local materials to remain relatively consistent over time, yet increase in variety and spatial distribution.

This pattern was observed by MacDonald at the Weir and Partridge Island sites, and certainly applies to Devil's Head as well with the presence of yellow jasperoid Minas Basin chalcedony in Area C, originally derived from Nova Scotia. In comparison to the limited quantity and variety of exotic material in the Late Maritime Woodland component, Area A, which mostly consists of Munsungun chert from northern Maine, the Area C material suggests more extensive regional mobility and interaction.

### **Addressing These Questions Requires Geospatial Data Integration**

The question of settlement and temporal change during the Late Maritime Woodland to Protohistoric period, although conceived of temporally, is essentially a spatial problem of how people and things moved over large regional and extra-regional landscapes at points in time. It requires archaeologists to think about hunter-gatherer use of space in complex and multifaceted ways. While there is still ample site discovery and excavation to be done in the Quoddy Region, it is equally important to synthesize available data in a way that is attuned to its geospatial complexity. Integrating large and diverse sets of site data into a single geospatial database would reveal how the lithic materials at each site relates to those at other sites, as well as to the broader landscape.

A Geographic Information System (GIS) is a type of computer software that is capable of this very task. GIS programs such as *ArcMap* are used widely by archaeologists to generate site maps, as well as for larger scale questions that require the synthesis of big data (ie. The Paleoindian Database of the Americas). Using *ArcMap*, it would be possible to map all

archaeological sites with a Late Maritime Woodland component in the Quoddy Region, as well as to integrate available data on lithic materials at each site. By also mapping the locations of known archaeologically relevant lithic source outcrops, it would contribute to a more nuanced understanding of the relationship between site location and the proportion of lithic material types.

With this type of database, it would be possible to quickly and easily examine the distance between any archaeological site, the source of a lithic material, and other sites containing that material. It would also provide a framework for a more nuanced examination of how canoe travel would have impacted lithic procurement; in the context of the Protohistoric, portages could also be mapped. This would have the potential outcome of problematizing the notion of culturally local and exotic materials in the region, as well as assessing how and where certain materials may have circulated in a more detailed way.

Settlement-subsistence is an especially complex issue archaeologically because it requires the synthesis of different types of data to form a compelling argument. Faunal assemblages can address questions of seasonal ~~migration~~transhumance while ceramic styles can be used to study cultural diffusion and diachronic technological change. The framework of a GIS would allow archaeologists to build on lithic data by also integrating other types of archaeologically relevant information. Integrating radiocarbon dates allows this method of comparison to be used for both broad and narrow swathes of time. In the context of the Protohistoric period, ethnohistorical information such as tribal territories could also be integrated. The possibilities of such analyses are only limited by the types of available evidence and the scope of the questions posed by archaeologists.

## Conclusion

In this thesis I have described lithic patterning at the Devil's Head site in the Quoddy Region, a site which includes discrete Late Maritime Woodland and Protohistoric components. The Late Maritime Woodland component, consisting of a midden and the edge of a dwelling feature, is consistent with similarly dated assemblages from elsewhere in the Quoddy Region or the Maritime Peninsula and exhibits a lithic assemblage that, while predominantly comprised of local materials, includes a strong minority of materials that are from outside the Quoddy Region.

The structure of the Devil's Head site permitted me to compare this Late Maritime Woodland lithic assemblage to the spatially distinct Protohistoric occupations of the Devil's Head site, revealing illustrative differences. At Devil's Head, the pattern of amplified and extended interactions spheres is borne out, especially with the presence of Minas Basin materials from Nova Scotia in the Protohistoric but not the Late Maritime Woodland component. The quantity of this material suggests (following Sanger 1991) the likelihood of pronounced and well-defined Maine-Nova Scotia procurement. Given the quantity of material at Devil's Head, direct procurement of Minas Basin materials via canoe (*sensu* Blair 2010) seems likely.

The morphology of tools at Devil's Head does little to clarify an enigmatic and already clouded evolution of tool technology during the Maritime Woodland and Protohistoric periods. To this point, the tremendous morphological diversity of bifaces within a single Protohistoric dwelling feature at Devil's Head serves as a call for caution in using bifaces as temporal indicators, even accepting the possibility of some reoccupation of the feature surface within a limited temporal range (*i.e.*, within a period that cannot be resolved with absolute dates). With

regard to site structure, the morphology of tools and debitage continue to support the sharpening and tertiary reduction of projectile points within dwelling features rather than at processing portions of sites.

Future research on the Late Maritime Woodland to Protohistoric tradition will necessarily require a merging of ethnohistorical research with both historical and prehistoric archaeology. The amplification of interaction and procurement I have described here may be indicative either of a continued Indigenous evolution of interaction, or may reflect the ripples of early interaction with Europeans by some Native peoples with profound impacts throughout the region.

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## Appendix I: Tool Analysis

### Bifacial Tools:<sup>2</sup>

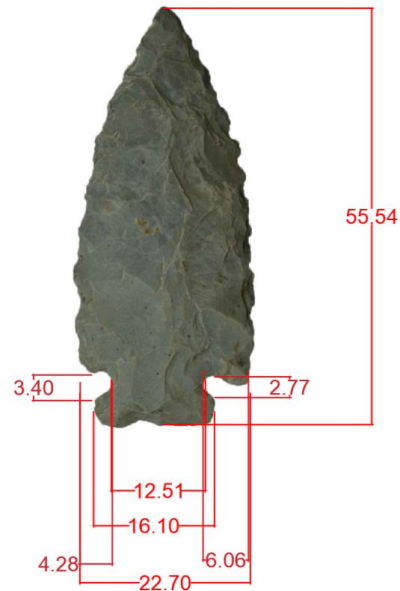
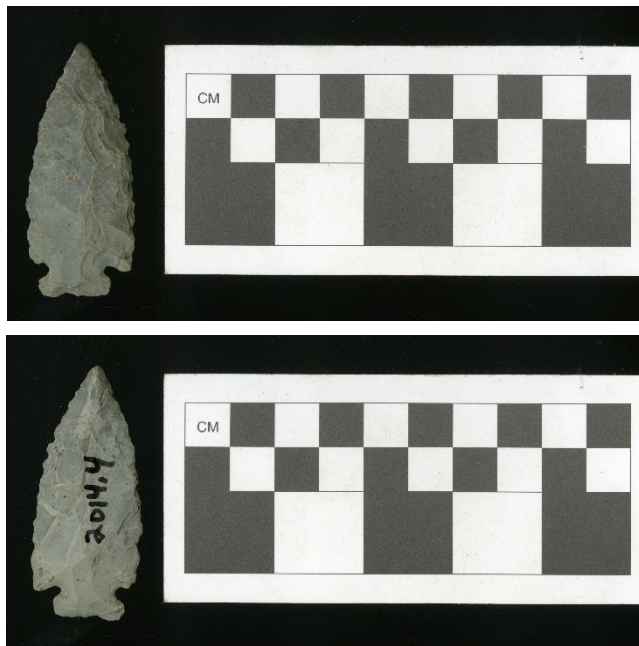
#### Complete Stemmed Bifaces

Four morphologically diverse stemmed bifaces were recovered from the Devil's Head Site, each from Area C. Three of the points appear to be made from local varieties of grey chert (2014.4A, 2014.6A, 2014.12A), while the final point is made from a deep red, probably Minas Basin chert.

- 1- Catalog No. 2014.4A  
Area C, Unit N179 E6, Level 2

Morphology: Triangular with gradually tapering convex edges and a narrow, corner-notched expanding stem. Concave base. Bi-convex cross-section.

Description: Fine-grained light grey/green chert with dull luster. Side to corner notched projectile point, with evidence of pressure flaking and basal edge thinning.

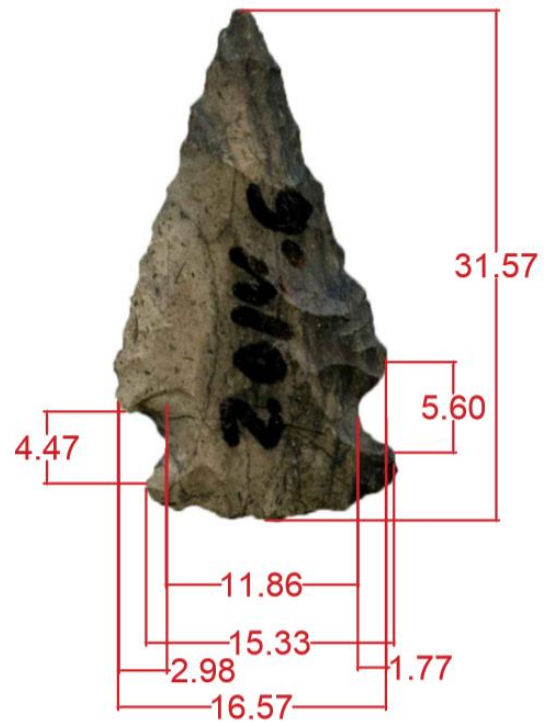
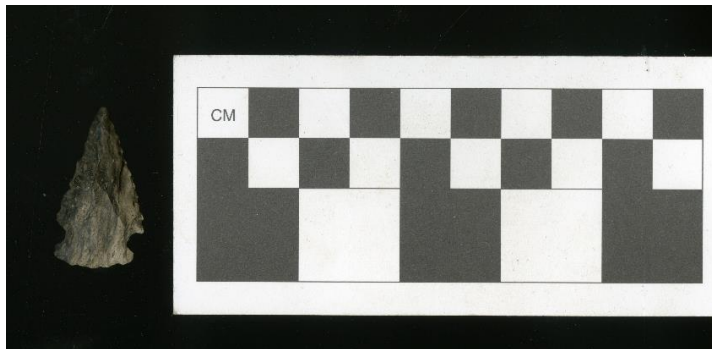
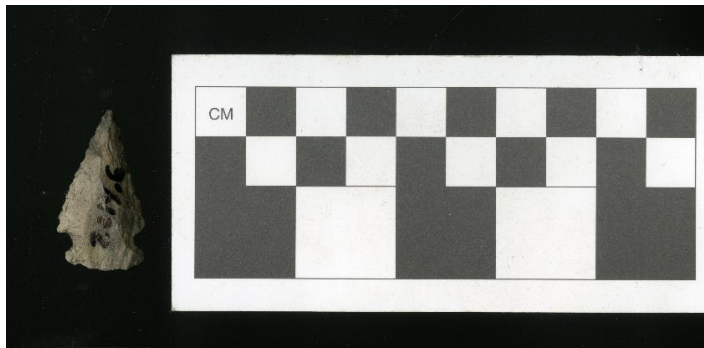


<sup>2</sup> All metrics are in mm unless otherwise stated. Metrics were calculated using an Epson digital scanner at a resolution of 600 dpi. Initial measurements were performed in Adobe Photoshop, and then scaled and annotated in Autocad 2016.

2- Catalog No. 2014.6A  
Area C, Unit N180 E7, Level 3A

Morphology: Triangular with a slightly concave ventral right lateral edge. Side-notched with an expanding stem and convex base. Plano-convex cross-section.

Description: Fine grained light to dark grey chert with vitreous luster and flow-banding. Evidence of pressure flaking with serrated base and large, concave bump on ventral surface<sup>3</sup>. Evidence of retouch on ventral right lateral edge. Basally thinned.



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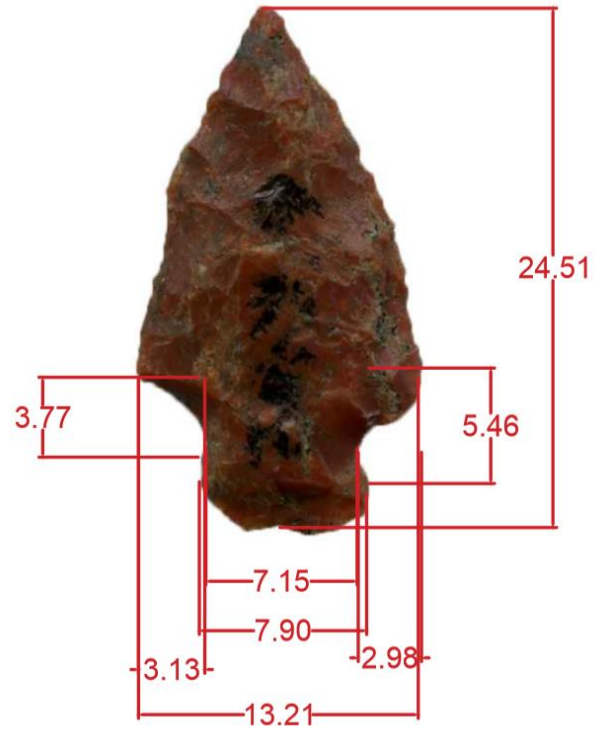
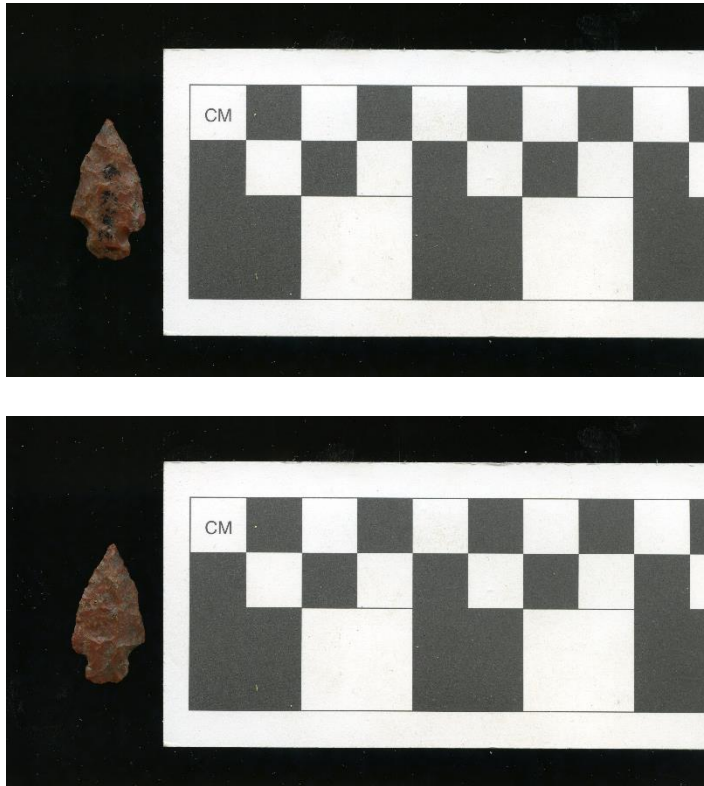
<sup>3</sup> I am defining the dorsal surface as the side shown in the annotated images, and the ventral side as the reverse of this.

3- Catalog No. 2014.9A

Area/Unit/Level: Area C, N180 E7, 3A

Morphology: Triangular wide-corner notched projectile point with slightly concave lateral edges and a narrow-round, asymmetrical shoulder form. Concave base with biconvex profile.

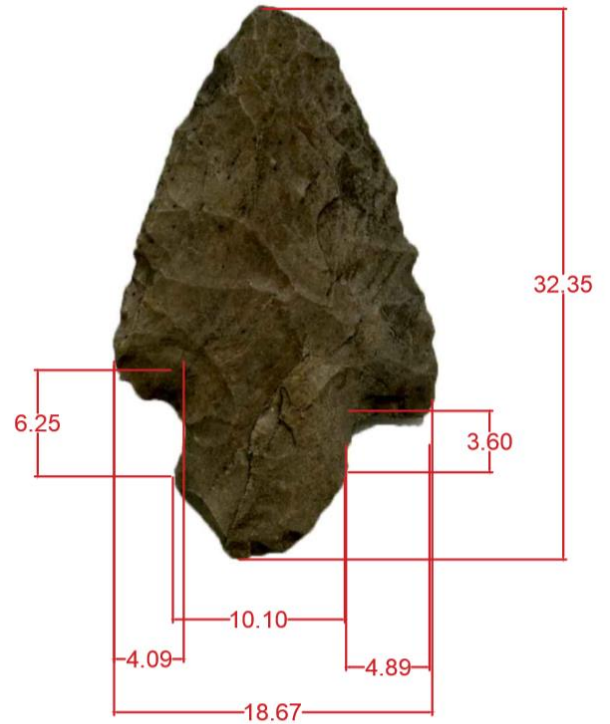
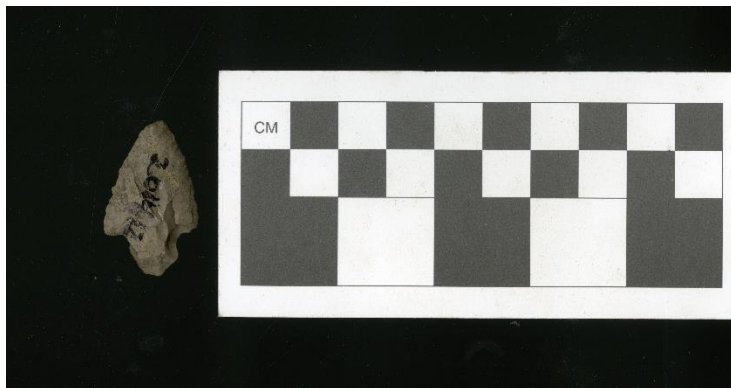
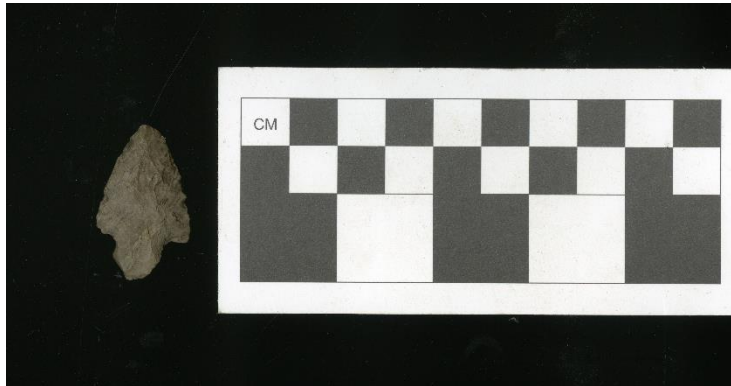
Description: Opaque red chert, probably Minas Basin material, with black patches on ventral side and vitreous luster. Basally thinned with evidence of pressure flaking and possible asymmetrical retouch. Obverse-reverse thickness: 3.75mm.



4- Catalog No. 2014.12A  
Area C, Unit N180 E7, STP

Morphology: Triangular, wide-corner notched with slightly concave lateral edges, a straight to rounded stem form and a convex base. Biconvex cross-section.

Description: Light grey chert with dull luster and some blackish streaking along lateral edges. Thinned, asymmetrical base with pronounced bump on ventral side.

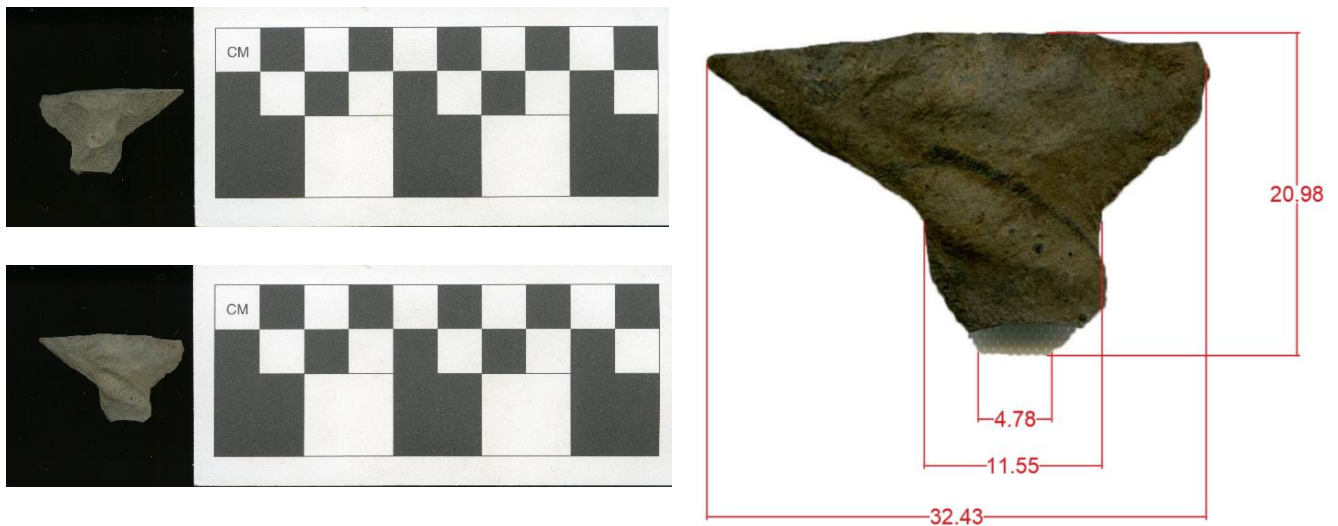


## Incomplete Stemmed Bifaces

1- Catalog No. 2014.19A  
Area C, Unit N179E6, 3A

Morphology: Proximal biface fragment with contracting stem, wide corner notch, and concave base. Biconvex cross section.

Description: Dark grey chert with black streaks and dull luster. Evidence of basal thinning.



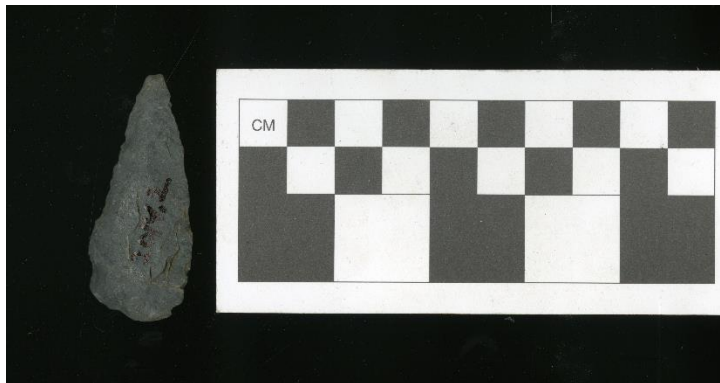
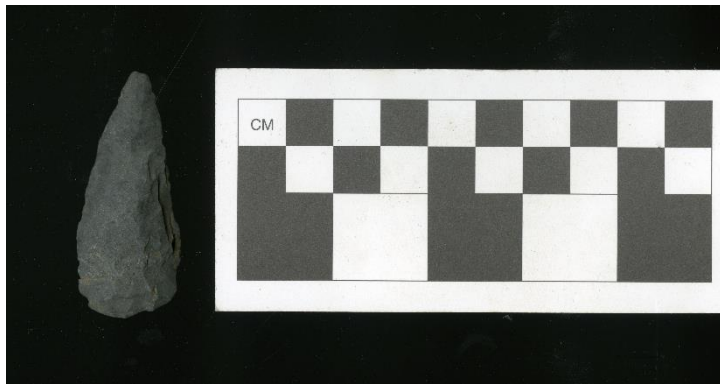
## Complete Unstemmed Bifaces:

1- Catalog No. 2014.2A  
Area C, Unit N180 E5, Level 3A



Morphology: Triangular preform with a convex left lateral edge and a concave right edge, wide rounded shoulders, and a convex base. Biconvex cross section.

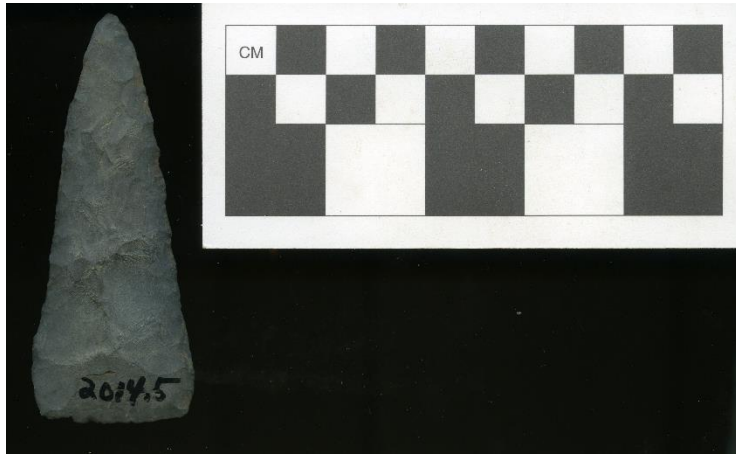
Description: Local grey chert with dull luster and serrated right edge. Evidence of pressure flaking and basal thinning.



2- Catalog No. 2014.5A  
Area C, Unit N181 E8, Level 2

Morphology: Triangular with straight lateral edges, narrow angle shoulders and a slightly convex base. Biconvex cross-section.

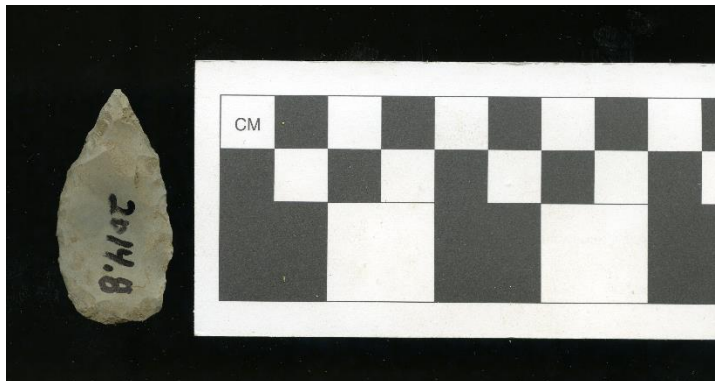
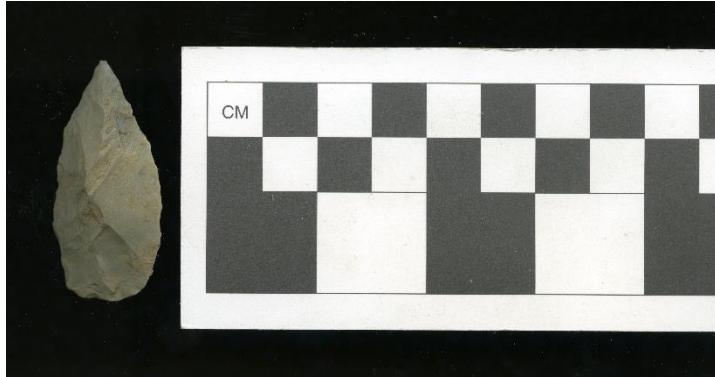
Description: Dark grey chert with dull luster. Basally thinned.



3- Catalogue No. 2014.8A  
Area A, Unit N126 E25, Level 3A

Morphology: Triangular preform with convex lateral edges, wide rounded shoulders, a convex base, and biconvex cross section.

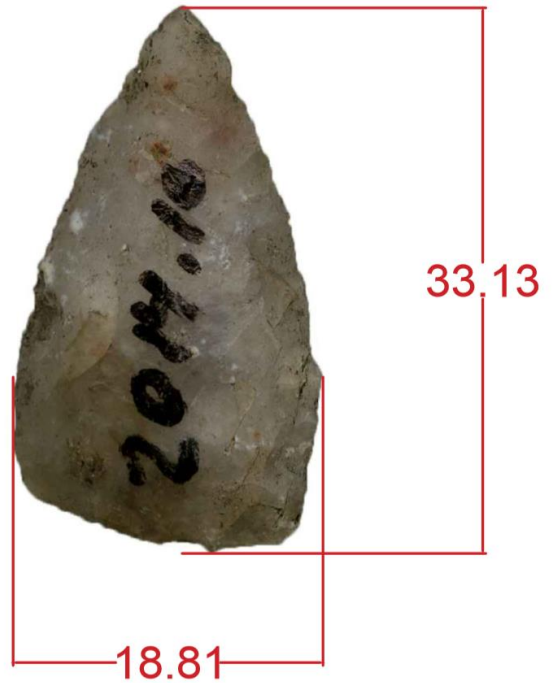
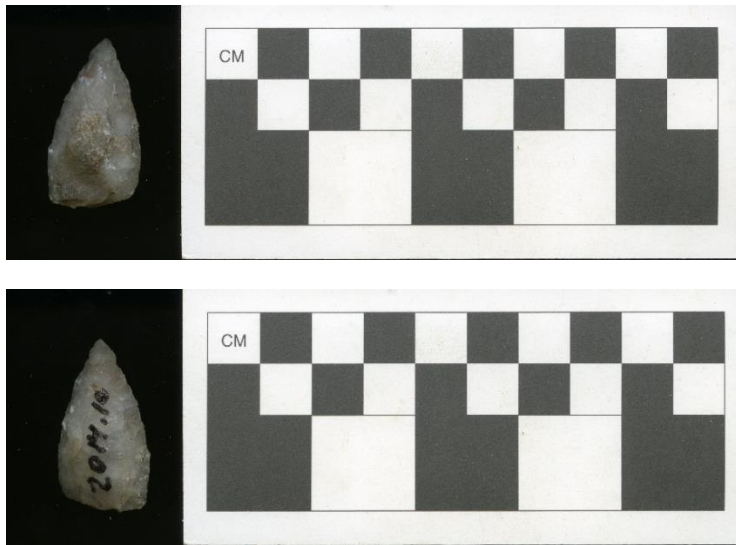
Description: Grey chert with dark streaks and dull luster. Smooth ventral surface. Some basal thinning.



4- Catalog No. 2014.10A  
Area B, Unit N148 E32, Level 3A

Morphology: Triangular preform with convex lateral edges and an asymmetrical convex base. Biconvex cross section.

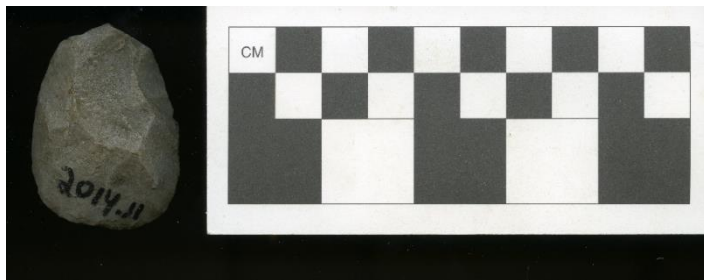
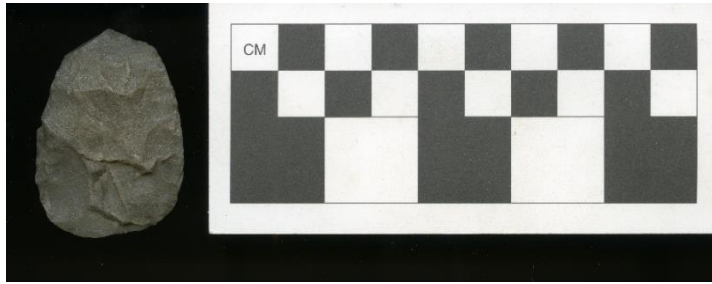
Description: Highly translucent white chert. Unique material type for formal tool specimen in this assemblage.



5- Catalog No. 2014.11A  
Area C, Unit N180 E8, Level 1

Morphology: Ovate to Lanceolate preform with convex lateral edges and an asymmetrical convex base. Plano-convex to biconvex cross section.

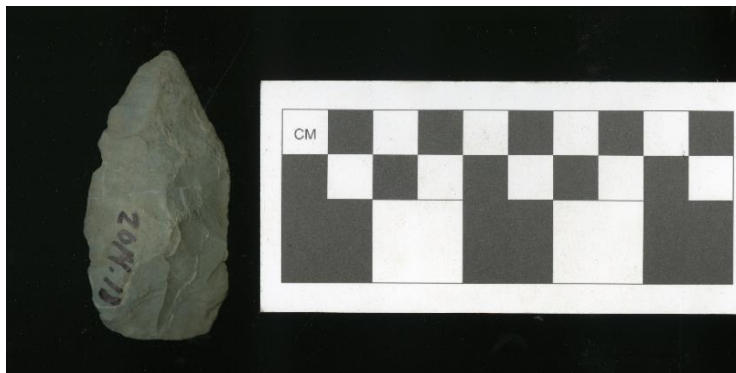
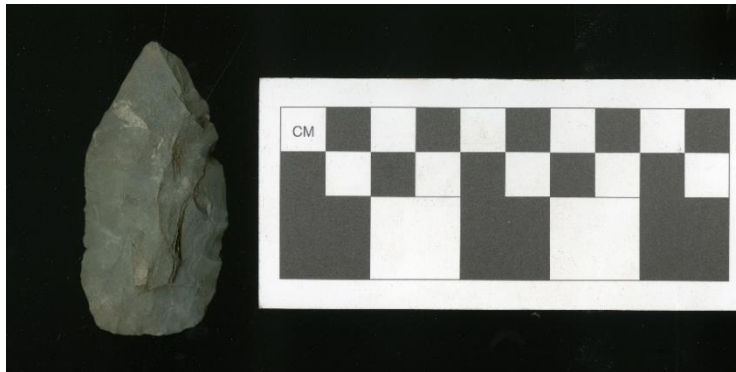
Description: Grey material, possibly quartzite, with waxy luster. Translucent around edges.



6- Catalog No. 2014.18A  
Area C, Unit N179 E7, Level 3B

Morphology: Lanceolate preform with convex lateral edges, wide rounded shoulders and a straight base. Biconvex cross-section.

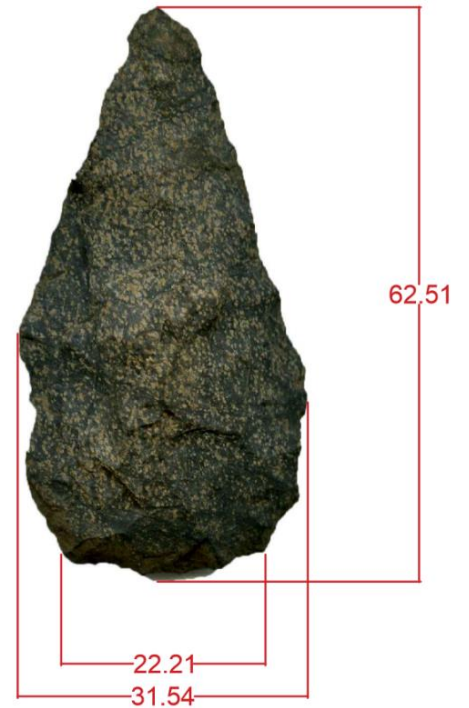
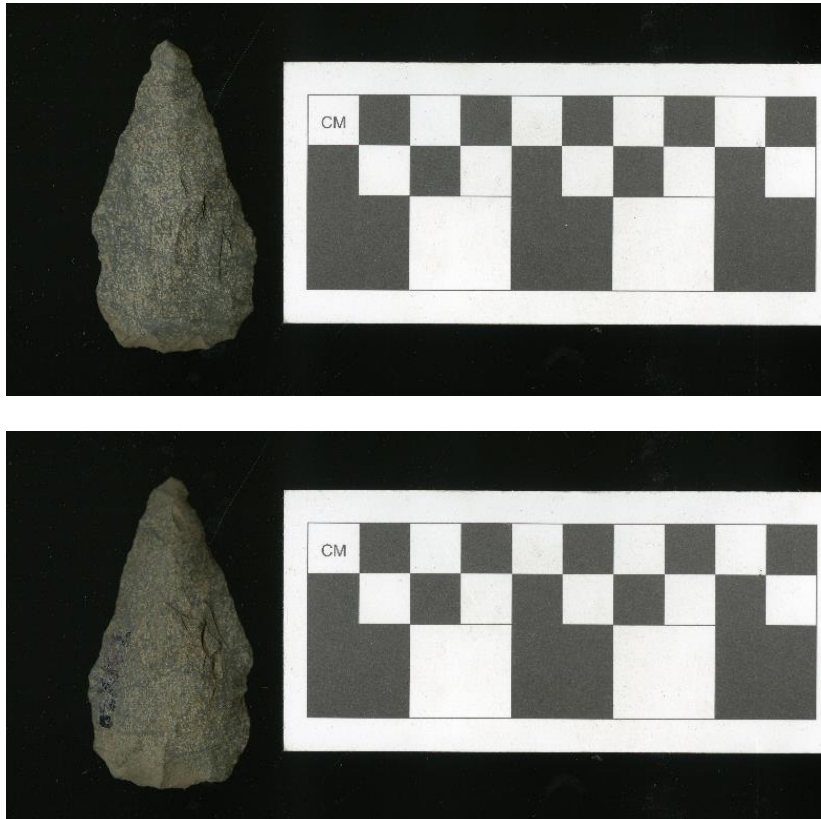
Description: Grey chert with dull luster and white streaks. Pronounced, likely un-knappable lump on dorsal face. Some evidence of use-wear on left lateral edge. Evidence of pressure flaking and basal thinning.



7- Catalog No. 2014.20A  
Area C, Unit N179 E7, 3C

Morphology: Triangular unstemmed preform with convex lateral edges and base. Biconvex cross-section.

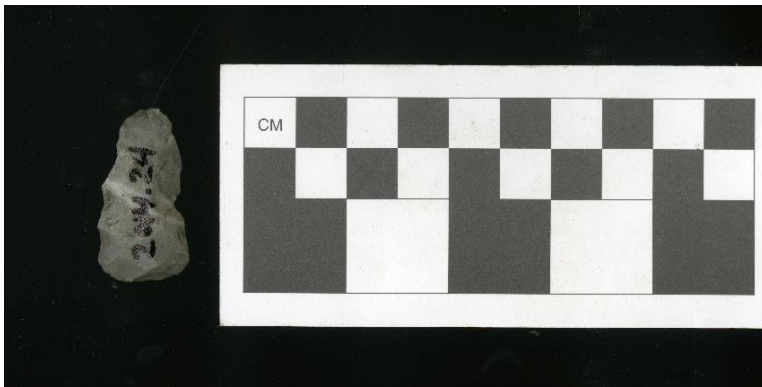
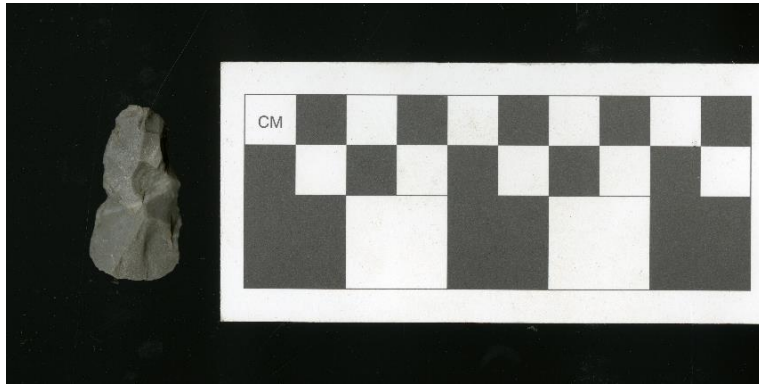
Description: Dark grey chert with patchy white spots, possibly Hinkley Point metasediment. Evidence of some pressure flaking and basal thinning.



8- Catalog No. 2014.24A  
Area A, Unit N127 E24, Level 4

Morphology: Triangular, coarsely knapped biface with wide rounded shoulders and convex base.  
Biconvex cross section.

Description: Grey quartz with white streak and waxy luster. Small and roughly formed.

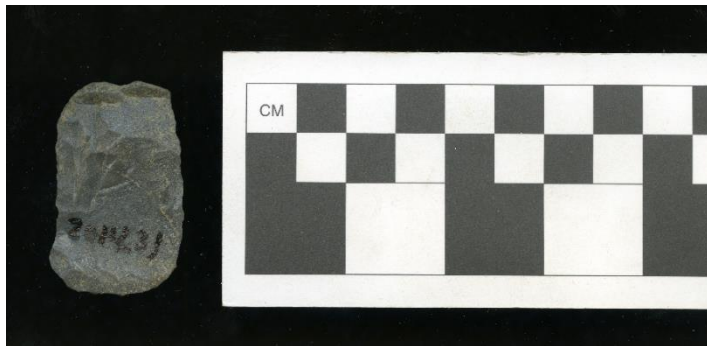
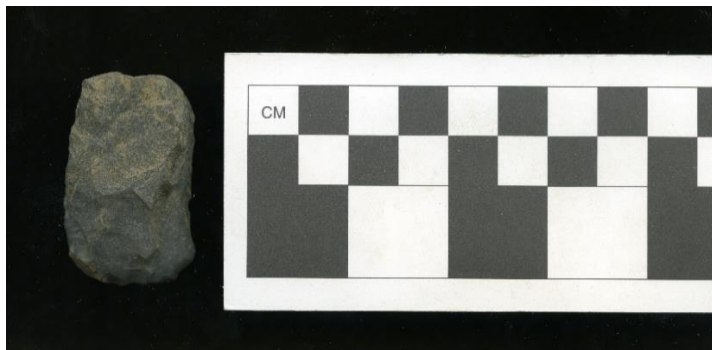




9- Catalog No. 2014.31A  
Area A, N126 E25, Level 3A

Basic Form: Lanceolate biface with a concave left lateral edge, convex right lateral edge, narrow angle shoulders and straight base and tip. Plano-convex cross-section.

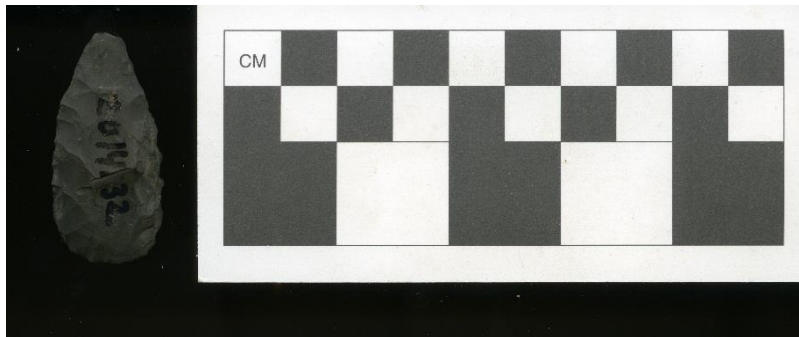
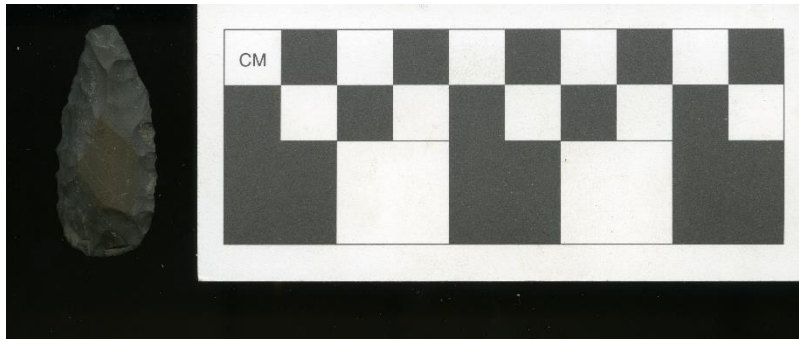
Description: Grey quartzite with waxy luster; translucent around edges. Visible striking platform at base. Possible evidence of use-wear along left lateral edge.



10- Catalog No. 2014.32A  
Area C, Unit N180 E7, Level STP

Basic Form: Triangular with convex lateral edges, wide rounded shoulders, and a convex base.  
Biconvex cross-section.

Description: Dark grey-black chert with vitreous luster. Evidence of basal thinning. Heavily pressure-flaked along left lateral margin on dorsal surface.

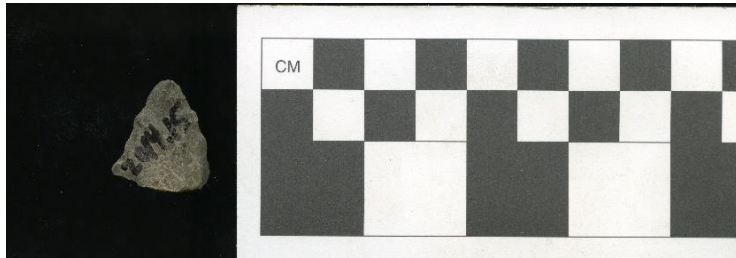
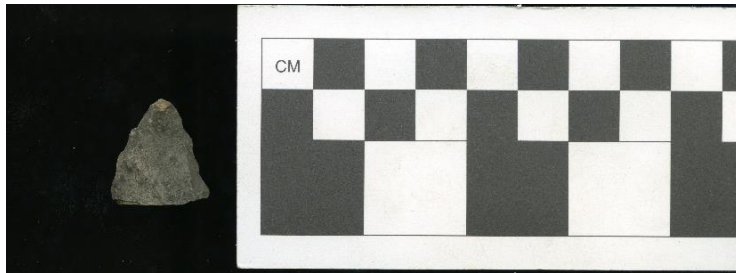


## Biface Fragments

1- Catalog No. 2014.15A  
Area B, Unit N148 E32, Level 3A

Basic Form: Biface tip fragment. Biconvex cross-section.

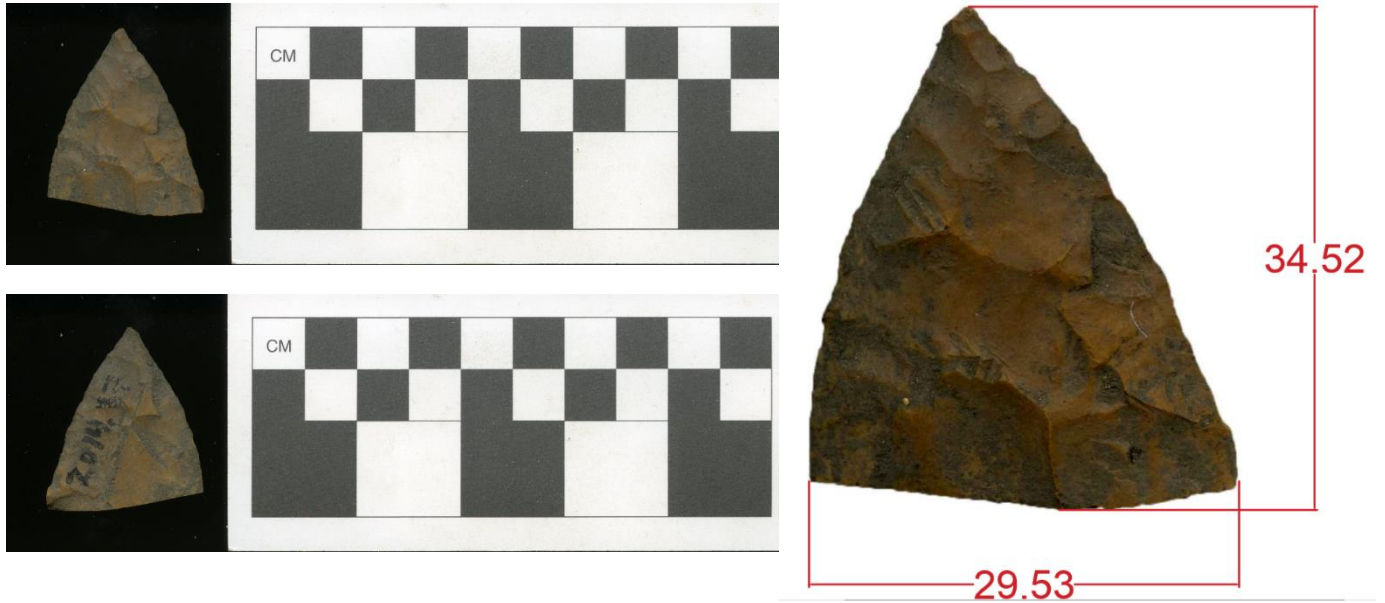
Description: Grey chert with dull luster. Tip slightly rounded.



2- Catalog No. 2014.37A  
Area C, Unit N180 E8, Level 4

Basic Form: Triangular biface tip fragment with convex lateral edges. Biplano cross-section.

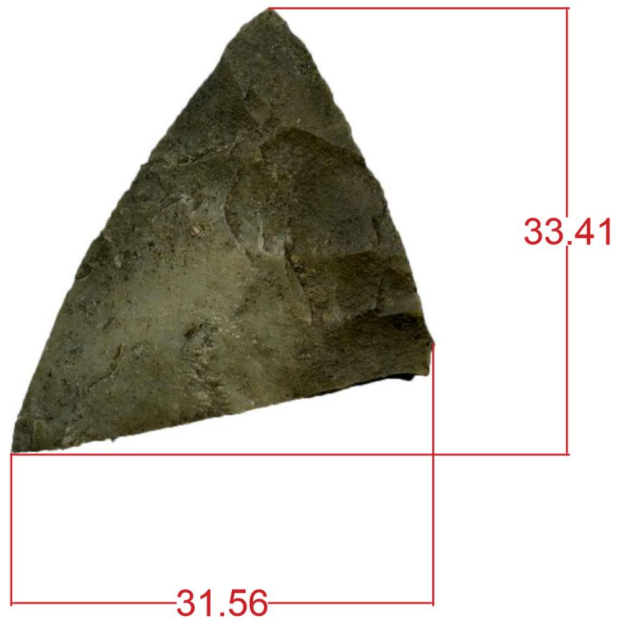
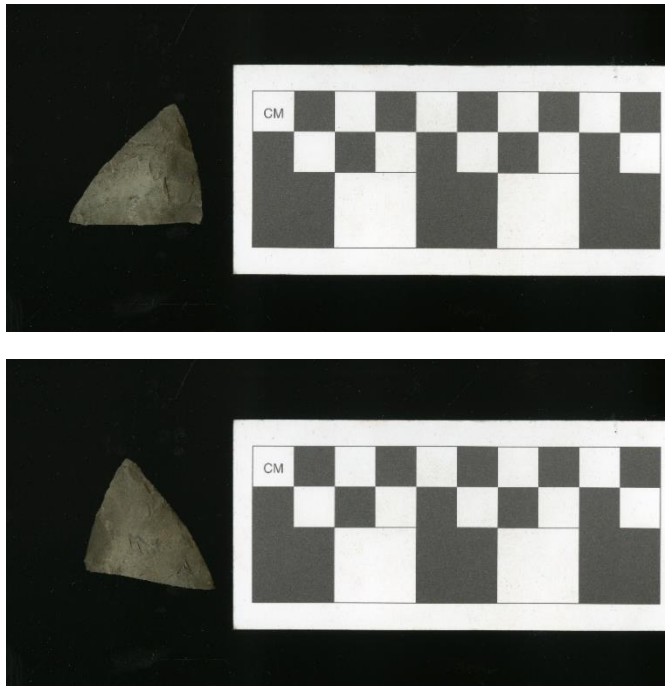
Description: Dark red-orange chert with dull luster. Edge thinning present along lateral edges.



3- Catalog No. 2014.25A  
Area A, Unit N127 E24, Level 4

Basic Form: Triangular biface tip fragment with convex lateral edges. Biconvex to plano-convex cross-section.

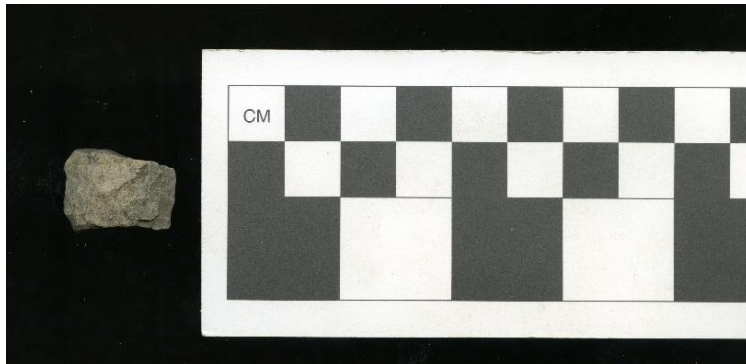
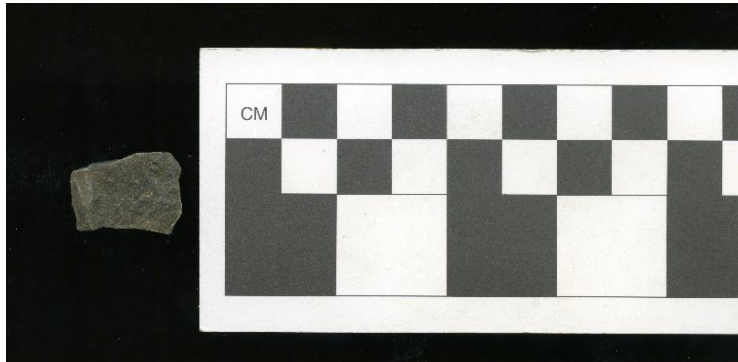
Description: Grey chert with dull luster; translucent around edges. Evidence of pressure-flaking around lateral edges.



4- Catalog No. 2014.34A  
Area B, Unit N148 E32, Level 3A

Basic Form: Medial biface fragment. Biplano cross-section.

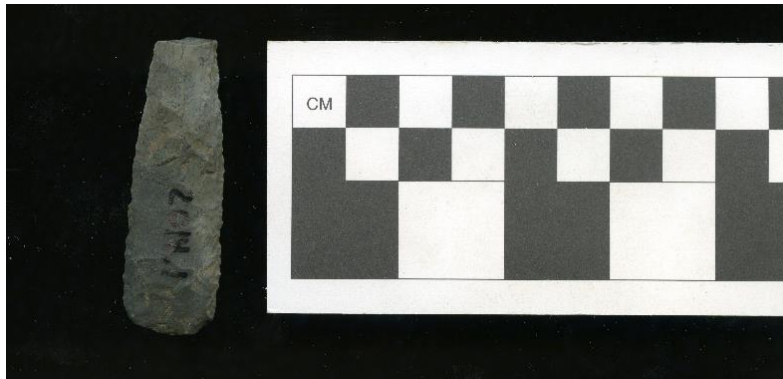
Description: Dark grey chert with dull luster. Weathered along ventral face. Possible refit with 2014.15A.



5- Catalog No. 2014.1A  
Area A, Unit N26 E25, Level 3A

Basic Form: Proximal bifacial blade fragment with straight lateral edges, wide rounded shoulders and a convex base. Biplano cross section.

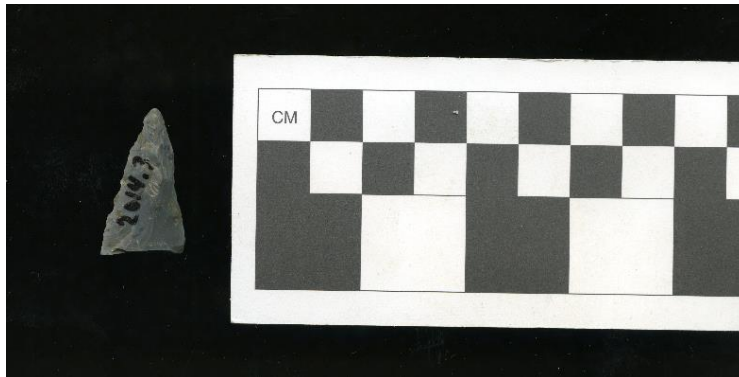
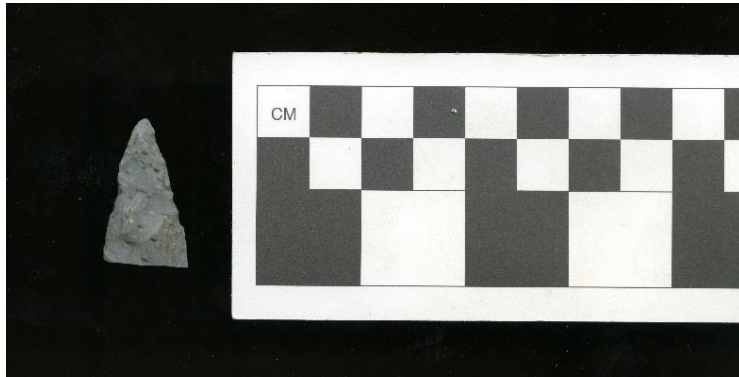
Description: Dark grey chert with weathering at distal end. Evidence of pressure flaking and possible use-wear along lateral edges. Basal thinning present.



6- Catalog No. 2014.3A  
Area B, Unit N147 E32, Level 3A

Basic Form: Biface tip with straight lateral edges. Biconvex cross-section.

Description: Grey chert with dull luster and black/white speckled appearance on dorsal face. Some evidence of pressure flaking along lateral edges.

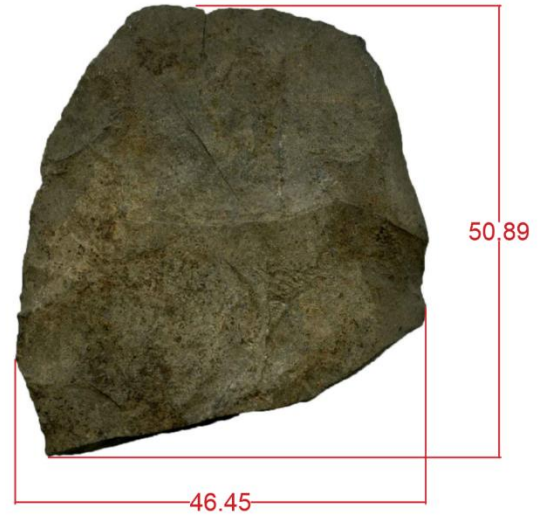
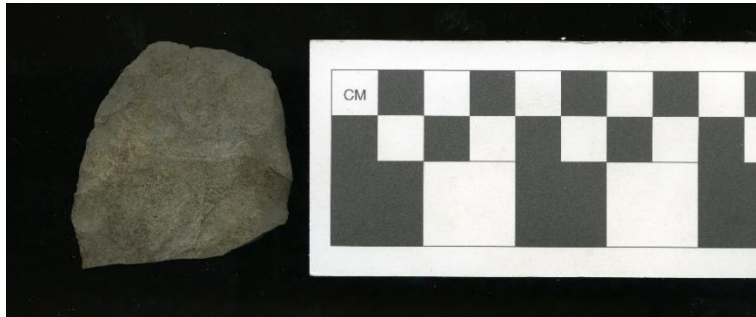
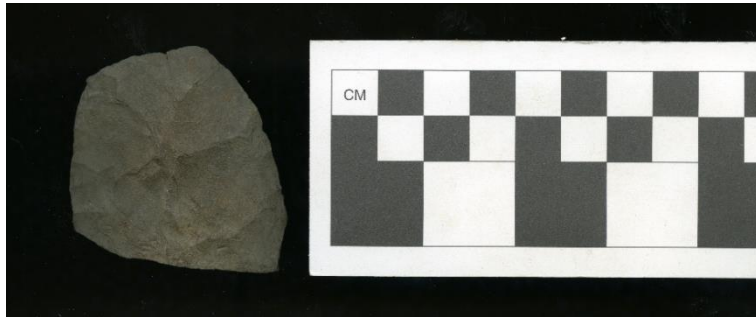




7- Catalog No. 2014.29A  
Area B, Unit N148 E32, Level 3A

Basic Form: Lanceolate proximal biface fragment with narrow round shoulders, convex lateral edges and a straight base. Plano-convex cross-section.

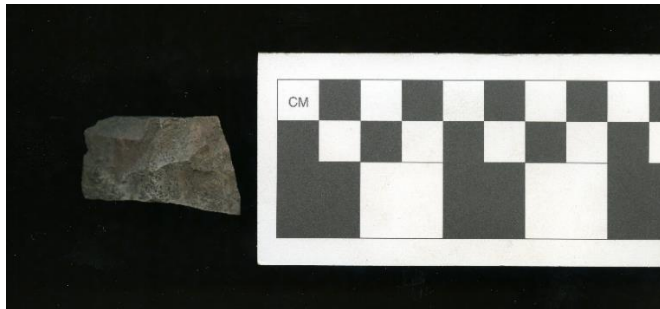
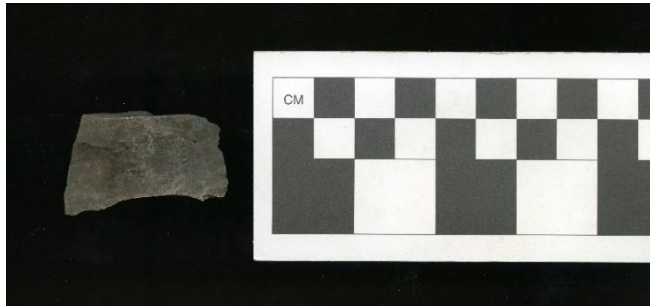
Description: Dark grey chert with dull luster. Evidence of pressure flaking and basal thinning. Noticeable flake scars visible on both faces.



8- Catalog No. 2014.14A  
Area B, Unit N148 E32, Level 3A

Basic Form: Proximal biface fragment. Plano-convex cross-section.

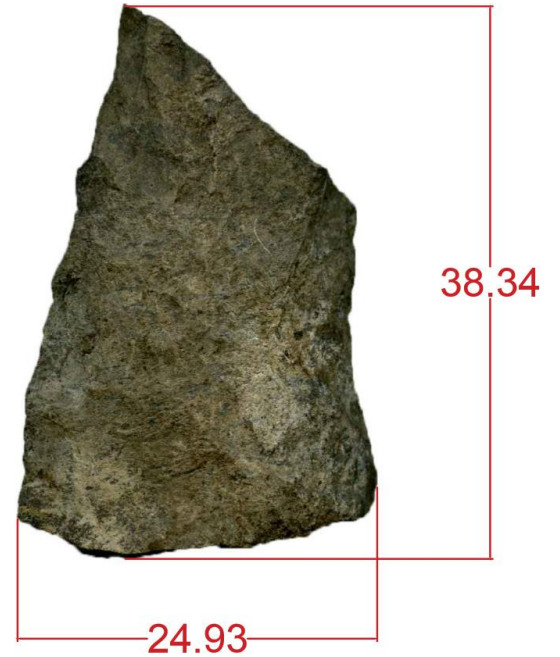
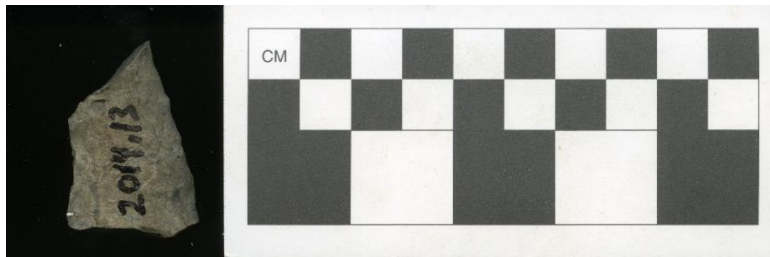
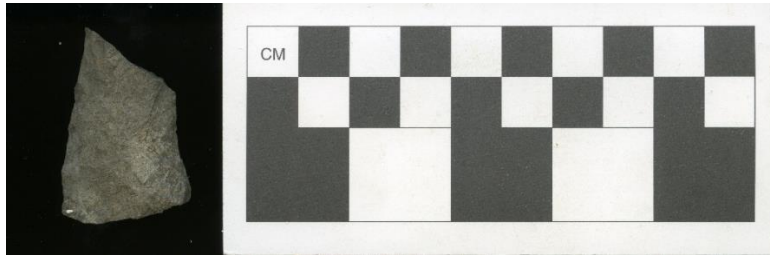
Description: Weathered, coarse grey chert. Visible striking platform at base.



9- Catalog No. 2014.13A  
Area B, Unit N48 E32, Level 3A

Basic Form: Triangular medial biface fragment with convex lateral edges. Biconvex cross-section.

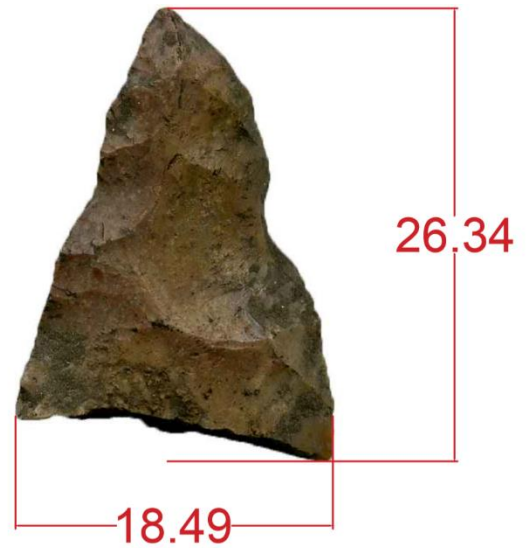
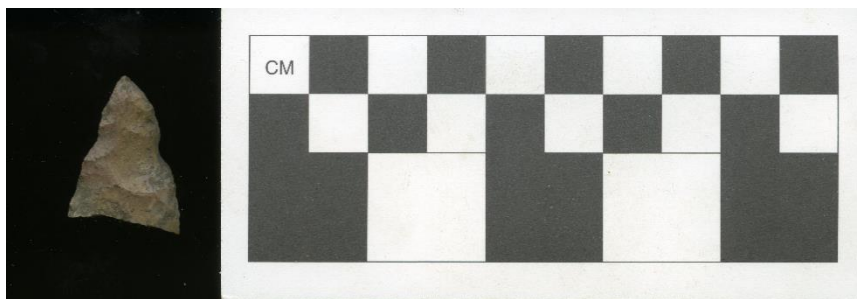
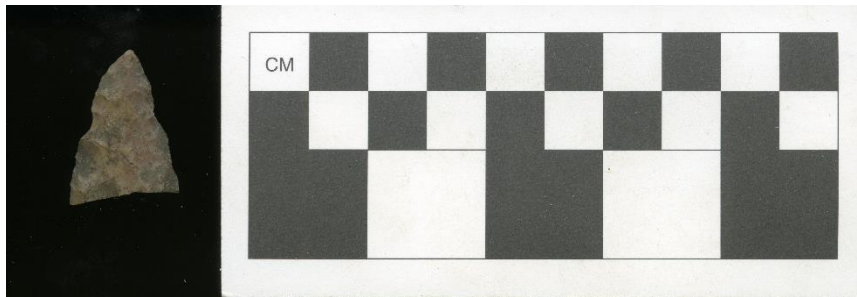
Description: Grey chert with dull luster. Possible use-wear along right lateral edge.



10- Catalog No. 2014.17A  
Area C, Unit N181 E7, Level 3A

Basic Form: Biface tip fragment with convex lateral edges. Biplano cross-section.

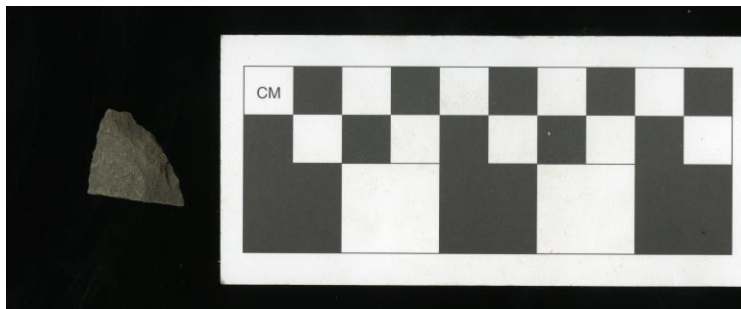
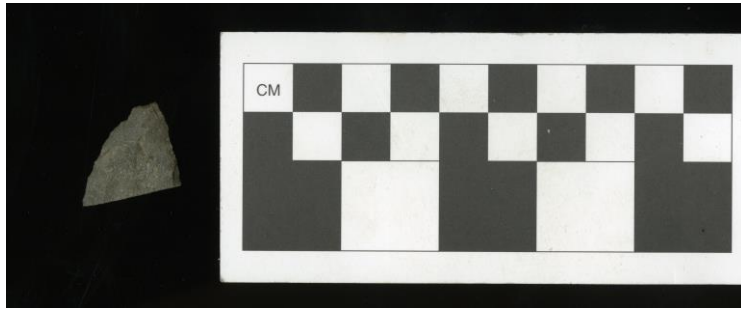
Description: Grey chert with vitreous luster and some weathering.



11- Catalog No. 2014.225A  
Area A, Unit N127 E25, Level 4

Basic Form: Biface tip fragment with convex lateral edges. Biplano cross-section.

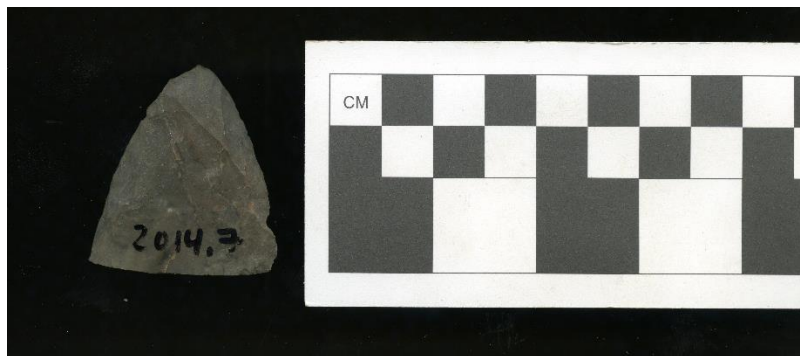
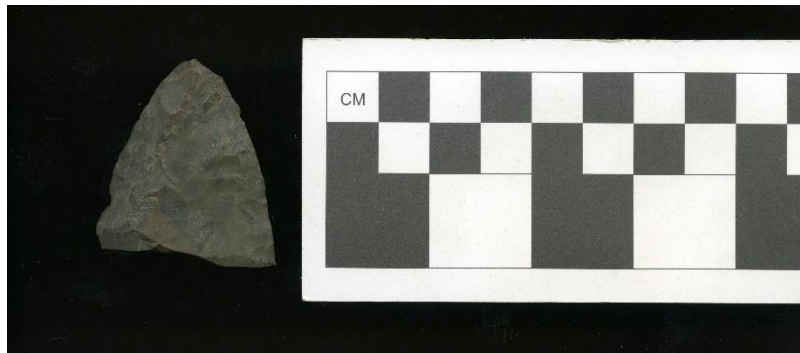
Description: Possibly quartzite.



12- Catalog No. 2014.7A  
Area A, Unit N127 E25, Level 4

Basic Form: Triangular biface tip fragment with convex lateral edges

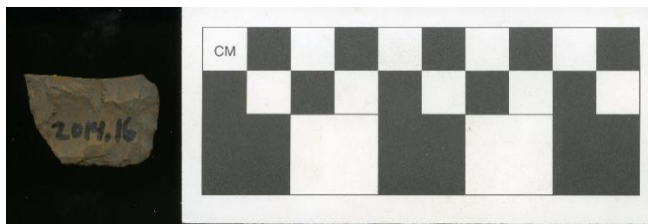
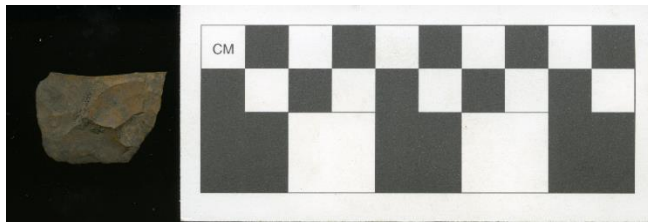
Description: Grey chert with dull luster. Evidence of pressure flaking and edge thinning.



13- Catalog No. 2014.16A  
Area C, Unit N180 E8, Level 3A

Basic Form: Lanceolate proximal biface fragment with convex lateral edges, narrow angle shoulders, and a straight base. Biplano cross-section.

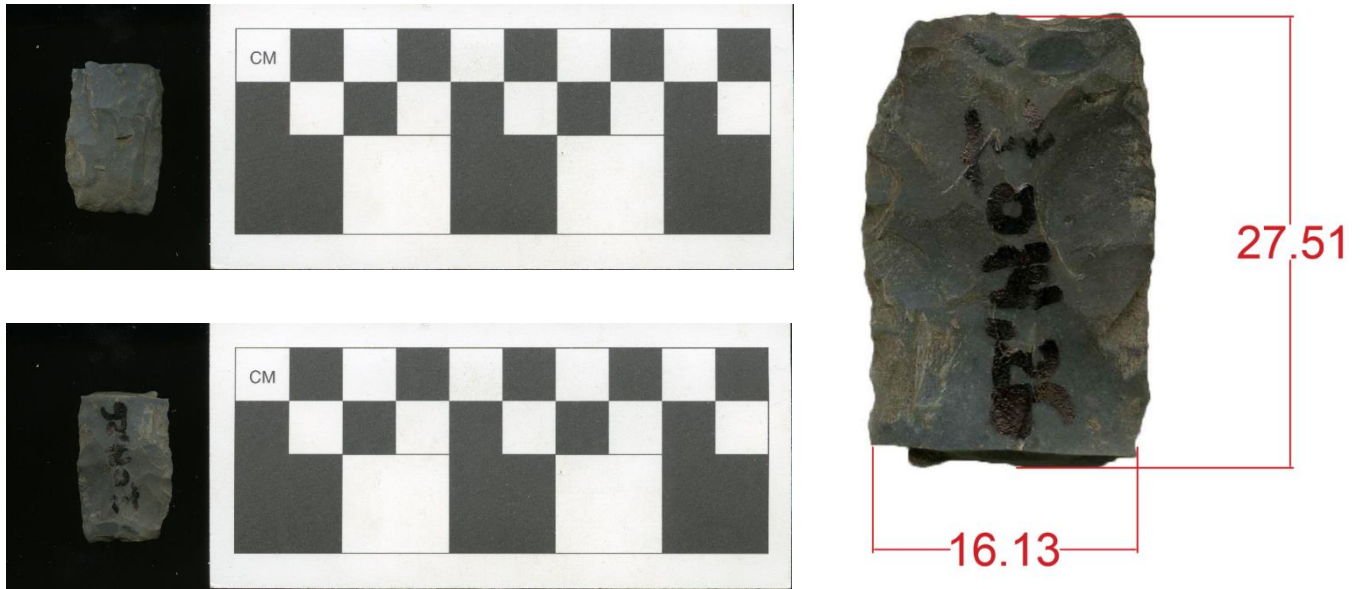
Description: Yellow-orange chert with black weathering, possibly Minas Basin. Pressure flaking and basal thinning.



14- Catalog No. 2014.26A  
Area B, Unit N147 E32, Level 3A

Basic Form: Lanceolate medial biface fragment with convex lateral edges. Biconvex cross-section.

Description: Dark grey chert with dull luster. Evidence of possible pressure flaking at base on dorsal face.

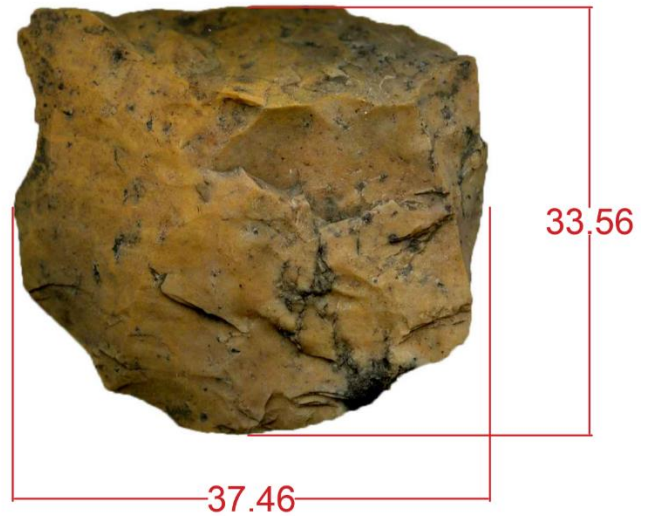
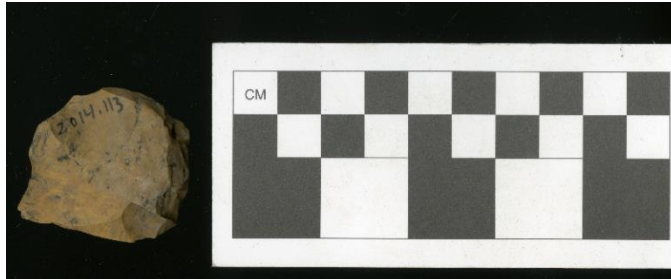
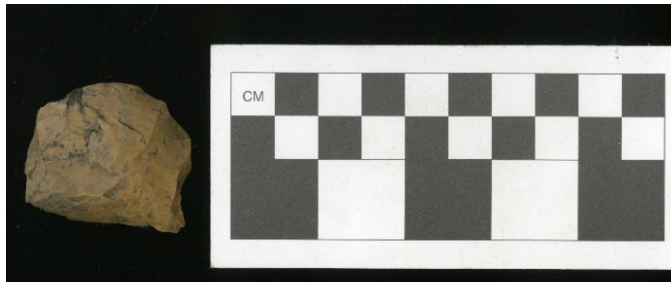




15- Catalog No. 2014.113A  
Area C, Unit N180 E8, Level 2

Basic Form: Proximal biface fragment with angular edges and a convex base. Biconvex cross-section.

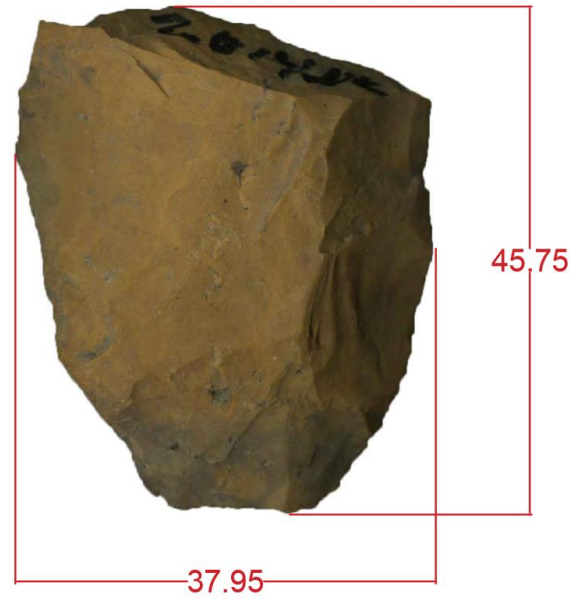
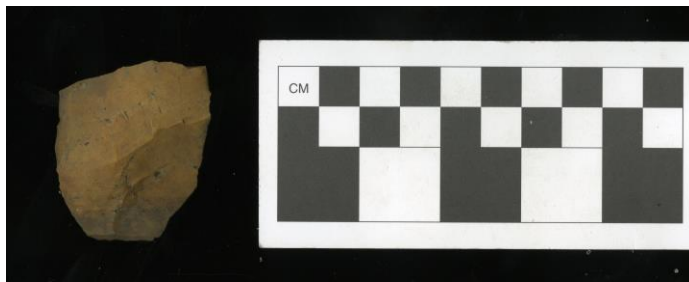
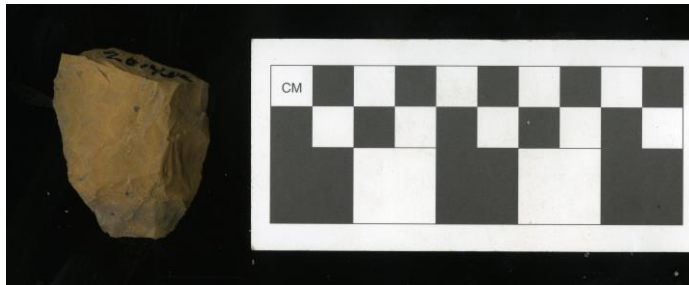
Description: Yellow jasperoid Minas Basin Chalcedony with drusy quartz mosaics. Biface fragment in very early preform stage, with minimal edge thinning. Refit with artifact 2014.112A.



16- Catalog No. 2014.112A  
Area C, N179E5, Level 2

Basic Form: Distal biface fragment with angular edges. Biconvex cross-section.

Description: Yellow jasperoid Minas Basin Chalcedony with drusy quartz mosaics. Biface fragment in very early preform stage, with minimal edge thinning. Refit with artifact 2014.113A.



## Bifacial Tool Summary Tables

| Stemmed Biface Metrics |                           |                        |               |                        |               |                           |            |            |                  |                  |                   |                   |
|------------------------|---------------------------|------------------------|---------------|------------------------|---------------|---------------------------|------------|------------|------------------|------------------|-------------------|-------------------|
| Catalog #              | Type                      | Petrographic Series    | Exotic/Local? | Distal-Proximal Length | Maximum Width | Obverse-Reverse Thickness | Neck Width | Base Width | Left Notch Width | Left Notch Depth | Right Notch Width | Right Notch Depth |
| 2014.19A               | Incomplete Stemmed Biface | Grey Chert or Volcanic | Local         | 20.98                  | 32.34         | 5.29                      | 11.55      | 5          | N/A              | N/A              | N/A               | N/A               |
| 2014.9A                | Stemmed Biface            | Minas Basin            | Exotic        | 24.51                  | 13.21         | 3.75                      | 7.15       | 8          | 3.13             | 3.77             | 2.98              | 5.46              |
| 2014.6A                | Stemmed Biface            | Grey Chert or Volcanic | Local         | 31.57                  | 16.57         | 7.13                      | 11.86      | 17         | 2.98             | 4.47             | 1.77              | 6                 |
| 2014.4A                | Stemmed Biface            | Grey Chert or Volcanic | Local         | 55.54                  | 22.7          | 6.19                      | 12.51      | 16         | 4.28             | 3.4              | 6.06              | 3                 |
| 2014.12A               | Stemmed Biface            | Grey Chert or Volcanic | Local         | 32.35                  | 18.67         | 5.44                      | 10.1       | N/A        | 4.09             | 6.25             | 4.89              | 3.6               |

| Biface Fragments and Preforms |                 |                        |               |                        |               |                           |            |
|-------------------------------|-----------------|------------------------|---------------|------------------------|---------------|---------------------------|------------|
| Catalog #                     | Type            | Petrographic Series    | Exotic/Local? | Distal-Proximal Length | Maximum Width | Obverse-Reverse Thickness | Base Width |
| 2014.29A                      | Biface Fragment | Grey Chert or Volcanic | Local         | 50.89                  | 46.45         | 10                        | N/A        |
| 2014.13A                      | Biface Fragment | Grey Chert or Volcanic | Local         | 38.34                  | 24.93         | 8.99                      | N/A        |
| 2014.14A                      | Biface Fragment | Grey Chert or Volcanic | Local         | 24.58                  | 40.28         | 10.8                      | N/A        |

| Biface Fragments and Preforms |                 |                        |               |                        |               |                           |            |
|-------------------------------|-----------------|------------------------|---------------|------------------------|---------------|---------------------------|------------|
| Catalog #                     | Type            | Petrographic Series    | Exotic/Local? | Distal-Proximal Length | Maximum Width | Obverse-Reverse Thickness | Base Width |
| 2014.15A                      | Biface Fragment | Grey Chert or Volcanic | Local         | 20.91                  | 18.93         | 8.23                      | N/A        |
| 2014.16A                      | Biface Fragment | Minas Basin            | Exotic        | 19.57                  | 30.46         | 5.21                      | 19         |
| 2014.17A                      | Biface Fragment | Unknown                | Unknown       | 26.34                  | 18.49         | 5.53                      | N/A        |
| 2014.1A                       | Biface Fragment | Grey Chert or Volcanic | Local         | 55.66                  | 17.49         | 6.38                      | N/A        |
| 2014.26A                      | Biface Fragment | Grey Chert or Volcanic | Local         | 27.36                  | 17.85         | 6.17                      | N/A        |
| 2014.225A                     | Biface Fragment | Grey Chert or Volcanic | Local         | 21.36                  | 20.11         | 5.72                      | N/A        |
| 2014.3A                       | Biface Fragment | Unknown                | Unknown       | 27.95                  | 16.43         | 5.32                      | N/A        |
| 2014.34A                      | Biface Fragment | Grey Chert or Volcanic | Local         | 14.96                  | 20.08         | 5.76                      | N/A        |
| 2014.37A                      | Biface Fragment | Minas Basin            | Exotic        | 34.52                  | 29.53         | 4.99                      | N/A        |
| 2014.112A                     | Biface Fragment | Minas Basin            | Exotic        | 45.75                  | 37.95         | 14.71                     | N/A        |
| 2014.113A                     | Biface Fragment | Minas Basin            | Exotic        | 37.46                  | 33.56         | 13.55                     | N/A        |
| 2014.7A                       | Biface Fragment | Grey Chert or Volcanic | Local         | 40.15                  | 34.84         | 7.56                      | N/A        |
| 2014.25A                      | Biface Fragment | Grey Chert or Volcanic | Local         | 33.41                  | 31.56         | 7.02                      | N/A        |

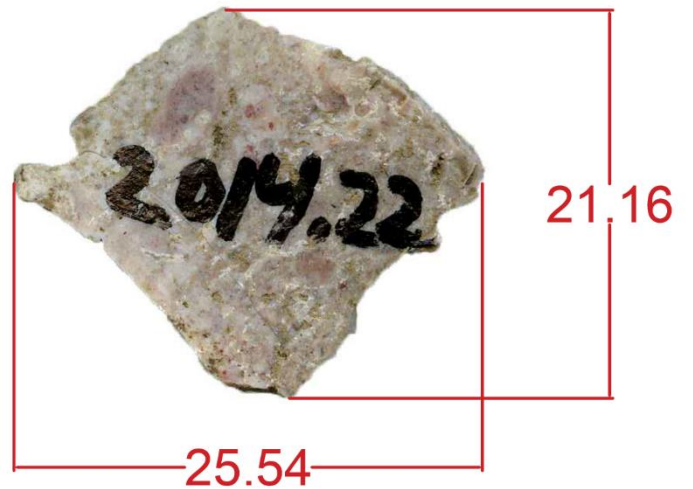
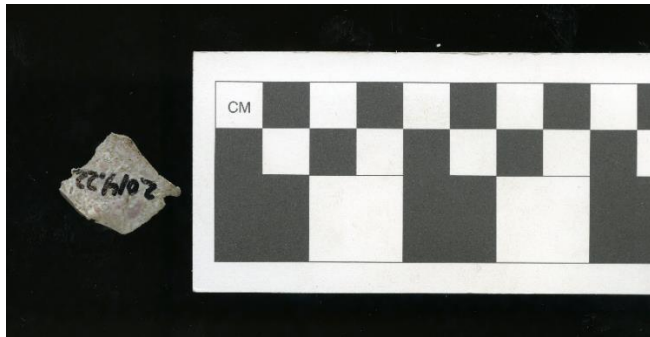
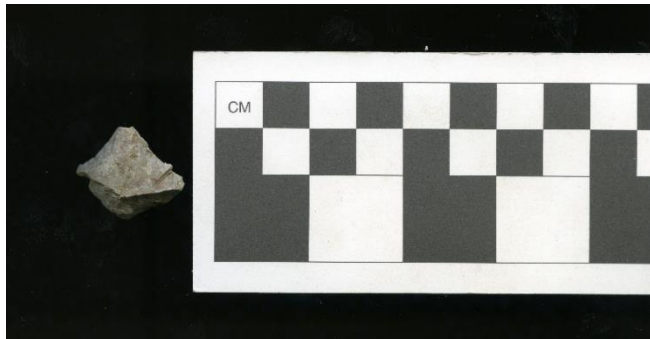
| <b>Biface Fragments and Preforms</b> |                |                                 |                      |                               |                      |                                  |                   |
|--------------------------------------|----------------|---------------------------------|----------------------|-------------------------------|----------------------|----------------------------------|-------------------|
| <b>Catalog #</b>                     | <b>Type</b>    | <b>Petrographic Series</b>      | <b>Exotic/Local?</b> | <b>Distal-Proximal Length</b> | <b>Maximum Width</b> | <b>Obverse-Reverse Thickness</b> | <b>Base Width</b> |
| 2014.11A                             | Biface Preform | Quartzite                       | Local                | 43.79                         | 32.46                | 10.67                            | N/A               |
| 2014.8A                              | Biface Preform | Grey Chert or Volcanic          | Local                | 43.26                         | 21.98                | 7.82                             | 18                |
| 2014.18A                             | Biface Preform | Grey Chert or Volcanic          | Local                | 65.59                         | 30.8                 | 12.73                            | 26                |
| 2014.32A                             | Biface Preform | Grey Chert or Volcanic          | Local                | 40.71                         | 19.67                | 9.3                              | N/A               |
| 2014.20A                             | Biface Preform | Hinkley Point Metasediment      | Local                | 62.51                         | 31.54                | 12.45                            | 22                |
| 2014.24A                             | Biface Preform | Grey Chert or Volcanic          | Local                | 34.01                         | 17.4                 | 8                                | N/A               |
| 2014.10A                             | Biface Preform | White Spotted Translucent Chert | Local                | 33.13                         | 18.81                | 8.66                             | N/A               |
| 2014.2A                              | Biface Preform | Grey Chert or Volcanic          | Local                | 52.22                         | 21.47                | 10.14                            | 19                |
| 2014.5A                              | Biface Preform | Grey Chert or Volcanic          | Local                | 81.33                         | 32.09                | 8.06                             | N/A               |
| 2014.31A                             | Biface Preform | Quartzite                       | Local                | 42.82                         | 25.76                | 7.91                             | N/A               |

## Unifacial Scraper Tools

- 1- Catalog No. 2014.22A  
Area A, Unit N126 E25, Level 3A

Basic Form: Rectangular, plano-convex cross-section.

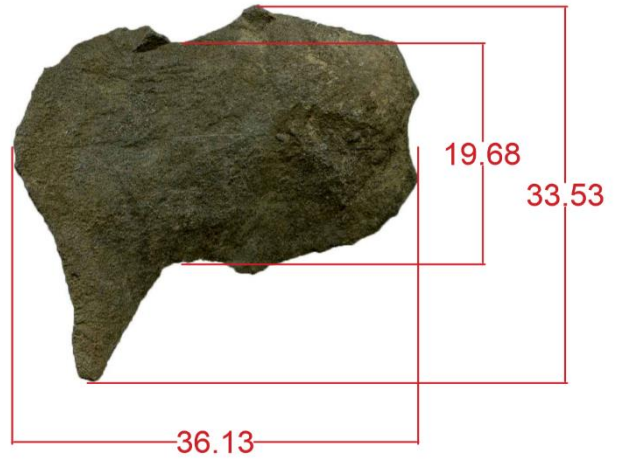
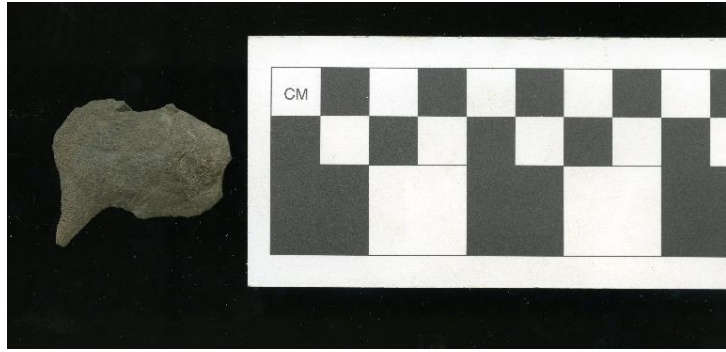
Description: Coarse-grained grey chert with dull luster. Possible cortex on ventral surface. Some evidence of use-wear along lateral edges.



2- Catalog No. 2014.21A  
Area C, Unit N180 E7, Level 3B

Basic Form: Ovular uniface with pronounced triangular extrusion.

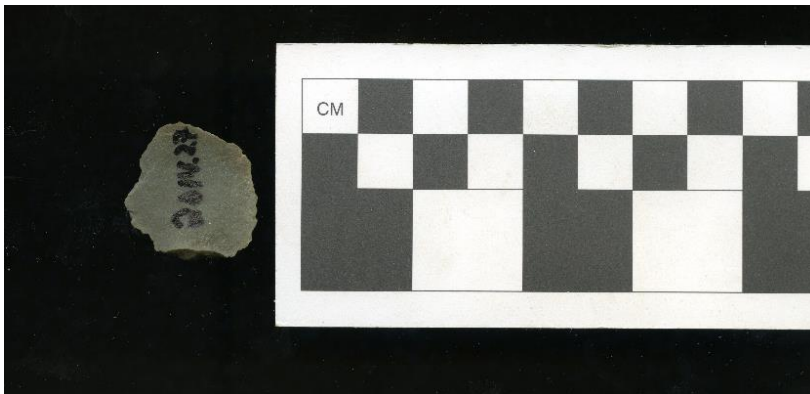
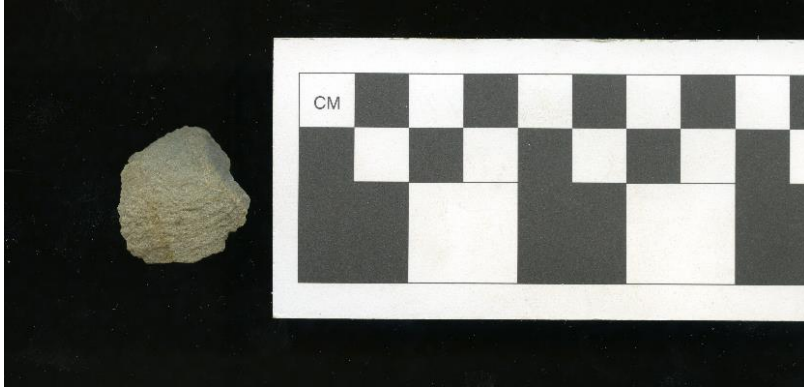
Description: Coarse-grained grey chert. Flake scars on dorsal face. Possible graver tool.



3- Catalog No. 2014.27A  
Area A, Unit N126 E25, Level 3A

Basic Form: Complete utilized flake.

Description: Grey-green chert. Evidence of use-wear along edges of flake. Striking platform approx. 45 degrees.

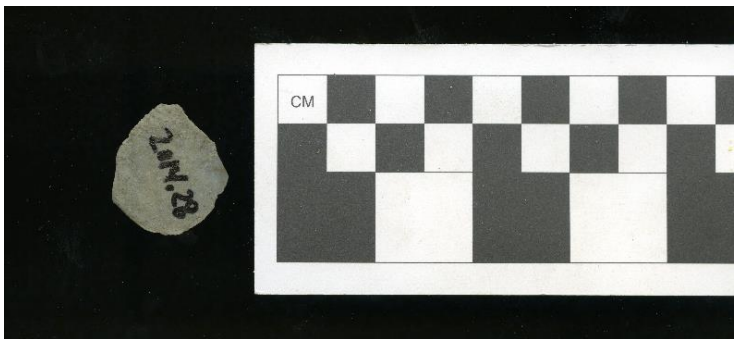
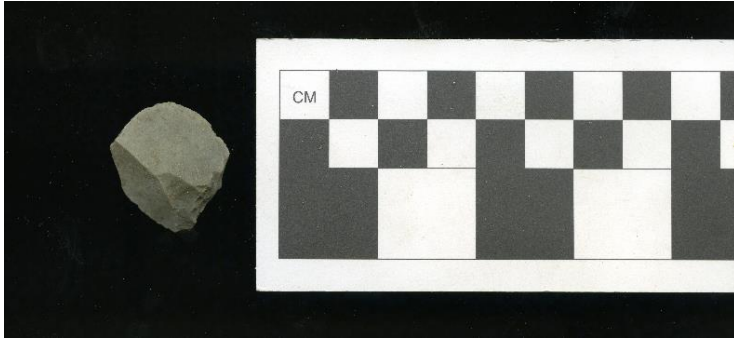




4- Catalog No. 2014.28A  
Area A, Unit N126 E25, Level 3A

Basic Form: Utilized flake with flake scars on dorsal surface.

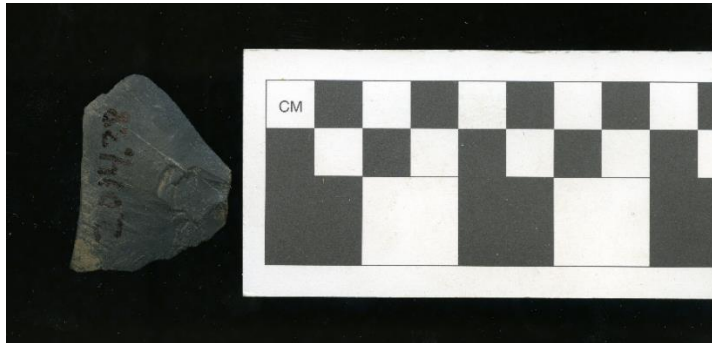
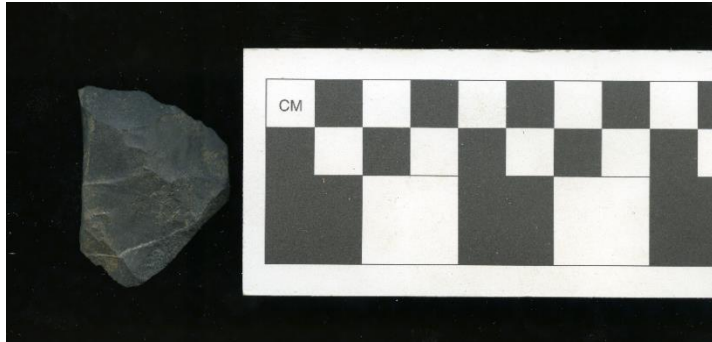
Description: Grey-green chert with dull luster. Use wear along distal and lateral edges.



5- Catalog No. 2014.38A  
Area A, Unit N126 E25, Level 3A

Basic Form: Proximal fragment of a utilized flake.

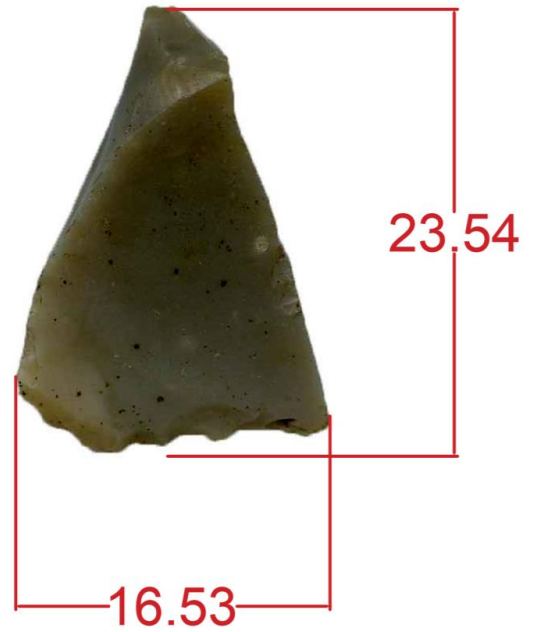
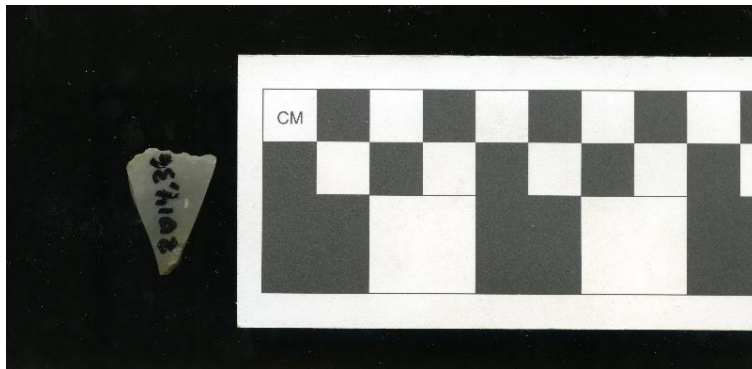
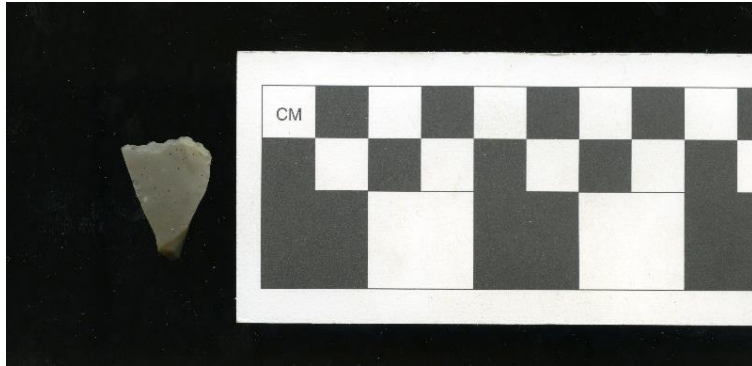
Description: Black chert with dull luster, possibly Touladie. Bifacial use-wear along both lateral edges. Flake scars present on both faces.



6- Catalog No. 2014.36A  
Area A, Unit N127 E25, Level 3A

Basic Form: Triangular, unifacially worked serrated scraper tool.

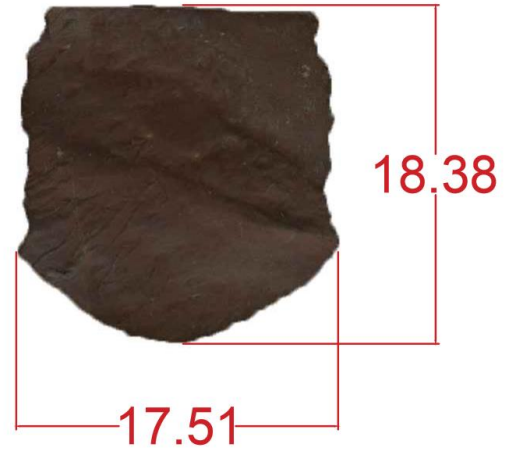
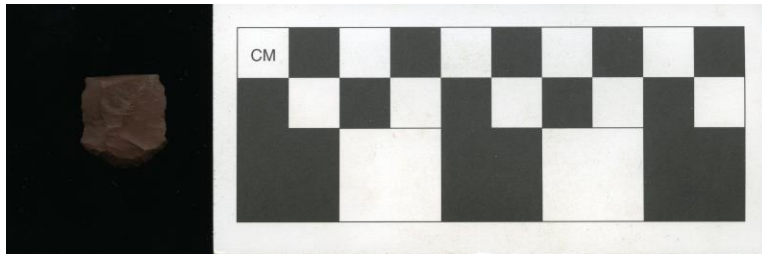
Description: Grey to white fine-grained chert, possibly Wachadamoak. Composed of four smooth faces with unifacial pressure flaking along distal edge.



7- Catalog No. 2014.95A  
Area C, N181E8, Level 3B

Morphology: Utilized flake unifacial scraper tool.

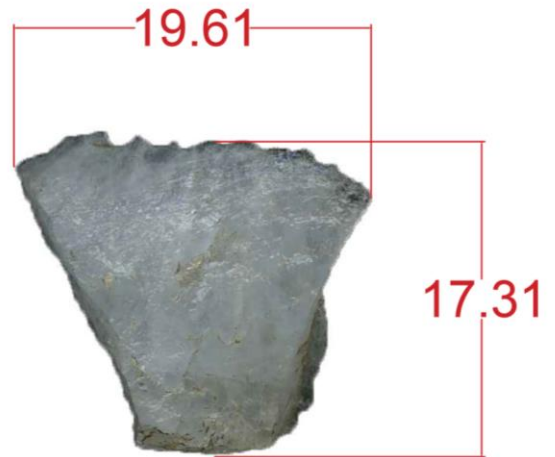
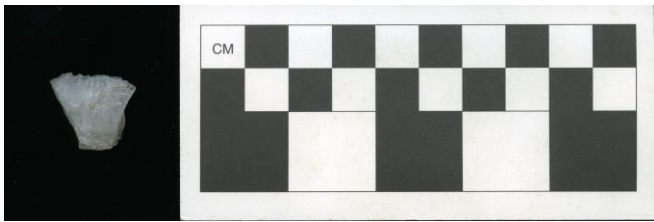
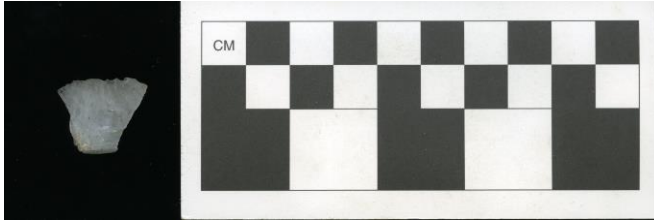
Description: Comprised of Munsungun red chert. Only scraper tool made from Munsungun in this assemblage. Use wear on both lateral edges and on distal edge.



8- Catalog No. 2014.163A  
Area A, Unit N146E30, STP

Morphology: Triangular utilized flake unifacial scraper tool.

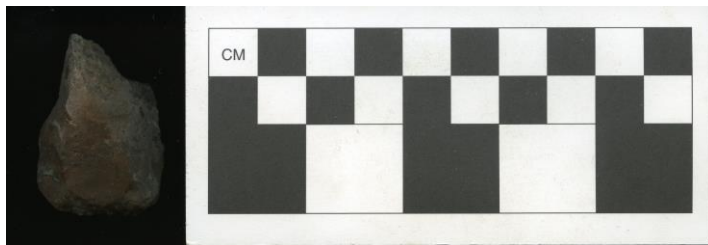
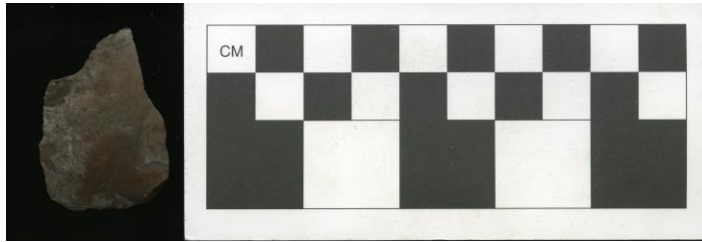
Description: Comprised of quartz. Tapers at distal edge, with use wear.



9- Catalog No. 2014.162AJ  
Area A, N127E24, Level 4

Morphology: Unifical endscraper.

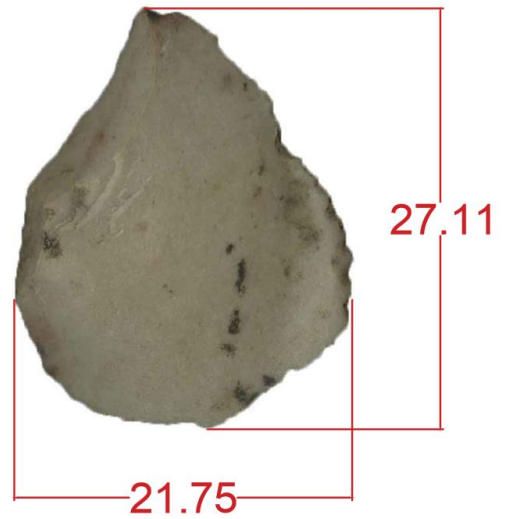
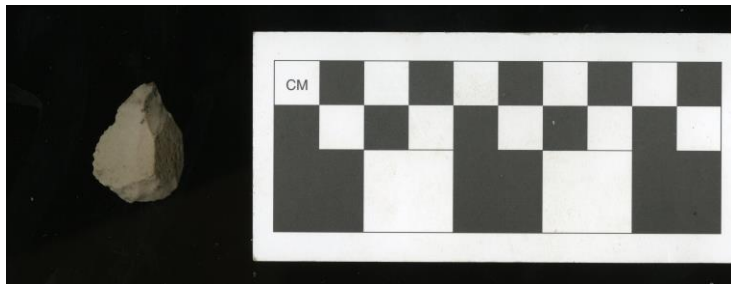
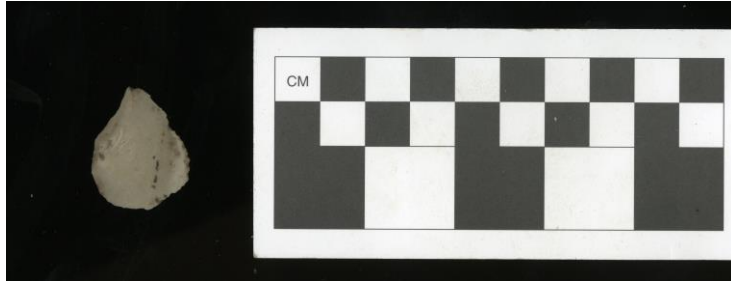
Description: Comprised of local grey chert or volcanic material. Use wear on distal edge.



10- Catalog No. 2014.209A  
Area A, N127E24, Level 3A

Morphology: Unifical scraper.

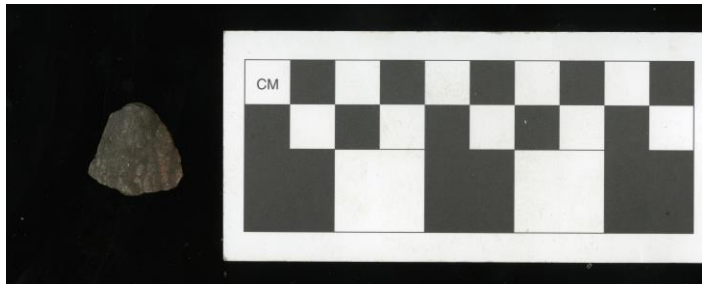
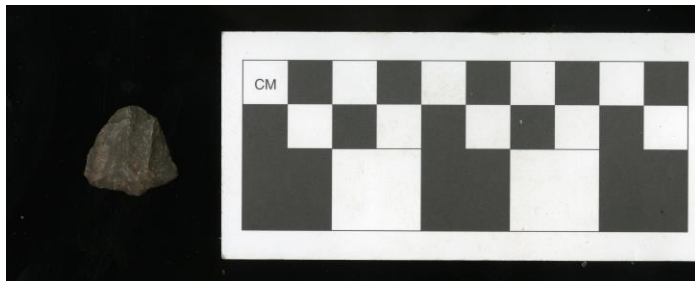
Description: Comprised of local grey/beige chert or volcanic material. Use wear on distal edge.



11- Catalog No. 2014.33A  
Area A, N127E24, Level 3A

Morphology: Unifical endscraper.

Description: Comprised of local grey chert or volcanic material. Inclusions of other materials can be observed.





## Unifacial Tool Summary Table

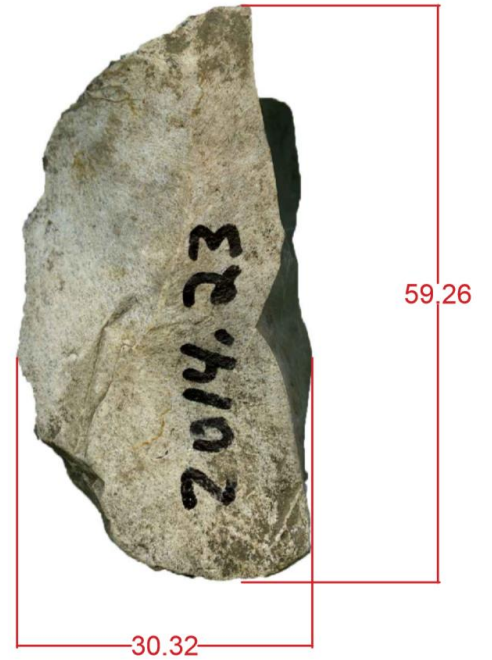
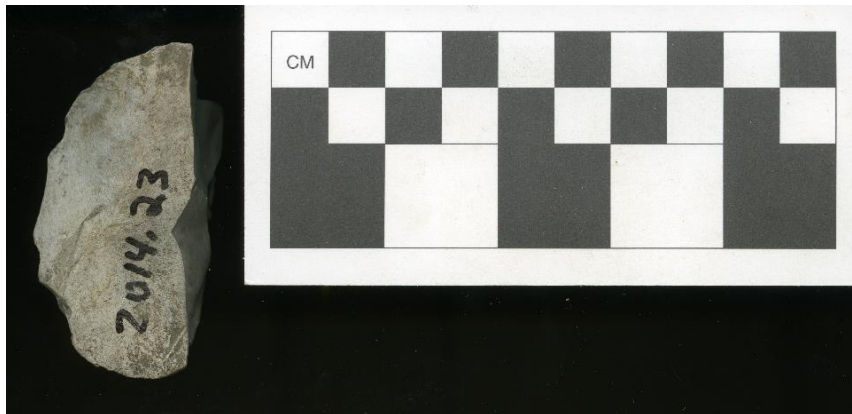
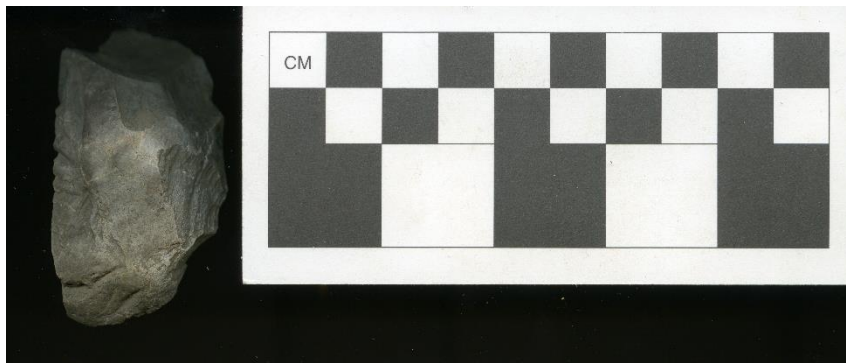
| Unifacial Tools |                   |                        |               |                        |               |                           |
|-----------------|-------------------|------------------------|---------------|------------------------|---------------|---------------------------|
| Catalog #       | Type              | Petrographic Series    | Exotic/Local? | Distal-Proximal Length | Maximum Width | Obverse-Reverse Thickness |
| 2014.162AJ      | Endscraper        | Grey Chert or Volcanic | Local         | 37.18                  | 25.97         | 9.63                      |
| 2014.21A        | Scraper/Graver    | Grey Chert or Volcanic | Local         | 33.53                  | 36.13         | 9.95                      |
| 2014.209A       | Unifacial Scraper | Grey Chert or Volcanic | Local         | 27.11                  | 21.75         | 7.62                      |
| 2014.33A        | Unifacial Scraper | Unknown                | Unknown       | 20.07                  | 21.07         | 4.98                      |
| 2014.95A        | Unifacial Scraper | Munsungun              | Exotic        | 18.38                  | 17.51         | 3.86                      |
| 2014.163A       | Unifacial Scraper | Quartz                 | Local         | 17.31                  | 19.61         | 3.3                       |
| 2014.38A        | Unifacial Scraper | Grey Chert or Volcanic | Local         | 32.55                  | 39.5          | 6.97                      |
| 2014.36A        | Unifacial Scraper | Washademoak            | Exotic        | 23.54                  | 16.53         | 6.73                      |
| 2014.28A        | Unifacial Scraper | Grey Chert or Volcanic | Local         | 50.89                  | 46.45         | 4.94                      |
| 2014.27A        | Unifacial Scraper | Grey Chert or Volcanic | Local         | 25.12                  | 24.05         | 4.1                       |
| 2014.22A        | Unifacial Scraper | Unknown                | Unknown       | 21.16                  | 25.54         | 7.49                      |

## Cores

Two cores were found: One at Area B and one at Area A. Both appear to be made of local grey chert, and each have one nearly flat, planar face.

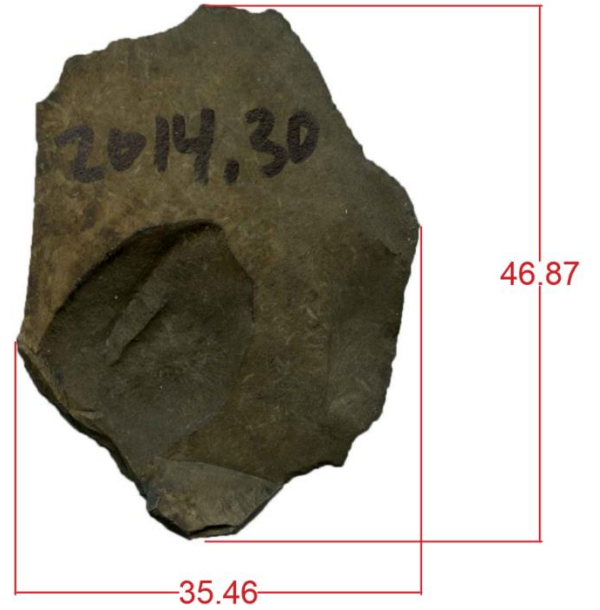
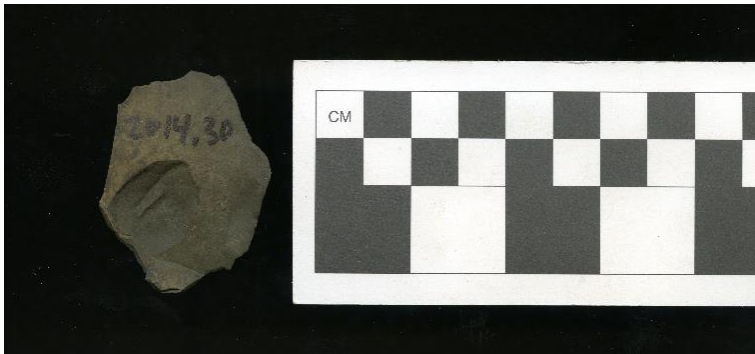
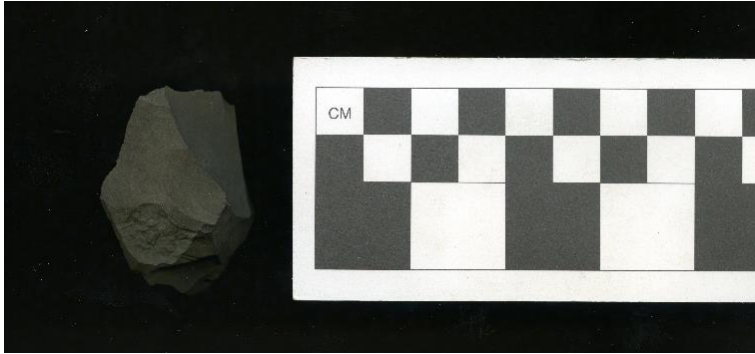
- 1- Catalog No. 2014.23A  
Area B, Unit N148 E32, Level 3B

Description: Multidirectional core with cortex present. Dull grey chert with white weathering on ventral face.



2- Catalog No. 2014.30A  
Area A, Unit N127 E24, Level 3A

Description: Multidirectional core with a single flake scar on its ventral surface. Black chert, possibly Touladie. No cortex present.



## Hammerstones

- 1- Catalog No. 2014.40A  
Area B, N148E32, Level 3B

Morphology: Hammerstone with battered edge (pictured).

Description: Granular volcanic material.

