A NORTON TRADITION VILLAGE SITE ON THE ALAGNAK RIVER, SOUTHWEST ALASKA

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ABSTRACT

In 2004, National Park Service archeologists conducted an intensive testing program at a prehistoric village site, DIL-161, along the Alagnak River. The site consists of prehistoric house depressions and a twentieth century cabin complex. Some features are threatened by severe river erosion.

Alagnak prehistory is poorly understood, and no other site has been intensively tested or excavated. Work at DIL-161 revealed that the site includes forty-six prehistoric and seven historic features. Thirteen radiocarbon dates fall between 2140 and 1300 cal B.P., within the Norton period on the Alaska Peninsula. A preliminary comparison between DIL-161 and other Norton sites suggests considerable variation that may be the result of differential resource availability, gradual cultural change, or seasonality.

KEYWORDS: seasonality, intrasite variation, ceramics, Kvichak drainage

INTRODUCTION

The Alagnak River flows west from Kukaklek and Nonvianuk lakes in Katmai National Park and Preserve into the lower reaches of the Kvichak River near where it enters Bristol Bay (Fig. 1). The upper reaches of the river are within view of the mountains of the Aleutian range, but downstream of the confluence of the Nonvianuk and Alagnak rivers, the river meanders through fairly flat, boggy, open spruce tundra.

Much of the Alagnak River is a designated Wild River and is managed by the National Park Service (NPS). In 1997 and 2001, National Park Service archeological survey crews identified and mapped a large prehistoric village site along the Alagnak River, DIL-161. They classified DIL-161, as "one of the most threatened sites on the Alagnak River corridor" because of severe erosion (Hilton 2002:83). In 2004, NPS conducted an intensive testing program at the site to better understand the site and the impacts of erosion.

DIL-161 is located along a section of the river where multiple braids narrow into a single, deep channel about 20 meters across. Local residents mentioned to archeologists that caribou cross the river there in the fall. This may have been the case in prehistory, although the alluvial history of the Alagnak is unknown. Mapping and testing at DIL-161 revealed that the site occupies 3.8 acres (15,400 m^2) and includes forty-six prehistoric features (a

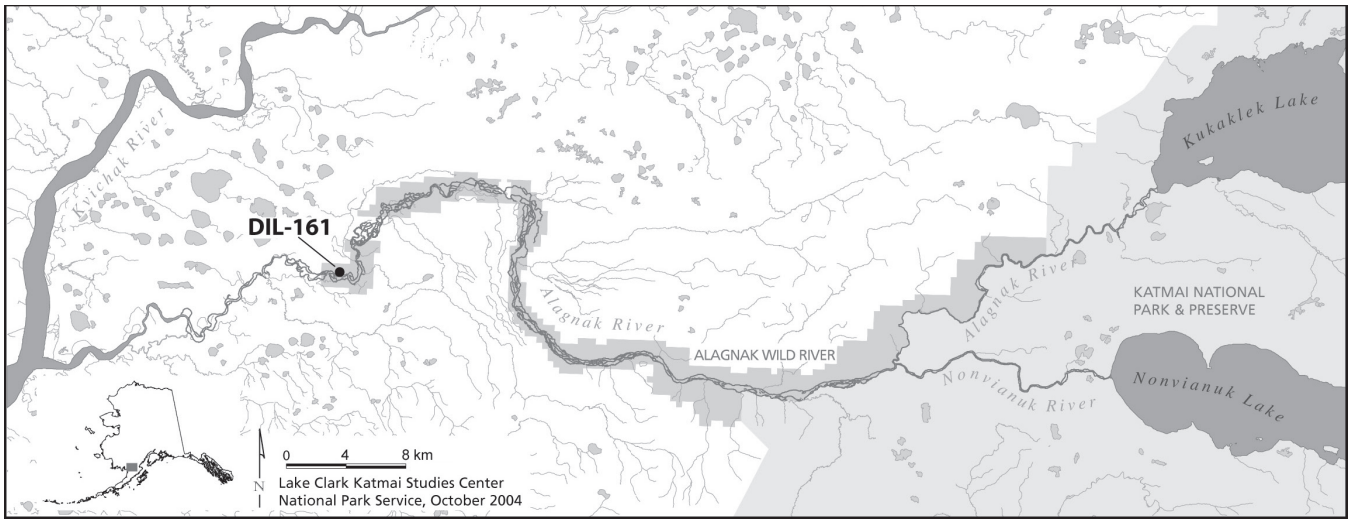

Figure 1. The Alagnak Wild River showing the location of site DIL-161.

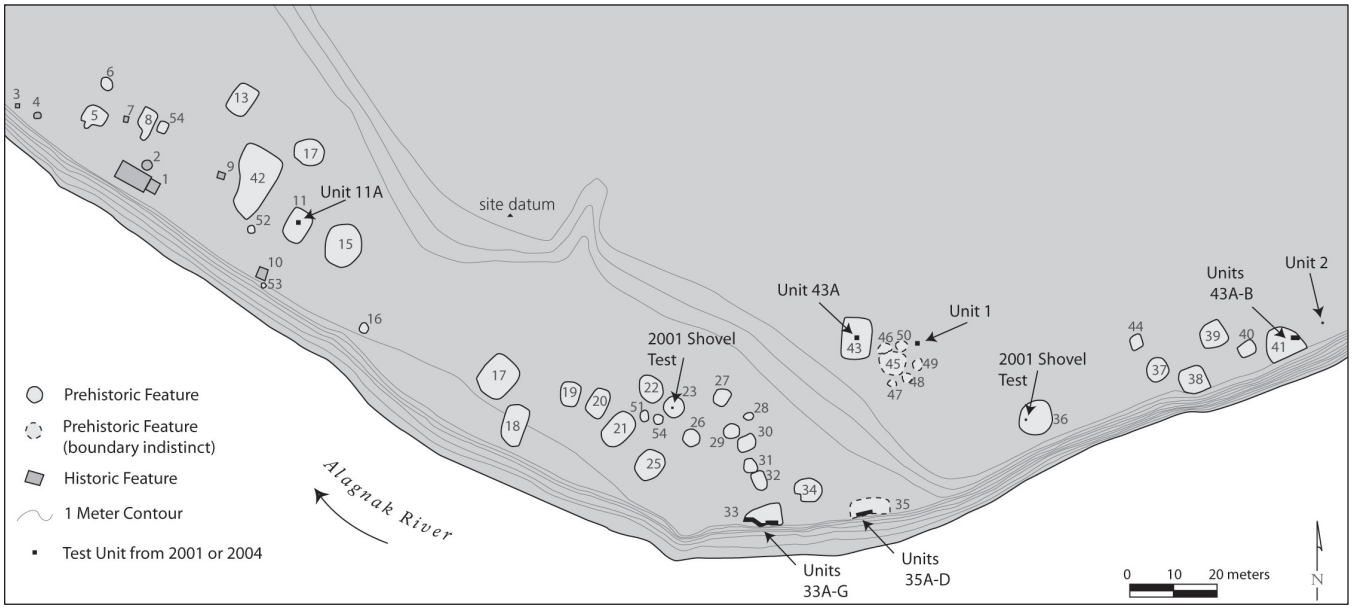

Figure 2. Prehistoric and historic features at DIL-16.

mid-twentieth century cabin and associated structures add another seven features; Fig. 2). Although a few of the features at the western extent of the site may date to the Thule period, six features in the main site area that have been radiocarbon dated fall within the Norton period.

Archeologists have not intensively tested or excavated any other site along the Alagnak River. Shovel testing at several sites during the 1997 and 2001 surveys produced a small number of diagnostic artifacts from a few of the thirty-eight known sites along the river. The artifacts, along with radiocarbon dates, indicated that Alagnak prehistory may be similar to that of the more intensively studied Naknek River and Ugashik drainages to the south. Work at DIL-161 generally supports this hypothesis, although artifacts and features differ in some ways from those reported from other Norton tradition sites.

HISTORIC USE OF THE ALAGNAK RIVER

Historic use of the Alagnak River area has been documented through archival research (NPS 1983; Stirling 1982) and ethnographic interviews (Endter-Wada and Levine 1994; Crow 2001). Additional interviews with elders in Levelock and Igiugig were conducted by Morseth in 2000 and by Hilton in May 2001 (summarized in Hilton 2002). In addition to documenting traditional place names for the area, informants indicated current and past uses such as trapping, ice fishing, and dogsled travel in the winter,

and fishing with traps in the summer. Historic remains of these activities include several cabins and camps as well as a village site thought to date to the late 1800s (Luttrell 1997). Crow (2001:3) described the richness of the Alagnak River's recent culture history:

> In the spring the people catch birds and gather eggs, sourdock, wild celery and fiddlehead ferns. In the summer camps, fish are gathered for smoking, salting, canning, and freezing for the winter. When dogs were used as the major mode of transportation, fish was stored for them, too. Long ago, fish was stored in underground pits and was used to make fermented fish heads, a delicacy. In the fall season, salmon berries, blackberries, blueberries and cranberries are gathered and stored for winter. Also wild game such as caribou and moose are caught. After the bears have consumed berries, they are ready to eat. In the late fall, white fish are harvested and stored for the winter. In the winter, smelt, trout and grayling are caught by ice fishing. Trapping is still done, to provide fur for hats, mittens, coats and household use such as throw rugs and furniture coverings.

In modern times, most of the above-mentioned resources are available at DIL-161. The two main ecosystems nearby are the shrub tundra on which the site is located and low-lying marshy areas (tundra ponds and sloughs of the river). Together these host an assortment of berries and other plants as well as small game. The narrowing of the river creates a bottleneck for fish and a crossing point for large game. Despite the year-round availability of various resources in the area, the majority of modern subsistence use is reportedly in the winter.

NORTHERN ALASKA PENINSULA PREHISTORY

The prehistory of the Alagnak River is not well understood, but other interior rivers on the upper Alaska Peninsula have been more intensively studied, especially the Naknek and Ugashik drainages (Fig. 3). Dumond (1981:189-190) defined five traditions (divided into ten phases) in the Naknek drainage area. The first of these is the Paleoarctic tradition (9000-7000 B.P.), characterized by blade technology and wedge-shaped cores. Habitations were temporary campsites. After an apparent hiatus, the Northern Archaic tradition (5000-3900 B.P.) appeared in the area. Flaked stone projectile points (especially side-notched varieties), knives, and scrapers dominate Northern Archaic assemblages. Assemblages attributed to the Arctic Small Tool tradition (3900–3100 B.P.) appeared after the Northern Archaic. These are characterized by small, finely flaked bipoints and scrapers, adzes, and a few small microblades and burins. Small campsites and small permanent houses are known from this period. After another hiatus, the Arctic Small Tool tradition was followed by the Norton tradition (2300–900 B.P.). Norton assemblages include the first ceramics in the area (generally fiber tempered), as well as larger flaked stone projectile points and knives, drills, notched sinkers, pecked stone vessels and lamps, flaked bifaces and the occasional ground slate knife. The permanent houses from this period in the Naknek drainage are of small, relatively shallow, single-room construction (although they are larger elsewhere, such as Kukak Bay, Clarks Point, and Ugashik; Clark 1977; McMahan et al. 2000; Henn 1978 respectively). The Thule tradition (900 B.P. to historic contact) succeeded Norton and is characterized by thick-walled, gravel-tempered ceramics; ground slate projectile points and ulus; planing and splitting adzes, hammerstones, abraders and whetstones; bone harpoon points and bone or antler wedges. Houses are deeper and more sturdily constructed than Norton houses. After 600 B.P., multiroom houses appear in the Naknek drainage. The cultural sequence from the Ugashik drainage, far to the south, is very similar to the Naknek drainage (Henn 1978:75–85).

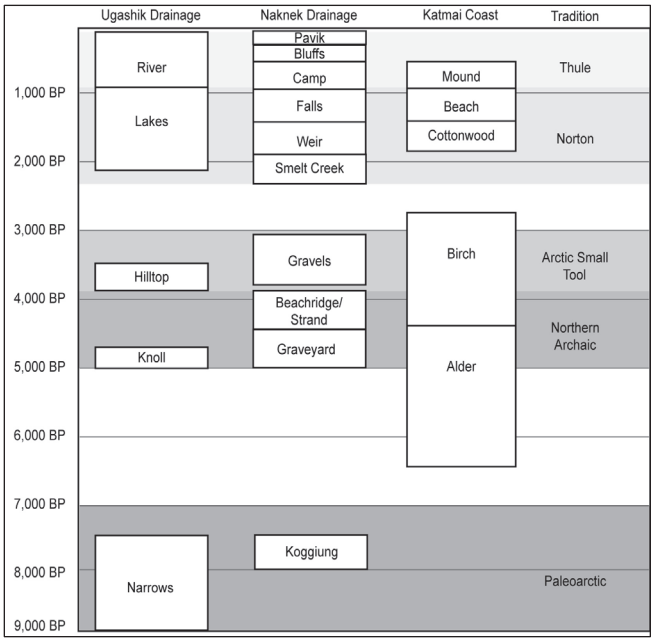

Figure 3. Alaska Peninsula Culture History, after Dumond (1981).

Henn (1978:84–85) suggested that the Naknek and Ugashik records are the result of broad regional patterns. The Alagnak drainage, like the Naknek and the Ugashik, flows into Bristol Bay from the western flank of the Aleutian range. All three areas have substantial rivers with large salmon runs and uplands that host caribou and other game as well as berries and edible plants. The prehistory in the Alagnak area is not well known, with less than four percent of the Wild River corridor surveyed at the reconnaissance level. Radiocarbon dates from seven sites reveal prehistoric occupation from 2140 cal. B.P., with some evidence for two periods of occupation (one before 1300 cal. B.P. and the other from 750 to 310 cal. B.P.; Hilton 2002). Archeological sites that are likely older have been found along the river but are undated. Artifacts suggestive of the Paleoarctic tradition were found at a site near the Nonvianuk Lake outlet of the river (ILI-102), including a subsurface microblade scatter with a core platform tablet (Rasic 1998). A blowout site near the Kukaklek Lake outlet (ILI-088) produced surface artifacts consistent with both the Paleoarctic and Northern Archaic traditions (Vinson, pers. comm. 2005). The two sites are undated. Previous to the current project, all diagnostic artifacts from dated sites along the Alagnak fit with the Naknek/Ugashik cultural sequence (Hilton 2002). All fiber-tempered ceramics were found in sites that dated to before 1000 cal. B.P. while a single gravel tempered example was found in a site that dated to 750 cal. B.P. A ground stone adze preform also dated to 1700 cal. B.P. Five Alagnak sites have features that appear to be multiroom houses. Three of these sites are dated, and all post-date 750 cal. B.P (Hilton 2002).

THE NORTON TRADITION

The Norton culture was first defined by Giddings (1949, 1964) from his work at the type site of Iyatayet in eastern Norton Sound, and was later described by others at numerous sites along Alaska's western coast (Dumond 2000). Differences between the preceding Arctic Small Tool tradition and the Norton tradition signify a change in subsistence focus. According to Dumond (2005:30), Norton people had:

> a developed interest in harvesting massive fish runs, while the taking of sea mammals along the coast was also practiced. Compared to most representatives of the Arctic Small Tool period, increases in sedentariness and in attention both to sea coasts and salmon streams are unmistakable.

Some collections made before the description of the Norton culture, first attributed to the Near-Ipiutak culture, were reclassified as Norton or Norton-Near Ipiutak (Giddings and Anderson 1986:312). As more sites were studied, it became apparent that "the chronology of the Norton tradition was markedly different between the coasts of the Chukchi and Bering seas" (Dumond 2000:4). On the Chukchi Sea, the umbrella Norton tradition includes the Ipiutak, Norton (Norton-Near Ipiutak), and Choris cultures, while the Bering Sea sequence (which includes the Alaska Peninsula) shows more homogeneity (Dumond 2000). This interpretation is not universally accepted. Giddings and Anderson (1986:315) recognized the continuity between the Ipiutak, Norton, and Choris cultures, but placed them all within the Arctic Small Tool tradition, along with the earlier Denbigh Flint complex. This implies that Ipiutak, Norton, and Choris are as distinct from each other as they are from Denbigh, while Dumond (2000) concluded that Ipiutak, Norton, and Choris show continuity and represent a distinct break from the Arctic Small Tool tradition.

Shaw and Holmes (1982:3) attempted to explain the various incarnations of Norton tradition cultures and the attendant "taxonomic confusion" with the concept of the Norton Interaction Sphere. The interaction sphere is "a high level abstraction with both spatial and temporal dimensions in which communication … takes place" (Shaw and Holmes 1982:4). The concept of the interaction sphere offers a framework for describing the complex cultural developments and connections across western and interior Alaska from 2500 to 1000 B.P., but it risks introducing so much variation into what can be called a Norton site that it could render the term nearly meaningless. In this paper, I generally follow Dumond's terminology and the term *Norton tradition* will refer to the larger entity encompassing a variety of cultures and phases, *Norton period* will refer to the date range during which Norton tradition sites occur in the Alaska Peninsula area, and *phase* will refer to a cultural unit with a limited geographical and temporal range (e.g., the Smelt Creek phase of the Norton period). Dumond (1981) referred to the Norton tradition date range as the Brooks River period, but I substitute the term Norton period to avoid any confusion about applying the term beyond the Brooks River sites. Radiocarbon dates from the current project (discussed further below) are

all within the Norton period as defined for the Naknek/Ugashik area by Dumond (1981, 1982, 2000).

METHODOLOGY

Mapping and testing at DIL-161 accomplished two goals. First, the entire site was mapped and selectively tested to better understand its extent. Second, features that were actively eroding or in danger of eroding were investigated by subsurface testing. Six research questions formed the basis of the project design:

1. Which of the surface depressions are cultural and what was their function?
2. How many temporal components are present at the site (i.e., are all the features contemporaneous, or are there multiple occupations representing different time periods)?
3. What is the relationship between the eroding, potentially eroding, and potentially impacted features and the site as a whole?
4. In what season was the site occupied, and what activities were carried out at the site?
5. What type of house form (house architecture) is represented by the eroding depressions?
6. What are the similarities and differences between DIL-161 and other archeological sites in the upper Alaska Peninsula region, including contemporaneous coastal and Brooks River sites? What is the significance of DIL-161 relative to these sites?

A three-part testing program was designed to address the six research questions, including: (1) site and profile mapping, (2) soil probing and small-scale feature testing, and (3) large-scale feature testing. In the first part of the program, the crew intensively surveyed the area and mapped all features. Rebar monuments were set at intervals bordering the river bank to serve as permanent measuring points for monitoring erosion rates. The exposed river bank was cleaned for profiling where possible.

The second part of the program was designed to test features sufficiently to characterize archeological deposits across the site. Probes and single test units (1 x 1 m or 50 x 50 cm) were placed inside and outside the surface depressions to verify that depressions are cultural in origin, to obtain material for radiocarbon dating, and to locate possible buried features and exterior activity areas. Features at the site fall into five categories: very large single room (represented only by Feature 42), large single room, small single room, cache pit, and possible multiroom (Table 1). Very hummocky tundra made the possible multiroom features, which tended to be shallower, difficult to discern. Repeated construction episodes, especially at the central portion of the site, made identifying features by surface topography difficult.

In addition to differences in size and shape, features appeared to be spatially patterned into three clusters—west, central, and east. Archeologists initially believed that the clusters might be temporally sequential. Hoping to sample features from different time periods, and given that the very large feature (42), and a small single room feature (23) had already been tested by survey crews, we selected noneroding features for testing based on spatial patterning rather than feature type. Feature 11 was selected in the west cluster because it appears typical of that cluster, and Feature 43 in the central cluster because it is on the upper terrace and two eroding features from that cluster would be tested on the lower terrace. Two areas were selected for testing outside features, Unit 1 and Unit 2, because there appeared to be anthropogenic sediments in the soil probe. The final part of the research program was more intensive feature testing, during which larger areas were excavated in the three features suffering the worst erosion (33, 35 and 41). The testing program was designed to recover data threatened by erosion, date three distinct spatial areas of the site, and assess site boundaries by determining the extent of deposits outside surface features.

RESULTS

Limited testing in two features and two outside areas and intensive testing at three features produced 6,056 artifacts, mostly lithic flakes and ceramic sherds, from floors and fill. One hundred and twenty-five samples of organic material were collected.

Table 1. Features at DIL-161.

Feature Type	Feature Number
Historic	1–4, 7, 9, 10
Prehistoric	
Very Large Single Room	42
Large Single Room	11, 15, 17, 18, 21, 25, 33, 35, 36, 38,41
Small Single Room	5, 12, 19, 20, 22, 23, 26, 27, 29, 30, 31, 32, 34, 37, 39, 40, 44
Cache Pit	6, 16, 28, 51–54
Possible Multiroom	8 and 54, 45–50

Stratigraphy

Under the modern vegetation across the site is a thin (less than 0.5 cm thick) whitish tephra that is probably from the 1912 Mt. Katmai/Novarupta eruption. In some places, below the tephra is a reddish, mottled, sandy silt that contains decayed organics and is not cultural. Another light-colored tephra, informally called the "second" tephra, is below either the sandy silt or the 1912 tephra. It is often thicker than the 1912 tephra, more than 1 cm in places, but can also be very thin and is not present across the site. Based on its stratigraphic position above the dated cultural layers, the second tephra could be from the same event as the layer designated "Ash C" in the Brooks River area by Dumond (2005:8), which fell about 600 years ago. A third possible tephra underlies the second tephra across the site (occasionally with noncultural sandy sediments between). The layer is 1 to 2 cm thick, consists of dark brown to black silt above grey silty sand, and was informally named the "black-and-grey" layer. No cultural material was found above the black-and-grey layer in any test unit or profile (with the exception of modern debris on the surface).

Cultural sediments underlie the black-and-grey layer. The first cultural layer in all tests was mixed cultural fill—silty sand with sparse concentrations of artifacts and lenses of charcoal. In features, one or more house floor levels are below the mixed cultural fill (in the two tests outside features, sterile sand and gravel are below the mixed cultural fill). Floors are 1 to 3 cm thick, charcoal-rich layers with dense concentrations of artifacts and debitage. In Feature 33, there were two distinct floor levels separated by a layer of "floor fill." The top "floor" may in fact have been roof fall if the roof of the house was an activity area. Under the house floor in every feature excavation unit was sterile sand and gravel.

Radiocarbon Dates

Twelve samples of organic material were radiocarbon dated. Table 2 and Fig. 4 show radiocarbon results, plus the single sample from the 2001 season. Previous radiocarbon dates suggested that there were two periods of occupation on the Alagnak: 1870–1700 cal. B.P. and 750–310 cal. B.P. (Hilton 2002). The current suite of dates extends the first range to 2140–1300 cal. B.P. It seems likely that future radiocarbon dating at Alagnak sites will close the gap between the two periods and even, given the presence of Paleoarctic artifacts at Kukaklek and Nonvianuk Lakes, extend the range into the early Holocene.

Table 2. Radiocarbon dates from DIL-161.[a]

	Lab Number (Beta-)	Provenience	Material Dated	Technique	Conventional Radiocarbon Age (1-sigma)	Calibration Curve Intercept	Calibrated Age Range (2-sigma)
1	196941	Fea. 33 Floor	charcoal	AMS	1390 ± 40	1300	1340–1260
2	196947	Fea .33 Floor	charcoal	extended count	1480 ± 60	1350	1520–1280
3	196945	Fea. 41 Fill	charcoal	AMS	1580 ± 40	1500	1550–1380
4	196948	Fea 33 Floor	charcoal	AMS	1580 ± 40	1500	1550–1380
5	159796	Fea. 36 Floor (from 2001)	bark	AMS	1760 ± 40	1700	1800–1560
6	196939	Fea. 35 Fill	bark	standard	1810 ± 60	1720	1880–1570
7	196938	Fea. 11 Floor	charcoal	extended count	1850 ± 80	1810	1960–1570
8	196940	Fea. 33 Fill	charcoal	extended count	1880 ± 90	1830	2000–1580
9	196944	Fea. 35 Floor	charcoal	AMS	1890 ± 40	1840	1900–1720
10	196937	Fea. 43 Floor	charcoal	AMS	2100 ± 70	2060	2320–1900
11	196946	Fea. 41 Floor	charcoal	AMS	2130 ± 40	2120	2300–2250, 2170–2000
12	196943	Fea. 35 Base of Floor	charcoal	extended count	2140 ± 70	2130	2330–1940
13	196942	Fea. 35 Top of Floor	charcoal	AMS	2150 ± 40	2140	2310–2230, 2190–2010

a All dates are B.P.

Radiocarbon testing produced dates with calibrated radiocarbon curve intercepts between 2140 and 1300 cal. B.P. (a 2-sigma calibrated range between 2330 and 1260 B.P.). The features in the western part of the site near the cabin differ from the rest of the site, where depressions are deep and oval in shape with no entry. Features 5 and 8 are shallow depressions with entryways visible in the walls. Feature 8 may have a side room (mapped as Feature 54). These features may date to a later occupation, but were not tested because they are filled with garbage from the occupation of the cabin. Another mapped feature, numbered 45–50, is poorly defined and may be a shallow multiroom house or merely the result of tundra hummocks or prehistoric construction activity. The features tested all dated to the time of the Norton period on the Alaska Peninsula, but radiocarbon dates and the presence of historic and apparently late prehistoric features indicate that the site may have been occupied during Norton, Thule, and historic times.

Radiocarbon dates from the site appear to fall into three groups: the earliest from 2140 to 2060 cal. B.P., the middle from 1840 to 1700 cal. B.P., and the most recent from 1500 to 1300 cal. B.P. These three groups were tested for contemporaneity (Table 3), following the procedure recommended by Long and Rippeteau (1974). Features from the early group are most likely to be occupied during

Table 3. Probability of contemporaneity of apparent radiocarbon date groups.

Dates	F	Probability of Contemporaneity
All 13 dates	1.26	≈ 25%
Late Group: dates 1–4	0.80	≈ 50%
Middle Group: dates 5–9	0.09	≈ 99%
Early Group: dates 10–13	0.06	≈ 99%
Late and Middle Groups	0.83	< 50%
Middle and Early Groups	0.56	> 75%

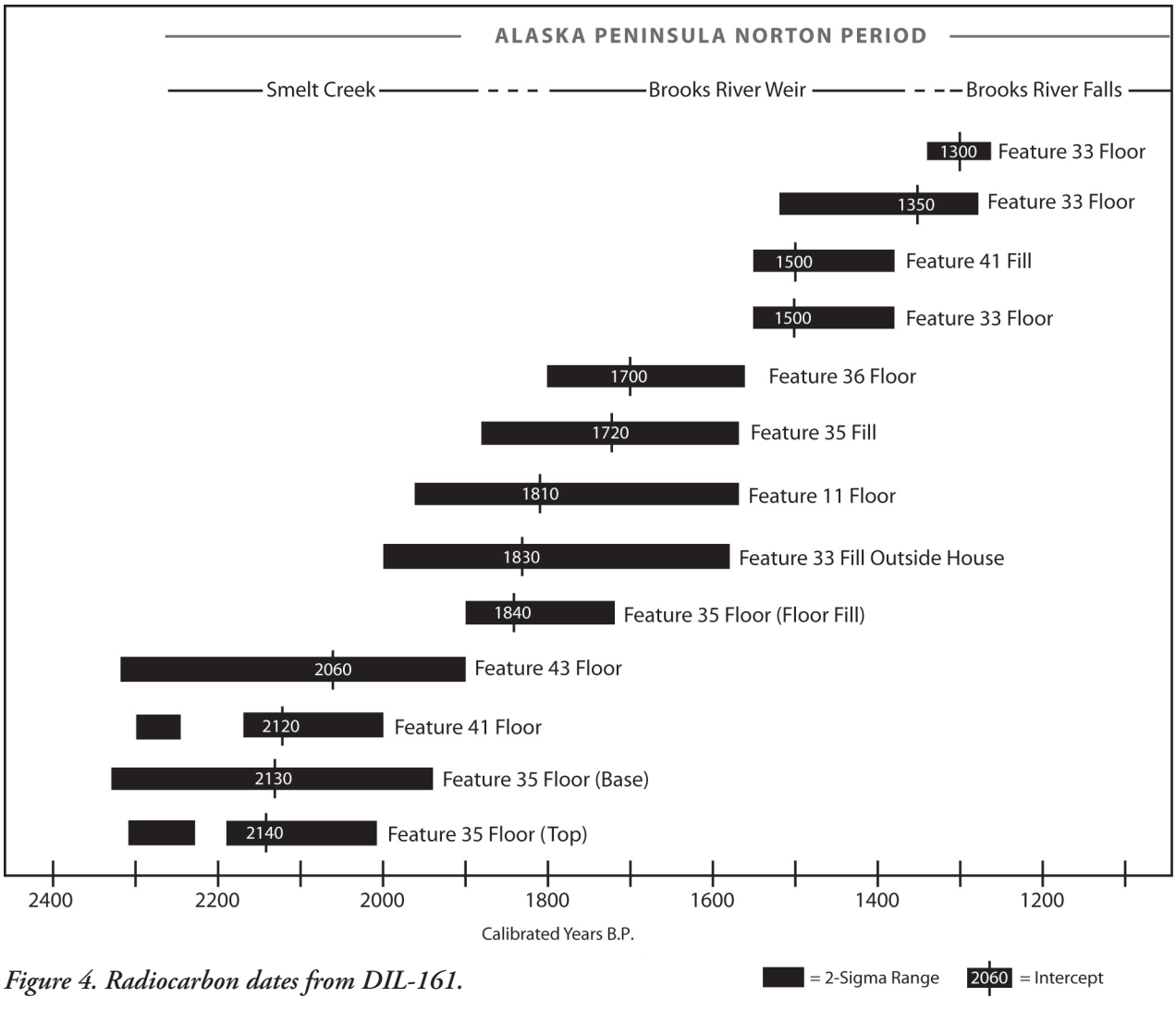

Figure 4. Radiocarbon dates from DIL-161.

the same time period, and features from the middle group are also highly likely to have been contemporaneous. The probability of contemporaneity for the two groups together is slightly lower, but still an acceptable possibility. The dates in the late group are slightly more likely to be contemporaneous than the late and middle groups together. If the most likely results are accepted, Features 43, 41, and 35 were occupied around the same time in the early group of dates (if the date on the floor fill is excluded because it is several hundred years younger than dates above and below it). Features 36 and 11 were occupied around the same time the fill in Features 33 and 35 was deposited, in the middle group of dates. Three of the four dates in the late group come from the floor of Feature 33. The remaining late date comes from the fill in Feature 41, indicating that both terraces were in use later in the Norton occupation of the site. Although it is possible that the three groups overlap in time, the division into three different time periods is validated by the statistical analysis. Whether the groupings actually represent three different occupations of the site—between which it was not occupied—is another issue. Only six of the forty-six prehistoric features were dated, and it is possible that dating other features would close the gaps between the three groups.

Fig. 5 shows radiocarbon dates mapped by provenience and age group. All three age groups include at least one feature (fill or floor) from both the upper and lower terraces. Apparently large areas of the site were used throughout the occupation. Overall, radiocarbon dates confirm that the site was occupied intensively over a long period.

FEATURE ARCHITECTURE

Substantial depressions visible on the surface indicate that semisubterranean houses at DIL-161 were relatively large and deep. No single feature was completely excavated, but some architectural features such as walls and post holes were found in test units. Excavation at Features 33 and 35, the intensively tested houses in the actively eroding area, revealed cross-sections of the features. Table 4 gives characteristics of features excavated at DIL-161.

The limited excavation indicates that Norton tradition houses at DIL-161 are large semisubterranean structures with unconstructed central hearths. Size varies, but all appear to be larger than 5 m on the shortest side (some unexcavated features may be smaller). The superstructures are supported by thick upright logs at the edges of the floor surrounded by smaller upright posts as needed (Bundy 2006). Sod, grass, or bark may have been used for roofing, but poor organic preservation makes the identification of roofing materials difficult. None of the houses appear to have been abandoned in a sudden or unplanned manner. There may be features other than houses at DIL-161 but none were encountered in the excavation and hummocky tundra topography makes smaller depressions on the ground surface difficult to identify.

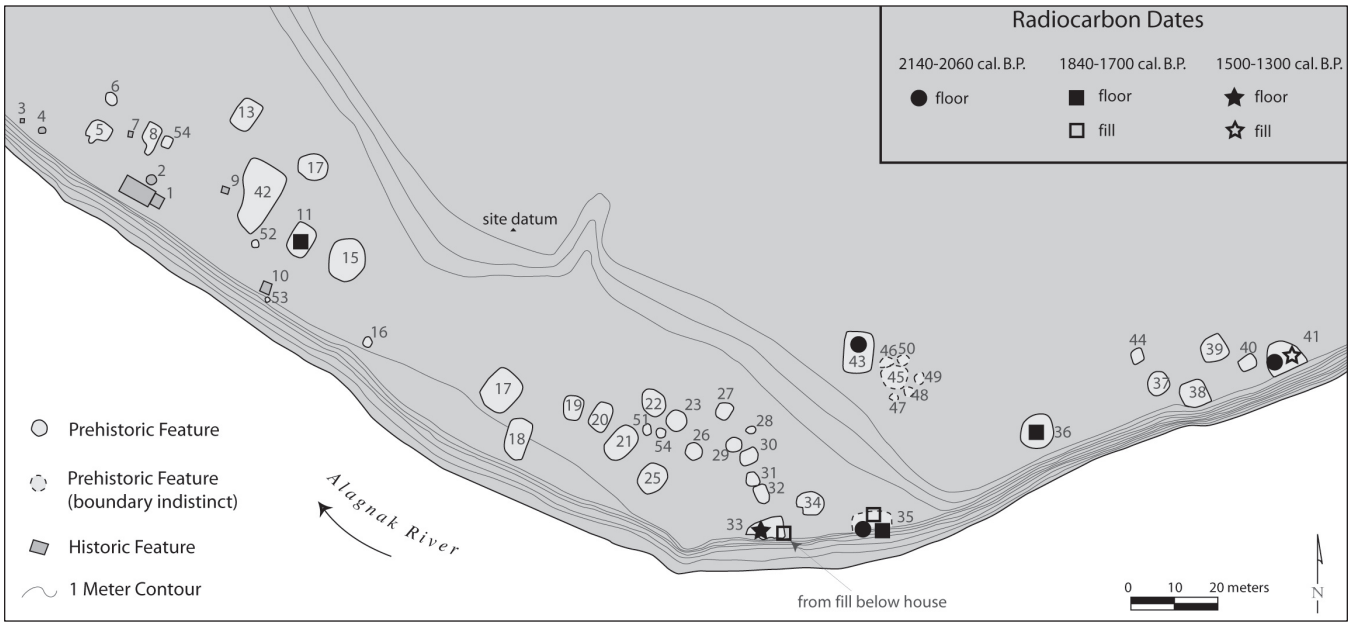

Figure 5. Radiocarbon date locations.

Table 4. Characteristics of tested features.

Feature	Estimated Size	Size Estimated By	Estimated Depth Below Contemporary Surface	Floor Features
11	7 x 5 m	surface depression and small test	70–100 cm, based on surface depression	
33	6.5 x 5 m	test excavation	40 cm	unconstructed hearth, two post holes
35	7 x 6 m	test excavation	35 cm	hearth, six post holes, pit feature, bark surface (roof fall?)
36	8 x 7.5 m	surface depression and small test	unknown*	bark surface (roof fall?)
41	8 x 6.5 m (?)	surface depression and small test	unknown*	three post holes
43	9.5 x 7 m	surface depression and small test	unknown*	unconstructed hearth

* too much fill above floor to determine feature depth from surface depression.

ARTIFACTS

The artifact assemblage from DIL-161 consists entirely of lithics and ceramics; no organic artifacts were preserved (Table 5). The assemblage is biased by the small areas excavated, lack of excavation in features other than houses, possible repeated floor cleaning in prehistory, planned abandonment, and poor organic preservation.

Table 5. Artifacts from DIL-161.

Object	Number		Object	Number
flakes: unmodified	3,984		perforators	3
ceramic sherds	1,840		endscrapers	3
unmodified bone	52		abrader fragments	3
retouched flakes	22		mineral substances	2
projectile points	12		lamps	2
biface bases	17		knife	1
sideblades	17		hammerstone	1
biface fragments	14		whetstone	1
utilized flakes	11		ground item	1
flake scrapers	11		ground burin	1
ground flakes	10		pebble core	1
bifaces	6		ground biface fragment	1
pumice abraders	6		basalt piece	1
projectile point bases	6		adze blade fragment	1
projectile point tips	5		adze blade	1
drills	5		adze bit fragment	1
chert pieces	5		adze bit	1
sidescrapers	4		bullet casing	1
biface tips	3		Total	6,056

A total of 6,056 artifacts were recovered, the most common of which were lithic flakes (unmodified, retouched, and utilized, n = 4,027), followed by ceramic sherds (n = 1,840). Together these two artifact categories make up 97% of the total artifacts. Flaked stone bifaces make up most of the balance of the assemblage.

Nearly a third of the artifact assemblage from DIL-161 is ceramic sherds (n=1,840, 30%). Of these, most were relatively thin-walled (0.4 to 1.0 cm thick) plant fiber tempered body sherds (Table 6 lists the ceramics by temper, surface treatment, and location on the vessel). Some sherds also had a mix of plant fiber and fine gravel temper. Rim and base sherds were also represented, as were sherds with surface treatments such as stamping or pigment.

Stamping is present on fifteen sherds, although it is typically very light. Three fiber-tempered sherds have diamond or parallelogram shaped stamping that is greater

Table 6. Ceramic sherds.

Sherd Type	Number of Sherds	Percentage of Total Sherds
Fiber tempered undecorated body sherd	1,695	92.0
Fiber tempered undecorated rim/base sherd	30	2.0
Fiber tempered stamped body sherd	9	0.5
Fiber tempered stamped rim/base sherd	1	0.05
Fiber tempered pigmented body sherd	71	4.0
Fiber tempered pigmented rim/base sherd	10	0.5
Gravel and fiber tempered undecorated body sherd	18	1.0
Gravel and fiber tempered stamped body sherd	5	0.3

than 4mm on the longest side (Brooks River Diamond Stamp variety; Dumond 1981:213). Six fiber tempered sherds have check stamping smaller than 4mm on the longest side (Smelt Creek Check Stamp variety; Dumond 1981:213) The remaining six stamped sherds are a gravel and fiber tempered variety with Brooks River Diamond stamping, three of which refit. Neither linear-stamped nor cord-impressed ceramics were found at DIL-161.

Sherds from a pigmented vessel from the floor of Feature 43 (Fig. 6) are the only group to refit into a recognizable (although incomplete) vessel shape. The pigment is a dark red-to-black shade and appears in overlapping "watercolor-like" vertical swathes on the top two-thirds of the vessel. The outer surface of the vessel is very smooth, as if burnished, in contrast with other ceramic sherds from the site, which are much rougher. Under magnification, the surface of the pigmented areas is cracked in the same manner as the unpigmented areas, but whether the cracking is from manufacture, use or post-depositional processes is unknown. No striations from burnishing or polishing are visible, and there is no evidence of a slip applied to the outer surface. There is some charring on the interior of the vessel, but only a tiny charred area near the rim on the outside. There may be pigment on the interior surface, but the charring and rough texture obscure it.

Figure 6. Partially reconstructed vessel with pigment.

Chipped stone untyped bifaces and biface fragments were the most numerous stone tool. These tools show bifacial manufacture but are not identifiable to a specific tool type, either because they are incomplete or because the morphology is not consistent with standard categories. Of the forty items in this category, seven are essentially complete tools or preforms. There is only one knife in the artifact collection. Many of the biface fragments are likely from sideblades, given their asymmetrical shape and the prevalence of sideblades among finished bifaces.

Twelve flaked stone projectile points were recovered, as well as six bases and five tips (Fig. 7). The points as a group are similar to assemblages recovered from the Naknek drainage area (Dumond 1981:203–204). Examples are present of the Brooks River Square Base type (*ibid*.; Fig. 7:A and S), the Smelt Creek Contracting Base type (*ibid*.; Fig. 7:D, Q, and T), and the Falls Stemmed type (*ibid*.; Fig. 7:I–L, V and W), as well several points that are distinct from any categories previously defined for the region. (Fig. 7:C, E–G, U). The four remaining points are not complete enough to be typed (Fig. 7:M–P).

Of the projectile point types present, three are characteristic of cultural phases in the Naknek drainage. Smelt Creek Stemmed and Smelt Creek Contracting Base points are associated with the Smelt Creek and Brooks River Weir phases (2250–1950 B.P and 1950–1350 B.P., respectively; Dumond 1981:135,143) and Falls Stemmed points are associated with the Brooks River Falls phase (1350–900 B.P.; *ibid*.:147). The projectile point types found at DIL-161 are generally consistent with radiocarbon dates from the site.

Eighteen scrapers were found at the site: nine flake scrapers, four sidescrapers, three endscrapers, one end and side scraper and one possible discoidal scraper (Fig. 8). All of the scrapers are made of chert or basalt, except for one indurated sedimentary flake scraper. Most had only a minimal degree of working, although three scrapers had bifacial working elsewhere on the flake in addition to the unifacial scraping edge. Six scrapers showed signs of use-wear in the form of polish or edge-crushing. One of the sidescrapers could be called a "flake knife" because of its blade-like form and extensive unifacial retouch on two lateral edges (Fig. 8:A).

Seventeen flaked stone sideblades of various shapes were recovered. The sideblades are pictured in Fig. 9 classified according to the Naknek drainage typology (Dumond

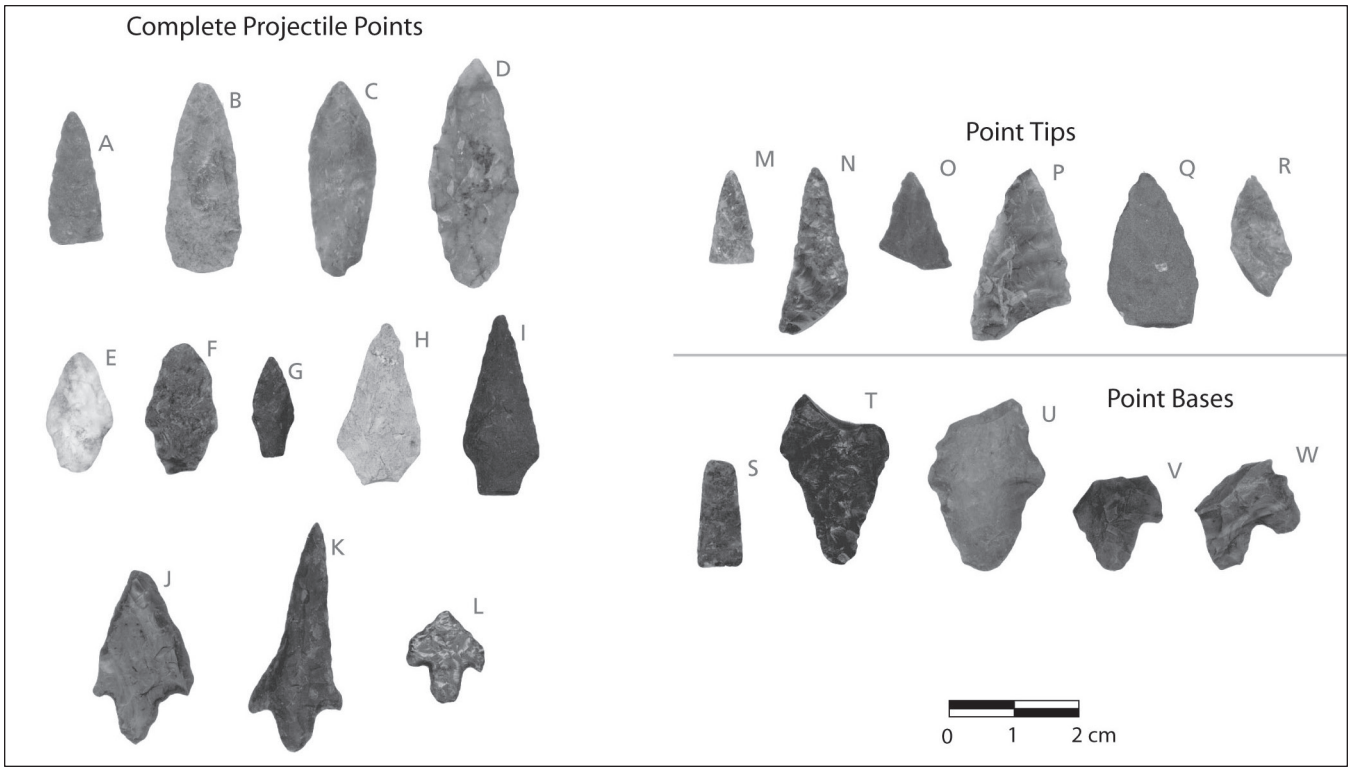

Figure 7. Projectile points.

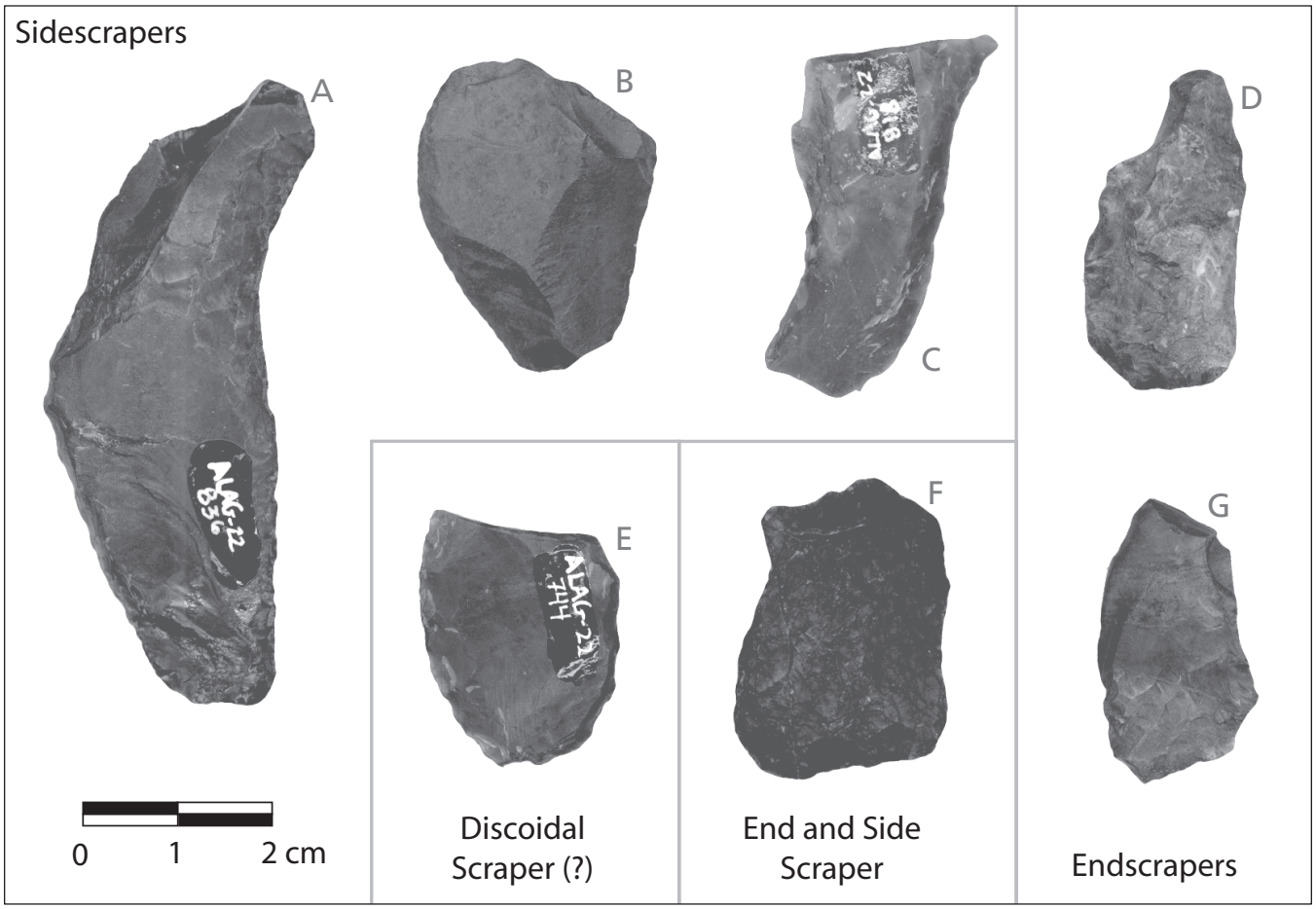

Figure 8. Scrapers.

1981:205). The cutting edge faces downward, and the hafted edge to the top and right. As Dumond (1981:205) noted, considerable variation among sideblades makes categorizing difficult. Although the artifacts shown in Fig. 9 are divided into Sideblade I, II and III categories after Dumond (*ibid.*), these may not represent functional differences, and there may be such differences within categories.

The excavation produced 5 whole or partial flaked stone drills. Three showed some usewear on the point in the form of edge-crushing or polish. Different forms are evident. Two drills had asymmetrical bases and a projection at least as long as the base. One other was broken, but was also likely of this type. A second type of drill is represented by only one specimen. It was ovoid in form with a small projection. The final type of drill is a chipped stone form with heavy polish on a short projection, and is also represented by only one artifact. The polish appears to be the result of manufacture rather than usewear.

Six abraders and abrader fragments were recovered along with a fine-grained sandstone cobble that may have been a whetstone. All six of the abraders and abrader fragments were of pumice with a broad flattened surface rather than deep grooves. A large sandstone cobble appears to have striations from use as a whetstone, but these may also be natural banding in the lithic material.

Only nine ground stone items were found: three endshavers or perforators, four adze parts, a ground burin, and a midsection from a ground slate projectile (Fig. 10).

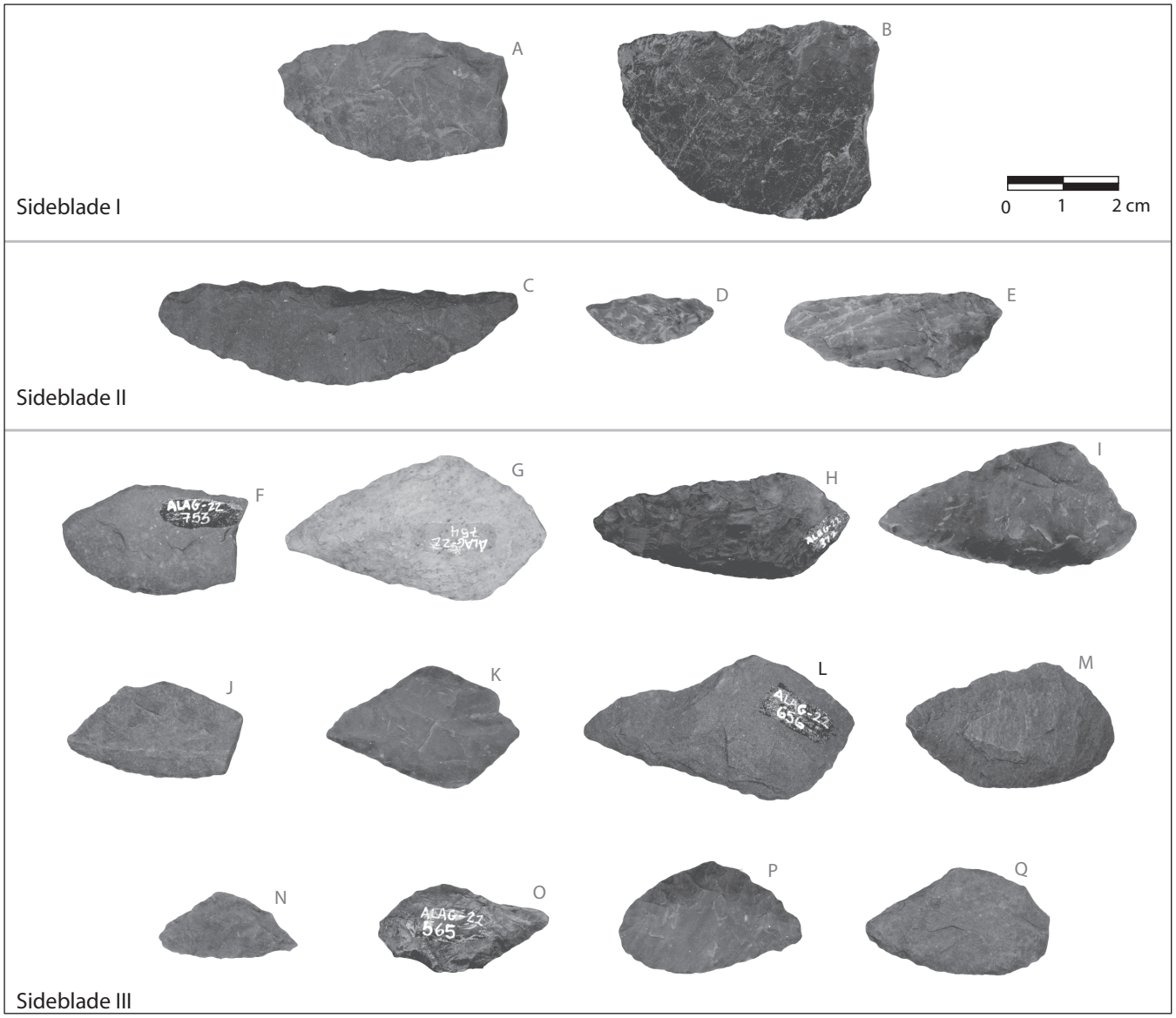

Figure 9. Sideblades.

The complete endshaver has a flat ground surface on the ventral side and a curved surface on the dorsal side (plano-convex), and is made of andesite (Fig. 10:F). It was found on the floor of Feature 33. Two other items are similar in size and shape, with roughly chipped bases and ground portions that are plano-convex in cross-section (rather than round or lenticular as a drill would be), but are missing the tip (Fig. 10:G and H). Without knowing the shape of the tip, it is not possible to determine whether these were endshavers or perforators. The ground slate projectile point midsection was the only ground slate item found at the site (Fig. 10:E). It has a single ground facet on one side, and two ground facets on the opposite side that meet in a central ridge. The ground burin is made of andesite, and has four polished facets that meet at a corner (Fig. 10:D). Four adze parts were found: a complete andesite blade, chipped all over and ground at the working edge (Fig. 10:A); a distal fragment of a ground blade of unidentified lithic material (Fig. 10:B); an andesite bit, chipped all over and ground at the working edge (Fig. 10: C); and a small ground flake with an angled edge that indicates it was chipped from an adze. All three larger adze pieces are lenticular in cross-section, have working edges that are curved rather than angled, and show usewear at the working edge.

Pecked stone vessels are represented by two items: a small complete specimen and a larger fragment (Fig. 11). Neither has evidence of burning or oily residue that might indicate use as a lamp, nor of ochre residue that might indicate use as pigment grinder. The large vessel fragment (Fig. 11:A) may be natural rather than culturally modified. A single hammerstone was recovered from the excavation. No other large pecked stone items were found, including net sinkers, which had been expected. The sampled area was small, though, and the absence of sinkers might be the result of spatial patterning.

DISCUSSION

Testing at DIL-161 was designed in part to address questions about the occupation of the site and its relation to other archaeological cultures in southwest Alaska. The combination of architectural, radiocarbon, and artifact data allows comparison to other sites and speculation

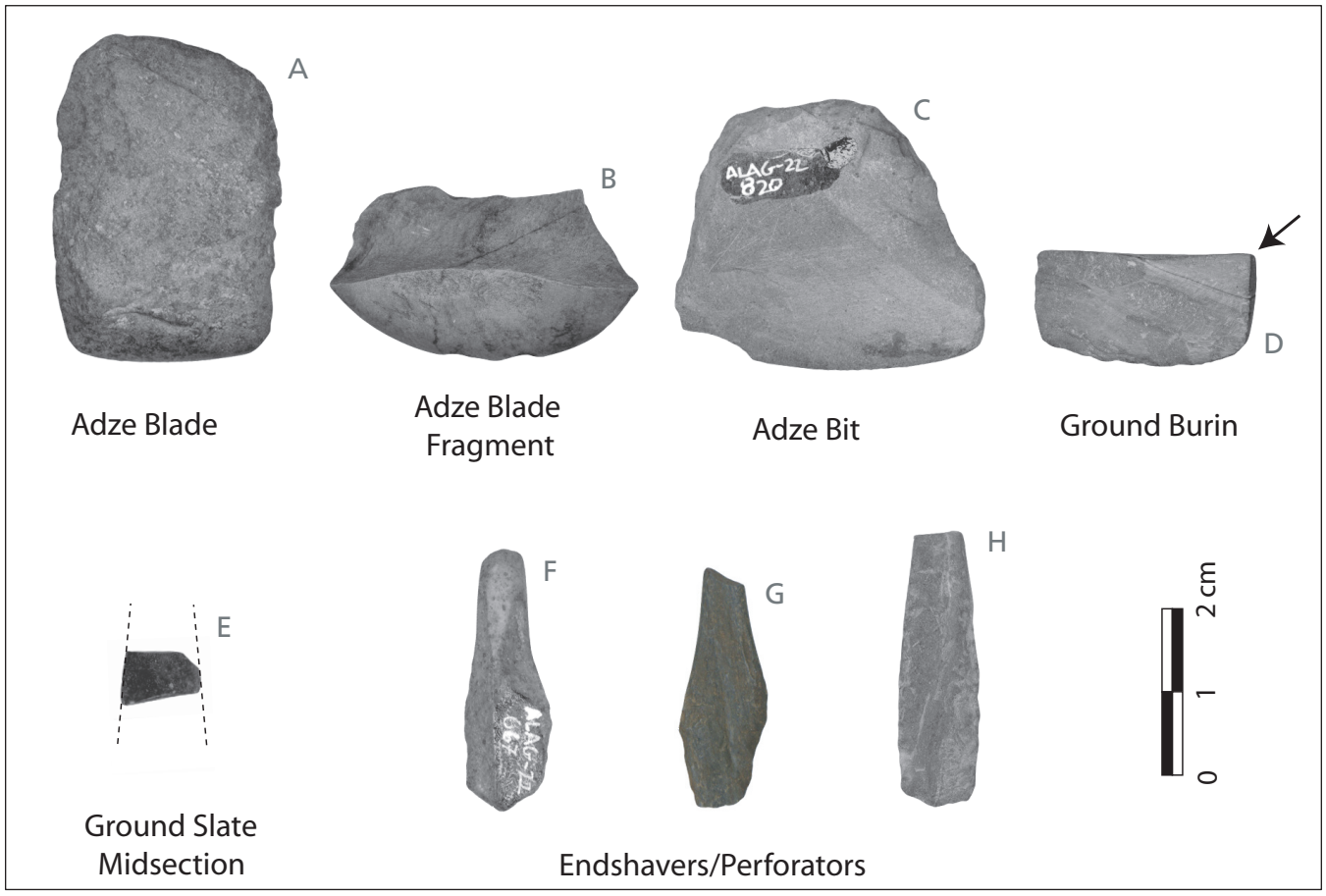

Figure 10. Ground stone artifacts.

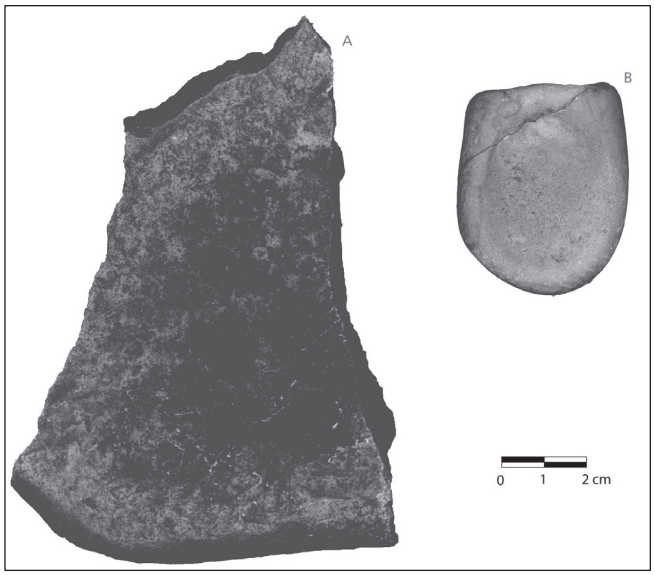

Figure 11. Pecked vessels..

about similarities and differences at Norton tradition sites in southwest Alaska and beyond.

FEATURE OCCUPATION SEQUENCE

Testing produced radiocarbon dates and artifacts from five habitation features. Although the excavated areas were limited, the data provide some insight into the sequence of feature occupation at the site and the relation of the artifact assemblages to Norton period phases established for the nearby Naknek drainage sites. Radiocarbon dates indicate that Features 35, 41, and 43 are contemporaneous. Of the tested features, these three are the earliest. About 250 years later, Features 11 and 36 were occupied contemporaneously, followed by the occupation of Feature 33 about 300 years later. By dates alone, these three groups fall into the Smelt Creek, Brooks River Weir, and Brooks River Falls phases as defined by Dumond (1981:189–190), although the transitions between these phases is gradual and affiliation should be assigned on the basis of artifact assemblages (Dumond 2005:31). The assemblages from house floors from the three chronological groups were reviewed to examine the relation to the Naknek drainage cultural phases. Artifacts from mixed fill are not included. Although there are dates from the fill in some features, stratigraphy within the fill resulting from different deposition episodes might not be apparent. All of the fill within a feature cannot be assumed to be contemporaneous.

The earliest-occupied group consists of Features 35, 41, and 43. Feature 35 was the most extensively tested in this group, with four square meters excavated. Artifacts recovered from the floors of these three features included stamped ceramics (Smelt Creek Check Stamp and Brooks River Diamond Stamp varieties), a ground burin, an adze bit fragment, projectile points (Smelt Creek Contracting Base, Brooks River Contracting Base, and Brooks River Square Base), and sideblades (varieties I, II and III). Eighty-six percent of the artifact assemblage from these three features (excluding debitage) is ceramics.

The lithic artifact collection from these three features is similar to collections from the Smelt Creek phase of the Norton period (Dumond 1981:132–152). Two of the three identifiable projectile point types, Smelt Creek Contracting Base and Brooks River Contracting Base, are found in all three phases. The third, Brooks River Square Base, is confined to the Smelt Creek and Brooks River Weir phases. The ceramic assemblage is similar to the Brooks River Weir phase in that Smelt Creek Check Stamp and Brooks River Diamond Stamp varieties occur together. Pigmented ceramics have not been identified from any of the Naknek drainage sites. All other artifact classes appear throughout the Norton period.

The artifact collection from the early group, then, appears similar to Smelt Creek assemblages in lithics (based on only one diagnostic artifact, the ground burin), and similar to Brooks River Weir assemblages in ceramics (based on only two diagnostic sherds). The radiocarbon dates for the group, however, fall early in the Smelt Creek phase. The collection from the early group can be attributed to that phase, with the understanding that a larger artifact collection would be necessary to make a more definitive assignment.

The middle group includes Features 11 and 36. Artifacts recovered from floors included Brooks River Diamond Stamp ceramics, a flake knife, and an untyped biface with a burin-like flake removal. Seventy-five percent of the artifact assemblage from these three features (excluding debitage) is ceramics. The possibly burinated biface is the only potentially diagnostic artifact. The only chipped burin from the Naknek drainage Norton period collections came from the Brooks River Falls phase, the latest of the three phases (Dumond 1981:152). The presence of a single artifact that is rare in the type collection is a slim basis on which to make a cultural attribution, though, and the radiocarbon dates fall at the boundary between the Smelt Creek and Brooks River Weir phases (although they trend towards the younger Weir phase). In the absence of more conclusive data, the group can be ten-

tatively attributed to the Brooks River Weir phase based on the radiocarbon dates.

Feature 33 is the only feature in the latest-occupied group. Artifacts from the floor included projectile points (Falls Stemmed Varieties 2 and 4, Brooks River Square Base, and Smelt Creek Contracting Base), a perforator, and a chip from an adze bit. Only 51 percent of the artifact assemblage from the feature (excluding debitage) is ceramics. The Falls Stemmed projectile points are the only diagnostic artifacts. Variety 2 is found in both the Brooks River Weir and Brooks River Falls phases, but Variety 4 is only found in the latter (represented by eight examples from three sites; Dumond 1981:145, 151). Radiocarbon dates also point to the Brooks River Falls phase, although one falls in the Brooks River Weir phase age range. Given that the dating of the phases is still somewhat ambiguous, attributing the collection to the Brooks River Falls phase is appropriate.

The three radiocarbon date groups from DIL-161, in order from earliest to latest, can be tentatively assigned to the Smelt Creek, Brooks River Weir and Brooks River Falls phases. None of the artifacts represent a significant departure from those reported from the Naknek drainage sites (Dumond 1981:132–152; discussed further below), and radiocarbon dates are roughly commensurate with the phases in that area, although as noted earlier, transitions between phases of the Norton period are gradual (Dumond 2005:31).

While Dumond's (1981) analysis of the Naknek drainage assemblages provides a framework by which to evaluate Norton tradition assemblages from the Alagnak River, there are differences between artifact collections from the two areas. The significance of these differences can best be assessed by reviewing the range of Norton traditions assemblages in southwest Alaska, and select assemblages from outside the region.

VARIATION AMONG NORTON TRADITION SITES

Norton tradition sites across Alaska are remarkable not for their differences but for their many similarities across a wide geographical and chronological range. Examining variation among the sites, though, could offer insight into Norton cultural development and lifeways. A review of data from several Norton tradition sites in southwest Alaska, and a few in northwest Alaska considers several possibilities for explaining differences and similarities. Sites discussed are listed in Table 7 and shown in Fig. 12. This discussion is not intended to be a comprehensive analysis of Norton tradition sites and assemblages, but an overview to better understand the place of DIL-161 in the context of the tradition as a whole.

Differences in artifact assemblage, house form, and site location are apparent among Norton tradition sites in southwest Alaska and beyond. Variation is also undoubtedly introduced by differing collection sizes and excavation methodologies. There might also be several cultural reasons for this variation: geographical differences in resource availability, change in cultures over time and space, or seasonal changes in residence and subsistence. Norton tradition sites are found in diverse environments, from the arctic coast to interior mountain ranges to the relatively mild Gulf of Alaska coast. Important resources such as large salmon runs, construction-quality trees, and seasonal sea ice are not available across the Norton tradition area, undoubtedly introducing differences. If regional resource availability were the primary reason for variation, we might expect to see:

- house construction differences correlated with available construction materials,
- similarities between sites near similar resources, and
- artifact assemblage variation mostly in tools with specific subsistence functions (as opposed to design elements).

The Norton tradition lasted for around 1500 years across a wide geographic span. Some aspects of the tradition, such as ceramics, are Asian in origin (Dumond 2005:30); some appear to have developed in situ in northwest Alaska, such as small insert sideblades; and others originated in the Pacific coast area, such as slate grinding and oil lamps (Dumond 2000) Wherever the Norton cultural pattern first came together, many sites would have been far from this "homeland." If culture change were the main reason for variation between sites, we would expect differences to occur gradually over time and space, both in functional and decorative elements.

Seasonality can be estimated using direct and indirect methods (Monks 1981). Direct methods involve study of faunal materials, which are available from very few Norton traditions sites. Indirect methods use other data, including "matrix granulometry, matrix chemistry, population size, settlement pattern, community pattern, artifact function, and burial pattern" (Monks 1981:217–218). With limited data available from Norton tradition sites, the most useful analyses are examination of artifact assemblages, geography of settlement, and feature construction. If seasonal

variation were present among Norton tradition sites, we could expect to find:

- artifact assemblage and feature construction variation between sites in different environmental locations, even if they are geographically relatively close,
- cold weather and warm weather features at different sites (e.g., deep semisubterranean houses),
- artifacts associated with seasonal pursuits, such as net sinkers or ground slate lances, present at some sites and absent at others, and
- more complete assemblages with nonportable artifacts at sites occupied for more of the year.

Evaluating these possibilities requires assessing the function of artifacts and features based on morphology and ethnographic data. Extending ethnographic analogy into the past is problematic, especially in western Alaska where there is a clear division between Norton people and the subsequent Thule people who are the ancestors of ethnographically described populations. The seasonal round may have been quite different than the pattern reported during

Table 7. Sites referenced in text.

Site	General Location	Reference
Naknek Drainage Sites (Brooks River and Smelt Creek)	Alaska Peninsula	Dumond 1981
Hook Point (XMK-020)	Alaska Peninsula	Clark 1977
Kukak Bay (XMK-059)	Alaska Peninsula	Clark 1977
Ugashik Coastal Sites	Alaska Peninsula	Henn 1978
Ugashik Inland Sites	Alaska Peninsula	Henn 1978
Clark's Point (XNB-055)	Bristol Bay	McMahan et al. 2000
Pedro Bay (ILI-001)	Bristol Bay	Reger and Townsend 2004
XNI-028	Yukon-Kuskokwim Delta Area	Nowak 1982
MAR-007	Yukon-Kuskokwim Delta Area	Shaw 1982
Iyatayet	Northwest Alaska	Giddings 1964
Kugzruk Island Site 1	Northwest Alaska	Giddings and Anderson 1986
Cape Krusenstern Sites	Northwest Alaska	Giddings and Anderson 1986

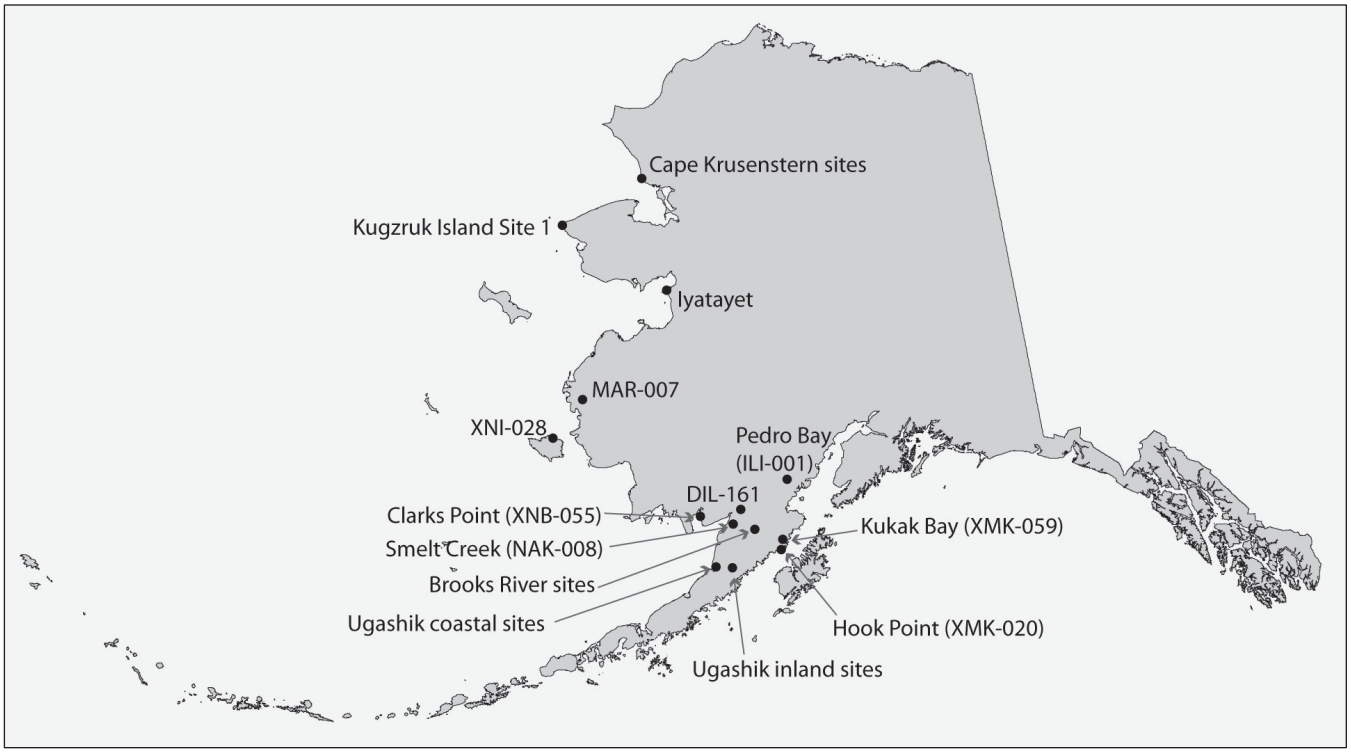

Figure 12. Norton tradition sites referenced in text.

the historic period, and may even have varied with time and place within the Norton period. Nonetheless, many technologies are similar. In the absence of indications to the contrary, Norton artifacts and features probably had a similar function to their contact period counterparts.

House construction in western Alaska has been tied to climate and seasonality (e.g., Giddings and Anderson 1986:159–160). Larger and deeper houses, which are better insulated, are thought to be evidence of winter occupation. Some were even covered with frozen sod, which melted in the summer and made the house uninhabitable. Smaller, shallower dwellings, or campsites with little evidence of structure, are considered summer houses. Deep semisubterranean houses require sturdy frames, especially if they are covered with heavy sod rather than grass matting, bark, or hides. Large spruce trees were probably not growing near any of the Norton sites discussed here, with the possible exception of Pedro Bay (Brubaker et al. 2001); most lack large trees even today. Driftwood is available at coastal sites, but would have been difficult to move up rivers to interior sites. Variation in house size, then, could be attributed to geographical location in relation to raw materials or to seasonality.

Some Norton tradition artifacts have been associated with specific activities. Net sinkers, ground slate ulus, and fish spears are indicative of river fishing, while toggling harpoons suggest sea mammal hunting (Dumond 2000). Some researchers have suggested that toggling harpoons are oriented towards winter hunting, either through breathing holes on pack ice or in open water with icebergs (Arutiunov and Fitzhugh 1988). Ground slate lances and end blades have also been associated with sea mammal hunting, but could also be used in hunting large terrestrial mammals. Other artifacts are associated with sedentism. Ceramics and pecked stone vessels are generally absent from sites identified as short-term campsites (Dumond 2000). The size and variety of artifact assemblages has been taken as evidence of duration of occupation, and therefore, of seasonality (McMahan et al. 2000).

If winter settlements are occupied for much of the year, and summer or fall occupations are more temporary camps, then winter assemblages would be more diverse due to the duration of occupation and feasibility of using less-portable items. Settlement size might differ if families or lineages traveled to their own fishing sites in the summer but congregated in a single location in the winter. Unfortunately, the number of contemporaneously occupied houses at Norton sites has been difficult to estimate due to reoccupation and deeply buried cultural horizons. Site location might also be related to seasonality. Sites can be classified as coastal or interior, although Dumond (2000) noted that many Norton coastal sites are located near stream mouths, and may represent a less intensive focus on harvesting marine resources compared to later Thule economy. Nonetheless, Norton tradition coastal sites have been identified as one phase of a seasonal round that included an interior component focused on fishing and a coastal component that included sea mammal hunting.

The three possible reasons given here for variation among Norton tradition sites—resource availability, gradual cultural change, and seasonality—are not mutually exclusive. For example, Dumond (2000) attributed the spread of Norton culture into the Pacific to "an improved ability to hunt in open water," which is related to both cultural development and resource availability. Despite the overlap, patterns pointing to gradual change and seasonality are apparent in Norton tradition sites in the Upper Alaska Peninsula/Bristol Bay region and beyond.

NORTON PERIOD SITES IN THE UPPER ALASKA PENINSULA/BRISTOL BAY REGION

For the nine sites (or groups of sites) in the Upper Alaska Peninsula/Bristol Bay region in this analysis, several variables have been chosen for analysis based on the above discussion: site date(s), general location, assemblage size, ceramic use frequency, ceramic decoration, feature dimensions, and the presence or absence of various artifact types (Table 8; Fig. 13).

The distribution and chronology of sites in this sample does not fit well with the resource availability explanation. Coastal sites with access to driftwood are no more likely to have large, deep houses than sites in the interior, although Dumond (1982) found the opposite to be true for a larger sample of Norton tradition sites across Alaska. Net sinkers are absent from some riverine sites, such as DIL-161, but present at coastal sites not near rivers, such as Hook Point. The functional tool assemblage among the sites varies most in the presence or absence of net sinkers and ground slate tools, and the proportion of ceramics. These are not more variable, however, than decorative details such as surface treatment of ceramics and the presence of labrets, indicating that differences are not only attributable to resource availability. Sites near each other and in similar settings, such as the Brooks River sites and DIL-161, differ in feature

construction and artifact assemblage. Conversely, sites in very different environments, such as Clarks Point and Pedro Bay, have similar assemblages. Differences between Norton tradition sites in the Upper Alaska Peninsula/Bristol Bay area cannot be explained by resource availability, although seasonal mobility undoubtedly affects feature construction and artifact assemblages at various sites. Further testing at Norton tradition sites could reveal patterns not evident in the small sample discussed here.

Gradual cultural changes over time may explain some, though not all, variation among Norton period sites in the Upper Alaska Peninsula/Bristol Bay region. Site location appears to be correlated with time of occupation in that early sites are more likely to be located along rivers, while later sites are more likely to be located on the coast. This may represent the continuation of a trend towards coastal residence that began during the transition from the Arctic Small Tool tradition to the Norton tradition (Dumond 1982). A large sample of Norton tradition sites across Alaska showed that "Norton people show a stronger preference for locating their permanent settlements on the seacoast than did their predecessors" (Dumond 1982:43). Data from the Upper Alaska Peninsula/Bristol Bay sites discussed here indicates that the trend may have continued through the Norton period. Four sites have large, deep houses: two early sites in the interior (DIL-161 and the Ugashik inland sites); and two late sites on the coast (Kukak Bay and Clarks Point). Late sites tend to have fewer ceramics as a proportion of the total artifact assemblage, and are less likely to contain stamped ceramics. None of the other artifact classes appear to vary with site date. The sample from nine sites (or site areas) in the Upper Alaska Peninsula/Bristol Bay region indicates change in residence patterns from river towards coast through the Norton period, although variation among artifact assemblages cannot necessarily be linked to the shift.

Artifact assemblage variation among sites may be related to seasonal mobility. The variation does not appear to fit the seasonal winter/summer round as reported ethnographically, where the expected pattern would be large deep houses on the coast associated with sea mammal hunting gear and nonportable artifacts, and small, shallow summer camps along rivers associated with reduced artifact inventories and fishing gear. None of the relevant artifact classes, nor overall assemblage size, correlates with

Table 8. Selected characteristics of upper Alaska Peninsula/Bristol Bay Norton sites.

	DIL-161	Hook Point	Kukak Bay	Brooks River Sites	Smelt Creek	Clarks Point	Pedro Bay	Ugashik inland sites	Ugashik coastal sites
Location	**Interior**	**Coast**	**Coast**	**Interior**	**Coast Riverine**	**Coast**	**Interior**	**Interior**	**Coast Riverine**
Earliest Date, B.P.[a]	2150	1680	1460	2140	2255	1630	1340	2110	1535
Latest Date, B.P.[a]	1390	1680	1075	975	1900	1630	1340	1665	930
Position in Norton Tradition	early and late	late	late	early and late	early	late	late	early	late
Assemblage Size	Medium	Large	Large	Large	Large	Small	Small	Large	Medium
Organic Preservation	–	+	–	–	–	–	–	–	–
Ceramics	+	+	+	+	+	+	+	+	+
Stamping on Ceramics	+	–	–	+	+	–	+	+	–
Ceramics as % of Assemblage	78–86%	2%	12%			38%	0%	6%	9%
Stone Vessels	+	+	+	+	+	–	–	+	+
Ground Slate Ulus	–	+	+	+	+	–	–	–	–
Net Sinkers	–	+	+	+	+	–	–	+	+
Labrets	–	+	+	+	+	–	–	–	+
Fish Spears		–							
Toggling Harpoons		+							
Average Feature Size (m)	7.5 x 6		7 x 6.5	4 x 3	3.5 x 2.5	7.5 x 6		6 x 5	
Average Feature Depth (cm)	~50		60	20	30	35		60	

[a] Uncalibrated radiocarbon age; calibrated dates are not available in all publications.

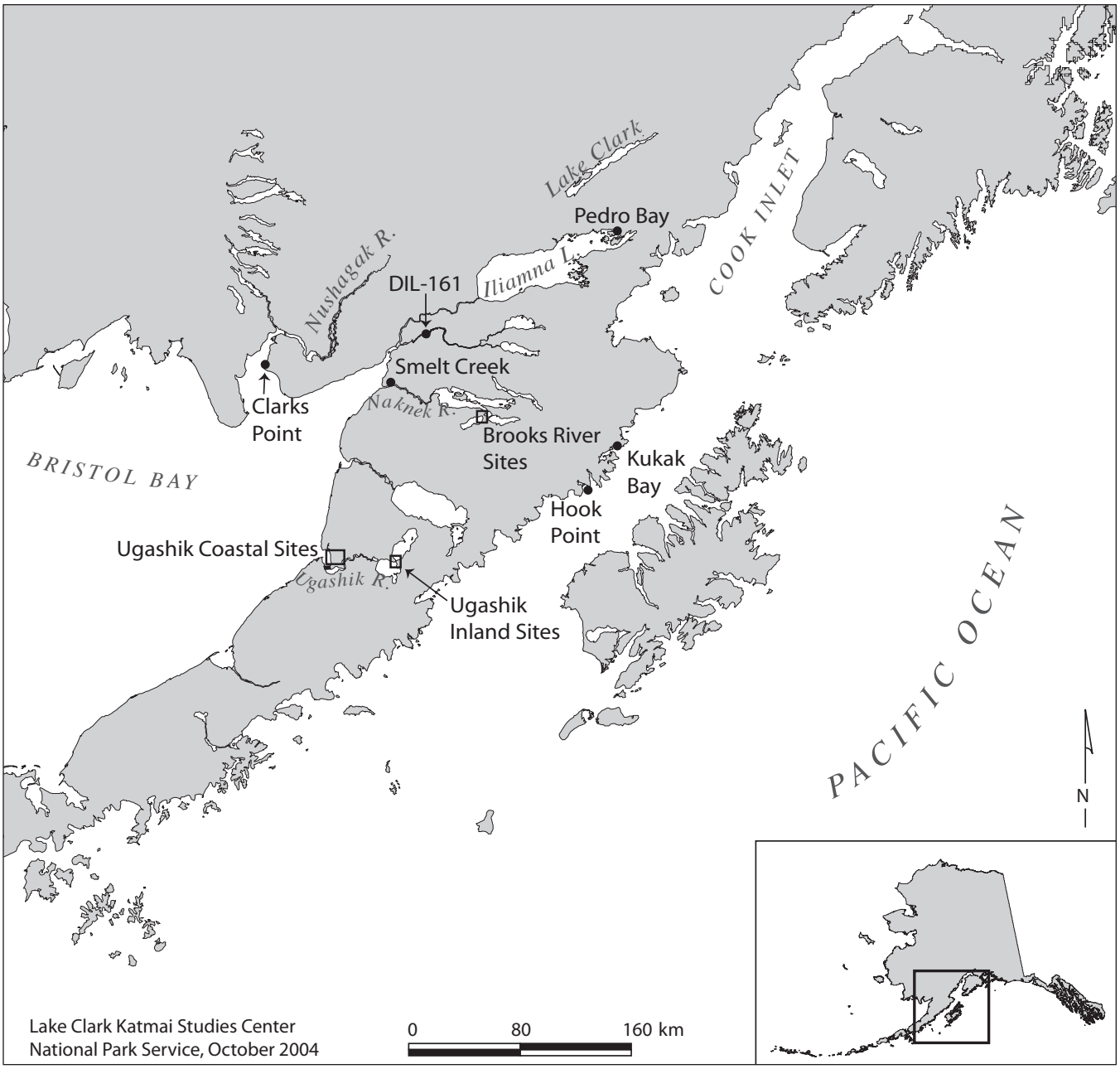

Figure 13. Norton tradition sites in the Upper Alaska Peninsula/Bristol Bay area.

coastal vs. interior site location. Ground slate ulus and net sinkers, however, tend to occur together. Feature size is also not correlated with location. This does not, however, rule out seasonality during the Norton period.

At the risk of reducing significant variation to a few factors, three artifact types, in addition to feature construction, can be used to assess sedentism and seasonality. The presence of net sinkers and ground slate ulus may indicate summer fishing. A significant proportion of ceramics in an assemblage suggests sedentism. Large, deep features indicate both a long duration of occupation, and winter use.

By these indicators, Kukak Bay and the Ugashik inland sites may have been occupied nearly year-round. It is possible that larger houses were occupied in the winter, and nearby campsites or lightly built shelters in the summer, as with the Cape Krusenstern Ipiutak beach ridges (Giddings and Anderson 1986:158). Ceramic use is low, but other nonportable items such as large stone lamps are present. Ceramic manufacture may have been limited by the availability of raw materials.

The Naknek drainage sites could have been occupied in the warmer months for a relatively long period (ceramics

make up a significant portion of the assemblage, but houses are relatively lightly built). Clarks Point may have been a short-term winter or fall encampment, which would explain relative scarcity of all artifacts, and especially ceramics. McMahan and colleagues (2000:64) concluded that "it is at least conceivable that the site was occupied only briefly, in response to fluctuations in the seasonal movements of caribou."

A long winter occupation could explain the large, deep houses and profusion of ceramics at DIL-161, where net sinkers are absent. This is in accord with reports that historic use of the middle river has been heaviest in the winter. The contents of sites in the Upper Alaska Peninsula/Bristol Bay region suggest variable seasonal movements determined by the resources immediately available. In resource rich areas like the Katmai coast, nearly year-round living could be possible. In less productive areas, a seasonal round is more likely. The round apparently did not follow a consistent pattern of coast-to-interior travel, nor was long duration occupation limited to the winter. More data from sites in the area could confirm or refute these hypotheses.

NORTON TRADITION SITES OUTSIDE THE UPPER ALASKA PENINSULA/BRISTOL BAY REGION

A review of all Norton tradition sites in Alaska is beyond the scope of this report, but examination of a few sites in Western Alaska offers a comparison to the apparent Upper Alaska Peninsula/Bristol Bay pattern (Table 9). The sample is quite small, but shows similar variability to the Peninsula sites.

One coastal site, XNI-028, has a large house and toggling harpoons, indicating possible winter use, and net sinkers and ground slate ulus suggesting summer fishing. Long term occupation is indicated by the large assemblage and significant proportion of ceramics. This site, like Kukak Bay and the Ugashik inland sites, may have been occupied for much of the year.

Two other sites, Iyatayet and Kugzruk Site 1, have similar artifact patterns but smaller houses. These may have been occupied in spring and summer, or house size might be related to the availability of construction materials. The small assemblages from Cape Krusenstern sites identified as "campsites" indicate seasonal use of temporary camps on the coast. The only interior site, MAR-007, has both ground slate ulus and toggling harpoons (represented by a foreshaft); no other evidence is available to assess seasonality.

The increased sedentism noted by Dumond (1982) is evident in sites with apparently long-term occupation, and there is also indication of seasonal movement. None of these sites is similar to DIL-161—an interior site with evidence of long-term occupation that lacks fishing gear—although this may be an effect of small sample size.

Table 9. Selected characteristics of western Alaska Norton sites.

	MAR-007	XNI-028	Cape Krusenstern Norton Campsites	Kugzruk Site 1	Iyatayet
Location	**Interior**	**Coastal**	**Coastal**	**Coastal**	**Coastal**
Earliest Date, B.P.[a]	1300	2100		2566	2530
Latest Date, B.P.[a]	1100	1360		2306	2016
Position in Norton Tradition	late	early and late		early	early
Assemblage Size	Medium	Large	Medium	Large	Medium
Organic Preservation	+	+	–	+	+
Ceramics	+	+	+	+	+
Stamping on Ceramics	+	+	+	+	+
Ceramics as % of Assemblage		47%			32%
Stone Vessels	–	–	–	+	+
Ground Slate Ulus	+	+	–	–	–
Net Sinkers	–	+	–	+	+
Labrets	–	–	–	+	+
Fish Spears	–	–		+	+
Toggling Harpoons	+	+		+	+
Average Feature Size (m)		6 x 5		unknown, apparently small	5 x 4 m
Average Feature Depth (cm)		unknown		apparently shallow	unknown

[a] Uncalibrated radiocarbon age; calibrated dates are not available in all publications.

Cultural differences between the Peninsula and western Alaska sites are suggested by the ceramic assemblages. Stamping is present in all ceramic collections in western Alaska, but absent at several Peninsula sites. Hair and feather temper is common in some western sites, and plant fiber dominant in Peninsula sites. Despite these differences, artifact assemblages are for the most part similar.

This short review suggests that much of the variation among Norton tradition sites may be explained by differing seasonal rounds and, in the Upper Alaska Peninsula/Bristol Bay region, by gradual cultural change. A more comprehensive study of Norton tradition sites across Alaska is necessary to assess the validity of these explanations.

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