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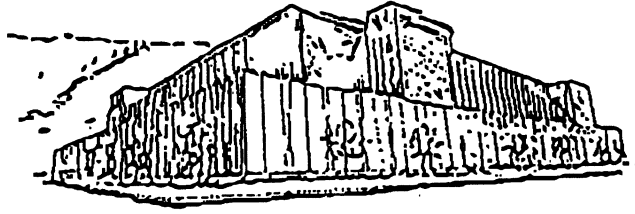
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A STYLISTIC ANALYSIS OF PICTOGRAPHS AND PETROGLYPHS IN HELLS  
CANYON

by

Robyn L. Johnson

B.S., M.A., California Polytechnic State University—1988, 1990

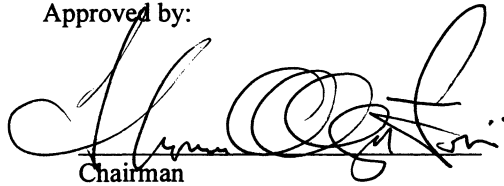
Presented in partial fulfillment of the requirements

for the degree of Masters of Anthropology

University of Montana

1998

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## Acknowledgements

In conducting this research, I was assisted by certain individuals whose experiences and knowledge were invaluable to the completion of this paper. A very special thanks goes to Idaho Power Company Archaeologist, Mark Druss, Ph.D. who served as advisor, guide and mentor throughout the entire project. I would also like to express appreciation to U.S. Forest Service Archaeologist, Bruce Womack who provided access to the multitude of Hells Canyon site forms at his office in Enterprise, Oregon and whose expansive personal knowledge of the canyon proved invaluable to me on many occasions. Boise State University Professor, Max Pavesic also shared his knowledge of the region and provided many important insights. A tremendous amount of gratitude is also due David Green who contributed his technical expertise, creativity and personal support. Finally, this project is dedicated to the memory of John S. Curtis whose petroglyph research in Southern Idaho, knowledge and wisdom provided a foundation from which this study was conceived.

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## Preface

The following professional paper meets the requirements of the Cultural Heritage track, nonthesis option for the Master's degree in Anthropology at the University of Montana. Areas of specialization include museum studies and cultural resource management. This project was an outgrowth of both my coursework and professional work experience. It was initiated in the context of Idaho Power Company's cultural resources management activities in Hells Canyon.

The paper contains a research methodology, literature review and data analysis required to satisfy the degree requirements. The methods developed will assist in Idaho Power Company's cultural resources inventory of Hells Canyon. This inventory is part of the relicensing effort of the Hells Canyon Hydroelectric Project.

## **I. Introduction**

The Hells Canyon region was formerly believed to form a cultural, linguistic and natural boundary between the Great Basin and the Columbia Plateau (Pavesic 1971:156-157). A cluster analysis of Hells Canyon pictograph and petroglyph sites indicated an absence of spatial patterning of styles within the study area. In addition, this analysis suggests stylistic influences from both the Great Basin and Columbia Plateau regions and the presence of a unique rock art style in Hells Canyon.

## II. Background

Hells Canyon forms a winding border between Idaho, Oregon and Washington and is defined as the upper reach of the Lower Snake River between the confluence of the Power and the Salmon Rivers (Reid: 1991a:96). Most of the canyon's length is rugged, with precipitous canyon walls and peaks in the Seven Devils Range rising to 9,000 feet (Figure 1). The river is characterized by a series of rapids with varying turbulence separated by stretches of moderate to slow flowing currents. The major tributary basins are the Palouse, Tucannon, Clearwater, Salmon, Grande Ronde, Imnaha and the Powder (Reid 1991:18). Climatic conditions in Hells Canyon consist of hot and arid summers and mild winters as compared to the higher elevations enclosing the canyon (Leen 1988:1).

The late Pleistocene flood from glacial Lake Boneville introduced large volumes of water and sediment up the Snake River resulting in the widening of Hells Canyon and the formation of three major alluvial terraces at Pittsburg Landing, Temperance Creek and Johnson Bar. The downcutting action of the Snake created broad level surfaces tens of meters above the present river level. These terraces provided large expanses of sheltered pasturage for mule deer, elk, bighorn sheep (Reid 1991a:18) and offered desirable locales for human habitation.

The earliest sign of human occupation in Hells Canyon occurs at

Bernard Creek rockshelter (Randolph and Dahlstrom 1977) and Hells Canyon Creek rockshelter (Pavesic 1971), where Cascade phase assemblages were found below Mazama ash dating to 6800 B.P. (Reid 1991a:96). In addition, various prehistoric sites, one of which included an isolated Folsom point, were located along the lower Snake River near Asotin in southeastern Washington (Leen 1988:1).

Archaeological investigations of Hells Canyon were initiated by Shiner (1951), with the River Basin Surveys of the Smithsonian Institution in August of 1950. The survey was conducted in anticipation of the construction of a high dam by the Army Corp of Engineers that was later deferred in the favor of private power interests. The survey completed in just three weeks set out to determine the nature and extent of aboriginal occupation in ninety river miles (Pavesic 1971:2). With the planned construction of three dams in the upper canyon at the Brownlee, Oxbow and Hells Canyon sites by the Idaho Power Company, further field investigations were undertaken by Caldwell (Caldwell and Mallory 1967:1-2). Several sites were excavated by Caldwell and completed by Coale including Robinette Cave, the Ray Site, Big Bar and Allison Creek Shelters located between the Powder River and Hells Canyon Dam (Caldwell and Mallory 1967:3). In 1964, Pavesic (1971:8-9) undertook investigations in Hells Canyon with Idaho State University in cooperation



with the Smithsonian Institution to determine the value of sites for field training in archaeology. Excavations were concentrated at McGraw Creek, Squaw Creek Rockshelter and Big Bar. Pavesic (1971:9) began investigations at Hells Canyon Creek in 1967 under an agreement with the U.S. Forest Service with the excavation of a housepit village and rockshelter. The reconstruction of the vertical distribution of Cascade points in Hells Canyon Creek Rockshelter was an important focus of Pavesic's research (1971:150). In 1977 the University of Idaho (Randolph and Dahlstrom 1977:1) conducted a preliminary archaeological examination of Bernard Creek Rockshelter to determine the archeological potential of the site. Lanceolate points were the most abundant projectile point type recovered at Level VI and Level IX. Uncorrected radiocarbon dates for these levels include  $7250 \pm 80$  and  $7190 \pm 135$ , respectively (Randolph and Dahlstrom 1977:38). Randolph and Dahlstrom (1977:77) identified a predominance of Great Basin projectile points in Layers VI to Layer III. The occurrence of Great Basin points at Bernard Creek Rockshelter in pre-Mazama through post-Mazama ash represented, to Randolph and Dahlstrom, the northern influence of Great Basin styles (1977:80).

During the summer of 1989, the University of Idaho conducted test excavations at two sites near Camp Creek in the Hells Canyon National

Recreation Area (HCNRA) as part of an ongoing cultural resource management program (Leonhardy and Thompson 1991:1). The principal assemblage recovered dates between ca. 1500 and 500 years B.P. and was relatively homogeneous (Leonhardy and Thompson 1991:31). The majority of projectile points were small stemmed and barbed points representing the Columbia or the Rosegate series. The sites excavated suggested small-scale occupations devoted to collecting river mussels and hunting medium mammals in early spring (Leonhardy and Thompson 1991:i).

More recent excavations by Reid et al (1991b:ii), sponsored by the Hells Canyon National Recreation Area (HCNRA), included six sites at Pittsburg Landing and yielded 21 defined analytical units including two residential bases, three field camps, seven briefly occupied locations, one aggregate of naturally transported artifacts and eight indeterminate aggregates. The residential bases and field camps were radiocarbon dated to the Harder/Piqunin/Numipu cultural continuum of the late Holocene and several of the aggregates were dated to the earlier Tucannon and Cascade periods.

In 1994, a Passports in Time training session was sponsored by the US Forest Service at Kirkwood Bar in Hells Canyon. The objective of this project was to define the boundaries and sample the contents of a middle

Holocene site. Block excavations revealed three successive occupations organized around 13 hearths. Charcoal from three hearths representing the identified occupations gave uncorrected radiocarbon ages ranging from 6740  $\pm$  50 to 7100  $\pm$  60. All three occupations at Kirkwood bar were assigned to the Cascade phase ca. 8,000 – 5,000 B.P. in the lower Snake River sequence of Leonhardy and Rice (Reid and Chatters 1997:ii, iii, 6.7). The Kirkwood Bar site, taken together with some of the other middle Holocene habitation sites at Bernard Creek Rockshelter and Deep Gully, fits within a Hells Canyon adaptive area where riverine and upland resources occur together in close proximity. In addition, the middle Holocene components at all of three sites can be placed in a sphere of social interaction defined by the Western Idaho Archaic Burial Complex as identified by Pavesic (1992) (Reid et al. 1997: 6.7).

In addition to the archaeological evidence, the volume of ethnographic history in Hells Canyon also speaks to the issue of cultural boundaries. Ethnographic data indicate that the Nez Perce occupied the Clearwater River area north and west of the Snake River. Spinden (1908: 172) designates the boundaries of the Nez Perce from the Bitterroot Mountains on the northern and eastern side to the Blue Mountains on the west. He identified the southern boundary as the confluence of the Snake and Imnaha rivers at river mile 191.7 (Spinden 1908:172-173). Alice

Cunningham Fletcher, the first anthropologist to study the Nez Perce, requested an elder to prepare a map of Nez Perce territory that included the locations and descriptions of 78 villages as they existed in the 19th century. One interpretation of these locations places the southern frontier of the Nez Perce winter settlement near Somers Creek at river mile 210. Some have suggested the location of a Nez Perce village 25 miles upstream, between Rush Creek and Bernard Creek (Sappington et. al. 1995:17). Others claim these accounts fail to accommodate the informant's assertion that the most southern settlement of Group 2 was fifty miles above the mouth of the Salmon River in the reach between Saddle and Granite Creeks, at about river mile 238 (Sappington et al. 1995:17).

Others point out the presence of Great Basin or Numic speaking groups in Hells Canyon. According to Leen (1988:1-2), numerous Shoshonean speaking groups migrated from the Great Basin into the southern Idaho Snake River plain about 1000 years ago, and that Sahaptin groups, such as the Cayuse, Palouse and Umatilla, were also likely residents. The Umatilla and Palouse lived harmoniously with the Nez Perce Indians to the north and west of them. However, the Shoshoni to the south and Spokane and Coeur d' Alene to the north were considered traditional enemies of the Nez Perce (Spinden 1908:173).

## **Rock Art and Cultural Boundaries**

An investigation of rock art style may indicate the existence of cultural boundaries of the groups who inhabited Hells Canyon. Vucannon (1986:98) looked at rock art at four seasonal camp sites in an attempt to demonstrate evidence for the presence of different linguistic groups in Hells Canyon. He suggests the Shoshone were most likely visitors to the Granite Creek and Pittsburg Landing and that rock art designs reminiscent of the Great Basin at Pittsburg Landing indicates Shoshone groups made use of this fishing ground.

Keyser (1975:209) suggested a Shoshonean origin for the shield bearing figures, claiming these figures have a wide distribution on the northwest plains with a "core area" located in north central Wyoming and south central Montana. Keyser states "the distribution resembles a large, irregular fan with its base in central Wyoming near South Pass, a major route of access between the Great Basin and the Northwestern Plains". The evidence of Shoshonean origin for the shield-bearing figure includes a coinciding maximum distribution of Shoshone occupation with the shield bearing motif. Keyser (1975:209) also points out the most concentrated areas of the shield bearing motif corresponds to the area occupied the longest by the Shoshone, more so than the surrounding zones which they

occupied by for only a short time.

The distribution of rock art motifs is suggestive of who inhabited and/or was responsible for the designs in Hells Canyon. Likewise, the various methods of dating rock art can add chronological data to the picture of aboriginal occupation of the canyon.

### **Methods of Dating Rock Art**

Keyser (1992:17-21) identifies several factors that provide clues to dating rock art in the Columbia Plateau. One example is to reference rock art elements to the historic period, such as the appearance of horses. At least one occurrence of a horse and rider motif has been recorded at Pine Bar (river mile 227.5) in Hells Canyon. This depiction can be dated after about 1720 A.D., when horses were first introduced to the Columbia Plateau.

Occasionally, rock art can be associated with dated archeological deposits. When Randolph and Dahlstrom excavated Bernard Creek Rockshelter in Hells Canyon in 1976, they discovered a spall covered with red pigment in a level dating to 6000 to 7000 B.P. In addition, buried rock art, also located at Bernard Creek Rockshelter, was associated with materials in the sediments providing an indication of when it was created. Although a direct association between the deposits and pigment can not

be established, they are indicative of a chronological link.

The degree of patination of petroglyphs is another indicator of antiquity. When a petroglyph is pecked or abraded through the patina of the rock surface, the lighter or true color of the rock is exposed. As the image begins to age, if similar conditions that created the original patina exist, a repatination process will occur. Although absolute dates cannot be ascertained from the observance of repatination, a relative chronology can be suggested. For example at Pittsburg Landing in Hells Canyon two boulder fields containing petroglyphs occur. Site 10IH1639 at the river's edge appears to be significantly older than 10IH1012 due to the degree of repatination (Figure 2). Weathering and seasonal flooding may also indicate the antiquity of a rock art panel. Some designs may appear more "fresh" looking while others may be obscured by mineral deposits (Keyser 1992:17-20). However, this is also dependent on the location and degree of exposure of the panel and it is difficult to determine if all weathering agents are equal at different locations when making these assessments.

Leen (1988:i) contends that although some evidence indicates that rock art in Hells Canyon may have been made as early as 7000 B.P., most of the rock art was probably manufactured during the last 2000 years. In Leen's (1988:193) chronological framework, cupules (Figure 2, 10IH639) were probably the earliest style, possibly dating to 5,000 –7,000

B.P. as suggested by their wide distribution in North America. He assigns petroglyphs in Hells Canyon to a period dating between 1,000-3,000 B.P. and 450 B.P. because of their clear stylistic similarity with much of the abstract curvilinear petroglyphs located in southern Idaho. Leen (1988:194) suggests the time frame for pictographs at 2,000-3,000 B.P. based on their relative similarity to pictographs in western Montana. The most recent pictographs in Leen's chronological framework are the superimposed black images and scratched angular petroglyphs. The Drawn Black Linear Abstract Style is unique to Hells Canyon and placed in his chronology based on its consistent superimposition over red pictographs. Finally the Drawn Black Linear Abstract Style is superimposed by the Scratched Angular Abstract Style. Both of these styles are usually found superimposed over pictographs and are the most recent styles in Hells Canyon.

Boreson (1975:30) concurs that most of the rock art in the Pacific Northwest was probably created within the past 2,000 years, but especially in the last 300 years. This is because many sites contain dateable figures, such as horses. Those sites without horse figures often show similar rates of weathering to those that contain horse figures. She suggests the span of 300 years may simply indicate the amount of time it takes weathering processes to obliterate a pictograph on certain rock



materials such as granite or sandstone.

### **Rock Art Style**

An examination of rock art styles of the Columbia Plateau and Great Basin provides a larger context from which to appreciate the styles that occur in Hells Canyon. Rock art styles defined in these regions appear in Hells Canyon and suggest stylistic origins and/or influence.

The Great Basin is the southern neighbor of Hells Canyon. Basin styles as defined by Plew (1996:5) include Great Basin Pecked style with the subtypes Great Basin Representational and Great Basin Abstract (Table 1). The Great Basin Abstract substyle is divided into Curvilinear and Rectilinear substyles. The representational substyle consists of elements reflecting forms occurring in nature such as mountain sheep, quadrupeds, feet, hands, human figures, shield figures, deer, lizards and hoofs. Examples of the Abstract Curvilinear substyle includes circles, circle chains, sundiscs, stars, snakes and curvilinear meanders. The Great Basin Abstract Rectilinear substyle includes dots, rectangular grids, bird tracks, rakes, straight lines, crosshatching and triangles.

On the southeastern Columbia Plateau and Hells Canyon region there are three prevailing rock art styles as identified by Keyser (1992:108-112). The *naturalistic* pictograph style depicts animals, stick figures, tally

marks and an assortment of geometric designs. A second style consists of petroglyph designs such as dots, circles, and various rectilinear and curvilinear figures. This style has been recognized as the *pit and groove* or *Great Basin curvilinear* by different investigators. Keyser suggest this style contains elements of both pit and groove and Great Basin abstract. A third unnamed style occurring at Buffalo Eddy, includes pecked mountain sheep, deer and triangular shaped humans. Keyser contends these panels are similar in style to those found at mid and lower Columbia River sites differing only in terms of the triangular human body and barbell like objects that many of the humans are holding.

A fourth style discovered during recent work in Hells Canyon is composed of finely scratched petroglyphs (Keyser 1992:111). These may be random scratched lines or in some cases, they form rectilinear or curvilinear figures. They appear to be the most recent style of rock art since, in most cases, they are superimposed over the painted pictographs. Keyser (1992:111) discusses the evidence of this style occurring independent of earlier pictographs, as some scratched figures have been recorded where no superimposition exists. Boreson has also reported faint scratches at a lower Salmon River site without superimposition of a pictograph, indicating the possibility of surface preparation (Boreson 1984:7). However, there were not enough

examples at this site to define a unique style. Leen (1991:49) recorded a unusual site (OR4N48E 8/2) in Hells Canyon where a large panel of this type of petroglyph exists independently. These glyphs form numerous rectilinear designs, including some highly stylized anthropomorphs. Keyser (1992:111) suggests Boreson's and Leen's findings indicate the scratched angular constitutes a distinct rock art style in this area.

Bettinger and Baumhoff (1982: 494) refer to the above style as "Great Basin Scratched" and describe it as lacking the elaboration and attention to detail of Pre-Numic styles. They contend that this style is frequently superimposed on Pre-Numic elements occurring as unpatterned scrawls serving to neutralize or purify malevolent magic thought to be associated with Pre-Numic designs. This allowed the site to be used safely or to disrupt the activities of Pre-Numic groups still using them as hunting locations (Bettinger and Baumhoff 1982:494).

Heizer and Baumhoff (1962:56,167-8) state that there are numerous examples of scratched petroglyphs in the Great Basin. Many of these exist by themselves while others occur underneath and overlying both petroglyphs and pictographs. Often these scratched petroglyphs occur as an enclosed area with square or diagonal crosshatching or nonenclosed areas, with either square or diagonal crosshatching. Heizer and Baumhoff (1962:306) claim that some examples of enclosed crosshatchings are

related to the gridiron element found in the Great Basin.

Leen (1988:i, 6) describes a fifth style known as (drawn) black linear abstract, constituting a distinct component at seven sites in the canyon. According to Leen, both the drawn black and scratched petroglyphs are superimposed over the painted pictographs, appearing to be the most recent styles of rock art in the Hells Canyon.

### **The Numic Connection**

The question of Numic expansion is relevant to the issue of aboriginal occupation in Hells Canyon. Their migration may help explain the variation of rock art in the canyon.

Bettinger and Baumhoff (1982:494) suggest that most of the rock art in the Great Basin was created by Pre-Numic peoples. Hells Canyon's rock art contains styles similar to that produced in the Great Basin and specifically to sites in Southern Idaho. Discussions concerning the origins and range of Numic speaking peoples are summarized below.

Lamb (1958:98-9) has argued that beginning about A.D. 1000, Numic speaking peoples spread across the Great Basin from a homeland near Death Valley, California. Using glottochronology, he dated the divergences of three Numic languages at approximately three thousand years ago when they began to spread north and east across the

Intermountain West. This migration was occurring at about the same time other language groups were moving into the Great Basin. Lamb contends this indicates some kind of common influence present in the Great Basin, drawing people deeper into it.

A recent paper by Thomas (1994:56-71), describes how archaeologists have oversimplified Lamb's linguistic model and that it has no demonstrable relevance to high altitude archaeology in the Great Basin. In Thomas' conversations with Lamb, Lamb explains that lexicostatistic figures must be understood as "rough approximations" subject to wide margins of error (Thomas 1994: 57). Lamb's estimates of the dating of separations were largely intuitive based on vocabulary, morphology and phonology and should be considered minimum estimates of the beginning of Numic separation (Thomas 1994:57). Lamb indicated that the divergence was probably very gradual and perhaps as early as 2,000 to 3,000 years ago. Thus, when archaeologists find significant changes at A.D. 1300 it does not necessarily correspond to Lamb's period of Numic spread. If a significant change is found much earlier it does not necessarily conflict with Lamb (1994:58). Interpretations of Lamb's hypothesis that argue for a "wavelike spread" (Bettinger and Baumhoff 1982:490) of Numic peoples to the north and east have been put to the test by dating two high-altitude sites in eastern California and central

Nevada. The radiocarbon dates from these sites indicated the Nevada site was nearly six centuries earlier than the California site. To Thomas (1994:61), these findings do not necessarily indicate the Numic spread in a direction opposite to the one suggested by Lamb's model. Instead, it demonstrates that the presence of high-altitude sites may be explained by causes other than population movement and that we need to begin rethinking the relationship between the archaeological and linguistic evidence.

Bettinger and Baumhoff (1982:489) hypothesized that a rapid spread of Numic speakers into the Great Basin occurred about 500 to 700 years ago when the Numic peoples began a subsistence strategy that made less use of large animals and greater use of small seeds and hunting locations as residences. One line of evidence for this expansion is the Great Basin Scratched style that appears as "unpatterned scrawls" superimposed over what they identify as Pre-Numic rock art. Bettinger and Baumhof (1986:494) explained this as an attempt to counter or purify potentially malevolent magic believed to be affiliated with Pre-Numic designs. According to Baumhoff and Bettinger (1982:489), the different subsistence strategy was higher in cost, but sustained higher population densities that ultimately provided a greater economic advantage over Pre-Numic peoples. The competitive advantage of these new high-cost,

higher population density strategies may have facilitated the spread of Numic-speakers into the Basin.

In contrast to Lamb's and Bettinger and Baumhoff's theories, Aikens and Witherspoon (Grayson 1993:270) reject glottochronological dates, propose a much larger Numic homeland and a scenario based on extinction of non-Numic speaking inhabitants in the Great Basin. They suggest that Numic peoples engaged in hunting and gathering economy for about 5,000 years in the central Great Basin and that Numic peoples expanded and contracted as environmental conditions allowed. They argue that late prehistoric drying trends forced abandonment of the western and eastern Great Basin by Anasazi, Fremont, Lovelock and Chewaucanian cultures, thereby providing an opportunity for the desert-adapted Numic groups from the central Great Basin to take hold (Sutton 1994:13). What is documented in the linguistic and ethnographic data reflects a recent expansive phase in a cycle of expansion and contractions that began as people first entered the central Great Basin in significant numbers 5,000 years ago (Aikens and Witherspoon 1986:15).

### **Previous Rock Art Research**

Numerous studies have focused on Columbia Plateau and Great Basin rock art, including stylistic analyses and inventories that address the

concept of population movements and/or cultural boundaries. Nesbitt's (1968:2) research of Hells Canyon along the Snake River between the Ice Harbor Dam and the Grande Ronde River set out to ". . . isolate spheres of social articulation using the stylistic unity and disunity of the glyphs." He defined the two styles derived from the data of Snake River rock art as naturalistic and graphic. The naturalistic styles consist of glyphs that represent forms appearing in nature, while the graphic style, which occurs along the entire length of the Snake in Washington state, is composed of geometric forms. Nesbitt (1968: 31) concluded that based on the stylistic data, the Graphic Period of rock art segregates into three locales: the Page Glyph area, the Buffalo Eddy area, and an intermediate area, where elements of both localities occur. In this analysis, he associated the Nez Perce tribal locality with the glyph locale near Buffalo Eddy and tentatively matched the Page glyph area with Wauyukma habitation. Nesbitt could not correlate the intermediate area with an ethnographic group because the petroglyphic data on that part of the river is insufficient. However, he acknowledged that locales tend to grade into each other with no sharply delineated stylistic areas (Nesbitt 1968:29).

Nesbitt also provided a glyph chronology for the Buffalo Eddy area. His diagram indicated that naturalistic style petroglyphs are the oldest, followed by graphic style petroglyphs and finally pictographs (Nesbitt



1968:24).

In 1987 the Forest Service surveyed rock art sites of the Hells Canyon National Recreation Area and documented 177 sites between Hells Canyon dam and the Grande Ronde River (Reid 1991:109). The majority of these sites are pictographs, but there are several major petroglyph sites that include Buffalo Eddy, Dug Bar and Pittsburgh Landing. Motifs typical of Hells Canyon include tally marks, geometric forms and human and animal shapes (Keyser 1992:104) and 13 panels of shield bearing human figures (Leen 1988:172). The sites were located within a 1/4 mile corridor on both sides of the Snake River from Hells Canyon Dam to the Washington border in the Wallowa Whitman National Forest.

Leen (1988:6,190) determined accurate locations for all known rock art sites in Hells Canyon and documented the physical settings and all identifiable rock art images at these sites. The results of his fieldwork indicated that pictographs are the most common type of rock art in the canyon, with 172 mostly executed in red pigment. He also discovered a previously unrecorded type of petroglyph, called scratched angular abstract, at 22 to 25 sites. Some distinct black pictographs occurred at seven sites in the canyon

Leen (1988:192) found that the most common motifs included groups of tally marks, human figures, complex angular abstract designs, line

groups, complex geometric designs and quadruped profiles. Based on his inventory, relative concentrations of rock art are located on the uppermost 20 miles of the projects area and approximately 65% of the sites are found on the Idaho side of the canyon (Leen 1988:192).

Curtis (1990) conducted a study of Great Basin petroglyphs which covered approximately 20,000 square miles of Southwestern Idaho. While recording petroglyph sites in the study area, Curtis (1990:6) concluded that there were substantial differences in the petroglyph sites in different parts of the study area. Curtis claimed this was expected since the entire area was occupied by the Numic Shoshoni and Northern Paiute at the time of contact. Since the boundary line between these groups was near the western boundary of his study area it was expected that different petroglyph styles would be encountered. The petroglyphs recorded for this study were placed in one of 87 carefully defined groups called elements, which were then placed in categories. His categories contained information regarding method of manufacture and superpositions. This information was recorded in a database to allow for sorting and manipulation of the data.

The data Curtis collected were analyzed to identify element similarity in an attempt to locate cultural boundaries. Elements are the individual design components that make up the panel such as zigzags, circle chains

or lizards. By counting all of the elements in each of the sites and regions being considered, Curtis sought to identify spatial patterns that would indicate cultural boundaries. The elements were totaled for each region and the probability of occurrence for each element in its region was computed. He then compared the probabilities of occurrence of an element for each region. The sum of these probability differences was the measure of difference between the regions. He converted these sums to percentages, which provided a measure of difference between the regions. Curtis arrived at the degree of similarity by subtracting the percentage difference from 100 to provide a percentage of the degree to which the regions are similar.

The result of Curtis' numerical analysis indicated three distinctive groups of petroglyphs were evident. These were referred to as the Northern Uplands, Snake River, and the South Uplands. A firm boundary between the North Uplands and the rest of the study area was identified; however, Curtis (1990: 19-21) could not find a clear distinction between the Snake River and South Uplands regions.

Curtis (1996:6) took this study a step further by using hierarchical cluster analysis from the statistical program SYSTAT to analyze his data. He states that petroglyphs and pictographs have identifiable styles and that styles match societies. He suggests that the boundaries of a

petroglyph style are a reflection of cultural boundaries (1996:4).

Curtis chose sites from the 20,000 square miles of southwestern Idaho he examined in his 1990 study that contained ten or more panels, yielding a total of 31 sites to compare. The results from the clustering indicated four principal clusters with one outlier. These are the Little Blue Table group, which is part of the South Uplands. However, one site from the South Uplands was clustered with the Snake River group. Another cluster contained the “recent” North Uplands sites, meaning sites with elements such as horses and guns. The fourth cluster contained what Curtis termed the “old” North Upland sites. Curtis (1996:7) claims the division between the recent and old North Upland clusters is probably the boundary dividing the Numic from the pre-Numic speaking societies.

The most striking results of the cluster analysis of Curtis’ data was that the North Uplands site formed two separate and distinct groups. When he had originally recorded these sites, Curtis had concluded that this was one of the most homogeneous groups in the study area. Recognizing both old and new petroglyphs in this region, he concluded they were simply a metamorphosis of style indicating a long, sustained occupation.

Curtis’ petroglyph analysis in southwestern Idaho provided a stimulus and framework from which this paper was formed. In Curtis’ (1990:2) words, “Petroglyph style is part of the heritage of the people just as

language is and since petroglyph styles vary widely from region to region, simply studying these variations can assist in locating cultural boundaries of long-departed people.” Curtis adds that migrating routes may also be construed from the study of petroglyph style. His concept of stylistic variation representing cultural boundaries was recognized and a similar methodological approach was taken in this study.

### **III. Purpose Statement**

The purpose of this study was to determine the presence or absence of stylistic boundaries along the Snake River from the Hells Canyon Dam to the confluence of the Grande Ronde based on the analysis of the element content of pictograph and petroglyph sites and to determine if a unique rock art style could be identified in Hells Canyon. Given Hells Canyon's location between the Great Basin and Columbia Plateau culture regions, it was postulated that attributes from both regions would be present and possibly recombined to form a style endemic to Hells Canyon.

The results of this study indicated that no distinctive clusters of rock art attributes exist in Hells Canyon and stylistic boundaries based on stylistic variations could not be indicated. Instead, evidence of both Great Basin and Columbia Plateau rock art attributes were found throughout the project area including some forms that appear unique to Hells Canyon.

#### **IV. Materials and Methods**

Archaeological site forms recorded by Leen in his 1988 inventory were collected from the U.S. Forest Service office in Enterprise, Oregon based on the sites that included the region from Hells Canyon Dam to the confluence of the Grande Ronde River. The rock art elements were determined by reviewing the entire set of Leen's site forms and listing them in an excel database. (Table 2.0 contains a list of the 56 elements identified in this study).

Rock art "style" is recognized as a specific manner of executing rock art and for purposes of this study, it is further defined as either *representational* or *graphic*. Similar to Nesbitt's (1968:7) definition of naturalistic styles, *representational* designs are realistic depictions of something occurring in nature such as a mountain sheep (quadruped) or humans (anthropomorph). The graphic style includes designs that appear abstract; having no pictorial resemblance to anything occurring in nature. Examples of abstract designs in the study area include diamond chains, zigzags or tally marks

Keyser's (1992:16,132) definition of rock art style was also recognized. He states: "Researchers world-wide define rock art style as a group of recurring motifs or designs portrayed in typical forms which

produce basic recognizable types of figures. Usually these various figures are associated with one another in structured relationships, leading to an overall distinctness of expression". According to Keyser (1992:16) the greatest blending occurs among styles whose makers are culturally related with frequent contact. Resulting from this is a rock art tradition, which has two or more styles that are more similar to each other than to any neighboring style. For example, the Columbia Plateau rock art tradition consists of simple and abstract anthropomorphs, animal forms, rayed arcs, tally marks, and geometric forms are combined to produce rock art that is distinct from that of the neighboring areas of the Northwest Coast, Great Basin, or northwestern Plains.

For purposes of this study, the term "element " is defined as the individual units of design that are classified stylistically as either *representational* (naturalistic) or *graphic* (abstract). Style can be broken down into categories of elements that can be further divided into specific elements (Table 2). The data were recorded using Microsoft Excel 4.0 to form a rectangular database of 68 columns of variables including color, technique and elements and 92 rows of pictograph and/or petroglyph sites. The database was constructed with columns for the site number, UTM (Universal Transverse Mercator) coordinates, style (graphic or representational) and a list of the elements. The fifty-six rock art elements



were defined by conducting a survey of the Leen's entire inventory.

Seventy of the 177 sites were eliminated due to the undefinable nature of the panels. In most cases, these designs were considered amorphous areas of pigment and could not yield any information regarding the element content of the panel.

Each site was entered as one record or row and the presence or absence of each attribute was indicated. SYSTAT 7.0 's Cluster Analysis was chosen as the statistical method to analyze the data. Cluster Analysis is a statistical procedure that starts with a data set containing information about a sample of entities and attempts to organize these entities into homogeneous groups of cases called clusters (Aldenderfer and Blashfield 1984:7). Given the multivariate nature of the data and Curtis' (1994) experience with his petroglyph study in southern Idaho, Cluster Analysis was the most appropriate statistical method. Since the data were recorded based on the presence or absence of a particular element, Gamma was chosen as the distance measure. Gamma is a nonparametric measure of association for nominal-level data. The value of gamma can be taken as the probability of correctly guessing the order of a pair of cases on one variable once the ordering on the other variable is known. It is the number of concordant pairs minus the number of discordant pairs divided by the total number of united pairs. It takes on a

positive value if the concordant pairs predominate, a negative value if the discordant pairs predominate, and a zero value if they are equal (Nie, et al. 1975:228). Gamma allowed for significant clusters to form based on their degree of similarity. Complete linkage was employed as the linkage or amalgamation method, which uses the most distant pair of objects in two clusters to compute between-cluster distances and produce compact, globular clusters in multidimensional space (SYSTAT 1996:350). The complete linkage rule states that any candidate for inclusion into an existing cluster must be within a certain level of similarity to all members of that cluster. This method creates hyperspherical clusters composed of highly similar cases (Aldenderfer and Blashfield 1984:40).

SYSTAT expressed the results as a dendrogram with five clusters. Five clusters were created based on SYSTAT's default setting. The X axis label represents the UTM Northing at which each rock art site occur. The Y axis shows distances measured with regard to similarity of elements (Figure 3). All the elements exist to some degree in all of the clusters with no specific style dominating any one cluster with the exception of cluster five, which contains pit and groove style petroglyphs. In other words, each cluster consists of a specific combination of the presence and absence of elements, calculated by SYSTAT as a value. Because of the uniqueness of each site relative to the other rock art sites

in the canyon, no broad patterns could be clearly established and represented in a cluster.

## **V. Results**

The results from the Cluster Analysis of rock art elements in Hells Canyon indicated that no spatially distinct stylistic variations could be identified. The X axis of Table 4.0 contains the northings for each site recorded in the study. This demonstrates the absence of any north-south pattern to the defined cluster of elements in Hells Canyon. The northings forming the clusters range from all over the study area. It appears that the majority of the elements identified were consistently distributed throughout the study area. The exception being the location of petroglyphs in the canyon that consist of pit and groove styles (Tables 4). The petroglyphs (cluster 5) occur in two locations in the canyon from northing 5024470 to 5030000 and northing 5074500 to 5079760. Several small gaps occur in both cluster 1 and 2; however, these gaps appear consistently throughout the study area. It is not clear what the pockets and gaps in the data represent. Because we lack temporal control for the majority of rock art elements in the study area, it can't be associated with the archaeological and/or ethnographic evidence. The petroglyphs (cluster 5) in Hells Canyon appear similar to the Great Basin abstract and pit and groove styles (Keyser 1992:104, 109) and this may reflect a degree of Great Basin influence. Attributing these to either pre-Numic or Numic groups is suggestive but is not conclusive without temporal control. However, Reid

(personal communication, 1997) believes the weight of the historic evidence supported the existence of an often contested ethnic frontier running through Hells Canyon early in the 19<sup>th</sup> century. Skirmishes and massacres occurred throughout the valleys of the Grande Ronde, Wallowa, and Imnaha, as well as in Hells Canyon (Reid, personal communication: 1997).

A second database was formed in order to tally the number of sites that contain elements similar to those found in the Great Basin, Columbia Plateau, both the Great Basin and Columbia Plateau and those elements appearing unique to Hells Canyon. These categories are regional in nature and are separate from the clusters identified in the cluster analysis. The site number, northing and element type were listed and assigned to a regional category based on a visual inspection of the black line representation of the elements recorded in Leen's (1988) site forms. If more than one element type occurred for a particular site, then it was recorded in additional rows. Having developed a familiarity with styles in these regions bordering Hells Canyon, I felt confident in making these visual assessments. The goal of this analysis was to determine if any north-south patterns could be established with respect to regional style. The database was organized from the southern end to the northern end of the study area by northings in order to identify spatial patterns (Table 6).

Results from this analysis indicated that both Basin and Plateau elements occur uniformly throughout the study area with some sporadic gaps. More importantly, no boundaries could be established based on this analysis which is consistent with the results indicated in the cluster analysis. The totals for each region included 51 for the Great Basin styles, 31 for Columbia Plateau styles, 48 for styles that occur in both the Columbia Plateau and Great Basin and 44 for those appearing to be unique to Hells Canyon. The occurrence of 44 elements falling under the Hells Canyon category may suggest that this area shows stylistic influence from neighboring regions or that perhaps a recombination of Great Basin and Columbia Plateau styles have formed a style unique to Hells Canyon. The author recognizes that the sites indicated as belonging to the "Hells Canyon Style" in this table contain elements that occur in both the Great Basin and Columbia Plateau. However, the execution and uniqueness of this "recombined" style qualified them for placement in the Hells Canyon category.

## **VI. Sources of Error**

Various sources of error were recognized during the course of this study. One of the most obvious sources is the degree of completeness of element categories. Leen's (1988:5) field procedures involved walking sections of the canyon in order to locate previously undocumented sites. Much of the area was impassable on foot and were surveyed from a raft or jet boat using field glasses to scan likely rock faces. Because of the difficult terrain, it is possible that sites recorded in Leen's 1988 inventory did not contain the entire range of element categories that actually exist in Hells Canyon. Consequently, these categories would not be properly represented in the database. If this is the case, then stylistic or element boundaries could not be conclusively determined based on a general lack of information.

The analysis of the presence of Great Basin and Columbia Plateau elements indicated that rock art elements from both of these regions are represented in Hells Canyon. Intuitively, elements from the Great Basin and Columbia Plateau should be represented, but since this analysis was based on a literature review of both regions, it is possible that some rock art elements may have not been recorded and, therefore, not represented in the literature. Another possibility is that the author failed to discover the entire range of rock art elements for both regions during the course of the

literature review. If one or both scenarios is true, then it is reasonable to assume we don't have a complete representation of elements from both regions in the analysis.

In connection with this, Leen's inventory focused on 1/4 mile strip on either side of the Snake River, making it likely that some elements were not identified because they occur at higher elevations or along one of the numerous drainages. Sites closer to the water tend to be near occupational or village sites, whereas highland sites may have had a different function and, therefore, would be reflected in the style or types of elements occurring in the rock art. Further research is required in order to determine the significant of this and if increased recording, including higher elevation sites, should be conducted. Womack (personal communication, 1997), noted that in his 20 years experience in the canyon, he found no significant differences in style or element content between those rock art sites recorded in Leen's 1988 inventory and the few sites he has visited at higher elevation drainage sites.

Another source of error related to this study concerns the accurate dating of rock art. None of the pictographs or petroglyphs in Hells Canyon have been absolutely dated, although some can be relatively dated by the depiction of datable objects or the superimposition of elements. Some portrayal of datable objects such as the horse and rider motif can be used



reliably date to post 1720 A.D. when horses were first introduced to the Columbia Plateau. The depiction of bows and arrows, first introduced about 1500 to 2000 years ago, is another example (Keyser 1992:19).

Superimposition of stylistically distinct elements can also provide some chronological information, since the relative ages of each style can sometimes be demonstrated. Leen (1988:i) suggested a chronology of Hells Canyon rock art style as a result of his inventory. In his chronology, cupules are the earliest rock art style followed by pictographs and petroglyphs that are probably coeval. The drawn black and scratched angular styles are usually superimposed over the painted pictographs and, therefore, the most recent. However, some caution must be taken in making these determinations since superimpositions are not always chronologically consistent.

Henderson (personal communication, 1997) conducted a Rock Art Photographic Enhancement Pilot Project for Idaho Power Company which involved photographing several panels from two rock art sites using cross-polarized lighting and a digital enhancement process. Under close examination of panel AG photographed at Granite Creek (10IH479) (Figure 4), the drawn black linear styles were found beneath red pigment. This is in conflict with Leen's chronology that suggests the drawn black linear style is the most recent. Further investigation is required to

determine if this is an isolated incidence and if a reevaluation of Leen's chronological framework is necessary.

Henderson's cross-polarization photography also revealed the presence of polychromatic panels at Granite Creek (10IH479) consisting of a green wash, green designs, both red and black pigment and some scratched components known as scratched angular abstract. Much of the green pigment was not visible to the naked eye prior to the employment of the cross-polarization enhancement technique.

Other sources of error include the field conditions under which these panels were originally recorded. Varying weather and lighting situations are impediments to accurate and consistent determination of element types. Also, many of the panels have been obliterated or partly obstructed by water damage, lichenation, spalling, or vandalism making it difficult to accurately record the designs.

Finally, it should be noted that it is difficult to unravel the association of individual rock art sites to specific tribal groups in Hells Canyon. Especially since many Nez Perce elders object to interpreting or discussing rock art (Lyon personal communication, 1998). We can only attempt to associate rock art styles with the archaeological and ethnographic data due to the absence of temporal data.

## **VII. Conclusions and Interpretations**

Data on rock art element variations were gathered and an overall stylistic perspective was gained as a result of this study. The distribution of rock art elements and style suggests a varied usage by different groups or even the same groups at different or long periods of time. This is consistent with the ethnographic and archaeological record.

Spinden (1908) and Sappington et al. (1995) designated cultural boundaries for the Nez Perce. Others, including Lamb (1958), Bettinger and Baumhoff (1982) and Aikens and Witherspoon (1993), have proposed theories for the expansion of Numic speaking peoples.

Excavations at specific sites in Hells Canyon have produced archaeological data suggesting the displacement of indigenous cultures at various times throughout the canyon's prehistory. At Bernard Creek Rockshelter (river mile 235), a site with a 7,300 year old occupation, the displacement of indigenous culture from the south and to the east was concluded based on the presence of Great Basin projectile point forms (Randolph and Dahlstrom 1977:77). The Great Basin forms remain the "major influencing materials" for three stratigraphic layers. These layers include pre-Mazama ash, Mazama ash and postash indicating the antiquity of Great Basin presence at Bernard Creek. Yet, in the two layers just below the surface of this site, Columbia Plateau influences

predominate suggesting another more recent shift in lithic technology.

Although these data suggest that Great Basin and Columbia Plateau peoples were likely residents of Hells Canyon, the archaeology can not absolutely determine who and/or when the rock art was created.

At Pittsburgh Landing, several boulders containing petroglyphs have similar styles to those found in the Great Basin. These include cupules, Great Basin rectilinear and curvilinear styles.

More recent investigations by Reid and Chatters (1997:ii, iii) at Kirkwood Bar in Hells Canyon revealed three successive occupations organized around 13 hearths. Charcoal from three representative hearths had uncorrected radiocarbon ages of 6890, 6850, 7100 and 6740 B.P. All three occupations at Kirkwood Bar are assigned to the Cascade Phase and indicated the presence of Columbia Plateau cultural elements.

This study's analysis of Hells Canyon rock art seems to support what Reid et al. (1991b:458) describe as an interaction zone between the Nez Perce groups and immigrating Numic speakers or Shoshonean peoples in the 19<sup>th</sup> century. This interaction included a "kaleidoscopic pattern of raiding, trading, massacre and intermarriage, imitation and exclusion, kidnapping and bilingualism"(Reid et al. 1991b:458). The pattern is consistent with the findings of this study since the distribution of both Columbia Plateau and Great Basin rock art elements and styles indicate

groups from both regions are represented in the canyon. It also appears evident, from the preliminary regional analysis, that Hells Canyon has a unique style or perhaps a recombination of style resulting from the influence of both regions. In this case, we can view Hells Canyon, following Reid's (1997) lead, as an interaction zone and possibly an area where the formation of a unique rock art style took place. In Curtis' (1990:2) analysis of rock art in southern Idaho, he suggested pictograph and petroglyph stylistic variations may assist in locating cultural boundaries. In his words, "a migrating group take their language and petroglyph style with them as they move so migration routes can, in principle at least, be determined by a study of petroglyph style (Curtis 1990:2)." Thus, the stylistic diversity and distinctiveness of Hells Canyon might indicate that it was an area where numerous different migrating groups expressed their culture in the form of rock art. Which groups and when they were there is the obvious course for future research. In this context, accurately dating pictographs would provide another significant dimension to the ethnographic and archaeological record. A dating method developed by Watchman (personal communication; 1998) extracts carbon-bearing components from various rock surface deposits and paints for accelerator mass spectrometry (AMS) radiocarbon dating. Watchman's (1993) work in Northern Australia demonstrated the

implications of this technique to Australian archaeology. Similarly, dating of rock art in Hells Canyon could yield invaluable chronological data and assist in identifying relationships between rock art styles and the canyon's interactive prehistory.

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## Appendix



101H639



10IH477

Pittsburgh Landing Petroglyphs  
Figure 2

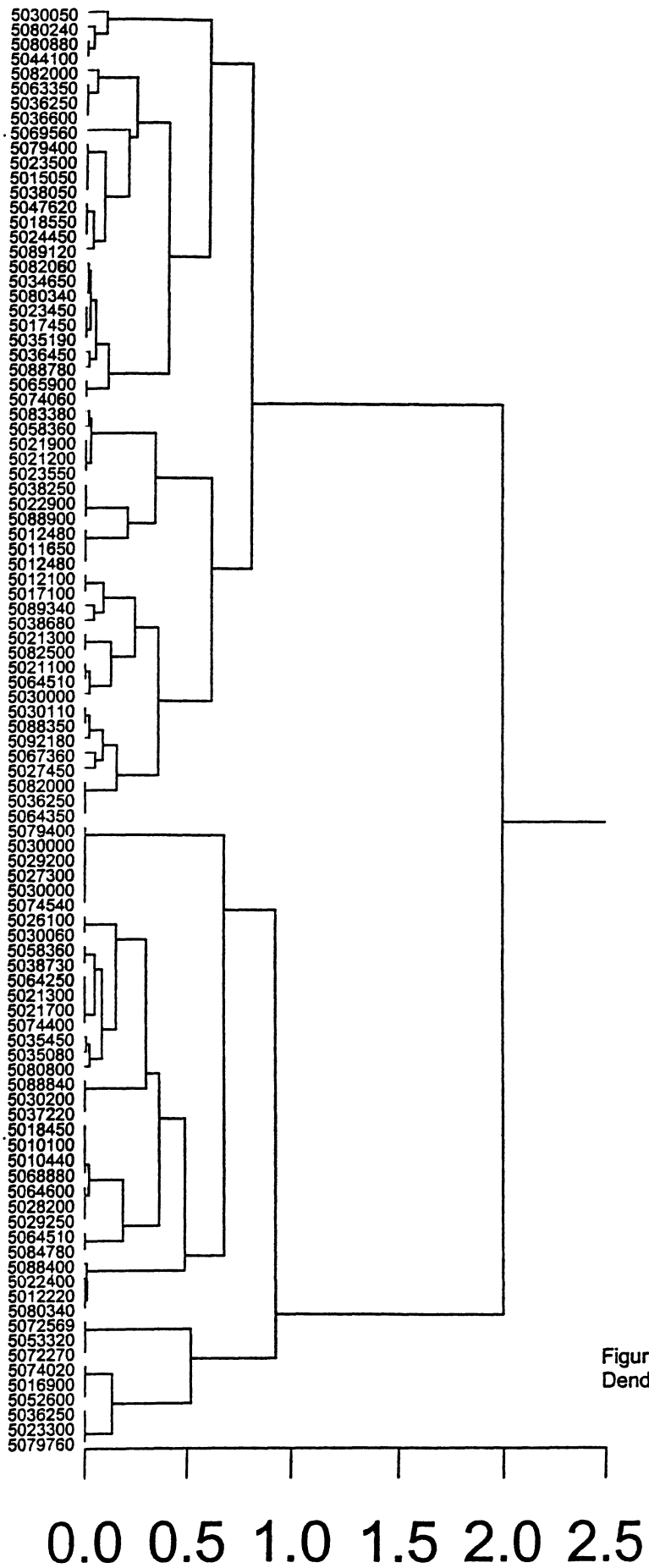
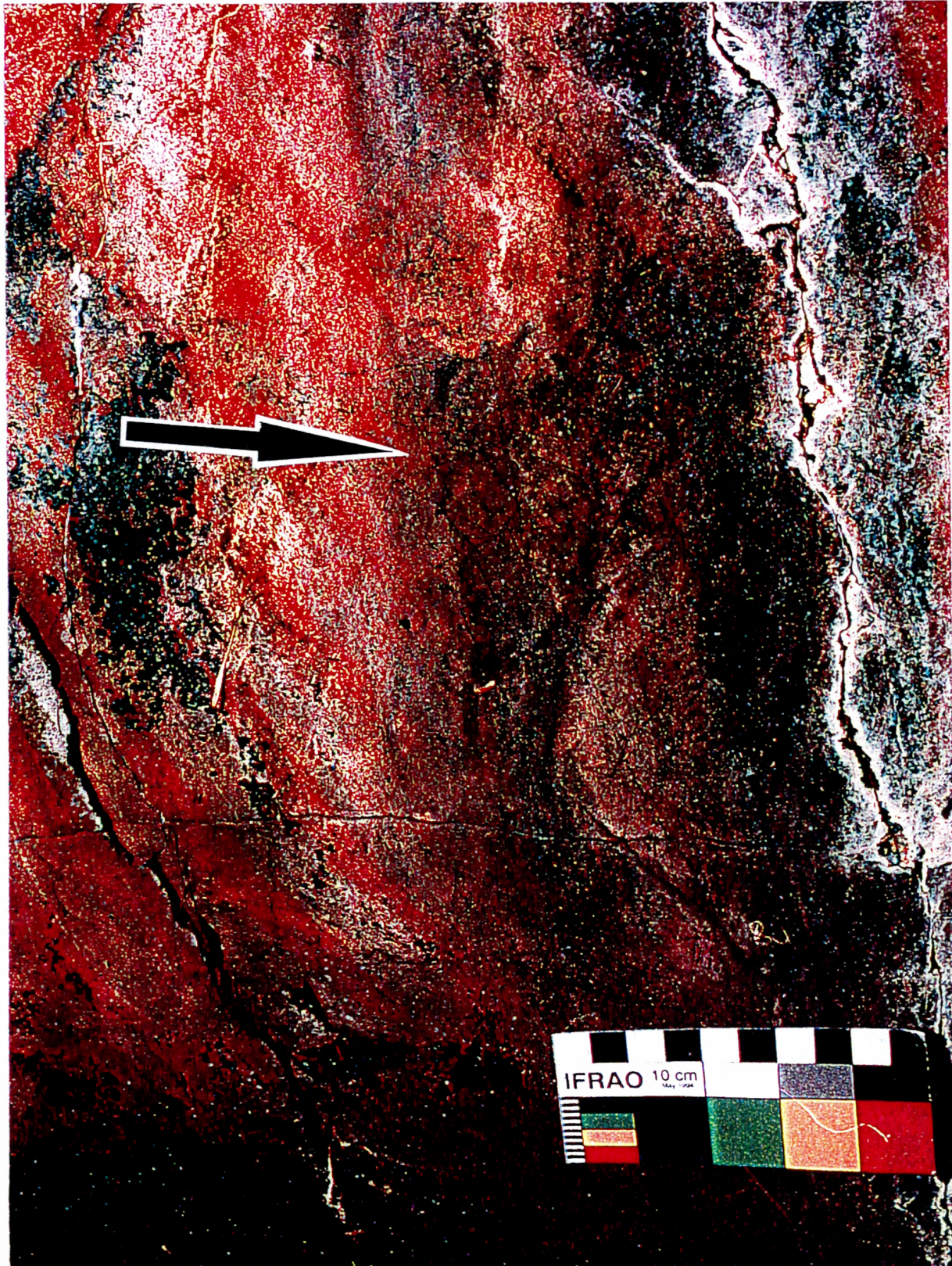


Figure 3  
Dendrogram



Pigment superimposed on Scratched Angular design made visible through cross-polarization technique.



Granite Creek 10IH479; Panel AG



## Great Basin Styles

### GREAT BASIN REPRESENTATIONAL

- Mountain Sheep
- Quadrapeds
- Feet
- Hands
- Anthropomorphs

### GREAT BASIN ABSTRACT

#### Curvilinear

- Circles
- Chains
- Sun discs
- Stars
- Snakes
- Meanders

#### Rectilinear

- Dots
- Rectangular Grids
- Bird Tracks
- Rakes
- Straight Lines
- Cross hatchings
- Traingles

### UTH EASTERN COLUMBIA PLATEAU STYLES

#### Naturalistic

- Animals
- Stick Figures
- Tally Marks
- Geometric Designs

#### Great Basin Curvilinear (Pit and Groove)

- Elements of Great Basin Abstract

### HELLS CANYON STYLES

- Pictographs
- Finely Scratched Petroglyphs
- Drawn Black Linear

Regional Styles  
Table 1

**Element List**  
**Table 2**

<b>Graphic (abstract designs)</b>	<b>Representational (naturalistic designs)</b>
<p><b>Rectilinear</b> Gridiron Grid Line Line Fragment Horizontal line Vertical line Parallel Lines Vertical Parallel Lines Horizontal Horizontal and Vertical Lines Ladder Rake Zigzag Grid Tally Marks Trident Diamond Diamond Chain Inverted V <b>Curvilinear</b> Arc Concentric Arc Arc with rays Circles Concentric Circle Circle Chain Circle Rayed Circle Tailed Loop (ovid) Meander Eye Cupules Curved Ladder <b>Dots</b> Dots Dots rows Dots Curved</p>	<p><b>Anthropomorphs</b> Complex Anthropomorph Simple Anthropomorph Spirit Figure Rows of Anthropomorphs Horned Anthropomorph Anthropomorph with Dumbbells Anthropomorph with Arc Anthropomorph with Vertical Lines Anthropomorph with Two Arms Anthropomorph with Arms Straight Anthropomorph with Bow and Arrow Shield Figure Horse and Rider Vulva Form Handprint <b>Quadrupeds</b> Quadruped Inverted Quadruped Mountain Sheep Bison <b>Reptiles</b> Zoomorph Lizardmorph <b>Vegetation</b> Plant Form</p>



## STYLE AND ELEMENT DENDROGRAM

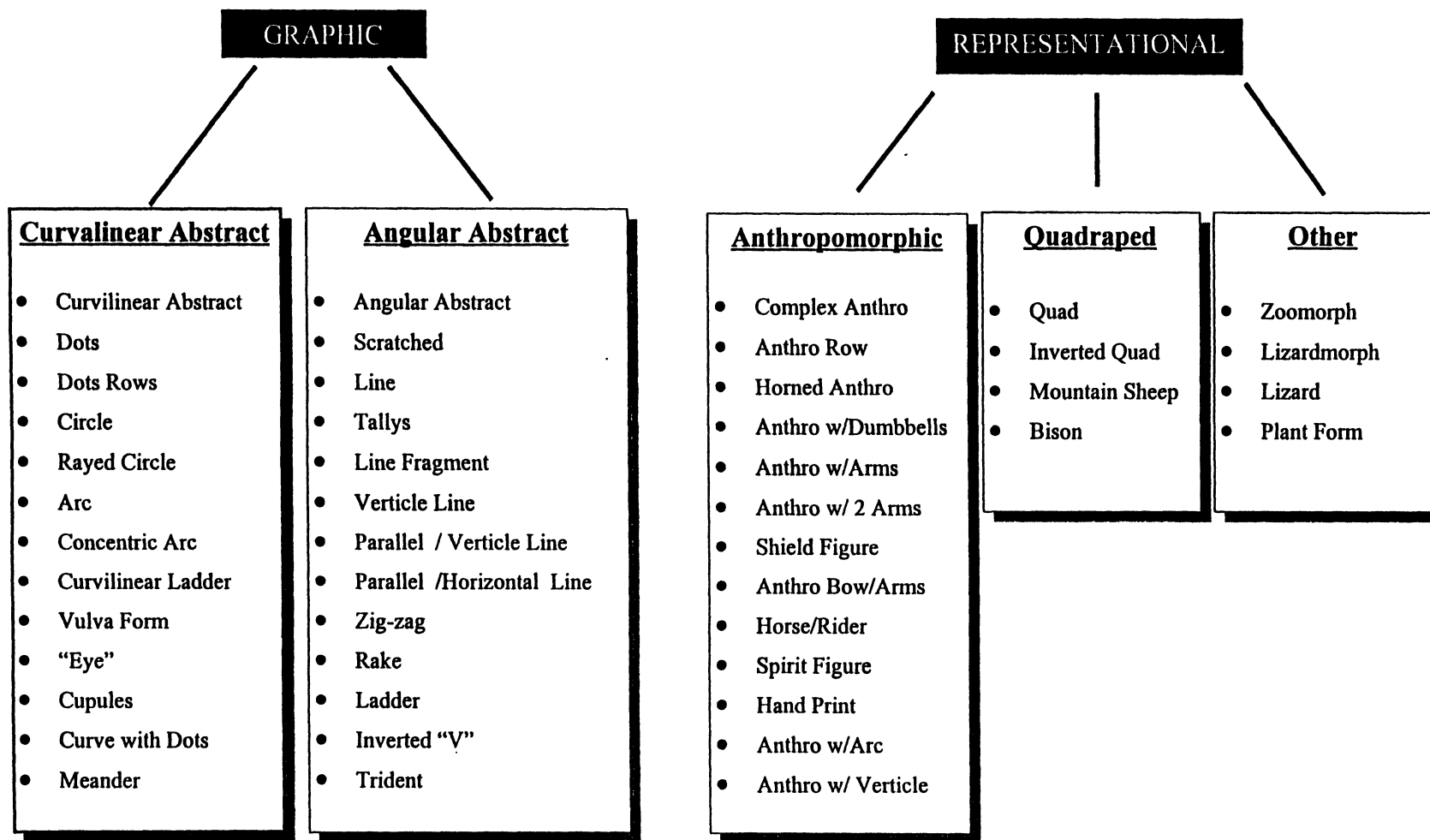


Table 3

### CLUSTER BY NORTHINGS

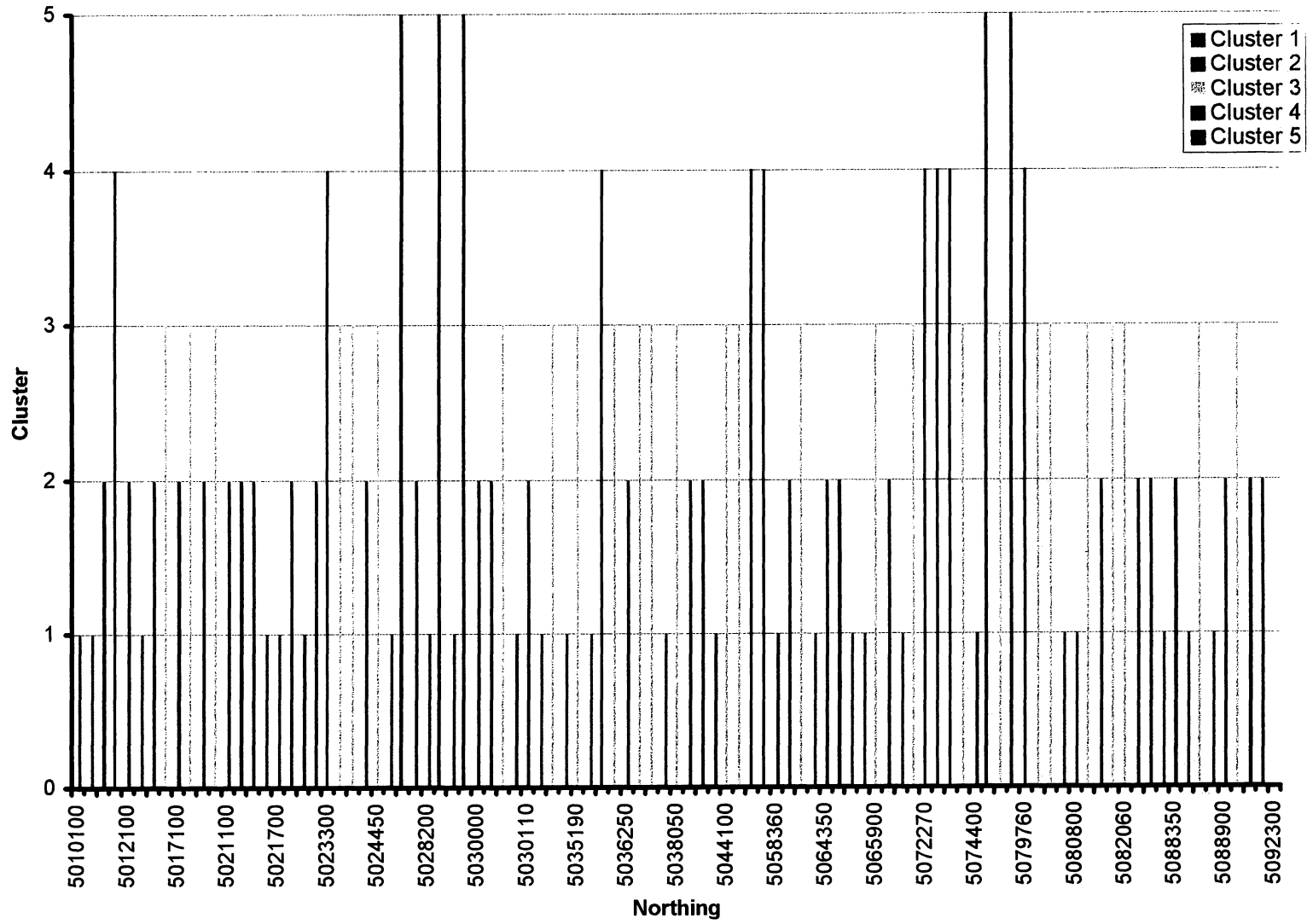


Table 4

























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Stief/Elements  
Table 5



## Regional Analysis of Rock Art Styles

Table 6

Site #	Elements	Great Basin	C. Plateau	Basin & Plateau	Hells Canyon
ID22N3W15/1	ang abstract				1
ID22N3W10/2	mtn. sheep			1	
OR1S50E15/6	tally marks		1		
OR1S50E15/2	dots/rows			1	
OR1S50E10/2	anthro (simple)			1	
OR2S49E25/5	anthro (simple)			1	
OR2S49E25/5	arc w/ rays				1
OR2S49E25/5	curv.abstract	1			
OR2S49E25/5	ang.abstract				1
OR2S49E36/2	lizards	1			
OR3S49E33/1	plant forms	1			
OR3S49E33/1	mtn. sheep			1	
OR3S49E33/1	ang.abstract				1
OR3S49E33/1	ang.abstract				1
OR3S49E33/1	rayed circle				1
OR3S49E33/1	curv.abstract				1
OR3S49E10/3	gridiron	1			
OR3S49E10/3	curv.abstract				1
OR3S49E14/1	lizardmorphs		1		
OR3S49E14/1	rayed arc design		1		
OR3S49E14/1	rake			1	
OR2S50E18/3	eye				1
OR2S50E18/3	fan rake				1
OR2S50E18/3	plant forms			1	
OR2S50E18/3	tally marks		1		
OR4S49E4/1	gridiron	1			
OR4S49E4/1	rakes	1			
OR4S49E4/1	rayed arc				1
OR4S49E4/1	anthro (simple)			1	
OR3N50E13/4	tally marks				1
OR3N50E4/6	ang.abstract				1
OR3N50E11/5	rayed circle				1
OR3N50E24/1	anthro (simple)			1	
OR4N49E22/7	cupules	1			



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OR4N49E36/6	tally marks		1		
OR4N49E36/6	gridiron				1
OR4N49E36/6	rake	1			
OR4N49E22/6	cupules	1			
OR4N49E16/4	arc w/ rays				1
OR4N49E16/12	scratched angular				1
OR4N49E16/12	rayed arc			1	
OR4N49E17/3	tally marks		1		
OR5N48E18/2	quadrupeds			1	
OR5N48E18/2	cross design				1
OR5N48E18/10	anthro w/arc		1		
OR5N48E18/10	tally marks		1		
OR5N48E18/10	horned anthro	1			
OR5N48E18/10	curv.w/dots	1			
OR5N48E18/10	scratched angular	1			
OR5N48E34/11	anthro (simple)			1	
OR5N48E34/11	tally marks			1	
OR5N48E28/5	rayed circle			1	
OR5N48E28/5	meander			1	
OR5N48E28/5	scratched angular	1			
OR5N48E28/7	lizards	1			
OR5N48E20/13	arc		1		
OR5N48E20/2	lizards	1			
OR5N48E20/2	anthro w/ lines		1		
OR5N48E20/2	tally marks		1		
OR5N48E20/5	tally marks			1	
OR6N47E36/13	concentric arcs		1		
OR6N47E36/6	anthro (simple)			1	
ID22N3W10/1	angular abstract				1
ID22N3W10/1	tally marks			1	
ID22N3W10/1	hand				1
ID22N3W10/1	dots/rows			1	
ID22N3W10/1	anthro (simple)		1		
ID22N3W1/7	tally marks				1
ID23N3W12/11	angular abstract				1

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ID23N3W12/23	quadraped		1	
ID23N3W23/4	horizontal lines		1	
ID23N3W12/22	rayed circle			1
ID23N3W12/22	scratched angular	1		
ID23N3W12/22	tally marks			1
ID23N3W1/8	anthro (simple)			1
ID23N3W1/9	tally marks		1	
ID23N3W1/9	quadraped		1	
ID23N3W12/14	curv. abstract			1
ID23N3W12/14	angular abstract	1		
ID23N3W12/14	scratched angular	1		
ID23N3W12/16	angular abstract	1		
ID23N3W12/16	scratched angular	1		
ID23N3W12/16	mtn. sheep			1
ID23N3W12/16	horned anthro	1		
ID23N3W12/16	anthro simple			1
ID23N3W12/16	complex diamond chain			1
ID23N3W12/16	curv. abstract	1		
ID23N3W12/16	angular abstract			1
ID23N3W12/16	plant forms			1
ID23N3W12/16	rayed circle			1
ID23N3W12/16	tally marks			1
ID24N2W16/16	bison		1	
ID24N2W16/16	horse/rider		1	
ID24N2W16/16	anthro w/two hands		1	
ID24N2W20/4	shield figures		1	
ID24N2W20/4	complex anthro.	1		
ID24N2W20/4	curv. abstract	1		
ID24N2W20/7	tally marks			1
ID24N2W20/7	angular abstract			1
ID24N2W16/19	tally marks		1	
ID24N2W16/19	triangle	1		
ID24N2W16/12	curv. abstract			1
ID24N2W16/12	ang.abstract	1		
ID24N2W16/12	zigzag	1		

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ID24N2W16/12	tally marks			1	
ID24N2W16/2	zigzag	1			
ID24N2W16/21	tally marks		1		
ID24N2W16/21	scratched angular	1			
ID24N2W16/20	angular abstract				1
ID24N2W31/5	anthro (simple)			1	
ID24N2W31/5	angular abstract				1
ID24N2W20/2	tally marks			1	
ID25N2W14/1	anthro w/hands		1		
ID25N2W14/1	horse/rider		1		
ID25N2W14/1	angular abstract				1
ID25N2W14/1	anthro (simple)			1	
ID25N2W23/7	dots/rows			1	
ID25N2W23/7	angular abstract				1
ID25N2W23/7	horizontal lines				1
ID25N2W23/7	scratched angular	1			
ID25N2W14/8	tally marks		1		
ID25N2W14/8	anthro				1
ID25N2W14/8	angular abstract				1
ID25N2W14/8	scratched angular	1			
ID25N2W23/5	anthro (simple)			1	
ID25N2W34/4	tally marks			1	
ID25N2W34/4	meander	1			
ID25N2W34/14	diamond				1
ID25N2W26/7	lizard	1			
ID25N2W26/11	grid	1			
ID25N2W14/7	hort/vert lines				1
ID26N1W4/5	angular abstract	1			
ID26N1W4/5	curv. abstract	1			
ID26N1W4/5	dots/rows	1			
ID26N1W4/5	meander	1			
ID26N1W4/5	anthro (simple)	1			
ID26N1W4/5	plant forms	1			
ID26N2W36/1	lizards	1			
ID26N2W36/1	mtn. sheep			1	

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ID27N1W29/14	anthro (simple)			1	
ID27N1W29/14	anthro (pair)		1		
ID27N1W29/14	quadrapped			1	
ID27N1W29/14	angular abstract				1
ID27N1W29/14	cupules	1			
ID27N1W29/14	anthro (simple)	1			
ID27N1W29/14	curv. abstract	1			
ID27N1W29/14	angular abstract	1			
ID27N1W29/14	meander	1			
ID27N2W12/1	tally marks			1	
ID27N2W12/1	anthro (simple)			1	
ID27N2W12/1	angular abstract				1
ID27N2W12/1	scratched angular	1			
ID28N2W25/4	curv. abstract				1
ID28N2W25/4	angular abstract				1
ID28N2W25/4	tally marks			1	
ID28N2W25/1	scratched angular	1			
ID28N2W26/3	tally marks			1	
ID28N3W12/3	tally marks			1	
ID28N3W12/3	horse/rider		1		
ID29N4W3/2	tailed circle/v-form			1	
ID29N4W3/5	tally marks				1
ID29N4W3/6	tally marks			1	
ID30N4W7/13	anthro w/ arc		1		
ID30N4W7/13	tally marks		1		
ID30N4W33/10	angular abstract				1
ID30N4W33/10	scratched angular	1			
ID30N4W33/10	zigzag	1			
ID30N4W33/10	handprints			1	
ID30N4W33/10	quadrapped			1	
ID30N4W7/6	anthro (simple)			1	
ID30N4W7/6	anthro w/ hand		1		
ID30N4W7/6	curv. abstract	1			
ID30N4W7/6	angular abstract				1
ID31N5W36/2	dots/rows			1	

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**TOTALS**

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