Prehistoric Rock Structures of the Idaho National Laboratory

Keywords: Archaeology, prehistoric rock structures, hunting and gathering

ABSTRACT

Over the past 13,500 years, human populations have lived in and productively utilized the natural resources offered by the cold desert environment of the northeastern Snake River Plain in eastern Idaho. Within an overall framework of hunting and gathering, groups relied on an intimate familiarity with the natural world and developed a variety of tools and structures to survive. Useful items were abundant and found everywhere on the landscape. Even the basaltic terrain and the rocks, themselves, were put to productive use. This paper presents a simple classification scheme for rock structures built on the Idaho National Laboratory landscape by prehistoric aboriginal populations, including discussions of the overall architecture of the structures, associated artifact assemblages, topographic placement, and possible functions.

Located 51 km (32 mi) west of Idaho Falls, Idaho, the Idaho National Laboratory (INL) is a government-owned, contractor-operated facility managed by the Dept. of Energy. Occupying 2,305 km^2 (890 mi^2) of the northeastern portion of the eastern Snake River Plain (Figure 1), the INL is a remarkable place to study the past. The undeveloped cold desert lands within its borders contain large numbers of well preserved archaeological sites representing human occupation from the late Ice Age through historic times. Archaeologists have studied the cultural resources of the INL for decades (DOE-ID 2007). Most investigations have been conducted in the context of compliance with federal laws such as the National Historic Preservation Act that require consideration of cultural resources during federal undertakings. As a result of these efforts, approximately 9 % of the land has been examined and over 2,200

archaeological sites have been recorded. Rocks structures are common in the known inventory and include structures from both historic (50 – 150 years ago) and prehistoric (> 150 years ago) periods.

Topographically, the INL is dominated by volcanic terrain that borders the broad flat floodplain of the Big Lost River and natural wetland sink areas of the Lost Rivers and Birch Creek (Figure 1). Basaltic lava is exposed extensively in outcrops along ridges, rises, craters, and caves. Soils have been deposited by wind action across the entire landscape, accumulating to greater depths in topographic lows and along the windward sides of ridges. Flood gravels also cover the basalt near the Big Lost River. During the Pleistocene, the shallow waters of a large freshwater lake known now as Lake Terreton inundated the northern portion of what is now the INL. Smaller, isolated playas located away from the Lake and River corridor also hold seasonal water, even today. Human populations have lived on what is now the INL for thousands of years. The earliest occupants were hunters of very big game like mammoth, camel, and giant bison during the terminal Pleistocene and Early Holocene as many as 13,000 years ago when Lake Terreton provided lakeside habitat and local rivers filled and probably overfilled their banks. As environmental conditions warmed in the Holocene, local flora and fauna changed, resulting in many of the species seen today. People changed too. Hunting technology was adapted with development of the spear thrower or atlatl and foraging spheres expanded as people began to utilize a wider array of resources from the desert environments beyond the lake margins and river corridors. About 1,000 years ago, the archaeological record shows another shift in technology with the addition of bows and arrows to the toolkit of prehistoric hunters. Climatic fluctuations may have also partially filled the basin of Lake Terreton at this time.

Rough calculations of the intensity of prehistoric use of the area can be obtained by examining the frequencies of temporally sensitive projectile points in relation to the length of time that they were employed (Reed et al. 1987). This simple analysis shows gradual increased use and a potential rise in human population densities through time in the region (Figure 2). Late Prehistoric times from roughly 1,300 – 150 years ago (DOE-ID 2007), when unique rock structures similar to hilltop fortifications appear to have been built, saw the highest intensity and probably the densest prehistoric human populations.

Basalt is ubiquitous on the northeastern Snake River Plain and was the building material of choice for prehistoric as well as early historic populations in the region. In the early 1900s it was used to build some of the finest homes. During the mid to late 1800s, it provided shelter for stagecoach passengers and intrepid homesteaders, held heat well enough to bake bread, and captured drifting snow to provide a source of water for stock animals. Prehistoric inhabitants of the INL area used basalt to build several types of structures including:

- rock cairns of several types
- small and large rock rings
- substantial rock walls/fortifications

Cairns (Figure 3) are stacks of cobbles and boulders that probably served as landmarks and trail guides. More than 20 cairns have been recorded on INL lands and many more are present but undocumented (DOE-ID 2007). As expected, many historic occupants of the INL area built cairns made of local basalt. However, many of the cairns identified on INL lands

exhibit dense lichen growth and none of the white calcium carbonate deposits indicative of recent construction.

In the rolling basaltic terrain of the INL, buttes and the nearby mountains provide useful landmarks, but efficient travel from one point to another across the desert can be difficult and circuitous. Prehistoric cairns on the INL are often associated with unique archaeological sites such as lava tube caves or small playas, which are not obvious on the landscape. They would have proven quite useful in efficient orientation and travel to these important destinations. Cairns on the INL that do not appear to be associated with evidence of prehistoric camping activities may mark important trails across this portion of the Snake River Plain, however additional research is needed to confirm this hypothesis.

On the INL, rock rings are circular arrangements of basalt typically only one course in height. Two sizes have been identified: small ($\leq$ 1 meter in diameter), and large (2 – 5 meters in diameter). Functionally, the smaller rock rings appear to have served as fire hearths and the larger rock rings define several different types of activity areas.

Small rock rings are no larger than a meter in diameter. They are ephemeral and hard to identify, but nearly 30 have been found during past INL surveys (DOE-ID 2007). All are associated with a variety of domestic artifacts reflecting stone tool maintenance/ manufacture, food processing, and cooking. Archaeological test excavations have been completed at four of these features (DOE-ID 2007, Ringe 1988), marked at the surface by rock rings and discrete concentrations of charcoal, fire-cracked rock, flakes and burned bone. The following radiocarbon dates have been obtained from charcoal in these features:

- Site 10-BT-1034: 1261 $\pm$ 64 calBP

- Site 10-BT-1052: 374 ± 84 calBP
- Site 10-BT-395: 1414 ± 70 calBP

All excavated features yielded faunal assemblages exhibiting cultural modification (charring, green fractures, butcher marks, etc.). While these assemblages are primarily dominated by nondiagnostic long bone fragments from large mammals, diagnostic bones have been identified as Bovidae (Bison spp.), rabbits (Brachylagus spp., Sylvilagus spp.) and hares (Lepus spp.). It is clear that the smaller rock rings found on the INL are fire hearths, built by prehistoric people to contain campfires and probably for cooking.

Approximately 25 larger 2 – 5 meter diameter rock rings have been discovered within the boundaries of the INL (DOE-ID 2007). A few of these features have been documented just inside the entrance of caves where cooking and leisure activities may have taken place. Here they define a domestic space. Excavations have revealed the deliberate placement of grass and brush mats within the rock circle to provide a clean living surface (Lohse 1989). Larger rock rings described as "tipi rings" are also reported in archaeological site recording forms prepared in the 1960s for properties within the boundaries of INL. These rock circles were probably created to anchor hide tipis and therefore also define a domestic space. However, additional fieldwork is necessary to confirm their presence and document their characteristics. A number of larger 2 – 5 meter diameter rock rings have been found out in open settings on the INL desert (Figure 4). The function of these features is implied by their topographic setting. All are constructed on ridges that provide commanding, but limited, views of playas, game trails, or other places favored by large game animals. Augmented with a bit of brush, they would have served as excellent hunting blinds. There are typically no artifacts associated with these rock rings,

indicating that silence was probably important and no distractions were allowed. However, it is common to find a large campsite located just over a nearby ridge, where artifacts that could have been used to butcher and process fresh kills are abundant. The ages of these nearby sites are highly variable, from 13,000 – 150 years old, based on temporally diagnostic artifacts.

Smaller rock rings (probable hearths) and larger rock rings (activity areas, tipi rings, hunting blinds) are relatively common on the INL. In addition to these features, prehistoric people also constructed a third variety of rock structure that is significantly more formidable. These structures are larger in both height and extent than the rock rings already discussed and they occupy uniquely strategic positions on the landscape. The archaeologists that have discovered these sites have been compelled to name them with impressive titles such as "Hellofasite," "Lost Arches," and "Bison Heights" (Miller 1985, Pace 2005, Henrikson 2005).

Currently, three of these unique rock fortifications are known to occur on the INL and others may be present. Two of the known INL sites occupy prominent spots on a system of high pressure ridges that overlook the Big Lost River Basin and the bed of ancient Lake Terreton. Figure 5 shows rock walls present at one of these sites ("Hellofasite"). The third site is located in and around the rim of a crater that provides a panoramic view up the Little Lost River Valley. From all three vantage points, individuals could see great distances on the open plain.

Each site contains an elaborate series of rock wall constructions a meter or more in height. The walls contain two, three, even four courses of stone, dry laid to form sizeable multi-room structures. Dense concentrations of artifacts are located inside the confines of the rock walls and in protected sandy coves in the surrounding basalt. Intensive camping activities are reflected in the artifact assemblages but from below and certainly from a distance, the sites remain virtually invisible, appearing to be natural sections of the surrounding rocky ridgelines.

The artifacts associated with the rock enclosures reflect use of these areas as seasonal base camps and include abundant stone debitage from the manufacture of stone tools, pottery, hearth features, game processing tools (teshoa scrapers), and several varieties of small finely made arrow points dating from approximately 750 – 150 years ago. Although none of the INL sites have been excavated, radiocarbon dates from excavations completed at similar sites located near INL (Henrikson 2005, Henrikson, McAlister and Long 2006, Henrikson and Pace 2006) place the occupations at rock structures like those found on INL firmly within the last 750 years.

The protected areas afforded by these substantial rock walls would have provided strategic, hidden viewpoints for many miles. What prompted Late Prehistoric populations to seek these prominent points and spend their time and energy in modifying them significantly with elaborate rock constructions? One possible trigger may have been an overall increase in human populations coupled with an increase in the availability of local resources, which in turn may have attracted more people to the area, resulting in local competition. There are some data to support this interpretation (Henrikson and Pace 2006). The overall frequencies of temporally diagnostic artifacts found at INL sites suggest that local populations rose gradually to peak during this time (Figure 2), a pattern repeated at nearby Craters of the Moon National Monument (Henrikson McAlister and Long 2006, Henrikson and Pace 2006). The paleoclimatic record, including geologic and pollen data, also suggests that cool moist conditions may have prevailed approximately 700 years ago, causing Lake Terreton to at least partially fill its basin (Bright and Davis 1982, Forman and Kaufman 1997, Gianniny 2002). Finally, obsidian sourcing data from artifacts in the region show a statistically significant increase in stone brought in from farther distances, perhaps reflecting the movement of new people into the region (Henrikson and Pace 2006).

Cool, moist conditions and a large, albeit shallow, freshwater lake on the northeastern Snake River Plain would have been attractive to animals and people, alike, during the late Holocene. Even today, when the Lost River and Birch Creek Sinks fill their basins during wet years, they become a magnet for migratory waterfowl and big game animals. Shrimp, toads, and many insects are also plentiful and useful and edible plants like cattails and rushes thrive. Although the rock structures on the INL at Lost Arches and Hellofasite would not have functioned well as scouting points for these resources, they would have provided an excellent vantage point to monitor the general movements of any human parties approaching the Lake during this late highstand. At locations within a few miles of the shoreline, both sites could also be seen as a safe retreat for parties burdened with resources from a day of foraging. In either case, it is possible that territorial competition may have prompted some groups to occupy positions on the landscape that may have been a bit less hospitable, but ultimately more strategic than ever before.

Prehistoric populations living on the northeastern Snake River Plain had intimate knowledge of the resources available in their cold desert home. On the INL, a largely undisturbed record of the activities of these people, including the structures they built of local basalt, is preserved. Research into these features at the INL will continue in collaboration with other federal land managers and archaeologists in the region. Topics of interest will include but certainly are not limited to: comparison of INL and eastern Snake River Plain sites with rock structures from other regions and with ethnographically documented rock structures, quantitative measurement of the walls and estimation of required labor for construction, plotting of cairn locations in relation to known and suspected trails, field of view analysis and classification using

geographic information systems technology, and further investigation of artifact assemblages, including data from excavations.

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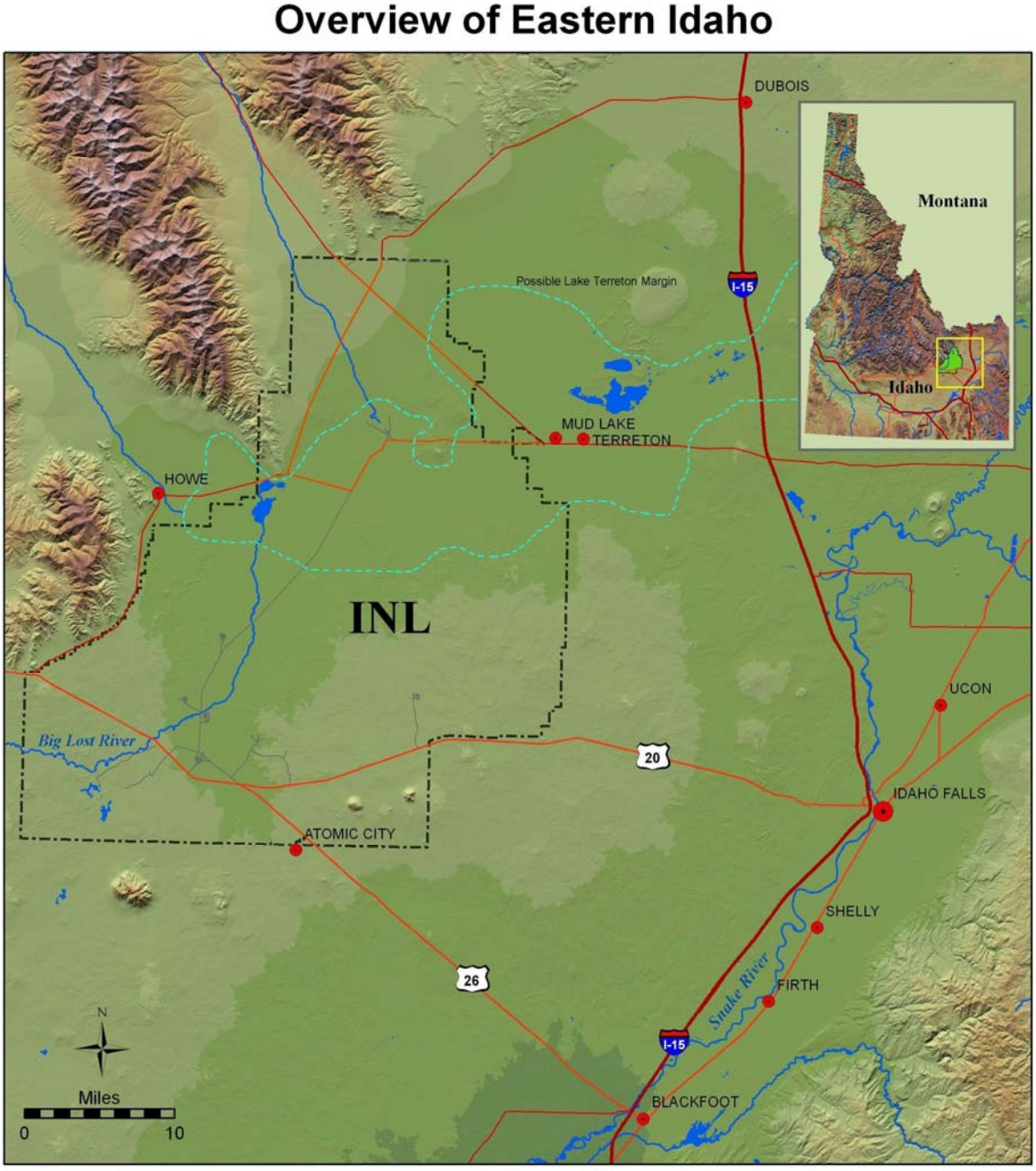
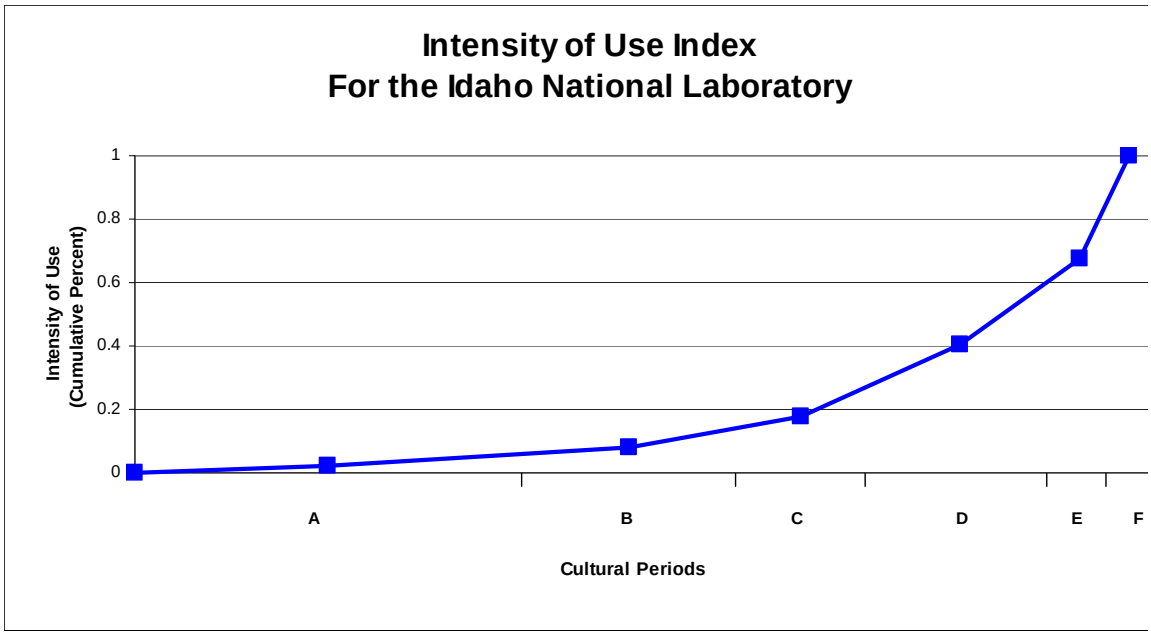

Overview of Eastern Idaho
DUBOIS
Montana
Idaho
Possible Lake Terreton Margin
I-15
MUD LAKE
TERRETON
HOWE
INL
UCON
Big Lost River
20
IDAHO FALLS
ATOMIC CITY
SHELLY
26
Snake River
FIRTH
I-15
BLACKFOOT
N
Miles
0
10

Figure 1.



Legend

A: Early Prehistoric (12,000 – 7,500 BP) N = 46
B: Middle Prehistoric I (7,500 – 5,000 BP) N = 57
C: Middle Prehistoric II (5,000 – 3,500 BP) N = 88
D: Middle Prehistoric III (3,500 – 1,300 BP) N = 233
E: Late Prehistoric I (1,300 – 750 BP) N = 88
F: Late Prehistoric II (750 – 150 BP) N = 107

Figure 2. Intensity of Use Index for INL.

Figure 3: Rock cairn from INL (note evidence of roosting birds on upper rocks)

Figure 4. Larger rock ring (probable hunting blind) from INL.

Figure 5. Substantial rock structure from INL (Hellofasite).