Prehistoric Land-Use Patterns within the Yellowstone Lake Basin and Hayden Valley Region, Yellowstone National Park, Wyoming

Paul H. Sanders

Abstract

Humans have inhabited the Yellowstone Lake area for at least the past 10,000 years. Archeological studies of the area are starting to provide a view of the prehistoric lifeways of these peoples. This paper summarizes the nature of this prehistoric use, including lithic raw material utilization, stone tool characterization, and food procurement practices. Changes in landform evolution during the late Pleistocene and early Holocene and their potential impact on prehistoric groups occupying the area are also discussed. Finally, the question of change versus stability is discussed in light of the prehistoric occupation of the area.

Introduction

This paper summarizes the archeological record of the Yellowstone Lake area; however, in order to place this record into its proper context, it is useful to provide some background information on the nature of Yellowstone archeology as a whole. Previous researchers have described the prehistoric occupation of Yellowstone National Park as poorly known (National Park Service 1993; Cannon, Crothers, and Pierce 1994; Cannon et al. 1997). This is partially true, as there are very few of the stratified, key "type" sites that are necessary for archeologists intent on building cultural chronologies or investigating changes in prehistoric life ways through time.

There are several reasons for this. First, the volcanic nature of much of Yellowstone has resulted in shallow, acidic soils. Both of these conditions adversely affect the preservation of prehistoric occupations. The acidic soils dissolve organic remains, which are most critical if one wants to know what animals prehistoric peoples were eating. This is particularly frustrating, because Yellowstone is the place people from across the world now come to view wildlife, and the archeological record is so poor in this respect.

The shallow soils that cover most of the Yellowstone Plateau are easily mixed by rodent burrowing, freeze–thaw cycles, and tree tip-ups, all of which disrupt the clarity of a buried prehistoric occupation. The volcanic rocks of Yellowstone and other geologic formations also lack the caves or rock shelters that provide the most ideal locations for the preservation of prehistoric artifacts and organic remains. More recently, the 125 or more years of artifact collecting by tourists and others has depleted the number of diagnostic artifacts that were once present. Wayne Replogle, a park naturalist who traced the Bannock Indian Trail through northern Yellowstone, noted in his 1956 publication on the trail (1956: 71) that he found comparatively few projectile points, but that old-timers said that they used to be quite common and were also a common souvenir in the early days of the park. This points to the diminishment of the archeological resource by the 1950s; so consider the state of affairs 50 years later, when annual park visitation is in the millions, despite the efforts of the National Park Service to discourage collecting.

Another factor is the virtual lack within Yellowstone of large-scale archeological excavations, which provide the most detailed information on prehistoric lifeways. Most of the archeological work in Yellowstone has been cultural resource inventories and small-scale test excavations. The inventories provide data on surface artifact assemblages and an assessment as to the site's potential for buried artifactual remains. The test excavations are generally designed for evaluative purposes and typically do not expose enough of a buried cultural level to provide much more than an inkling as to a site's actual contents. As a result of these factors, of the nearly 700 prehistoric sites that have been recorded thus far, most provide only a minimal glimpse of the prehistoric occupation of Yellowstone.

As a consequence, researchers have generally had to borrow cultural chronologies from regions that neighbor Yellowstone. The chronologies developed for the Northwestern Plains by William Mulloy (1958) and, later, George Frison (1978, 1991) are most often cited, although B.O.K. Reeves is currently developing a chronology for Yellowstone (see, e.g., Shortt 2001). Briefly, the chronological periods utilized in this paper follow Frison (1991) and are listed here in years before present (BP): Paleoindian period (ca. 11,500–8,000 BP), Early Archaic period (ca. 8,000–5,000 BP), Middle Archaic period (ca. 5,000–3,000 BP), Late Archaic period (ca. 3,000–1,500 BP), and Late Prehistoric period (ca.1,500–500 BP). Much of this chronology is developed around changes through time in the styles of projectile points, as well as past climatic conditions.

It should be noted that, in some ways, the borrowing of chronologies is somewhat appropriate, since it is likely that most if not all of the prehistoric inhabitants probably occupied Yellowstone only on a seasonal basis, moving to the lower elevations outside Yellowstone in the winter. As a result, some of the archeological remains in the valleys of southwestern Montana, northeastern Idaho, and northwestern Wyoming were likely created by the same peoples that spent the summer months in Yellowstone. Therefore, the styles and ages of the artifacts deposited in these neighboring areas should have relevance to Yellowstone.

Obsidian Utilization

The ability to determine the source of obsidian through x-ray fluorescence and similar techniques, and its prevalence within the Greater Yellowstone Ecosystem, is, perhaps, the one saving grace of Yellowstone archeology. Obsidian Cliff, located about 20 miles to the northwest of Yellowstone Lake, was a major source of obsidian throughout prehistory. Its occurrence within Hopewell sites in Ohio about 2,000 years ago is one of the more dramatic instances of artifact dispersal within North American prehistory.

Table 1 lists the results of the obsidian source analyses for the Yellowstone Lake area, while Figure 1 illustrates the locations of the various sources. All of the obsidian source analyses reported in this paper were conducted by Richard Hughes of Geochemical Research Laboratory. Two things are evident in Table 1. First, as to be expected, Obsidian Cliff is the dominant source. The popularity of the Obsidian Cliff source for tools is evident in the huge amounts of debris generated through its quarrying. The Hayden Valley–Yellowstone River area, just to the north of Yellowstone Lake, ranges from about 13–24 miles from Obsidian Cliff and, as expected, has the highest percentage (86.3%). However, the North Shore of Yellowstone Lake and West Thumb are both about 25–30 miles from Obsidian Cliff, but West Thumb has only 55.6% Obsidian Cliff obsidian compared with the 80.0% for the North Shore sites. This would suggest that the movement of peoples was along the Yellowstone River, through the Hayden Valley, and on toward Yellowstone Lake. The lower percentage of Obsidian Cliff obsidian at the West Thumb sites suggests that the movement of peoples from the Obsidian Cliff source area was more indirect.

Second, Bear Gulch obsidian is the next most common source, constituting, in the West Thumb sites, one-third of the obsidian for which a source could be determined. The Bear Gulch source area is in the Centennial Mountains along the Idaho–Montana border. From the West Thumb area, the Bear Gulch and Teton Pass (in Jackson Hole) sources are both about 60–65 miles away (Figure 1), yet Bear Gulch obsidian is much more common (Table 1). This pattern is duplicated in the Jackson Hole area, where Bear Gulch is also more prevalent than Obsidian Cliff obsidian (Reeve 1989; Schoen, Thompson, and Pastor 1995; Schoen 1997). This seems to suggest that there was some sort of boundary or obstacle that prevented people from accessing the Jackson Hole sources directly through southern Yellowstone. Based on the determination of obsidian sources, the pattern of movement appears to have been from Jackson Hole northwestward into northeastern Idaho, and then back east toward Yellowstone, probably following the Madison River. The other possibility is through Pacific Creek to the upper

Table 1. Summary of obsidian source analyses in the Yellowstone Lake Area.

	Obsidian Cliff, Yellowstone	Bear Gulch, Idaho	Teton Pass, Wyo.	Packsaddle Creek, Idaho	Park Point, Yellowstone	Cougar Creek, Yellowstone	Unknown	Total
Hayden Valley–Yellowstone Riv.	95 (86.3%)	7 (6.4%)	1 (0.9%)	1 (0.9%)	1 (0.9%)		5 (4.5%)	110
North Shore–Yellowstone Lake	132 (80.0%)	8 (4.9%)	1 (0.6%)			2 (1.2%)	22 (13.2%)	165
West Thumb	15 (55.6%)	9 (33.3%)	1 (3.7%)	2 (7.4%)				27

Sources:
Hayden Valley–Yellowstone River: Sanders (1999, Appendix 2); Sanders (2000, Appendix 1); Sanders (2001, Appendix 2); Shortt (1999a, Appendix 2)
North Shore–Yellowstone Lake: Cannon et al. (1997, Table 60)
West Thumb: Johnson (2001, Figure 1)

Yellowstone River and then along Yellowstone Lake (Wright 1975; Crockett 1999). Either route is indirect and would result in the gradual falling-off or discarding of lithic materials that occurs as distance from the source increases.

Another possibility is that the limited amount of Teton Pass or other Jackson Hole obsidians reflects a low prehistoric presence within this particular area. Except for Jackson Lake and a few other areas (Wright 1975; Connor 1998), previous inventories (e.g., Wright 1975; Waitkus, Rosenberg, and Wolf 1998; Sanders and Holtman 2001; Sanders, Waitkus, and Holtman 2001) have documented unusually low prehistoric-site densities over much of the open, lower elevations of Jackson Hole. Wright (1975: 44, 88) suggests that these areas of low site density may represent areas of low ecological productivity with regard to hunting and gathering potential, and also suggests that the game numbers in Jackson Hole were unpredictable and unreliable. Given the lower productivity of areas and carrying capacity within Jackson Hole, fewer people could have been supported, resulting in proportionally fewer people traveling out of Jackson Hole and, consequently, fewer instances of deposition of Jackson Hole lithic materials in Yellowstone. Conversely, there would be less motivation or attraction to trav-

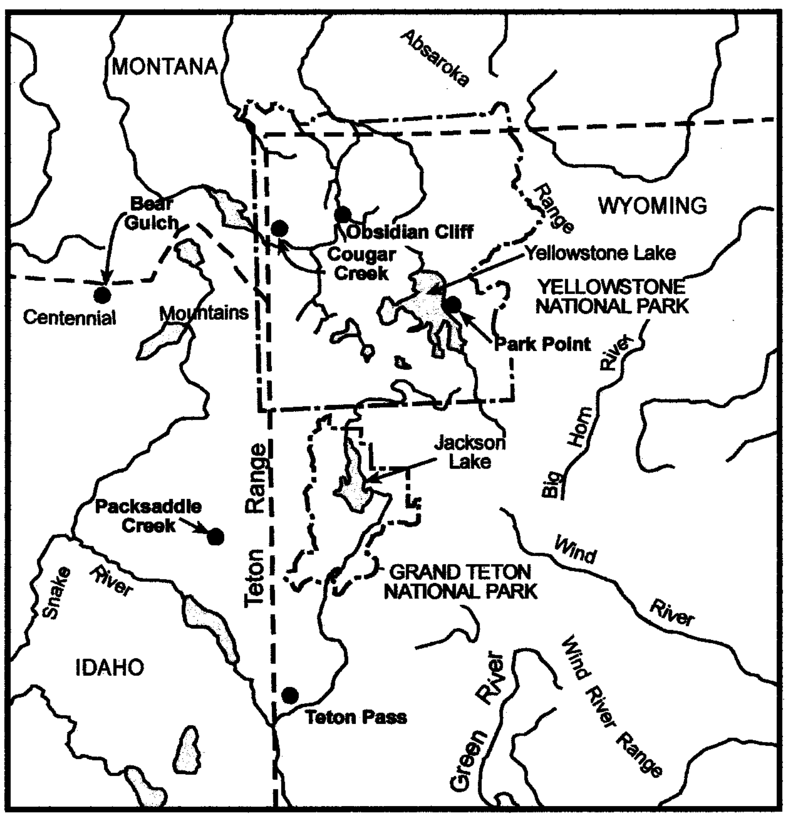

Figure 1. Map of obsidian source locations identified from archeological sites in the Yellowstone Lake area.

el into Jackson Hole, with fewer people depositing exotic lithic materials from outside areas (e.g., Yellowstone).

Subsistence Practices

Characterization of the foods eaten by prehistoric peoples is primarily based on inferences drawn from the recovery of faunal and floral remains from archeological sites. As noted previously, faunal remains are particularly scarce within Yellowstone. Within the Yellowstone Lake area, faunal remains have been recovered from only two sites, 48YE697, the Windy Bison site (Cannon et al. 1997) and 48YE545 (Sanders 2001; Table 2). Additional information has been gained from the analysis of blood residue on stone tools, which has identified a wider variety of animals that were likely hunted by prehistoric peoples. Curiously, no fish were identified, which would have been a rich resource. Although preservation of fish bones is a problem, fishing-related artifacts (e.g., net weights or sinker) have not been clearly identified (Taylor, Wood, and Hoffman 1964).

Bison were a primary food resource for Native Americans, as is evident by the number of bison kills that have been found throughout the Plains (see e.g., Frison 1991). No communal bison kill sites have been found within Yellowstone. The closest kill sites are north of Mammoth in Paradise Valley (Arthur 1966). The lack of communal kill sites is curious given the prevalence of bison within the park today, but, as noted earlier, the acidic soils are at least partially responsible. The excavations at the Windy Bison site indicated that only a single male bison had been killed and butchered. Cannon et al. (1997: 170) suggest that game animals were probably taken by small groups of hunters.

Besides faunal remains, inferences of hunting can be made because of the presence of projectile points. Test excavations of 20 sites in the Hayden

Table 2. Summary of prehistoric subsistence data in the Yellowstone Lake area.

	Species										
Area	Bovine	Bison	Elk	Bison/ Elk	Deer	Sheep	Bear	Felid/ Cat	Canid/ Dog	Rabbit	Vole
						Blood Residue[1]					
North Shore				1	6	1	1	2	2	4	
West Thumb	1					1				1	
						Faunal Remains					
North Shore[1]		58 (MNI = 1)	3 (MNI = 1?)			1 (MNI = 1)					1 (MNI = 1)
LeHardys Rapids to Fishing Bridge[2]	7 Medium Sized Mammal Bones (Deer/Sheep/Pronghorn)										

[1] Cannon, Pierce, Stromberg, and MacMillan (1997: Table 56).
[2] Sanders (2001: Table 27)
MNI = minimum number of individuals

Valley–Yellowstone River area recovered 40 projectile points, or an average of two points per site (Sanders 2000, 2001). Similar work in the Lamar Valley of northeastern Yellowstone found only six projectile points in eight prehistoric sites (Sanders, Wolf, and Rogers 1997), while excavations at sites along the Mammoth-to-Norris highway in northwestern Yellowstone found seven points from nine prehistoric sites (Sanders 1998)—both areas exhibiting less than one point per site. This suggests that hunting activities played a larger role within the Hayden Valley–Yellowstone River area than in these other two investigated areas of Yellowstone, despite the fact that the Lamar Valley, especially, also traditionally holds large numbers of potential game animals (National Park Service 1997).

Much of the prehistoric diet was composed of plants—usually the seeds, roots, or tubers. Archeologically, sites associated with the procurement and processing of plant resources are often identified by the presence of groundstone implements used to grind seeds and other plant remains. However, groundstone implements are uncommon in the park. Within the Yellowstone Lake area, the most prominent site with groundstone is 48YE701 (Cannon et al. 1997), located on the north shore near Steamboat Point, and which is also near the Windy Bison site. Limited groundstone suggests that processing of plant resources was similarly limited, or else utilized a different technology that is not presently showing up archeologically. Blood residue analysis of the groundstone from 48YE701 suggests that these types of implements could also be used to process animal remains, not plant remains (Cannon et al. 1997: 179).

The other line of archeological evidence for prehistoric use of plants is from fire hearths. These are usually about 1 m in diameter and 20–30 cm deep and often filled with burned rocks. Macrofloral analysis of the hearth fill can often reveal charred plant remains, most often chenopodium-amaranth seeds. However, such features are also uncommon within Yellowstone, and have generally yielded few charred plant remains. The lack of such features is unusual since their other function is to provide heat—essential for survival within Yellowstone's cool climate.

The limited number of identified hearths may be due to their low archeological visibility within Yellowstone. As noted above, burned rocks are commonly associated with hearth features; however, the local volcanic rocks do not change colors or fracture differently when heated in fires. In essence, culturally heated volcanic rocks do not look any different than the natural ones, which prevents archeologists from detecting the presence of fire hearths at an archeological site.

Geomorphological Factors

A factor concerning the locations and patterns of archeological sites is changes in the landform through time. Within the Yellowstone Lake area, Kenneth Pierce and others (e.g., Hamilton and Bailey 1990; Pierce, Cannon, and Meyer 2001) have documented changes in the level of Yellowstone Lake during the past 10,000–12,000 years. Obviously, this would have limited some of the areas available for occupation, especially during the Paleoindian period. Recent work within the Hayden Valley–Yellowstone River area (Sanders 1999, 2000, 2001) provides some additional details on the landform changes downstream from Yellowstone Lake.

In the late Pleistocene, after deglaciation, Alum Creek created a large outwash plain that was at least 5–10 m higher than the present level of the Yellowstone River. Alum Creek, and the Yellowstone River, started downcutting through the outwash plain sometime later. The starting date for this downcutting is not currently known, but was probably initiated by about 12,000 years ago, since a buried Paleoindian-age occupation was found in sediments overlying the outwash plains gravels at sites situated near the mouth of Alum Creek (Sanders 2000). Lower bracketing radiocarbon dates have been obtained from organic layers overlying fine alluvial sands, and indicate that 8,500 years ago in the Otter Creek area (a few miles north of the Hayden Valley), the Yellowstone River was approximately 1 m higher than it is at present, but had only cut down to within 2 m of the present river level in the Buffalo Ford area by 6,500 years ago (Sanders 2001: 159). Some of the reason for this may be due to the differential raising and lower of the Yellowstone caldera along a fault line that passes through LeHardy Rapids, just upstream from the Buffalo Ford area, as documented by Pierce, Cannon, and Meyer (2001).

The higher elevation of the Yellowstone River during the Paleoindian and Early Archaic periods indicates that such occupations should consequently be found on the higher terraces. Likewise, the lower terraces along the Yellowstone River would only have been available for occupation after the Early Archaic period. This appears to be the case in the Otter Creek–Chittenden Bridge area (just to the north of the Hayden Valley), where the first occupations at 48YE446 (Sanders 1999) and 48YE516 (Reeve 1984) are associated with the Middle

Table 3. Number of sites/components by area and period.

Chronological Period	Hayden Valley/ Yellowstone River	North Shore of Yellowstone Lake/ Pelican Creek	West Thumb	South Shore of Yellowstone Lake	Total
Paleoindian (ca. 11,500–8000 BP)	4 (23.5%)	7 (41.2%)	6 (35.3%)	0 (0%)	17
Early Archaic (ca. 8000–5000 BP)	2 (14.3%)	6 (42.9%)	5 (35.7%)	1 (7.1%)	14
Middle Archaic (ca. 5000–3000 BP)	8 (33.3%)	5 (20.8%)	9 (37.5%)	2 (8.3%)	24
Late Archaic (ca. 3000–1500 BP)	12 (38.7%)	10 (32.3%)	7 (22.6%)	2 (6.5%)	31
Late Prehistoric (ca. 1500–500 BP)	13 (41.9%)	9 (29.0%)	8 (25.8%)	1 (3.2%)	31
Multiple Components	10 (33.3%)	7 (23.3%)	10 (33.3%)	3 (10.0%)	30

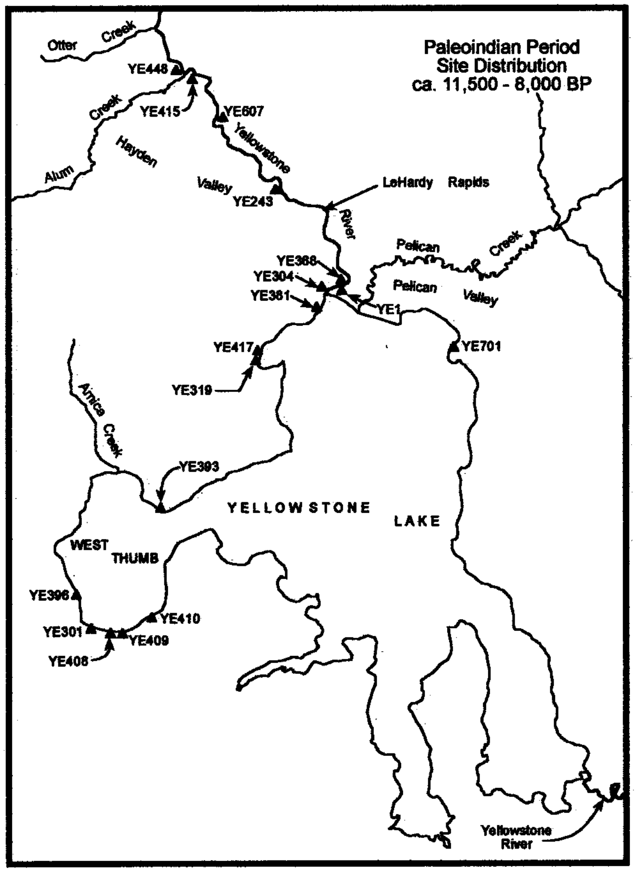

Figure 2. Paleoindian period site distribution in the Yellowstone Lake area.

Figure 3. Paleoindian artifacts from the Hayden Valley–Yellowstone River area. From left to right: fish-tailed point fragment from 48YE243, Scottsbluff point from 48YE448, and a spurred end scraper, also from 48YE448.

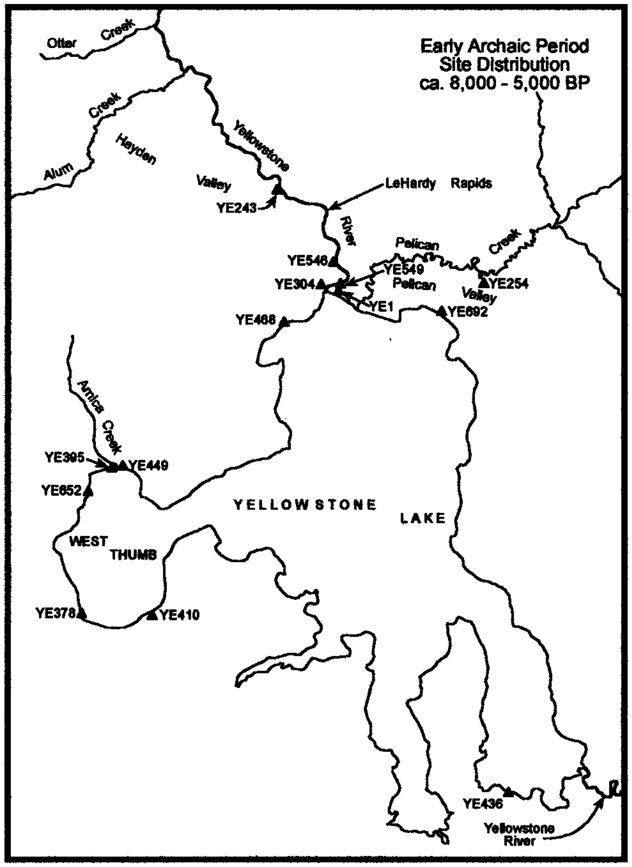

Figure 4. Early Archaic-period site distribution in the Yellowstone Lake area.

Archaic period (i.e., 5,000–3,000 years ago). The availability of the Yellowstone Lake shore for prehistoric occupation is much more complex (Pierce, Cannon, and Meyer 2001).

Prehistoric Land-Use Patterns

Investigations into the prehistoric use of the Yellowstone Lake area are based on the spatial distribution of those prehistoric sites containing chronologically diagnostic artifacts and/or radiocarbon dates. These data are summarized by area and chronological period in Table 3 from data presented in Table 4. The actual distribution of Paleoindian sites is presented in Figure 2. This figure shows that there are four sites in the Hayden Valley–Yellowstone River area, seven sites in the North Shore area (especially around the Fishing Bridge–Yellowstone Lake outlet), and six sites in the West Thumb area. Although it could be argued that some of this distribution may reflect areas that have received the most archeological investigations, it should be noted that most of these sites were initially

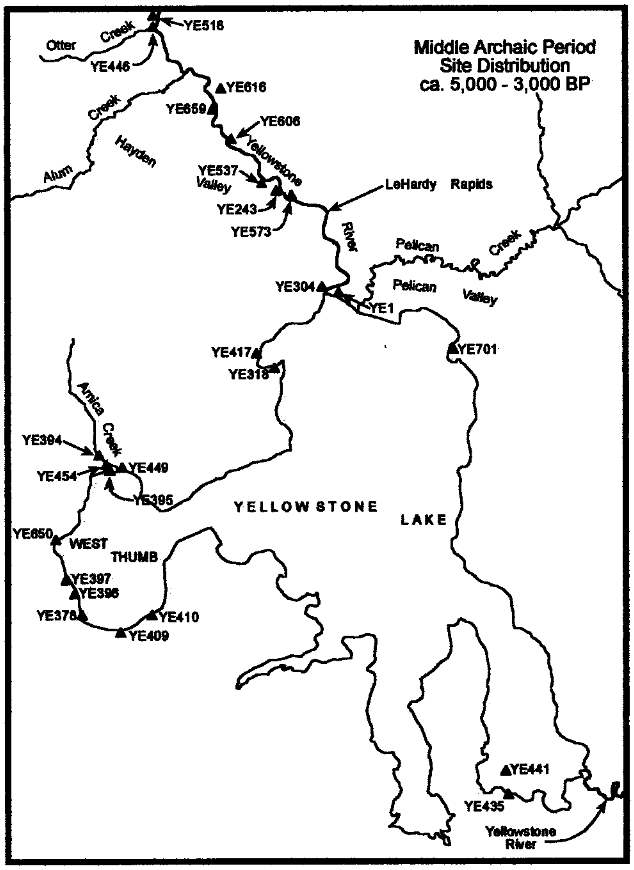

Figure 5. Middle Archaic-period site distribution in the Yellowstone Lake area.

recorded during first professional inventory of Yellowstone in 1958–1959.

One of the interesting aspects of the Paleoindian occupations is the presence of Cody Complex-style artifacts from this portion of Yellowstone, along with other stemmed or “fish-tailed” points (Figure 3). Cody knives and Scottsbluff points have been considered more “plains” adaptations, for example the Horner buffalo kill site near Cody, Wyoming, which incidentally contained the base of an obsidian Scottsbluff point thought to be from Yellowstone (Frison 1991: 66; Frison and Todd 1987: 275). The distinctive Cody Complex artifacts appear to illustrate the movement of peoples from plains or basins into mountainous areas, while the fish-tailed points appear to a part of a mountain–foothills-adapted complex that developed at around the same time.

The Early Archaic period shows a continuation of the use of the North Shore–Fishing Bridge and West Thumb areas (Figure 4). Within the West Thumb area, some of the focus has shifted to Arnica Creek, whose use may have been allowed due to a subsidence in lake levels. There appears to be less utilization of

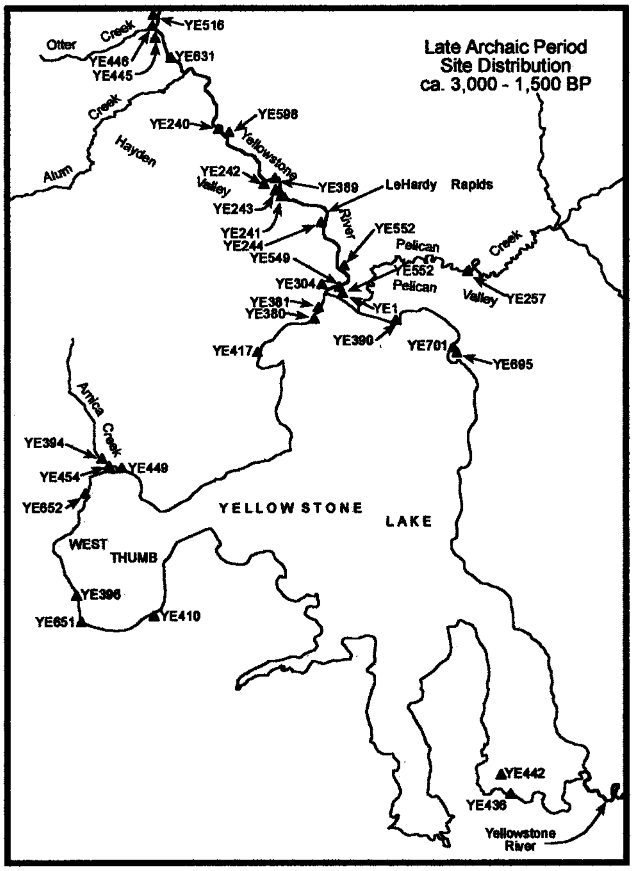

Figure 6. Late Archaic-period site distribution in the Yellowstone Lake area.

the Hayden Valley–Yellowstone River area during this period, but also the first apparent utilization of the South Shore of Yellowstone Lake.

The Middle Archaic period shows an overall increase in the number of components, with an apparent shift from the North Shore to both the West Thumb and Hayden Valley–Yellowstone River areas and additional components along the Southeast Arm of Yellowstone Lake (Figure 5). One of the latter occupations is located on the Molly Islands, indicating that the first use of watercraft occurred during this period. Within the Hayden Valley–Yellowstone River area, the increase in components may be partially due to the availability of new, lower landforms for occupation.

The Late Archaic period shows an increased use of the Hayden Valley–Yellowstone River and North Shore areas (Figure 6 and Table 3). The number of components slightly decreased in the West Thumb areas, while those along the South Shore remained the same. The Hayden Valley has the highest percentage (38.7%) of use (Table 3).

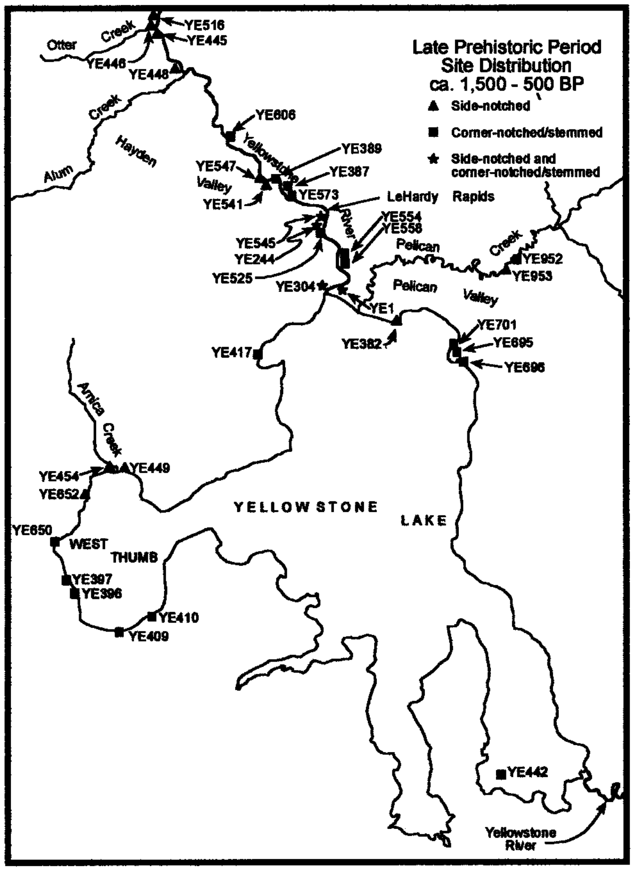

Figure 7. Late Prehistoric-period site distribution in the Yellowstone Lake area.

The Late Prehistoric period shows a slight increase in the use of the Hayden Valley–Yellowstone River and West Thumb, but slight decreases in the use of the North and South shores of Yellowstone Lake (Figure 7 and Table 3). One of the sites at Arnica Creek (48YE449) contained pottery, the only instance within Yellowstone (Taylor, Wood, and Hoffman 1964). Figure 6 also shows the distribution of two styles of Late Prehistoric-period projectile points: side-notched and corner-notched/stemmed points. The latter may be associated with the early portion of the Late Prehistoric period (i.e., Reeves' Tower Junction subphase). These sites appear to be more prevalent within the southern portion of the Hayden Valley area and throughout the shorelines of Yellowstone Lake. The side-notched points are more limited in distribution, although they co-occur at sites in the Fishing Bridge to LeHardys Rapids area along the Yellowstone River, and at Arnica Creek on the north side of West Thumb.

The shifts in occupations are summarized in Table 3, where it is evident that the North Shore has the highest percentages for the Paleoindian and Early

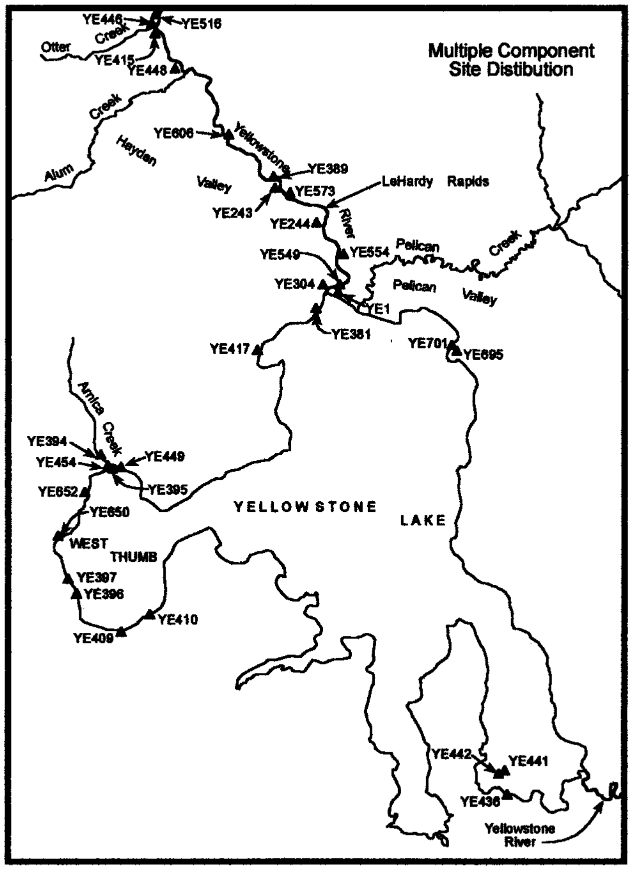

Figure 8. Multicomponent site distribution in the Yellowstone Lake area.

Archaic periods, while the Hayden Valley–Yellowstone River area has the highest percentage during the Late Archaic and Late Prehistoric periods. The pattern of use of the West Thumb also shows high percentages during the Paleoindian through the Middle Archaic periods, the latter exhibiting the highest percentage. The highest percentage for the South Shore area is also during the Middle Archaic period. However, the patterns exhibited in this latter area are based only upon sites recorded during 1958–1959. Additional inventories in this area would likely reveal additional prehistoric occupations, especially considering that the upper Yellowstone River Valley has been posited as a probable access route from Jackson Hole (Wright 1975; Crockett 1999)—as has the upper Wind River Valley.

Finally, the overall pattern in the use of the Yellowstone Lake area is depicted through the distribution of sites containing multiple components (Figure 8). Figure 8 shows that the multicomponent sites are concentrated in a small area of the South Shore of Yellowstone Lake, the west half of West Thumb, the North

Table 4. List of prehistoric sites and their general location and chronological periods.

Site	Area	Paleoindian	Early Archaic	Middle Archaic	Late Archaic	Late Prehistoric Side-notched	Late Prehistoric Corner-notched stemmed	References
48YE240	Hayden Valley/ Yellowstone River				X			Sanders 2000
48YE241	Hayden Valley/ Yellowstone River				X			Sanders 2001
47YE242	Hayden Valley/ Yellowstone River				X			Sanders 2000
48YE243	Hayden Valley/ Yellowstone River	X	X	X	X	X		Sanders 2000
48YE244	Hayden Valley/ Yellowstone River				X	X	X	Sanders 2000
48YE387	Hayden Valley/ Yellowstone River						X	Mitchell 2001
48YE389	Hayden Valley/ Yellowstone River				X		X	Shortt 1999a
48YE415	Hayden Valley/ Yellowstone River	X						Sanders 2000
48YE445	Hayden Valley/ Yellowstone River				X	X		Sanders 2001 Shortt 1999a
48YE446	Hayden Valley/ Yellowstone River			X	X	X		Sanders 1999
48YE448	Hayden Valley/ Yellowstone River	X				X		Sanders 2000
48YE516	Hayden Valley/ Yellowstone River			X	X	X		Sanders 2000
48YE525	Hayden Valley/ Yellowstone River						X	Sanders 2001
48YE537	Hayden Valley/ Yellowstone River			X				Sanders 2000
48YE545	Hayden Valley/ Yellowstone River					X	X	Sanders 2001
48YE546	Hayden Valley/ Yellowstone River		X					Sanders 2001
48YE547	Hayden Valley/ Yellowstone River					X		Sanders 2000
48YE552	Hayden Valley/ Yellowstone River				X			Mitchell 2001
48YE554	Hayden Valley/ Yellowstone River						X	Mitchell 2001
48YE558	Hayden Valley/ Yellowstone River						X	Mitchell 2001
48YE573	Hayden Valley/ Yellowstone River			X			X	Mitchell 2001
48YE598	Hayden Valley/ Yellowstone River				X			Mitchell 2001
48YE606	Hayden Valley/ Yellowstone River			X		X		Mitchell 2001
48YE607	Hayden Valley/ Yellowstone River	X						Mitchell 2001

Table 4. Continued.

Site	Area	Paleoindian	Early Archaic	Middle Archaic	Late Archaic	Late Prehistoric Side-notched	Late Prehistoric Corner-notched stemmed	References
48YE616	Hayden Valley/ Yellowstone River			X				Mitchell 2001
48YE631	Hayden Valley/ Yellowstone River				X			Mitchell 2001
48YE659	Hayden Valley/ Yellowstone River			X				Sanders 2000
48YE1	North Shore	X	X	X	X	X	X	Taylor et al. 1964 Reeve 1989 Cannon et al. 1997
48YE304	North Shore	X	X	X	X	X	X	Taylor et al. 1964 Reeve 1989 Cannon et al. 1997
48YE318	North Shore			X				Taylor et al. 1964
48YE319	North Shore	X						Taylor et al. 1964
48YE368	North Shore	X						Taylor et al. 1964
48YE380	North Shore				X			Cannon et al. 1997
48YE381	North Shore	X			X			Taylor et al. 1964
48YE382	North Shore					X		Cannon et al. 1997
48YE390	North Shore				X			Taylor et al. 1964
48YE417	North Shore	X		X	X		X	Taylor et al. 1964 Sanders and Wedel 1997
48YE468	North Shore		X					Sanders and Wedel 1997
48YE549	North Shore		X		X			Mitchell 2001
48YE692	North Shore		X					Cannon et al. 1997
48YE695	North Shore				X		X	Cannon et al. 1997
48YE696	North Shore						X	Cannon et al. 1997
48YE701	North Shore	X		X	X		X	Cannon et al. 1997
48YE952	Pelican Valley						X	Shortt 2000
48YE953	Pelican Valley					X		Shortt 2000
48YE254	Pelican Valley		X					Shortt 1999b
48YE257	Pelican Valley				X			Shortt 1999b
48YE436	South Shore		X	X	X			Taylor et al. 1964
48YE441	South Shore			X				Taylor et al. 1964
48YE442	South Shore				X		X	Taylor et al. 1964
48YE301	West Thumb	X						Taylor et al. 1964
48YE378	West Thumb		X					Taylor et al. 1964
48YE393	West Thumb	X						Taylor et al. 1964 Cannon et al. 1996
48YE394	West Thumb			X	X			Cannon et al. 1996
48YE395	West Thumb		X	X				Taylor et al. 1964 Cannon et al. 1996

Table 4. Continued.

Site	Area	Paleoindian	Early Archaic	Middle Archaic	Late Archaic	Late Prehistoric Side-notched	Late Prehistoric Corner-notched stemmed	References
48YE305	West Thumb		X	X				Taylor et al. 1964 Cannon et al. 1996
48YE396	West Thumb	X		X	X		X	Taylor et al. 1964 Samuelsen 1983
48YE397	West Thumb			X			X	Samuelsen 1983 Cannon et al. 1996
48YE408	West Thumb	X						Cannon et al. 1996
48YE409	West Thumb	X		X			X	Taylor et al. 1964 Cannon et al. 1996
48YE410	West Thumb	X	X	X	X	X		Taylor et al. 1964 Cannon et al. 1996
48YE449/457	West Thumb		X	X	X	X		Taylor et al. 1964 Cannon et al. 1996
48YE454	West Thumb			X	X	X		Cannon et al. 1996
48YE650	West Thumb			X			X	Samuelsen 1983
48YE651	West Thumb				X			Samuelsen 1983
48YE652	West Thumb		X		X	X		Cannon et al. 1996

Cannon et al. 1997 = Cannon, Pierce, Stormberg, and MacMillan 1997; Taylor et al. 1964 = Taylor, Wood, and Hoffman 1964; Cannon et al. 1996 = Cannon, Crothers, and Pierce 1996

Shore (especially around Fishing Bridge), and spread out along the Yellowstone River. Within the latter area, most of the sites border the Hayden Valley, with only one multicomponent site situated within it. This would suggest that the use of the Hayden Valley may have been as an extractive locale, where resources may have been procured and subsequently brought to campsites located at the valley margins.

The last question concerns evidence for stability versus change in the prehistoric use of the Yellowstone Lake area. Generally, there are few differences between the sites in this area, as they mostly consist of scatters of flakes and chipped stone tools, most of which were made from obsidian, primarily from the Obsidian Cliff source. These sites also contain relatively few fire hearths, groundstone implements, or floral or faunal remains. Although there appears to be some differences in the distribution of sites through time, the reasons for this remain elusive. However, most of the Paleoindian sites (*n*=10, 58.8%; Table 4) were reoccupied by later groups, suggesting that the characteristics that made these particular locales attractive for extractive activities and habitation during the Paleoindian period continued to be attractive in the later periods as well. At this time, it would appear that the limited variability in the archeological remains suggests that prehistoric use of the Yellowstone Lake area has been one of consistency (i.e., stability).

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Paul H. Sanders, Office of the Wyoming State Archaeologist, P.O. Box 3431, University Station, Laramie, Wyoming 82071; psande@state.wy.us

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