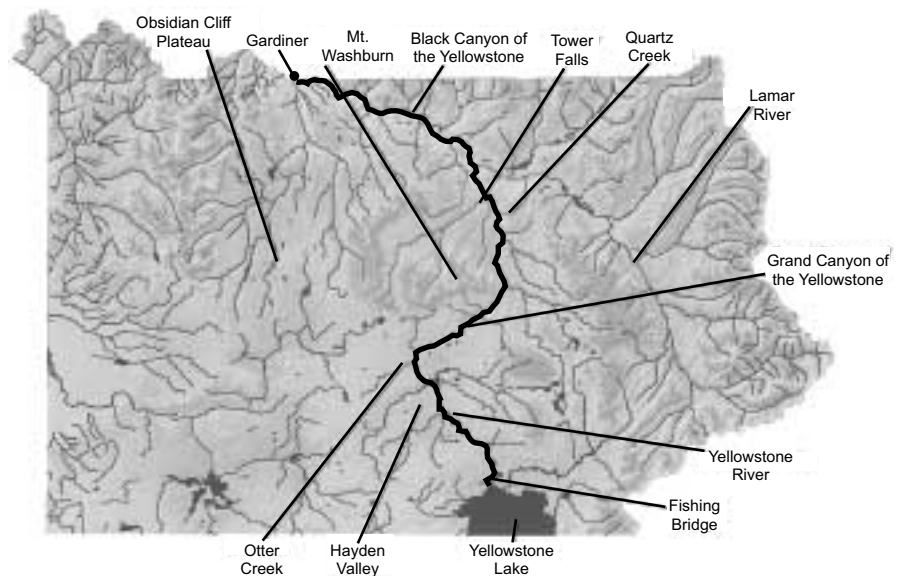


# Museum of the Rockies Archaeological Research in the Canyons of the Yellowstone

by Mack W. Shortt

For the past five years, the Museum of the Rockies (MOR) at Montana State University has been involved in an ongoing cooperative archaeology project with the National Park Service in Yellowstone National Park. Field studies, first conducted during the summer of 1996, have included a number of programs sponsored by the Federal Highways Administration, National Park Service trail realignment/rehabilitation inventories, site documentation and evaluation, and other projects related to infrastructure planning and development. The museum has also conducted archaeological site inventories in the Yellowstone River valley from its outlet at Yellowstone Lake to Gardiner, Montana. The river surveys have provided opportunities to address particular research-oriented questions concerning cultural history, Precontact<sup>1</sup> travel and migration, the exploitation of faunal and floral resources, site seasonality, the use of lithic raw materials, and paleoenvironmental reconstruction, *i.e.*, the use of information recovered through archaeological excavations to indicate past environments. Typically, these data sets include pollen, charcoal, tree-rings, animal bones, and plant parts and seeds.

In general terms, the Precontact Period in Yellowstone National Park and surrounding areas is divisible into a series of archaeological units (*e.g.*, phase), each possessing traits (*e.g.*, projectile point style) that distinguish them from other units. In this paper a phase assumes to represent one social-cultural group definable in space over a period of time. Subphases are divisions of phases that



**FIGURE 1.** An overview of the study area, showing the path of the Yellowstone River through the park from Yellowstone Lake to the town of Gardiner, Montana. Courtesy Kevin Thorson, MOR.

can be used for studying the internal variability within the phase and the relationships to both simultaneous and sequential phases. The term complex is used for a phase with unknown antecedents and descendants.

The purpose of this paper is to summarize some of our findings along the river while focusing on who was in the park and when. Past archaeological surveys, such as those done by the University of Montana at Missoula in 1958 and 1959, the State University of New York in the early 1980s, and Northwest College and the Midwest Archeological Center in the early 1990s, have included portions of the Yellowstone River. However, MOR's work is the first comprehensive site inventory of the Yellowstone River valley. To date, the Yellowstone River inventory from Fishing Bridge to Gardiner is nearly complete, with relatively small segments of the west bank of the river targeted for the upcoming 2001 field season.

## Study Area

The Yellowstone River flows through diverse topographies on its journey from Yellowstone Lake to the town of Gardiner, Montana (Figure 1). It is likely that this sometimes forested, sometimes grassy valley once served as a transportation corridor for people entering the park area from the north and traveling south toward Yellowstone Lake. A total of 244 Precontact sites were recorded by the end of the 2000 field season, including sites discovered by the MOR crew and those recorded by others and subsequently revisited. Site types include large, spatially complex lithic scatters<sup>2</sup> and campsites measuring several hundred meters in length, small lithic scatters, finds of single artifacts, and, in the northern extreme of the study area, cairns (rock piles) and stone circles or tipi rings. Precontact sites are distributed throughout the study area. From Gardiner in the north, sites are

present in relatively low numbers, and they rapidly diminish in the northern extreme of the Grand Canyon of the Yellowstone. A survey of the valley south of Tower Falls failed to record a single site above Quartz Creek. The paucity of archaeological sites in the northern end of the Grand Canyon above Tower Creek is likely due to Precontact movement around the shoulders of Mount Washburn toward Hayden Valley rather than through the canyon itself, which would have been extremely difficult. This hypothesis will be tested this summer by an inventory of portions of the Grand Canyon, and in subsequent years by an archaeological survey of Yellowstone's northern ungulate winter range. South of the Grand Canyon of the Yellowstone, Precontact sites increase in frequency, size, and complexity. These characteristics are especially true from the area south of Otter Creek in Hayden Valley to the outlet of Yellowstone Lake, where 176 sites (73% of all sites) are located.

Precontact peoples were attracted to all sections of the Yellowstone River by an abundance of exploitable resources and the convenient travel route by which it was possible to access the park interior, including the Obsidian Cliff Plateau, Yellowstone Lake, and other known trail systems. Obsidian source analyses of many artifacts collected from sites in the Black Canyon of the Yellowstone and from Hayden Valley to Yellowstone Lake indicate that over 95 percent of specimens tested derive from the Obsidian Cliff Plateau. It is not surprising that Obsidian Cliff volcanic glass dominates the obsidian stone tools found along the Yellowstone River, as these sites are relatively close to the premier obsidian source (Obsidian Cliff Plateau). "Foreign" obsidian from Idaho, southwestern Montana, the Grand Teton National Park area, and other sources in Yellowstone help archaeologists to document the movements of regional peoples who would have replenished their tool kits when in the vicinity of those stone sources.

### Prehistoric Use

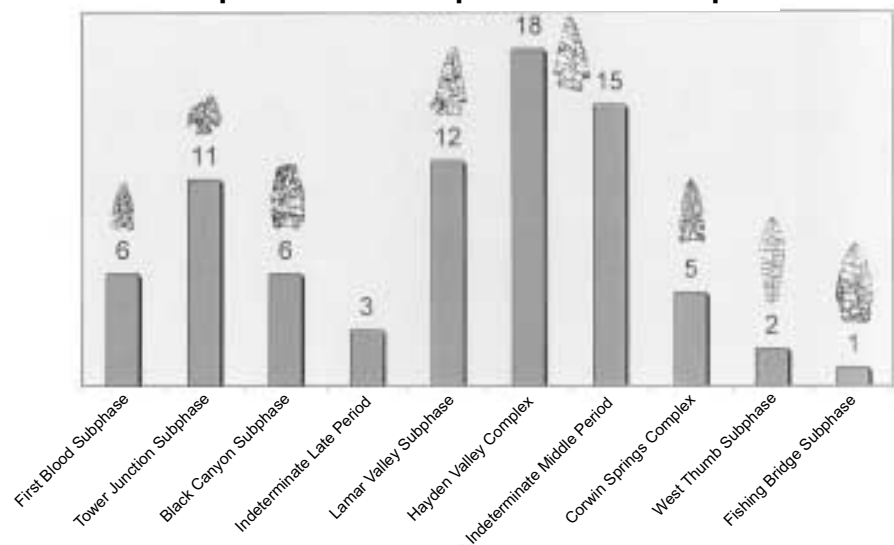
The archaeological sites found along the Yellowstone River demonstrate that nearly all segments of the river valley

were utilized during the Precontact Period; however, many questions regarding cultural and temporal affiliation remain. Although the dating of archaeological sites by reference to projectile point styles is not always appropriate (not all points represent classic types that are easily assigned to cultures and time period), it does provide a general framework for understanding the relative temporal range of the use of the Yellowstone River during the Precontact Period. Figure 2 thus illustrates the frequencies of Yellowstone River projectile point types that are assignable to particular Precontact Periods. Those points from the Late Precontact Period (Table 1), dating from 1,600 to possibly 200 years before the present (BP), are those in the first four columns from the left. Included are six specimens assigned to the First Blood Subphase representing a Late Precontact Numic (thought to be prehistoric Shoshone) occupation of the project area from possibly 800 to 200 years BP. A more intensive occupation of the Yellowstone River valley is manifested by 11 specimens identified as Tower Junction Subphase projectiles. These corner notched, often barbed arrow points are roughly contemporane-

ous with other late Precontact forms, such as those in the Todd Phase east and south of Yellowstone. Black Canyon Subphase points, representing local Avonlea Phase occupations that date from 1,600 to 1,200 years BP are relatively uncommon. This is interesting because Avonlea sites are common in northern Montana, Alberta, and Saskatchewan.

If the number of projectile points recovered during survey activities is indicative of the intensity of occupation, then it appears that the Yellowstone River valley system was most intensively utilized during the Middle Precontact Period. The human use of the Yellowstone River valley has fluctuated in intensity through time. It is probable that environmental changes (warming, drying, cooling, increased moisture) created more or less favorable conditions for people and local plants and animals. The Lamar Valley Subphase and Hayden Valley Complex points are numerous. These represent, respectively, regional expressions of the Pelican Lake Phase (3,000 to 1,600 years BP) and the McKean Complex (4,500 to 3,000 years BP). Hayden Valley Subphase components are well-represented where ground surfaces of the

**Frequencies of Subphases and Complexes**



**FIGURE 2.** Numbers of projectile points for each cultural group/time. It is assumed that relative numbers of these diagnostic artifacts can be used as proxy data for intensity/duration of occupation. Points in the indeterminate categories are fragmentary and cannot be identified specifically, but because of their size and flaking can be assigned to the relative time period. Courtesy Kevin Thorson, MOR.

**TABLE 1. YELLOWSTONE NATIONAL PARK PRECONTACT ARCHAEOLOGICAL SEQUENCE**

**Late Precontact Period (ca. 1,600 to 200 years BP)**

- First Blood Subphase (Ahvish Phase) (800 to 200 years BP)
- Tower Junction Subphase (Uinta Phase) (1,600 to 800 years BP)
- Black Canyon Subphase (Avonlea Phase) (1,600 to 1,200 years BP)

**Middle Precontact Period (ca. 7,750 to 1,300 years BP)**

- Antonsen Subphase (Besant Phase) (1,800 to 1,300 years BP)
- Lamar Valley Subphase (Pelican Lake Phase) (3,000 to 1,600 years BP)
- Hayden Valley Complex (McKean Complex/Hanna Phase) (4,500 to 3,000 years BP)
- Corwin Springs Complex (Mummy Cave Complex) (7,750 to 4,500 years BP)

**Early Precontact (Paleoindian) Period (ca. 11,500 to 7,750 years BP)**

- West Thumb Subphase (9,000 to 7,750 years BP)
- Fishing Bridge Subphase (9,500 to 8,500 years BP)
- Windust/Cascade Complex (10,000 to 9,000 years BP)
- Agate Basin/Hell Gap Complexes (10,000 to 9,500 years BP)
- Clovis Complex (11,500 to 10,000 years BP)

appropriate age are visible in exposed river benches and terraces. The frequency of sites of this age suggests a considerable increase in resource harvesting and occupancy along the Yellowstone River relative to earlier periods. The Corwin Springs Complex points represent the regional subphase of the Mummy Cave Complex in Yellowstone National Park. Their low frequency relative to those of the Hayden Valley Complex reflects, in part, natural processes that have removed ancient surfaces or so deeply buried them that they are not found by archaeological inventories. The West Thumb and Fishing Bridge subphases include early Precontact Period lanceolate and stemmed forms found during examination of museum collections. These are not discussed in this paper.

In addition to undertaking extensive inventory studies along the Yellowstone River, the museum crew conducted test excavations at five sites recorded in the Black Canyon of the Yellowstone during the survey program. These excavations were initiated as part of a site assessment program aimed at recovering archaeological deposits threatened annually by spring runoff. The need for such a program became apparent during early season flooding in 1996 and 1997, when resultant erosion created an excellent opportunity for assessing the depth, age, and extent of the archaeological deposits at each site. The MOR crew hoped to encounter well-separated, stratified deposits often missing at archaeological sites elsewhere in Yellowstone National Park. Of the five sites tested, two are discussed here.

**Ryder Site**

The first site investigated was the Ryder site, located on the south side of the Yellowstone River in its Black Canyon. During the initial inventory program there in 1996, the crew visited a large site associated with a well-defined river terrace that had undergone extensive terrace edge erosion. Large segments of the terrace had slumped and exposed quantities of fire-cracked rock, faunal remains, stone flakes, and a variety of formal stone tools including projectile points, bifaces (knives), scrapers, and expedient flake tools. Fire-cracked rock in this context is evidence of eroded hearths and roasting pits. Lithic material types were varied and included brown and red Madison

Formation cherts, chalcedonies, obsidian, and a limited number of quartzite and basalt artifacts.

In July 1997, the museum crew returned and established a small excavation block over the part of the terrace that was actively eroding and slumping into the river. Excavation exposed a stratigraphic profile consisting of a series of buried soil horizons and associated artifact assemblages. Fire-cracked rock features, faunal remains, and a variety of stone tools characterized each level. The uppermost buried soil, located only a few centimeters below the ground surface, did not contain any cultural materials. It did, however, yield a significant number of faunal specimens, one of which provided a radiocarbon age of 190±40 years BP. It is likely that this soil represents a stable landscape prior to the last major depositional event along the river near the end of the Little Ice Age (525–150 BP), a period of colder temperatures and increased precipitation.

At a depth of roughly 70 centimeters below the surface, crew members exposed a mixed Black Canyon Subphase/First Blood Subphase component associated with a thick, buried soil horizon. Cultural materials include scattered fire-cracked rock, hearth-like features, side-notched and tri-notched projectile points, bifaces, scrapers, flake tools, and, for the second time in Yellowstone National

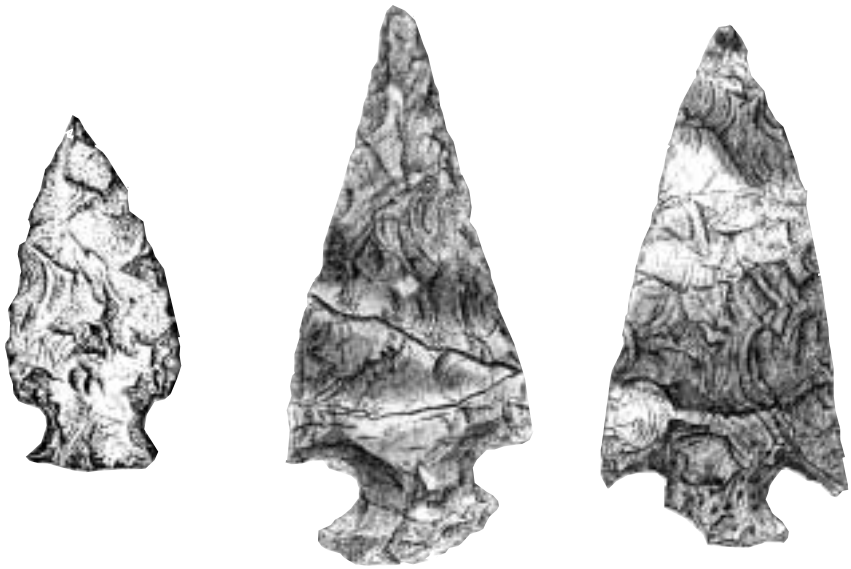


*Doug Mitchell excavating at the Ryder site. The light layer represents overbank flood deposits, while the dark zone contains remains of the Precontact campsites.*

Park, prehistoric pottery. A preliminary analysis of 96 sherds indicates that they fit into the range of variation for Inter-mountain Ware. Two radiocarbon dates were subsequently secured for the mixed component; 630+/-70 years BP and 930 +/-60 years BP. Mammalian species identified in the faunal record include bison, elk, pronghorn, and a very large number of skeletal fragments identified as mountain sheep. Of significance was the presence of three fetal sheep bones that suggest a late spring to early summer occupation of the site. Pollen and charcoal analysis indicated that sagebrush, spruce, pine, and Douglas-fir were used as fuel sources by the site's inhabitants.

Continued excavation at the Ryder site exposed a third, more deeply buried soil horizon that yielded several fragmentary Lamar Valley Subphase (or Pelican Lake Phase) projectile points and other tool forms. In addition to a diverse lithic assemblage larger and more complex than the later First Blood/Black Canyon component, this occupation is characterized by a considerable amount of fire-cracked rock and a zooarchaeological assemblage representing a relatively wide variety of mammals. Species identified in the faunal assemblage from the Lamar Valley component at the Ryder site include bison, elk, hare, marmot, pronghorn, and mountain sheep. The pollen record indicates that Douglas-fir, willow, and aspen grew in the vicinity of the site and were likely used as fuel sources. One faunal specimen subsequently provided a radiocarbon age of 2,370+/-60 years BP.

Like many of the sites in the Black Canyon of the Yellowstone, the deepest cultural deposits identified at the Ryder site consist of what are likely Hayden Valley Complex or McKean Complex materials. Although projectile points were not recovered *in situ*, a small number of points typical of the McKean Complex were collected from the river bottom and from eroded lumps of soil. The lowest buried soil horizon from which these materials are thought to derive contained small quantities of debitage, faunal remains, and fire-cracked rock. Fortunately, a radiocarbon age of 3,220+/-50 years was secured on a piece of animal bone from the soil horizon, supporting an assignment of these materials to the McKean



*A projectile point and two hafted knives (actual size) from the Pelican Lake camp at the LBD site. The knives are manufactured out of stone from the Hellroaring Creek drainage. Drawings by Tah Madsen.*

Complex. Pollen studies undertaken on soil samples taken during excavation suggest that a well-developed riparian community that included alder and pine surrounded the site. In contrast to the later components, Douglas-fir was not as abundant.

In the end, the Ryder site investigations allowed the crew to assess a portion of the site that would have eroded and slumped into the river during the summer or following spring. The subsequent collection of archaeological and paleo-environmental data provided information regarding three Precontact components: an early Hayden Valley Complex occupation followed by a much heavier, intensive use of the site area by Lamar Valley Subphase (Pelican Lake Phase) peoples, and finally, near the end of the Little Ice Age, utilization of the site area by Precontact Native American peoples, who used it as a springtime campsite where a variety of mammalian species were put to use. Stratified sites such as this allow us to study how different people used the same space and resources at different times.

As an aside, recent test excavations conducted last August at the LBD site (named for Dr. Leslie B. Davis of the MOR) on the opposite side of the Yellowstone River revealed a stratigraphic profile similar to the Ryder site. The crew identified a mixed Tower Junction Cor-

ner-Notched/Black Canyon (or Avonlea) component, a Lamar Valley (or Pelican Lake) component, and what also appears to be a Hayden Valley (McKean) component. Comparative analyses between these sites will certainly help us to synthesize and better understand middle- to late-Precontact occupations in the canyon system.

### **BOKR Site**

In the summer of 1999, the Museum of the Rockies crew returned to the BOKR site (named for Dr. Brian O. K. Reeves, professor emeritus of the University of Calgary), a large campsite on the north side of the Yellowstone River in the Black Canyon. Like the Ryder site in 1997, the aim was to conduct assessment-oriented excavations on those portions of the site undergoing erosion. First recorded during the 1996 field season, the BOKR site was heavily damaged by flood-level waters in 1996 and 1997. Subsequent annual snow melt and runoff have continued to erode archaeological deposits onto the sandy river bottom. In addition to lithic debris and the occasional stone tool, large concentrations of fire-cracked rock were observed on the beach between the terrace edge and river channel. These concentrations represent completely eroded roasting pits and hearths. Roasting pits were often used like crock pots to slow

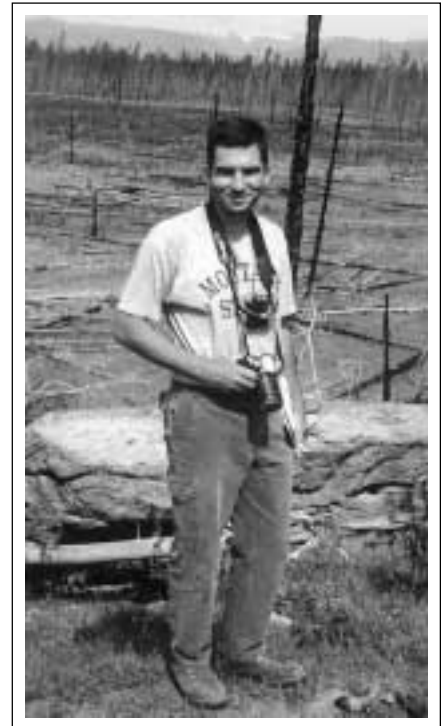
cook high carbohydrate plant remains. Excavations revealed a stratigraphic profile consisting of silty overbank sediments overlying a thick deposit of dark brown organically rich silt. Rather than a series of discrete buried soil horizons with associated archaeological components, the BOKR site consists of a single thick cultural deposit dating to the Tower Junction Subphase, approximately 1,600 to 800 years BP. The projectile points found during excavation include small, finely made corner-notched forms. Other tool types include bifaces, endscrapers, and a notched-pebble netsinker, which would have been used to help hold a fishing net in place in the river. The faunal assemblage, while not as extensive as that recovered at the Ryder site, consists of skeletal elements identified as mountain sheep and an unidentified bird species. Although the amount of fire-cracked rock exposed is suggestive of the processing of animal products, the relative lack of faunal remains may suggest that the processing of plant remains was a more important undertaking. To date, none of the bone or charcoal samples have been submitted for radiocarbon analyses. As with the data from the Ryder site, we certainly look forward to continuing our analyses of the artifactual remains from the BOKR site and incorporating the data into a regional synthesis of Tower Junction Subphase components.

## Summary

The ongoing archaeological project being conducted by the Museum of the Rockies along the Yellowstone River has demonstrated intensive Precontact use of most of the valley. The resulting archaeological record is extensive and suggests that at least 9,000 years of Precontact time is represented. In relative terms, the projectile point data suggest that the heaviest use of all parts of the river, from the town of Gardiner to the outlet of Yellowstone Lake, occurred during the Middle Precontact Period (from 4,500 to 1,600 years BP). Use of the valley system continued into the Late Precontact Period from approximately 1,600 to 200 years BP. Subsequent excavations at five of the sites, two of which were briefly discussed in this paper, revealed well-stratified buried soil horizons with associated middle-to-late-period archaeological components. Archaeological data germane to the study of resource exploitation, cultural history, and paleoenvironmental reconstruction has and will continue to shed light on Yellowstone's cultural past, determining who was in the park at what time—the past is the first step to understanding Yellowstone's archaeology. 🌿

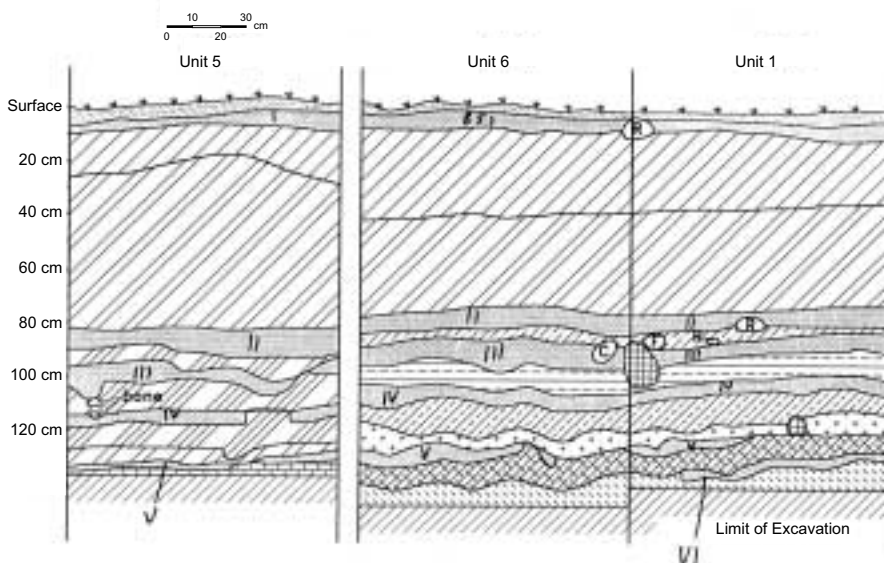
I would like to thank Dr. Leslie Davis of the Museum of the Rockies, Dr. Ann Johnson of the Branch of Cultural Re-

sources in Yellowstone, and Dr. Brian “Barney” Reeves for their ongoing support and guidance, and Devon Finley for her assistance in the production of this article.



NPS photo.

*Mack Shortt was born in Calgary, Alberta, Canada. He received a B.A. and an M.A. in archaeology from the University of Calgary, and has worked in the field of archaeology since 1989, in areas such as the boreal forests of northern Alberta, the Rocky Mountains in Alberta and British Columbia, the Alberta Plains, and the Siksika Nation. From 1993 to 1996 and in 1998 he worked on the Glacier National Park Archaeology Project for the Museum of the Rockies. Since 1996, he has worked for the Museum of the Rockies in Yellowstone National Park—his favorite place in the world.*



*Bank profiles of test units 1, 5, and 6 at the BR site showing six (I–VI) different campsites in this location. These distinct campsites are separated by overbank sand and silt deposits. Unit 1 has two crosshatched rodent holes. NPS graphic.*

## Footnotes

<sup>1</sup> Precontact is perhaps more politically correct than the term “prehistoric.” Both terms are used to mean that time before the coming of the Europeans.

<sup>2</sup> Lithic scatters are Precontact sites identified by the flake debris left from manufacture and repair of stone tools. Campsite is also a generic term for a Precontact site, and may also contain hearths, pottery, archaeological bone, and other materials.