National Park Service photograph

Test excavations underway at the Caribou Crossing site. A grid is projected onto the site to provide reference points for measuring artifact locations in three dimensional space. Sergei Slobodin, an archeologist from Magadan, Russia, and Sabra Gilbert-Young, a graduate student at Washington State University, take notes.

Left: Screening sediment to retrieve small artifacts at the Tuluaq Hill site. Wrench Creek and the De Long Mountains in the background.

National Park Service photograph

Ancient Hunters of the Western Brooks Range: Integrating Research and Cultural Resource Management

By Jeff Rasic

"Look at this one!" "Hey, here's another over here!" "This one is huge...and almost complete!" In the first ten minutes at the Caribou Crossing site—a barren, remote hilltop in northwestern Alaska surrounded by rocky peaks and hundreds of miles from the nearest road or village—the crew of eight archeologists found almost 30 large, masterfully made stone spear points. We suspected they were 10,000-11,000 years old. Even the old sourdoughs on the crew had given in to the excitement and were scurrying around like kids hunting for Easter eggs. And for good reason; rarely does an entire field season encompassing dozens of sites yield so many stone tools, particularly tools this old. The vast majority of known sites in the region consist of a surface scatter, with perhaps five or ten pieces of stone flaking debris. The sites are often impossible to date, a guess of 200-12,000 years old is the most precise archeologists can be. Particularly rare are sites dated to the early end of this time range, and few sites anywhere in the Americas have yielded such a dense accumulation of spear points.

In addition, we had been in a holding pattern for the first three days of the season, huddled in our tents waiting for the snow to melt from a July storm. The crew had just found a focus for their pent up enthusiasm. The systematic, painstaking, and sometimes tedious work of mapping and documenting the site could wait a few minutes while we enjoyed this amazing place. Despite the apparent chaos of archeologists running in all directions, the knoll quickly sprouted a forest of small pin flags, which marked the precise locations of artifacts and ensured each was returned to its original location. We would map these later and examine spatial patterns to reconstruct site activities and to establish the age of artifacts by associating them with any radiocarbon samples we might recover.

Holding these well-crafted tools in the hand, one could not help ponder some interesting questions. What animals were hunted using these massive points? Why were these painstakingly-made weapons thrown away with apparent carelessness and in such large numbers? Was the hilltop crowded with people all at once, or was the accumulation the result of occasional stops by a few hunters over centuries? Were there similar sites on the numerous hilltops visible from this knoll?

But our purpose here was not to tally a high artifact count. Nor did we have a special interest in projectile points. Points, however, and lots of them, were what this site presented, and they were obviously vital to the story the site had to tell. Information from Caribou Crossing was also part of a larger, multi-year program aimed at understanding how the earliest hunter-gatherers in the region made a living. The research sought information on how people structured their seasonal movements across the landscape, how they procured food and other resources, and how they organized family or social groups.

One of the most fascinating problems in archeology is how humans initially settled the Americas at the end of the last ice age, sometime before 12,000 years ago. It is truly an impressive story as nearly all corners of the New World were settled in an archeological instant, perhaps in less than a thousand years. In the process, people encountered unfamiliar plants and

animals, a countryside largely devoid of other people, and all occurring in the face of drastic environmental changes as the climate shifted to one more like that of today's.

The adaptations of early Alaskans is of special interest in this story since most archeologists agree that the first Americans originated in Asia and passed through Alaska. At some point, these people must have adapted to high latitude living, with its extreme seasonality, rapid fluctuations in food availability, and harsh temperatures.

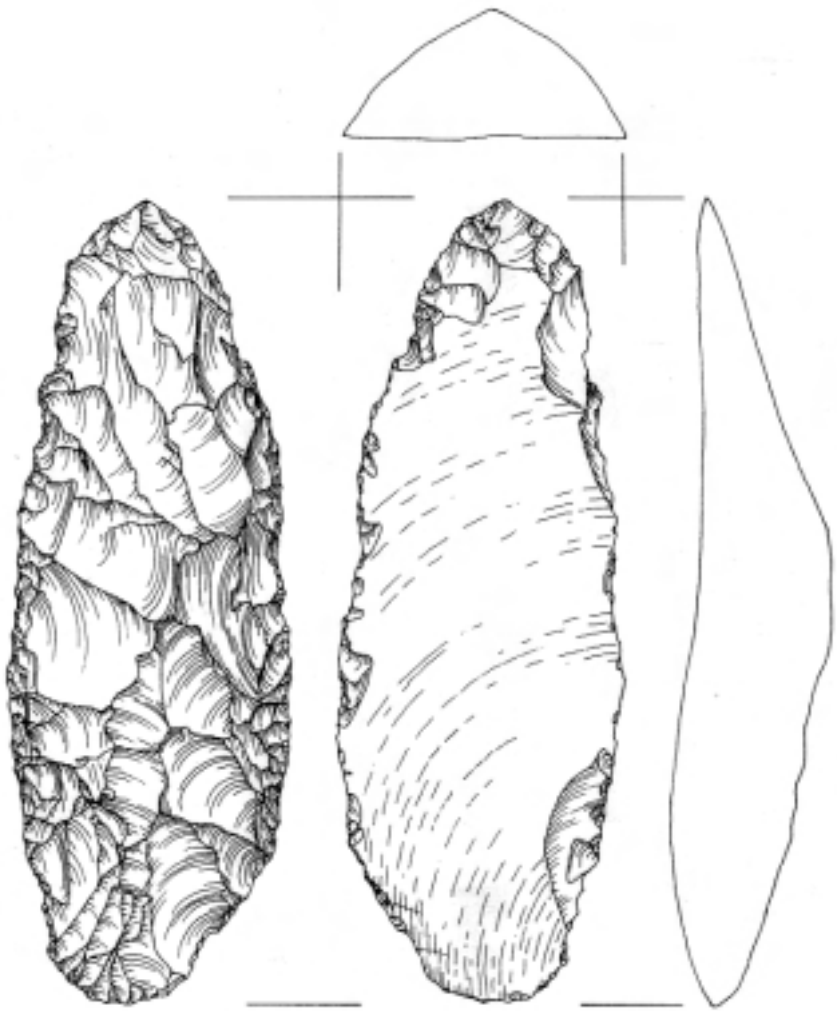


Illustration by Sara Moore

Thick, steep-edged tools like this one are often found in late ice age sites in the Noatak River basin and co-occur with damaged spear points. They show wear marks and damage that indicate use as woodworking tools, and they appear to be part of the tool kit used to manufacture and repair hunting weapons. This specimen is just over 4 inches (11 cm) long.

To understand this process, it is critical to have good information from Alaska—the gateway to the New World as it has been called—as a comparison with the early archeology of mid-latitudes.

The Caribou Crossing project in 2002, conducted by the cultural resources branch of the Western Arctic National Parklands, aimed to investigate both site-specific questions and contribute to some of these broader issues. As a federal agency, however, federal environmental policy and historic preservation laws, particularly the National Historic Preservation Act, were driving forces behind the work. Section 110 of this act directs federal agencies to identify and evaluate historic properties on their lands, and manage and maintain them so as to preserve their values. Furthermore, the National Park Service is unique among federal agencies in that a central part of its mission is to ensure important historic places and the information they hold are cared for and made available for public understanding and enjoyment. These laws and policies recognize that not only are sites valued by living people as links to their heritage and traditions, but are also important for their ability to provide information about history and past human behavior.

A logical first step toward managing the resources is to inventory and evaluate them, a tall order in the vast, remote, and rugged parks of Alaska. Many sites are already known. In the Brooks Range alone, 16.5 million acres of contiguous parklands (Kobuk Valley National Preserve, Noatak National Preserve, and Gates of the Arctic National Park and Preserve) contain more than 1,500 documented sites. To put this in perspective, a recent study estimates only about one percent of the land area has been viewed by archeologists, perhaps another 85,000 sites remain undiscovered.

Threats to the resource are real, especially considering much of the archeological record in northern Alaska is largely a surface phenomenon. Due to slow sediment deposition in the region, tools discarded thousands of years ago are still visible on the ground and are thus vulnerable to erosion, breakage from animal trampling (easy to imagine for anyone who has seen the herds of several thousand caribou that migrate yearly through the Brooks Range), and dispersal due to frost heaving. Other impacts result from current human use. People may unknowingly (but nonetheless illegally) pick up an artifact as a souvenir, or may disassemble an ancient tent ring in order to weigh down a tarp. This is a difficult problem to quantify unless detailed base line information exists, since the absence of artifacts is impossible to detect. It is likely a serious one, given that modern park visitors are drawn to the same places that attracted past inhabitants of these lands—flat, well-drained ground, good viewpoints, and shelter from the wind.

For cultural resource managers, tackling this issue is a huge problem—how can we protect or even find all of the thousands of sites that exist? One way of prioritizing is to focus survey efforts in areas with the highest potential for impacts, such as popular access points or shorelines subject to intense erosion. Another key factor in setting work priorities is the information value of particular sites. Those most likely to have high quality information can be tar-

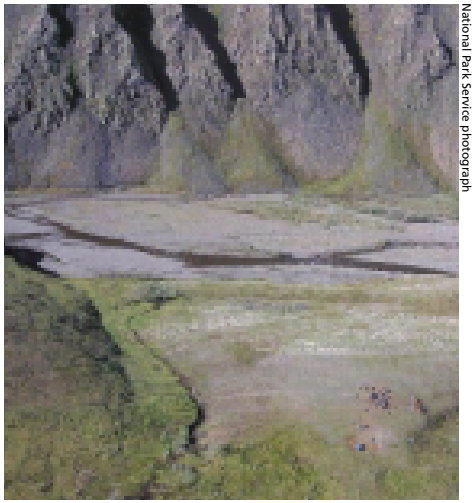
geted for more detailed documentation and protection. While seemingly self-evident, this is a challenge in northwestern Alaska where knowledge about the range of variation in sites and artifact types, and more importantly the causes of the variation, is still in a formative stage. While a site's ability to inform us about an interesting theme in human history or prehistory determines the significance of a site, themes are continually being redefined as we learn more about the archeology of the region. Thus we are presented with a moving target, and one we ourselves are responsible for clarifying.

Another of our goals at Caribou Crossing in 2002 was to flesh out an emerging construct that NPS archeologists were examining as both a research and resource management tool: the Sluiceway Complex. This was a provisional term we had begun to use in reference to a handful of sites from the western Brooks Range, which contained the distinctive projectile points seen at Caribou Crossing. The term "complex" refers to a patterned set of artifact types or manufacturing techniques. It is an imprecise term that simply notes a set of traits that occur together and seem different from other phenomena archeologists have observed. It skirts the tough questions of whether the manufacturers of the tools shared common ideas or values (culture), spoke the same language, or even whether the artifacts date to the same period.

Until recently few sites in northwestern Alaska were dated to older than 9,000 years old, and before five years ago, there was no concept of a Sluiceway Complex or recognition of the artifact styles we were now discovering. Similar spear points had been found as early as the 1960s, but their age and significance were ambiguous. No independent dating (from associated radiocarbon dates or stratigraphy) was available, and guesses based on the artifact shapes and styles varied from 2,000 years to 8,000 years old. Sometimes they were not even recognized as projectile points, but instead simply "bifaces", a general term without any functional or temporal implication.

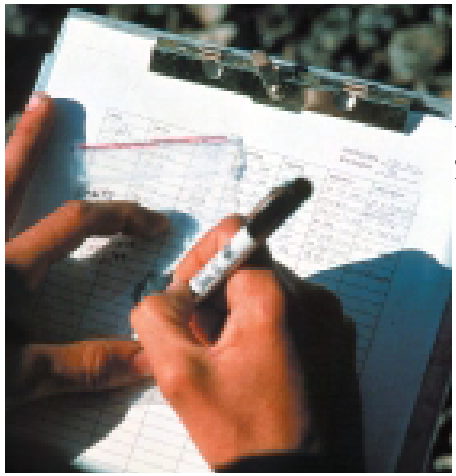
Identification of these tools began to change in 1993 when Western Arctic National Parklands archeologist Robert Gal and U.S. Geological Survey geologist Tom Hamilton discovered a site, later named the Irwin Sluiceway, in the Anisak River drainage, about 70 miles east of Caribou Crossing. Gal recognized the tools as projectile points since they had impact fractures—scalloped scars running down the face or edge of the point, which is a clear indication of a high velocity shock. He also knew these tools were not quite like anything previously noted in the region. The general outline of the points was not unique and could not be differentiated from tools 1,000 or 11,000 years old; however, manufacturing details were very distinctive. The flaking was quite regular, made in a serial fashion down each margin of the point. The edges along the base were ground or polished smooth—probably to help avoid damage to the wood or antler shafts to which the stone points were mounted. These features were reminiscent of early technologies known from the central Brooks Range and North Slope, as well as Paleoindian materials from the western U.S.

It was not until 1998 that an age for the



National Park Service photograph

Test excavations underway at the Caribou Crossing site in 2002.



National Park Service photograph

Archeologists catalog artifacts as they are collected and record precise location information for each item.

National Park Service photograph

A few of the 117 chert projectile points recovered during work at the Caribou Crossing site in 2002. Every single specimen was broken, and not one was a tip fragment. Instead, all are damaged basal portions that would have remained hafted in spear shafts. These were discarded at the site in the process of re-arming spears with serviceable points.

Site	Sample	Radiocarbon Age (years before present)	Context
MIS-495	Beta-165298	9910±40	Hearth feature
	Beta-165299	10,010±40	Hearth feature
NR-5	Beta-146117	9550±60	Wildfire? Sealed stratum
	Beta-146116	9640±300	Wildfire? Sealed stratum
Irwin Sluiceway	Beta-120696	9550±50	Hearth feature
	Beta-134677	10,050±70	Hearth feature
	Beta-131336	10,060±80	Hearth feature
Tuluaq Hill	Beta-133394	7950±40	Hearth feature?
	Beta-122323	11,110±80	Isolated charcoal fragment
	Beta-159913	11,120±40	Hearth feature
	Beta-159915	11,160±40	Hearth feature
	Beta-122322	11,180±80	Hearth feature
	Beta-159914	11,200±40	Above hearth D
	Beta-133393	11,200±40	Hearth feature

Table 1. Radiocarbon dates for charcoal samples from early Noatak river basin sites.

Irwin Sluiceway site — and perhaps the distinctive projectile points it contained — was established. In the summer of 1998, Dennis Stanford, a Paleoindian expert from the Smithsonian, collaborated with Gal on testing the site, and the work uncovered a well-preserved fire hearth. Charcoal samples from the ancient campfire were radiocarbon dated to 10,000 years old. Altogether the site yielded about ten projectile points and a small amount of flaking debris; it appeared to be the remains of a single, briefly occupied hunting camp and lookout site.

During the same season, an NPS inventory project was conducted on Wrench Creek, another Noatak River tributary located in the western portion of the preserve. More spear points of the same style were found at a site named Tuluaq Hill. The site yielded charcoal samples radiocarbon dated to between 11,100-11,200 years. Later work at the site in 1999 and 2001 yielded more dates in this time range and confirmed that the charcoal was from a human-made hearth. We also found hundreds of pounds of flaking debris and more than 300 bifaces that were broken in the process of manufacture. These artifacts indicated that Tuluaq Hill was an intensively used workshop site where people shaped chunks of chert into large bifaces, which were later made into tools such as projectile points or knives. We also recovered 64 worn out or broken projectile points that were discarded at the site in the process of re-arming spears.

The information from Tuluaq Hill helped support an early age range for the Sluiceway technology, but a complex history of site use and relatively shallow stratigraphy at Tuluaq Hill still left many questions unanswered. While the radiocarbon samples were spatially associated with Sluiceway-style artifacts, a concern at this site is whether people at other times in the past had also been drawn there for the same stone raw materials, thus resulting in a mixture of artifacts from different time periods. Dated occurrences of these artifacts at less complicated sites would help refine their age range.

In addition to the new field discoveries, in 1999 more Sluiceway-like artifacts were "rediscovered" in old museum collections. One such discovery was a collection at the Haffenreffer Museum at Brown University from the NR-5 site. Located on the Noatak River in what is now Noatak Preserve, the site was identified and tested by Brown University archeologist Douglas Anderson in the early 1960s. It was briefly described in a 1972 article, but never given much attention in subsequent academic discussions since its age and relationship to recognized complexes was unclear. The collection contains about a dozen spear points, identical to those from the Irwin Sluiceway and Tuluaq Hill sites, and a number of scraping and cutting tools, some of which replicated types seen at Tuluaq Hill. We were now beginning to piece together components of the Sluiceway tool kit other than spear points. The collection also contained microblades — long, thin stone flakes that were mounted in slotted handles for use as cutting tools or projectile armaments. Microblades occur in some, but not all, of the earliest sites in Alaska and are interpreted to indicate cultural contacts with Siberia since this technology is seen much earlier there than it is in Alaska. It would be interesting to know if microblades were also part of the Sluiceway Complex tool kit, and we continue to pursue this question. They have since been found at Caribou Crossing and another Sluiceway Complex site on the Kelly River.

National Park Service photograph

Dozens of microblades — small, regularly shaped slivers of stone — could be detached from a single core and set in pieces of slotted bone, antler, or wood for use as cutting tools or projectile armaments.

Other small collections housed at the University of Alaska Museum have also been found to contain Sluiceway-like artifacts, and additional new sites in Noatak National Preserve were discovered during surveys conducted between 1998 and 2002. Small scale testing at some of these sites has yielded radiocarbon dates. A revisit to NR-5 showed that the artifacts at the site where Anderson excavated occur in a discrete, sealed sediment layer, which has been dated to at least 9,550 years before present. A site near Natinakunit Pass (MIS-495) produced radiocarbon dates from a hearth feature of 9,910 and 10,010 years ago. In all, 19 sites with probable Sluiceway artifacts have been identified in northwestern interior Alaska, centered on the Noatak River Basin and the adjacent North Slope foothills. This is a substantial data set for looking at how some of the earliest known inhabitants of the region lived.

Test excavations at Caribou Crossing in 2002 unfortunately did not produce hearth remains nor samples suitable for radiocarbon dating, but an age estimate of about 10,000 years seems reasonable based on the

National Park Service photograph

Game trails crisscross the Caribou Crossing site. Despite its name, it is not clear which animals were hunted 10,000 years ago when this site was likely occupied.

radiocarbon dates accumulating at similar sites *(Table 1)*. The fieldwork did yield surprising information about prehistoric technology, and hunting and storage tactics. The sheer number of projectiles points, 145 from two nearby localities, is unmatched in any Alaska site of any age. This dense accumulation, along with other lines of evidence, suggests it is unlikely to have resulted from a single occupation. People were instead visiting this location repeatedly. They knew animal behavior well enough to predict their migrations through this narrow valley, probably using the natural topography to limit animal movement and kill large numbers of animals. Which prey species was hunted is still a mystery since no faunal remains (bones) are preserved at the site. It was almost surely a herd animal. Therefore bison, which still roamed northern Alaska at this time, as well as caribou, are good bets. The huge store of meat produced by group hunts like this probably meant that fairly substantial settlements were located nearby, in order to make use of these stores without having to transport them long distances.

The traces of past human activity—along with wildlife sightings, animal tracks, flora, etc.—are another of the rich layers of experience that make being in the wild places of an Alaska national park a memorable and enriching adventure. It is encouraging to think that these are still wild and beautiful places, and 11 millennia of human habitation have only added to their allure. Our understanding of human history in this region is very much a work in progress. Because sites must be evaluated in terms of what they can teach us about the past, it is important to have good baseline knowledge about the sites we encounter and to understand how they relate to interesting research problems. In this sense, research and resource management must proceed simultaneously. Ten years ago, before the age of Sluiceway Complex artifacts were known, a site like MIS-495 would probably have received little attention. Seen from the perspective of a regional research question about hunters and with enough background knowledge to spur interest, the site was given a second look and as a result became one the few sites in the region radiocarbon dated to the early Holocene.

NOTE: Ages cited in this article are expressed in radiocarbon years before present (BP), which differ from actual calendar years. By convention "present" is established as 1950.

Radiocarbon dating is based on the principle that all living organisms—and thus the wood charcoal or bone deposited in archeological sites—contains a small proportion of radioactive carbon-14. Upon an organism's death, carbon-14 is no longer ingested, and it begins to decay at a known rate (a half life of 5,730 years). The amount of carbon-14 remaining in an organic sample can then be used to calculate its age; however, the amount of carbon-14 in the atmosphere has fluctuated slightly over time.

The small errors compound with increasing age and can result in radiocarbon ages that are too young. For example, a radiocarbon date of 10,000 years BP is equivalent to about 11,400 calendar years, and a radiocarbon age of 11,200 years is equivalent to approximately 13,300 calendar years. To control for these discrepancies, scientists have documented the variation in atmospheric carbon-14 and developed calibration curves that can be used to convert radiocarbon ages into calendar years, known as calibrated radiocarbon years.

REFERENCES

Anderson, D.D. 1972.
An Archaeological Survey of Noatak Drainage, Alaska.
Arctic Anthropology 9(1):66-117.

Anderson, D.D. 1988.
Onion Portage: The Archaeology of a Stratified Site from the Kobuk River, Northwest Alaska.
Anthropological Papers of the University of Alaska 22(1-2).

Hopkins, D.M., J.V. Mathews, C.E. Schweger, and S.B. Young (editors). 1982.
Paleoecology of Beringia. Academic Press, New York.

Larsen, H. 1968.
Trail Creek: Final Report on the Excavation of Two Caves on Seward Peninsula, Alaska. Acta Arctic 15:7-79.

Rasic, J.T. and R. Gal. 2000.
An Early Lithic Assemblage from the Tuluaq Site, Northwest Alaska.
Current Research in the Pleistocene 17:66-68.

Rasic, J.T. 2000.
Prehistoric Lithic Technology at the Tuluaq Hill Site, Northwest Alaska. M.A. Thesis, Department of Anthropology, Washington State University.

Reanier, R.E. 1995.
The Antiquity of Paleoindian Materials in Northern Alaska.
Arctic Anthropology 32(1):31-50.

West, F.H. (editor). 1996.
American Beginnings: The Prehistory and Paleoecology of Beringia.
University of Chicago Press, Chicago.