2017

Late Precontact Settlement on the Northern Seward Peninsula Coast: Results of Recent Fieldwork

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LATE PRE-CONTACT SETTLEMENT ON THE NORTHERN SEWARD PENINSULA COAST: RESULTS OF RECENT FIELDWORK

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ABSTRACT

Changing arctic settlement patterns are associated with shifts in socioeconomic organization and interaction at both the inter- and intra-regional levels; analysis of Arctic settlement patterns can inform research on the emergence and spread of Arctic maritime adaptations. Changes in late pre-contact settlement patterns in northwest Alaska suggest significant shifts in subsistence and/or social organization, but the patterns themselves are not well understood. Prior research around Kotzebue Sound suggests three possible scenarios: 1) population decrease and dispersion from settlement centers after 550 BP, 2) population stability and dispersion after 550 cal BP, and 3) different settlement patterns in the northern and southern areas of Kotzebue Sound. We analyze site distribution and radiocarbon data from new research on the northern Seward Peninsula coast to address questions about local late pre-contact settlement patterns. Our results point to denser late pre-contact occupation of this region than previously understood, suggesting either population stability and dispersion after 550 cal BP or the development of differential settlement patterns around the Kotzebue Sound region. This research provides new information about late pre-contact settlement patterns in northwest Alaska and contributes to the broader debate about the changing nature of Arctic maritime adaptations during the dynamic late Holocene period. Results also indicate that people in this region were well integrated into both Kotzebue Sound and more distant socioeconomic systems despite potential reduction or change in interaction spheres during the late pre-contact period.

Considerable northern Alaskan archaeological study is focused on the development and spread of Arctic maritime adaptations over the last 5,000 years (e.g., Ackerman 1988, 1998; Harritt 1995; Mason 1998; Sheehan 1995, 1997). This research established a general understanding of northern settlement patterns but many questions remain about the relationship among growing population, increased sedentism, and the development of a coastal lifeway highly reliant on marine resource procurement. The generally accepted pattern is one of increased coastal sedentism, population increase, and the development of a maritime subsistence focus as early as 2800 cal BP. This pattern expanded rapidly after 2000 cal BP with the development of whaling technology and other maritime hunting and fishing innovations and continued until about 550 cal BP. Settlement patterns and subsistence practices between 550 years ago and the contact era are less well understood, with some evidence pointing to population decrease or dispersion on the coasts to previously uninhabited areas after 550 cal BP (Anderson and Freeburg 2013, 2014; Giddings and Anderson 1986) and other evidence indicating that settlement pattern change on the southern Seward Peninsula was less pronounced (Schaaf 1995:279). Forthcoming analysis of a regional radiocarbon dataset further indicates regional population decline after 550 cal BP (Anderson et al., forthcoming). Post–550 cal BP settlement pattern changes have greater significance for understanding potential correspondence among mid- to late Holocene environmental variability, regional demography, shifting coastal settlement patterns, and the emergence and spread of social complex maritime hunter-gatherer societies in the Arctic.

Research focused on the post–550 cal BP Late Thule/Kotzebue phase is limited and additional radiocarbon data and research on regional settlement patterns during this time period are needed to address larger questions about changing social organization, subsistence, and

settlement systems. We address this problem through research on previously uninvestigated areas of the northern Seward Peninsula coast, in the Nuluk river watershed (Fig. 1). We draw on site distribution data and new radiocarbon dates to make inferences about late pre-contact settlement patterns along the barrier islands and adjacent areas of this region. Our results points to denser late pre-contact occupation of this region than previously understood and indicate that people in this region were well integrated into both Kotzebue Sound and more distant socioeconomic systems despite potential reduction or change in interaction spheres during the late pre-contact period.

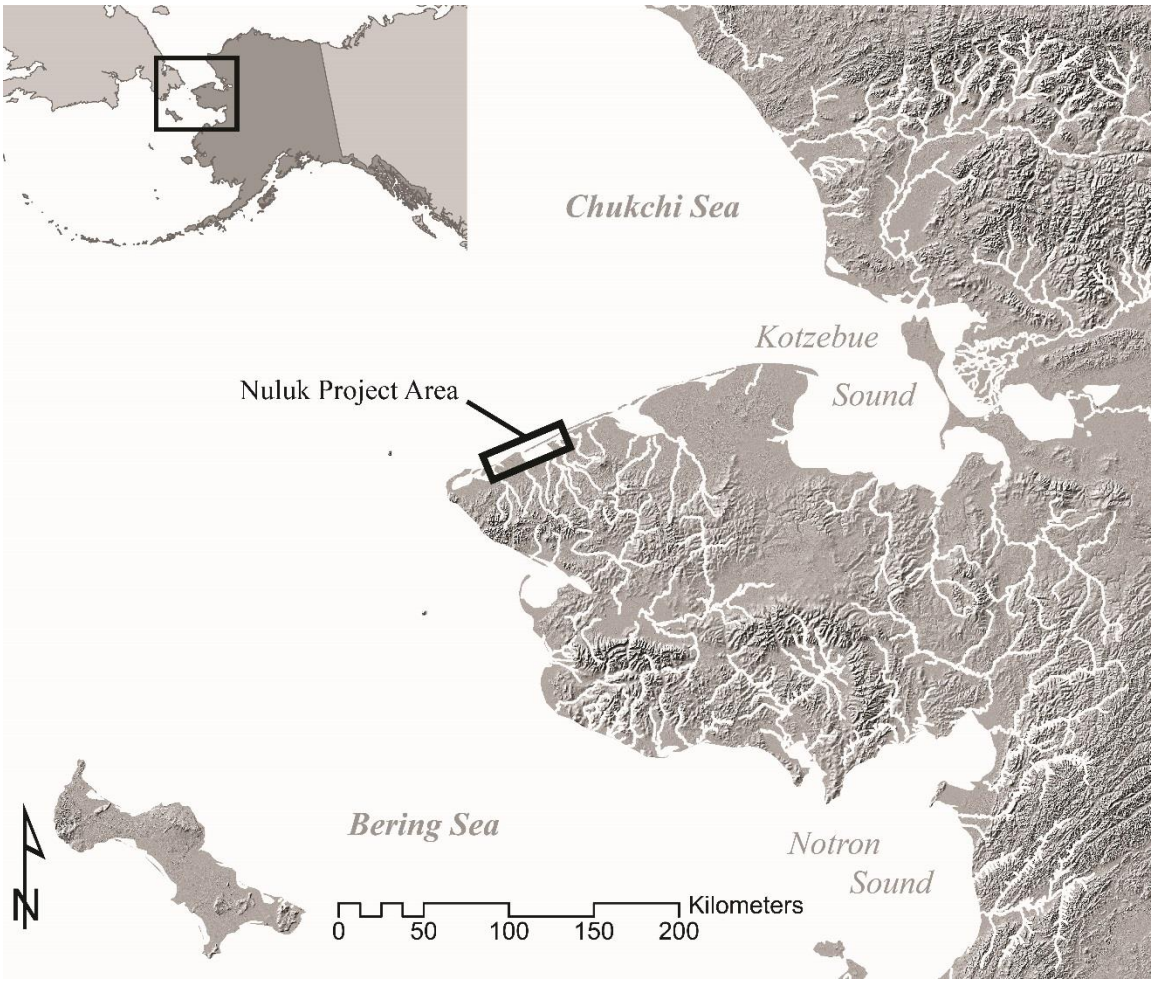

Figure 1. Project area map (figure by Justin Junge).

THE NORTHERN SEWARD PENINSULA

The Nuluk Project Area considered in this paper is limited to the coast, barrier islands, and lagoon shores of the northern Seward Peninsula between Lopp Lagoon and the boundary of Bering Land Bridge National Preserve (BELA)(see Fig. 1). The project name comes from the nearby Nuluk River, which drains into the northeast corner of Ikpek Lagoon. This area is characterized by a narrow coastal zone backed by a low-relief coastal tundra plain punctuated by thermokarst lakes and wetlands (Schaaf 1988a:14). The area from Lopp Lagoon to the northeast end of the project area and beyond is composed of a series of barrier islands; the origin of these barrier islands is unknown but is linked to local Holocene sea level change (Jordan 1988). Beach ridge systems around the region emerged between 4,000 and 6,000 years ago as sea level stabilized (Mason and Jordan 1993, 2002) and it is possible that barrier island systems formed at the same time. Extensive coastal dune systems are found on several of the barrier islands and mainland locations within the project area. Culturally important plants found in the project area include blackberries (*Rubus* spp.), blueberries (*Vaccinium* spp.), cranberries (*Vaccinium vitis-idaea*, *Vaccinium uliginosum*), salmonberries (*Rubus spectabilis*), rhubarb (*Rheum rhabarbarum*), sourdock (*Rumex arcticus*), wild celery (*Apium* spp.), various willows (*Salix* spp.), alpine sweetvetch (*Hedysarum alpinum*), and tall cottongrass (*Eriophorum angustifolium*) (Ray 1975). Riverine and anadromous fishes are found in lakes, rivers, and streams within or adjacent to the project area; a variety of both terrestrial and marine animal resources were most likely available to past residents as well. Local residents made extensive use of this region for hunting, gathering, and reindeer herding in the pre-contact (Harritt 1994; Schaaf 1988a) and contact era (Koutsky 1981a, 1981b; Ray 1975; Schaaf 1996) and many local resources continue to be important for subsistence into the present day.

LOCAL ARCHAEOLOGICAL AND ETHNOGRAPHIC CONTEXT

Early research along the northern Seward Peninsula coast was conducted by Jenness, Collins, and Hrdlička (see Powers et al. 1982 for summary of early research). Beginning in the 1940s, J. L. Giddings carried out survey and excavation at several locations along the coast (Giddings 1967; Giddings and Anderson 1986). Additional small-scale survey and excavation projects took place near the project area in the 1970s (Adams 1977; Powers et al. 1982; Schaaf 1988a:24) but the first extensive effort to study the archaeology of the northern Seward Peninsula was undertaken by National Park Service (NPS) archaeologist Jeanne Schaaf in 1985 and 1986 (Schaaf 1988a, 1988b). Schaaf led a reconnaissance survey of high probability areas in the interior and on the coast of BELA, including areas and sites revisited by the current project (Fig. 2). Schaaf's survey recorded more than 200 sites, provided baseline information about the pre-contact occupation of the northern Seward Peninsula coast, and identified critical sites and topics that required additional research. Subsequent work included testing of several sites, some within the current project area (Harritt 1994); related faunal analysis (Saleeby 1994); recovery efforts at an eroding Kitluk River Site (Schaaf 1993); and several projects focused on the ethnohistory, ethnoarchaeology, architecture, and human ecology of early twentieth century Inupiaq reindeer herders (Ellanna et al. 2004; Schaaf 1996; Simon 1998; Simon and Gerlach 1992). More recent research includes a NPS survey that covered approximately 55 miles of coast from Cape Espenberg to the Bering Land Bridge Preserve's boundary northeast of Shishmaref (Young and Gilbert-Young 2007) and ongoing survey and excavation at Cape Espenberg (Hoffecker and Mason 2010; Tremayne 2014) (see Fig. 2). The current project was driven by Schaaf's (1988a) and Harritt's (1994) recommendations for additional research and by the threat

of increased coastal erosion and other climate change impacts in the region (Jezierski et al. 2010).

According to the Alaska Heritage Resource Survey (AHRS) database there were 347 recorded sites on the northern Seward Peninsula coast at the outset of the Nuluk project; an additional 39 new sites are provisionally reported by Young and Gilbert-Young (2007) although official site forms were not completed. A total of 67 of the known sites are within the current project area. Prior research in the current project area was limited to reconnaissance survey between the outlets of Lopp and Ikpek Lagoons and aerial survey of a small area around Trout Creek (see Fig. 2). Limited testing (i.e., shovel probes and test units) was also conducted at six sites in the current project area (Harritt 1994; Schaaf 1988a).

Prior research established a cultural historical framework and expectations for the current research project. The culture history of this region is complex, due at least in part to millennia of interaction across the Bering Strait (Table 1). The archaeology within the current project area is limited to the last 5,000 years, with most sites dating to the last 1,000 years. Several Denbigh, Choris, and Ipiutak sites are reported in mainland areas of the northern Seward Peninsula coast, but known sites on the barrier island system are younger. The origin of these barrier islands is unknown but is linked to local Holocene sea level stabilization around 5,000 years ago (Jordan

1988). The results of prior archaeological and erosion research on the barrier islands suggests that sites more than 300–500 years old have already eroded away (Jordan 1988:351).

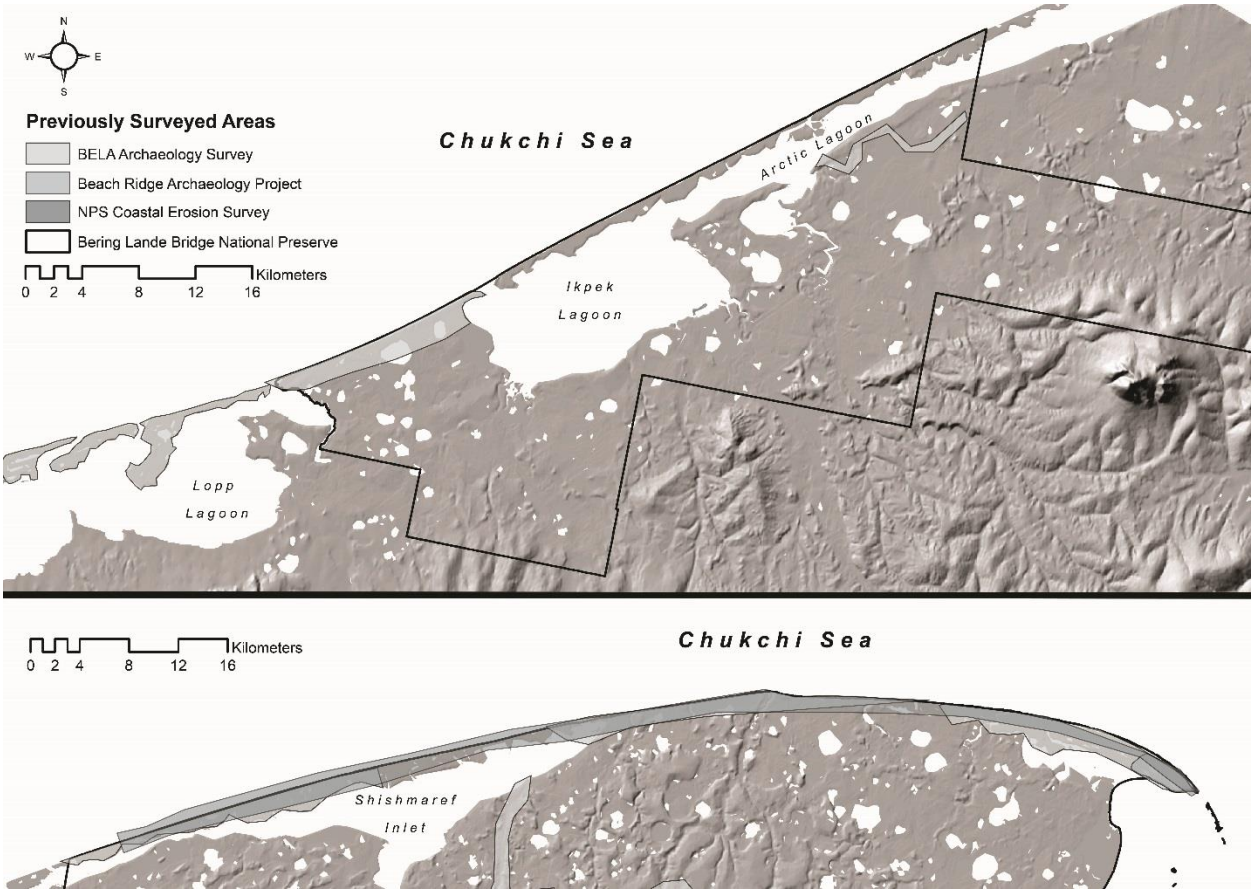

Figure 2. Previously surveyed areas of the northern Seward Peninsula Coast. Bottom map continues east from area included in top map. Note that surveyed areas are generalized and were reconstructed from project descriptions and also map digitization (Giddings and Anderson 1986; Schaaf 1988a; Young and Gilbert-Young 2007) (figure by Justin Junge)

Table 1. Summary of Archaeological Cultures of Northwest Alaska[a].

Phase	Approximate Age Range	Geographic Distribution
Denbigh–Early Choris	4500–2750 cal BP (2550–800 cal BC)	Kotzebue Sound, Brooks Range
Choris	2750–2450 cal BP (800–500 cal BC)	Kotzebue Sound, Brooks Range, Northern Yukon Territory
Norton (Near Ipiutak in northwest Alaska)	2450–1350 cal BP (500 cal BC–cal AD 600)	Southern Alaska Peninsula to Western Canada, unknown in Siberia and Chukotka
Ipiutak	1750–1150 cal BP (cal AD 200–800)	Norton Sound to Point Barrow, interior of Northwest Alaska and Brooks Range
Birnirk	1350–750 cal BP (cal AD 600–1200)	Eastern and western shores of Chukchi Sea
Thule	1000/950–550 (cal AD 950–1400)	Bering Strait to Greenland
Late Thule/Arctic Woodland	750–250 cal BP (cal AD 1200–1700)	Inland areas of Northwest Alaska
Late Thule/Kotzebue	550–250 (cal AD 1400–1700)	Coastal areas of Northwest Alaska

[a]Data from Anderson and Freeburg (2013), Mason (2009), Shirar (2011)

Several named places within or near the project area are identified by a variety of sources (Koutsky 1981a, 1981b; Ray 1964, 1975; Fair, n.d.) (Fig. 3); some are recorded as archaeological sites and/or Alaska Native Claim Settlement Act (ANCSA) 14(h) 1 sites. Place names within the project area include: *Sinrazat*<1> (SHF-1, 21,22), *Ikpik* (TEL-15, ANCSA Site #F-21966), *Issak* (TEL-52, ANCSA Site #F-21964), *Imiengnak* (TEL-53), the Olanna Gravesite (TEL-63, ANCSA Site #F-21967), *Itibliq* (SHF-2), and *Inuuanaituaq* (ANCSA Site #F-21965). Place names *Miłłitaavik* (TEL-20, ANCSA Site #F-22006), *Tuviqtuġvik*, *Aġvanaq* (ANCSA Site #F-21957), *Piŋu* (ANCSA Site #F-21963), *Siġluaq*, and *Yakpatakhaq* are outside the current project area but in the Ikpek Lagoon region. The field team for this study was asked by the NPS to avoid all of the named places within the boundaries of the Nuluk Project Area; as a result we

have no updated information to provide about these sites beyond data summarized below from existing site records and reports.

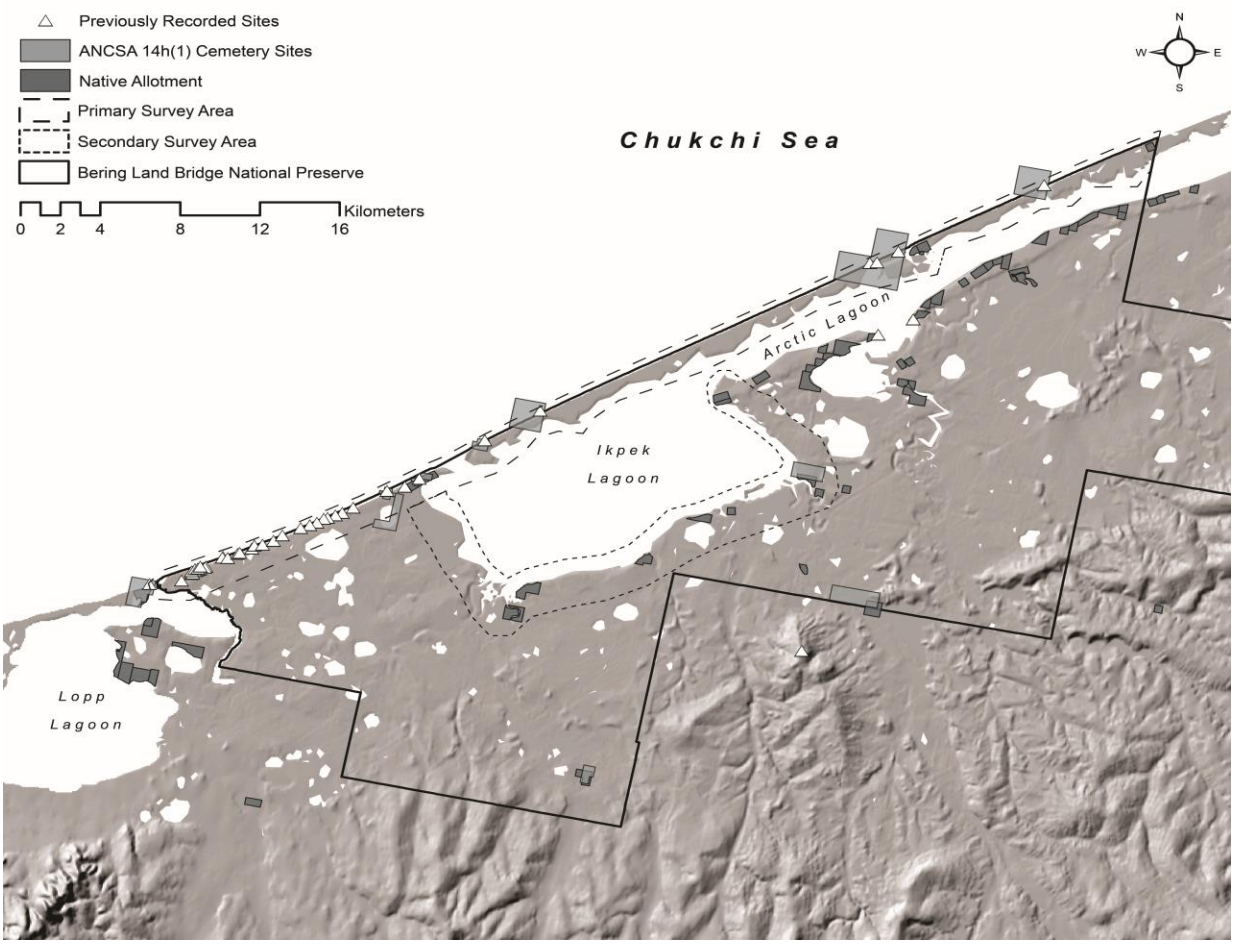

Figure 3. Approximate current project area with place names and previously recorded sites indicated (figure by Justin Junge).

Koutsky (1981b; see also Ray 1964, 1975) describes *Itibliq*, *Sinrazat*, *Ikpik*, and *Issak* as winter settlements; Ray (1964:81) mentions that these settlements were also often used in the summer. *Itibliq* (also known as *Itivlik, Itibluk, Owevuk, Owivik,* or *Ugiivik*) is a "place for traversing" or "portage" where boats could pass easily between the ocean and the lagoon (Kiyutelluk 1976 in Koutsky 1981b:19). In the mid-twentieth century the location was still visited in the spring by hunters from Shishmaref for spring sea mammal hunting (Ray 1964:81). *Owevuk* is either another name for the same site (Koutsky 1981b) or, perhaps, a separate but

adjacent site (Ray 1964)(SHF-3)(AHRS 1975). *Sinrazat* (also *Sinyasut, Sinazat,* or *Singaaruaq*), located to the southwest of *Itibliq* along the coast, was a small village of four houses in the late 1800s (Ray 1964:81); it is the current location of a historic shelter cabin (Schaaf 1988b). Like *Itibliq*, there are also two older habitation sites in the same vicinity (SHF-21, 22), that include at least 100 cultural features such as pre-contact and contact-era house remains, caches, and at least 29 burials (Schaaf 1988b). Koutsky (1981b:20) reports that this was and is a good location for sea mammal hunting because ocean currents create open-water leads in the spring. There are several stories about a mass death at *Sinrazat* following a beluga feast (Koutsky 1981b:20, 33–34) and it is a practice of visitors to *Sinrazat* to leave something for a crying child spirit that sometimes visits the area (Koutsky 1981b:36). *Ikpik* (or *Ikpek*), meaning "bluff", "bank along the shore", or "high ground", is the location of a large pre-contact village and a kazgi (AHRS 2006; O'Leary 1990; Ray 1964; Ray 1971 in Koutsky 1981b:20), as well as an actively used shelter cabin (O'Leary 1990). The site was occupied until the early twentieth century when people moved to Brevig Mission and Shishmaref so their children could go to school (Koutsky 1981b:20). *Ikpik* is one of several locations in the region where battles between Siberian Eskimos, the Chukchi, and the Tapqaaqmiut (people of the coast from *Ikpik* to Espenberg according to Ray [1964:81]) are reported. At *Ikpik*, Tapqaaqmiut reportedly trapped visiting Siberians under their umiaks and killed them. Tradition warns that if you walk between the two whale jaws standing upright at *Ikpik*, the jaws will close and kill you (Koutsky 1981b:32). *Ikpik* is also reported as the ancestral home of the Shishmaref family of Elliot Ollana (AHRS 2006). The Olanna Graves site (also known as *Issuk*), located approximately 4 km to the northeast, is also associated with the Olanna family (ANCSA 1984c). The site consists of both graves and

three village areas, composed of numerous pre-contact and contact-era house depressions and other cultural materials.

The village site at *Issak* (also *Esook* or *Ezooah*), located approximately 2 km southwest of *Ikpik*, was abandoned in the early twentieth century (Ray 1964:81) but the location was still used for sea mammal hunting in the late twentieth century (BIA ANCSA 1984b; Koutsky 1981b:20). Three semi-subterranean houses, associated cache pits and depressions, and a reindeer corral were reported at the site in the 1980s, as well as a variety of artifacts (e.g., ceramics, a wooden bowl or dish); the site has both a pre-contact and a contact-era component (BIA ANCSA 1984b). *Miłłitaavik* (also *Mitletavik, Mitletukeruk, Mitletak, Mitletpik*, or *Metlatavik*), or "jump across", is a large settlement site located outside the southwest boundary of the Nuluk Project, where the mainland meets a barrier island at a very narrow crossing (Koutsky 1981a:20; see also Connolly and Slaughter 1991; Ray 1964, 1975). There is both an ancient site and a historic village and mission that were occupied beginning in the late 1800s. Most of the community died in the 1918 influenza epidemic and the survivors moved to Wales (Koutsky 1981a:20). The village was also the site of a conflict between Siberian raiders and locals (Koutsky 1981a:28). Collins excavated at the village in 1928. In 1991, the large settlement included 124 features—at least 40 of which are semi-subterranean pre-contact and contact-era dwellings—and at least 30 graves; a contemporary cabin was also reported at the site (Connolly and Slaughter 1991).

In addition to large settlements, there are a variety of smaller settlements and seasonal use sites located within and near the project area (see Fig. 2). Koutsky (1981b:21; see also Ray 1964) reports *Imiengnak* (also *Imangnaq* or *Ima-Anok*) as a spring settlement, with people still visiting the site annually for seal hunting in the 1980s. *Yakpatakhaq* was a village, reportedly

named after the wounded survivor of a surprise Siberian attach on the settlement (Kiyutelluk 1976 in Koutsky 1981b:23, 32). *Yakpatakhaq* is still used as a summer subsistence camp. *Piŋu* (also *Pingu*), a second inland summer settlement, was also the location of a confrontation between Siberian attackers and local villagers (Koutsky 1981b:23, 31). Cultural materials at the site are limited to a pottery sherd and a piece of worked wood (Slaughter 1996). *Inuunaituaq*, an inland location, is described as a fall settlement and lake that was used to drive caribou into shallow water where they could be easily killed (Burch n.d.; Fair n.d.; Jolles n.d.; Koutsky 1981b:26). A kayaker reportedly drowned here when his boat tipped during a caribou drive (Koutsky 1981b:34). A field investigation by the Bureau of Indian Affairs in the 1980s did not identify any cultural features or artifacts on site (BIA ANCSA 1984a).

Tuviqtuġvik, "place to put a tent," was a reindeer herding location, one of the first established to teach Native Alaskans how to herd reindeer (Koutsky 1981b:53). It was used as a permanent base camp for many years, with several families living there year round until the 1940s. *Siġluaq*, "ice cellar" or "underground cache," is located outside the project area on the coastal margin (see Fig. 2) (Koutsky 1981b:18). The site was a village or a seasonal camp that people visited annually during pre- and post-contact times to procure a variety of resources including berries, ducks, fish, and seals. There is also a story about a shaman and his son who lived at *Siġluaq* (Koutsky 1981b:37). *Aġvanaq*, "where you go back and forth," is a named geographic feature located about 5 miles inland from *Ikpek*. It was used as a landmark and direction indicator when traveling and hunting in the region (Koutsky 1981b:28) and by reindeer herders (Ken Pratt, pers. comm. 13 May 2015); the location may also have been associated with pre-contact caribou hunting activities (Pratt, pers. comm. 13 May 2015) There is a stone cairn at the summit marked with the signatures of early reindeer herders (Koutsky 1981b) and a ring of

rocks also at the summit, interpreted as a hearth (Pratt, pers. comm. 13 May 2015).

Based on previous research, our expectations at the outset of the project were that we would find late pre-contact and contact-era sites on the barrier island system, with potentially older sites or site components in mainland areas. We anticipated that past occupation of the barrier islands would be minimal based on 1) the density of previously recorded sites in other barrier island systems to the east and west, and 2) the potential paucity of resources, particularly fresh water, on the barrier islands.

PROJECT GOALS AND METHODS

The current project was designed to recover data needed to address questions about late Holocene settlement patterns. Guiding research questions were: 1) What is the distribution and age of sites within the previously unsurveyed areas of the northern Seward Peninsula coast? and 2) Do these settlement patterns align with the current regional settlement model and expectations for the area? Why or why not? We addressed these questions through survey and data collection of a minimally investigated area of the northern Seward Peninsula (see also Anderson and Junge 2015). The highest priority area within the current project area, the coastal margin (approximately 200 m inland from the high mean tideline), was systematically surveyed at 20-m transect intervals. Other high probability areas adjacent to the coastal margin, e.g., dune formations on the lagoon shore, were investigated non-systematically. Subsurface testing was planned at a limited number of sites based on prior research recommendations. Where possible, testing took advantage of existing exposures, for example eroding bluff faces. In cases where existing exposures were not present, test units were excavated. Subsurface testing activities included shovel tests (typically round 50 by 50–cm or smaller tests) and 1 by 1–m square units. Shovel tests were excavated in approximately 10-cm-thick arbitrary units, which were screened

through ¼-inch and ⅛-inch mesh. Test units were excavated in natural levels with 10-cm arbitrary subdivisions. Exceptions to this sampling design include bulk collection of several levels at TEL-105, which were later screened in the lab, and limiting the use of the ⅛-inch screen to the northwest quad of TEL-105 Test Unit 2. All excavated material was collected for analysis and curation. Surface artifacts were only collected if they were either significantly degrading due to exposure or seemed vulnerable to unauthorized collecting activities.

FIELD AND ANALYTICAL RESULTS

In 2012 and 2013 we completed approximately 2.7 km^2 of reconnaissance survey and 12.5 km^2 of systematic survey, covering about 42 miles of the coast (Fig. 4). A total of 22 previously known sites were revisited and documented. Twenty-nine new sites and six new isolated finds were identified and documented. Surface collections of diagnostic artifacts and samples were made at 10 sites and limited testing (shovel tests and test units) was conducted at six sites (TEL-105, TEL-108, TEL-265, TEL-283, TEL-285, TEL-237). The most extensive testing was carried out at TEL-105 and TEL-108. Survey of the lagoon shore was limited to several high probability areas on the barrier islands. The most southwestern area of the park and the eastern and western shores of the Ikpek Lagoon outlet were not surveyed.

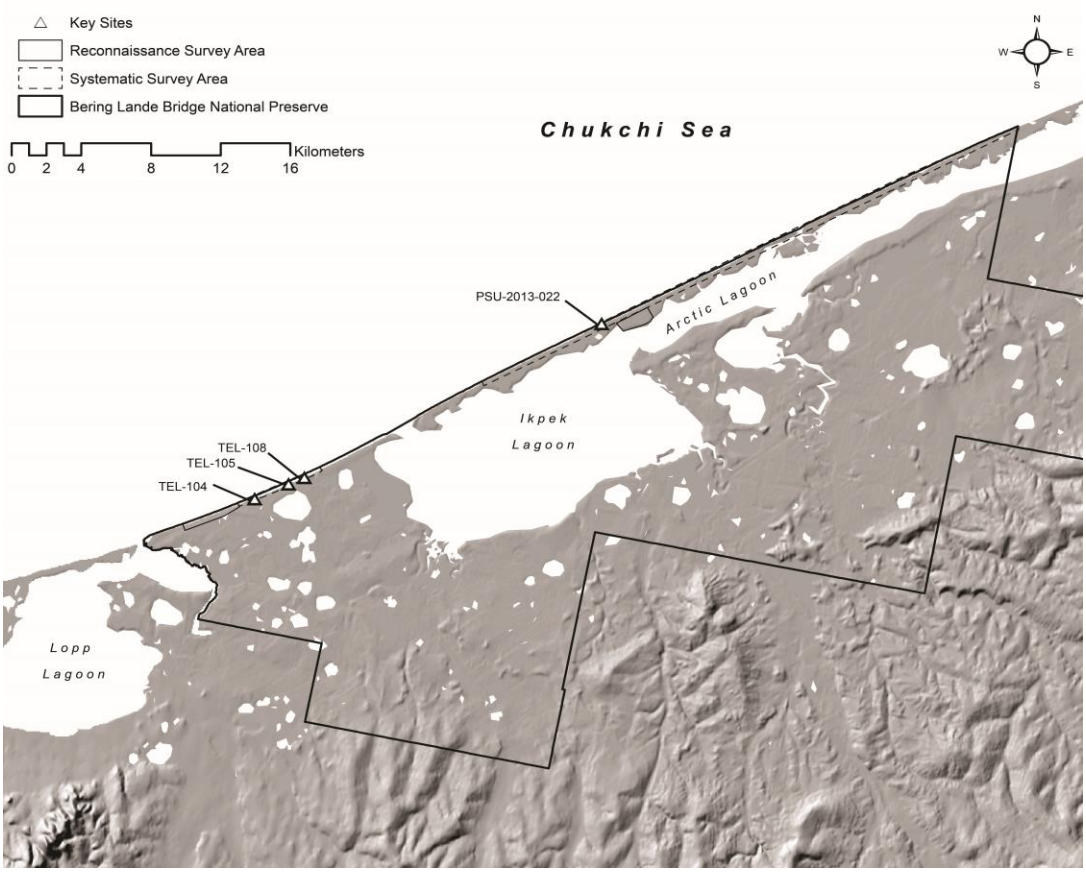

Figure 4. Survey area and key sites mentioned in text (figure by Justin Junge).

A total of 87,657 artifacts and samples were collected over the course of the Nuluk Project. These were materials collected from a variety of contexts—surface, shovel test, test unit, bank exposure—for the purpose of dating sites or addressing larger questions about subsistence and settlement patterns along the northern Seward Peninsula coast. Overall, little material was noted on the surface of sites within the project area. The most commonly surface-collected artifacts were ceramics, followed by charcoal, bone, and wood objects, which were typically unmodified. Osseous (bone, antler, ivory) materials were by far the most abundant materials collected during testing. Bone and antler comprised nearly 70% of the TEL-105 site assemblage (Table 2). This includes cut, ground, flaked, and scraped bone, antler, and ivory material. Some objects categorized as modified likely represent in-process tools while others are likely debris

from osseous tool manufacturing activities. Bone and antler materials comprise more than 50% of the assemblage from TEL-108 (see Table 2). A small number, 62 in total, of tools and highly modified objects were collected from all sites (Table 3); the majority of these were osseous and wood tools, although a small number of lithic, ceramic, and amber artifacts were also collected during testing and surface collection. Some of these tools are temporally diagnostic. Analysis of collected materials was limited to what was needed for classification, cataloging, and identification of temporally diagnostic materials. The results of artifact classification efforts also provided additional information for our preliminary interpretation of subsistence activities. Artifacts and other project materials are archived by the National Park Service in Anchorage.

Table 2. Artifact Counts from TEL-105 and TEL-108 Test Unit Excavation

	TEL-105		**TEL-108**	
Material Type	**Count**	**%**	**Count**	**%**
Amber	17	0.03	0	0
Antler	17500	25.50	3	1.80
Bone	42784	62.35	96	57.48
Ceramic	609	0.89	13	7.78
Clay	4	0.01	0	0
Glass	2	<.001	5	2.99
Ivory	1485	2.16	0	0
Shell	2873	4.19	36	21.56
Stone	2795	4.07	8	4.79
Teeth	285	0.42	4	2.40
Wood	262	0.38	2	1.20
Total	**68616**	**100**	**167**	**100**

Table 3. Tools and Highly Modified Artifacts Collected from All Sites, Probable Temporal Associations Noted Where Possible

Artifact Description	TEL-232	TEL-287	TEL-104	TEL-105	TEL-108	TEL-258	Grand Total	Temporal Association	Reference	Reference Identification
Abrader				1			1	Unknown		
Animal Figure, Wound Pin				1			1	Western Thule	Giddings and Anderson 1986:plate 47	Wound pin
Antler, Arrow Blunt				1			1	Thule	Dumond and Collins 2000:plate VIIIo–s	Bird arrow head
Antler, Modified (tool)				2			2	Western Thule	Giddings and Anderson 1986:plates 38, 40	Arrowhead fragment
Antler, Poss. Drum Rim				1			1	Birnirk–Historic	Ford 1959:222–223	
Antler, Possible Hafting Element				1			1	Early Western Thule	Giddings and Anderson 1986:plates 43m, 61s	Harpoon ice pick
Antler, Oblong Peg				4			4	Early Western Thule–Kotzebue	Giddings and Anderson 1986:plates 4h, 43k	Harpoon foreshaft
Antler, Prong Harpoon Point						1	1	Early Western Thule–Kotzebue	Giddings and Anderson 1986:plate 19k	Leister prong, antler
Bead, Amber				1			1	Thule–Kotzebue		
Bone, Harpoon Point			1				1	Kotzebue	Giddings and Anderson 1986:plate 1a	Harpoon head
Bone, Modified, Drilled, Sled Runner	5					3	8	Kotzebue	Giddings and Anderson 1986:plate 2f, m	Sled shoe fragment
Bone, Point, Wound Pin				1			1	Western Thule	Giddings and Anderson 1986:plate 47	Wound pin
Bone, Point shaft			1				1	Kotzebue	Giddings and Anderson 1986:plate 5k	Harpoon head fragment
Bone, Point Tip				1			1	Late Western Thule	Giddings and Anderson 1986:plate 9l	Piercer
Ceramic, Base Sherd						2	2	Late Western Thule–Kotzebue	Anderson 2011	
Ceramic, Rim Sherd				3	1	13	17	Late Western Thule–Kotzebue	Anderson 2011	
Chert, Drill Tip				1			1	Unknown		
Chipped Chert Biface Tip				1			1	Ipiutak–Western Thule	Giddings and Anderson 1986:plates 70n, 17i	Knife side-blade (fragment?)

Ground Slate Fragment, Ulu				1			1	Birnirk–Historic	Giddings and Anderson 1986	
Ground Slate Fragment, Utilized				1			1	Unknown		
Ground Slate Tip				1			1	Unknown		
Ivory, Haft, Drilled				1			1	Unknown		
Ivory, Point Tip				1			1	Late Western Thule	Giddings and Anderson 1986:plate 12n	Fishhook barb, ivory
Ivory, Barbed Point				1			1	Early Western Thule–Kotzebue	Giddings and Anderson 1986:plates 21f, 22b	Fish arrow prong, ivory; center prong, fish arrow, antler
Ivory, Barbed Point				2			2	Western Thule	Giddings and Anderson 1986:plate 22s	Leister prong, ivory
Ivory, Decorative Object				1			1	Birnirk or Punuk	Collins 1937:plates 68, 69	Ivory object (atlatl weight)
Labret				1			1	Recent	Ford 1959:221	Ivory labret
Lithic, Flaked, Point Base				1			1	Recent	Ford 1959:119–120	Arrowhead fragment
Lithic, Projectile Point						1	1	Early Western Thule	Giddings and Anderson 1986:plate 39o	Arrow point (fragment)
Wood, Drilled, Sled Part		2					2	Kotzebue–Historic		
Wood, Drilled, Sled Runner		8					8	Kotzebue–Historic		
Totals	**5**	**10**	**2**	**30**	**1**	**20**	**68**			

In addition to the 110 diagnostic artifacts collected over the course of the project, 16 new radiocarbon dates obtained as part of the Nuluk Project shed light on the occupation history of the northern Seward Peninsula (Table 4). These new dates expand on the suite of 13 radiocarbon dates for sites within the project area obtained by previous researchers (Harritt 1994; Schaaf 1988a) and contributes to what we know about the antiquity of sites and landforms in this area. Samples were selected for radiocarbon analysis based on their provenience and material type (with preference given to terrestrial mammal bone and short-lived plant species where possible). Radiocarbon dates were calibrated by Beta Analytic using the IntCal 13 calibration curve (Reimer et al. 2013).

In the following sections we summarize the results of analysis at the most significant sites identified by this study before turning to a synthesis and discussion of the results.

Table 4. Results of Radiocarbon Dating and Previous Dates in the Project Area

Catalog No.	Site No.	Provenience	Material	Description	Lab ID	13C/12C (‰)	Measured Radiocarbon Age	Conventional Radiocarbon Age	2 Sigma calibration[c]	Reference
	TEL-86	Feature 15, mid-level house	Charcoal	Not listed	BETA-33761			10±60 BP	cal AD 1688 to 1734 (cal BP 262 to 216); cal AD 1810 to 1930 (cal BP 140 to 20); cal AD 1955	Harritt 1994:305
	TEL-86	House Feature 7, 26 cm in depth	Charcoal		BETA-17951			220±70 BP	cal AD 640 to 1955 (cal BP 1310 to 0)	Schaaf 1988a:460
	TEL-86	Feature 2, Level 6	Charcoal	Not listed	BETA-33763			330±90 BP	cal AD (1420 to1680 (cal BP 530 to 270); cal AD 1739 to 1805 (211 to 145); cal AD 1934 to 1955 (cal BP 16 to 0)	Harritt 1998:305
	TEL-86	Feature 21, Level 6	Charcoal	Not listed	BETA-33762			410±50 BP	cal AD 1420 to 1530 (cal BP 530 to 420); cal AD 1552 to 1634 (cal BP 398 to 316)	Harritt 1998:305
	TEL-93	Feature 34	Charcoal	Not listed	BETA-33764			320±60 BP	cal AD 1440 to 1670 (cal BP 510 to 280); cal AD 1949 to 1952 (cal BP 1 to 0)	Harritt 1998:306
	TEL-104	House Feature 8, 58 cm in depth	Charcoal		BETA-17955			100±70 BP	cal AD 1650 to 1955 (cal BP 300 to 0)	Harritt 1998:307 Schaaf 1988b:580

	TEL-104	Feature 2, 50 cm below surface (BS)	Wood/Charcoal	Not listed	BETA-33765		200±70 BP	cal AD 1513 to 1602 (cal BP 437 to 348); cal AD 1610 to 1955 (cal BP 340 to 0)	Harritt 1998:306
	TEL-104	House Feature 8, 40 cm depth	Charcoal		BETA-20029		250±70 BP	cal AD 1470 to 1700 (cal BP 480 to 250); cal AD 1720 to 1820 (cal BP 230 to 130); cal AD 1831 to 1879 (cal BP 119 to 71)	Harritt 1998:307 Schaaf 1988a:460
	TEL-104	Feature 32, 30–33 cm BS	Charcoal	Not listed	BETA-33766 (ETH 5946)		470±70 BP	cal AD 1311 to 1354 (cal BP 639 to 596); cal AD 1380 to 1520 (cal BP 570 to 430); cal AD 1582 to 1624 (cal BP 368 to 326)	Harritt 1998:308
	TEL-104	House Feature 8, 40 cm in depth	Charcoal		BETA-17954		590±80 BP	cal AD 1270 to 1450 (cal BP 680-500)	Harritt 1998:307 Schaaf 1988a:458
	TEL-104	Feature 26, Level 6	Wood/Charcoal	Not listed	BETA-33768		760±50 BP	cal AD 1180 to 1290 (cal BP 770 to 660)	Harritt 1998:307
	TEL-104	Feature 26, Level 3	Wood/Charcoal	Not listed	BETA-33767		770±130 BP	cal AD 1010 to 1420 (cal BP 940 to 530)	Harritt 1998:306

BELA 60911	TEL-105	TU 1, Level 2 (20–30 cm below datum [BD]), ¼-inch screen	Bone	*Rangifer tarandus* (caribou) phalanx, 3rd	BETA-388180	-18.9	80±30 BP	180±30 BP	cal AD 1655 to 1695 (cal BP 295 to 255); cal AD 1725 to 1815 (cal BP 225 to 135); cal AD 1835 to 1840 (cal BP 115 to 110); cal AD 1855 to 1865 (cal BP 95 to 85); cal AD 1920 to Post 1950 (cal BP 30 to Post 0)	
	TEL-105	House Feature 18, 75–81 cm in depth	Charcoal		BETA-17953			290±60 BP	cal AD 1450 to 1950 (cal BP 500 to 0)	Schaaf 1988a:459
BELA 60825	TEL-105	Test Unit (TU) 1, Level 3 (40 cm BD)	Charred Material	*Picea* sp./ unidentified conifer	BETA-408915	-25.4	550±30 BP	540±30 BP	cal AD 1320 to 1350 (cal BP 630 to 600); cal AD 1390 to 1435 (cal BP 560 to 515)	
BELA 60827	TEL-105	TU 2, Level 3 (56 cm BD)	Charred Material	Unidentified plant material	BETA-408916	-18.3	770±30 BP	880±30 BP	cal AD 1045 to 1095 (cal BP 905 to 855); cal AD 1120 to 1220 (cal BP 830 to 730)	
BELA 60740	TEL-105	Shovel Test Pit (STP) 7 Level 8, 70-80 cm BS	Bone	*Canis* species (wolf/dog) premaxilla	BETA-388179	-13.2	810±30 BP	1000±30 BP	cal AD 990 to 1045 (cal BP 960 to 905); cal AD 1095 to 1120 (cal BP 855 to 830); cal AD 1140 to 1145 (cal BP 810 to 805)	
BELA 60728	TEL-108	TU 1 Level 1 (0-20 cm BD)	Bone	*Rangifer tarandus* (caribou) metpodial fragment	BETA-388178	-18.9	100.4±0.4 pMC	70±30 BP	cal AD 1690 to 1730 (cal BP 260 to 220); cal AD 1810 to 1920 (cal BP 140 to 30) and Post AD 1950 (Post BP 0)	

BELA 60750	TEL-108	STP 1 (101 cm BS)	Bone	*Canis* species (wolf/dog) sacral vertebrae	BETA-408917	-13.8	920±30 BP	1100±30 BP	cal AD 885 to 1015 (cal BP 1065 to 935)
BELA 61012	TEL-237	JAJ Way Point (WP) #07, 37 cm BS	Wood	*Salix* sp.	BETA-388184	-26	220±30 BP	200±30 BP	cal AD 1650 to 1685 (cal BP 300 to 365); cal AD 1730 to 1810 (cal BP 220 to 140); cal AD 1925 to Post 1950 (cal BP 25 to Post 0)
BELA 61015[a]	TEL-237	JAJ WP#11, 78 cm BS	Wood	*Picea/Larix* sp.	BETA-408909	-26.2	320±30 BP	300±30 BP	cal AD 1490 to 1655 (cal BP 460 to 295)
BELA 60890	TEL-250	Surface	Charred Material	*Picea/Larix* sp.	BETA-408910	-25.2	120±30 BP	120±30 BP	cal AD 1670 to 1780 (cal BP 280 to 170); cal AD 1800 to 1940 (cal BP 150 to 10); Post AD 1950 (Post BP 0)
BELA 61016	TEL-238	Surface	Wood	*Picea* sp.	BETA-408911	-24.2	580±30 BP	590±30 BP	cal AD 1295 to 1370 (cal BP 655 to 580); cal AD 1380 to 1415 (cal BP 570 to 535)
BELA 60982	TEL-258	16 m below surface	Charcoal	*Picea/Larix* sp.	BETA-388181	-24.6	300±30 BP	310±30 BP	cal AD 1485 to 1650 (cal BP 465 to 300)
BELA 60984	TEL-262	Surface	Charred Material	*Picea* sp.	BETA-408912	-25.8	410±30 BP	400±30 BP	cal AD 1440 to 1520 (cal BP 510 to 430); cal AD 1595 to 1620 (cal BP 355 to 330)
BELA 61014[b]	TEL-287	12 m BS, Feature 1	Plant Material	Unidentified sedge (woven grass mat).	BETA-408913	-24.4	530±30 BP	540±30 BP	cal AD 1320 to 1350 (cal BP 630 to 600); cal AD 1390 to 1435 (cal BP 560 to 515)
BELA 60986	TEL-263	Surface	Wood	*Picea* sp.	BETA-388182	-22.4	160±30 BP	200±30 BP	cal AD 1650 to 1685 (cal BP 300 to 265); cal AD 1730 to 1810 (cal BP 220 to 140); cal AD 1925 to

									Post 1950 (cal BP 25 to Post 0)
simonBELA 60988	TEL-264	Surface	Wood	*Picea/Larix* sp. (bark)	BETA-388183	-24.2	350±30 BP	360±30 BP	cal AD 1450 to 1640 (cal BP 500 to 310)
BELA 61013[c]	TEL-265	Surface	Wood	*Salix* sp./ *Populus* sp.	BETA-408914	-26.4	300±30 BP	280±30 BP	cal AD 1520 to 1595 (cal BP 430 to 355); cal AD 1620 to 1655 (cal BP 330 to 285)

[a]Degraded and soft root intrusion. Possible insect activity (picked to remove noticeable roots).

[b]Intrusive roots growing into sample (picked to remove noticeable roots).

[c]Degraded plant material and possible intrusive roots that may be younger and affect the age (picked to remove noticeable roots).
[d]Calibrated with IntCal13 (Reimer et al. 2013)

SITE TEL-105

TEL-105 is located at the top of the 5- to 6-m-high, dune-topped bluffs that characterize this area of the coast. The site was recorded by Schaaf in the 1980s (Schaaf 1988a, 1988b) as a large pre-contact settlement consisting of seven multi-roomed semi-subterranean houses and associated cache pit features; human remains were also noted at the site. A single 50 by 50–cm test unit was excavated in one of the features (Feature 18); testing identified at least one occupation layer and a possible buried surface (Schaaf 1988b:584). TEL-105 was selected for additional testing primarily because Schaaf (1988b:585) recognized it as a site with high potential for intact sub-surface deposits.

In 2012, additional features were identified at the site and erosion was noted along the upper dune edge and in the lower dune field located on the modern coastal plain (Fig. 5). There were no significant exposures of cultural features that could be sampled to obtain additional dates or to study stratigraphy; subsurface testing was required. A total of 34 shovel test pits (STPs) and two 1 by 1–m test units were excavated at TEL-105, with a total excavated volume of approximately 6.47 m^3. The STPs were placed in possible features, with a focus on areas along the lower terraces close to the perennial stream. STPs were also placed adjacent to features with the purpose of identifying and sampling midden deposits or activity areas associated with houses. Test Unit (TU) 1 was subsequently excavated in a midden deposit identified through shovel testing, with a total excavated volume of 0.43 m^3. TU 2 was placed in a depression feature located on the terrace below the densest concentration of house features adjacent to a shovel test that yielded cultural material; a total of 0.76 m^3 was excavated from TU 2.

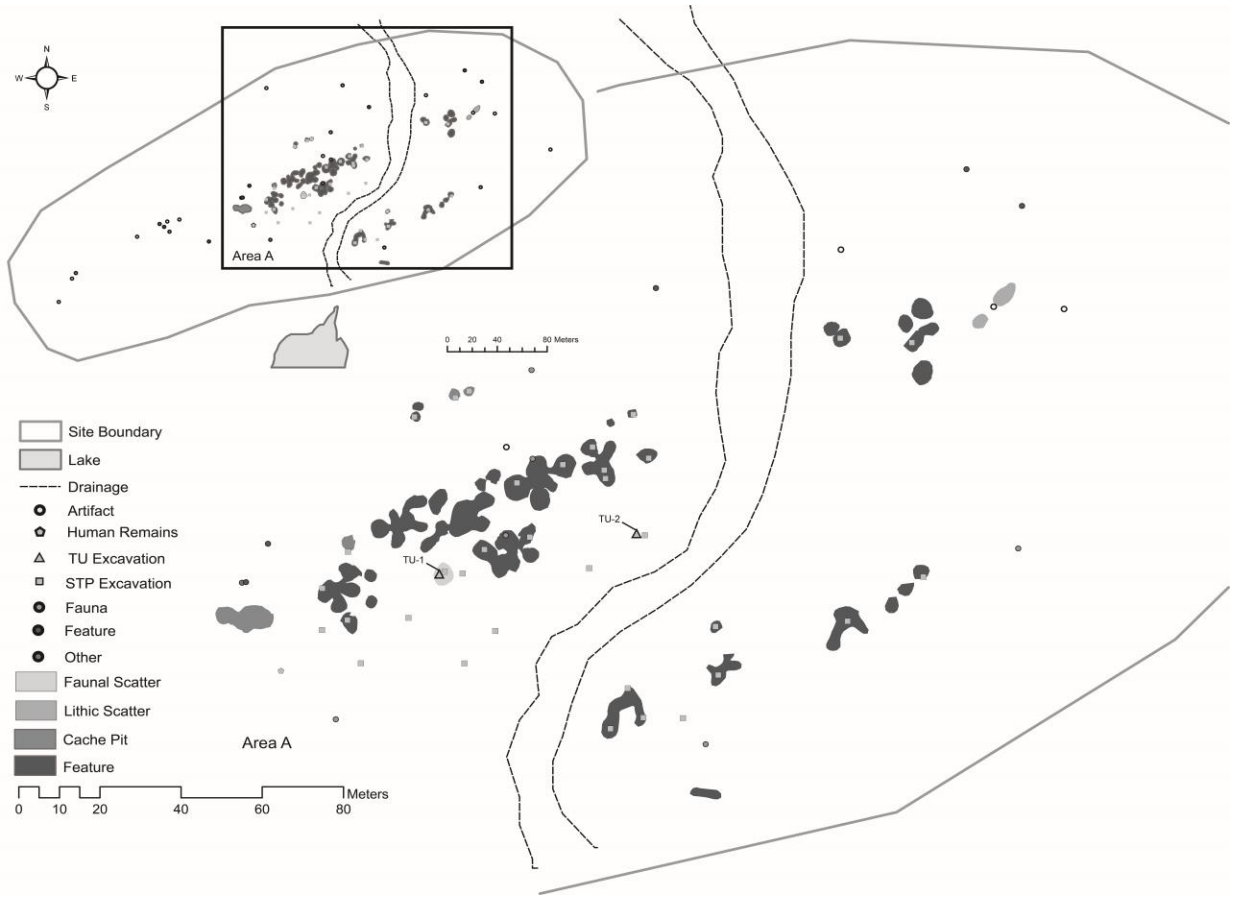

Figure 5. Overview map of TEL-105 site area (figure by Justin Junge).

The majority of temporally diagnostic artifacts recovered by the field team are from TEL-105; this is proportional to the overall greater volume excavated and corresponding greater number of artifacts and amount of cultural material collected from TEL-105 in comparison to any other tested sites. Many of the artifacts from TEL-105 suggest a Thule and/or Late Thule/Kotzebue phase occupation of the site. Three of a total of four antler harpoon foreshaft parts from TEL-105 are similar to harpoon foreshafts from Cape Krusenstern, which date from the Early Western Thule to the Late Thule/Kotzebue phase (Giddings and Anderson 1986:plates 4h, 43k) (Fig. 6). A variety of other bone, antler, and ivory implements from TEL-105 are found elsewhere around Kotzebue Sound in association with Thule and Late Thule/Kotzebue phase

occupations (Table 3). Several ground and drilled slate objects, including a knife, an ulu blade, and a knife or point tip are similar to Early Western Thule objects from Cape Krusenstern (Giddings and Anderson 1986:plate 26f–h, plate 34h) but such objects are found throughout the Thule phase. Several artifacts from TEL-105 suggest that the site may have an older component. An ivory decorative object recovered from the site has a linear decorative pattern similar to somewhat older Birnirk and Punuk phase items of the Bering Strait region (e.g., Bronshtein and Dneprovsky 2002; Collins 1937:plates 68, 69; Dneprovsky 2002, 2006) (Fig. 7). Two burin-like groundstone slate implements from TEL-105 resemble similar objects identified by Giddings and Anderson (1986:plate 92n–o) as dating to the Norton or Near Ipiutak phase. In addition, a chert biface tip may be part of what others have identified as a knife side-blade (Giddings and Anderson 1986:plates 17i, 70n); these are found during the Ipiutak and Thule phases.

Figure 6. Antler harpoon foreshafts from TEL-105: A) BELA 55710, B) BELA 55711, and C) BELA 55728 and D) ivory decorative object (BELA 55783) from TEL-105 (photos by Emily Rocha, figure by Justin Junge).

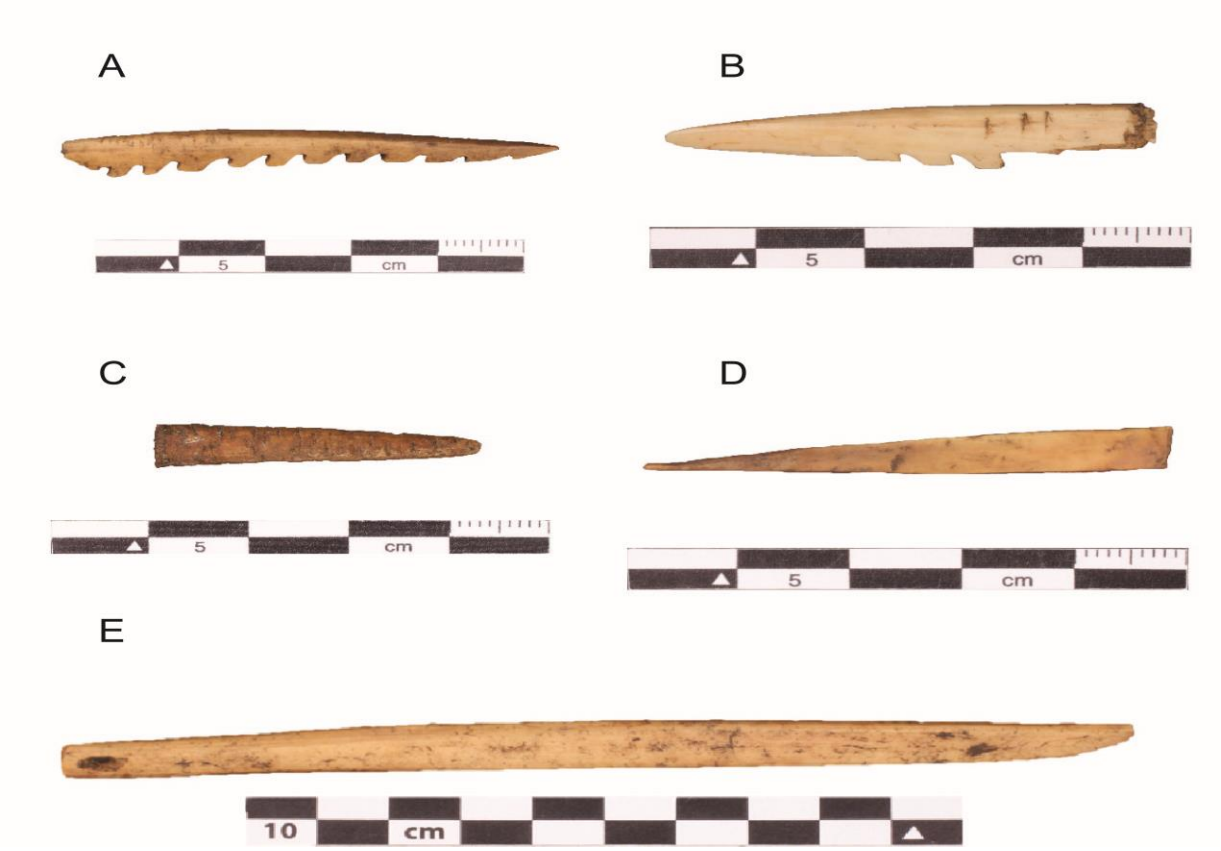

Figure 7. Ivory fishing objects from TEL-105. A) Ivory leister prong (BELA 55778), B) ivory leister prong (BELA 55779, C) ivory barb (BELA 55805), D) ivory fishhook barb (BELA 55842), E) ivory marlin spike (BELA 55836) (photos by Emily Rocha, figure by Justin Junge).

Schaaf (1988) obtained a radiocarbon date from the site that placed the occupation during the late pre-contact period, 550 cal BP to the modern era (AD 1450 to 1950). We obtained four new dates for TEL-105 that push the absolute age of site occupation back 400 years, to between 960 cal BP and the modern era (see Table 4), confirming Schaaf's hypothesis that the site has multiple components. This includes an older component that dates the site to the early Thule or even Birnirk phase.

Preliminary analyses of faunal materials and artifacts recovered during testing of TEL-105 and TEL-108 provide some provisional information on subsistence activities and season of site occupation on the Seward Peninsula coast over the last 1,000 years. Analysis of 1,631

specimens, out of a total of 46,016 recovered, indicates a focus on seal hunting at both TEL-105 and TEL-108. There is, however, an abundance of fish bone (6,492 specimens) recovered and not yet identified from these sites that indicates fishing was likely also an important subsistence activity (Table 5). Flotation of bulk midden samples from TEL-105 yielded additional fish bone that has not yet been quantified or analyzed. Analysis of fish bone could be particularly informative with respect to subsistence and perhaps season of site occupation, as some species have limited availability or were only procured during specific times of year (e.g., salmon fishing in late summer/early fall) (Burch 2006; Raymond-Yakoubian 2013).

Table 5. Number of Faunal Specimens Recovered from TEL-105 and TEL-108

Classification	**TEL-105**		**TEL-108**		**Total**
	¼-inch	⅛-inch	¼-inch	⅛-inch	
Terrestrial Mammal	39	0	4	0	43
Marine Mammal	495	1060	76	0	1631
Avian	11	1	0	0	12
Fish	480	6011	1	0	6492
Shell	985	1888	0	36	2909
Unidentified	392	9009	10	0	9411
Burnt Bone	4778	20735	5	0	25518
Grand Totals	7180	38704	96	36	**46016**

Preliminary analysis of the tool assemblage from TEL-105 further indicates that people were engaged in—or making tools in preparation for—fishing and bird and marine mammal hunting. Possible fishing tools include two barbed ivory points (BELA 55778 and 55789), which may be the center prong for a fish arrow or leister, found at sites dating from early Western Thule through the Late Thule/Kotzebue phase at Cape Krusenstern (Giddings and Anderson 1986:plates 21f, 22b, s) (see Fig. 7). Several other ivory barbs (BELA 55842 and BELA 55805) recovered from the site may also have been used for fishing (Giddings and Anderson 1986:plates 12n, 23) (see Fig. 7). BELA 55835 may be a Thule phase marlin spike (similar to Giddings and

Anderson 1986:plate 48bb). An antler net weight (BELA 55765) and netting shuttle (BELA 55777) were also recovered from TEL-105; nets were used for a variety of hunting purposes during the ethnographic period, including fishing, bird hunting, and even marine mammal hunting (e.g., Burch 2006:141–144, 149–50, 179). Other evidence of hunting activities at TEL-105 include two antler arrowhead fragments (BELA 55848 and BELA 55825), a bird arrow blunt (BELA 55784), and two wound pins that are likely associated with marine mammal hunting (BELA 55831 and BELA 55849)(Fig. 11)(Fig. 8). Antler debitage and modified antler objects were particularly abundant in the midden deposits at TEL-105, suggesting that antler working was an important on-site activity (see Tables 3 and 4).

Figure 8. TEL-105 hunting related artifacts: A) Antler arrowhead fragment (BELA 55848), B) bird arrow blunt (BELA 55784), C) bone wound pin with animal carving (BELA 55831), D) bone wound pin (BELA 55849) (photos by Emily Rocha, Figure by Justin Junge).

SITE TEL-108

Testing was also conducted at TEL-108, which was originally reported by Schaaf (1988b:591). Schaaf recorded four small cache-like depressions at the site and one possible house depression. A wood-framed seal poke cache was also noted eroding out of the site. The environmental setting of the site is similar to settings where settlements were identified in other locations along the northern Seward Peninsula Coast. Schaaf thought dense vegetation at the site could have obscured additional features and recommended additional testing. New features were discovered at the site in 2012, including seven larger surface depressions that may be occupation features (Fig. 9). Several of these features had been impacted by significant wind erosion since prior fieldwork in the 1980s. Despite this, there were no significant exposures of cultural features that could be sampled to obtain additional dates or to study stratigraphy; subsurface testing was required.

Eight STPs and two test units were excavated at TEL-108; the total excavated volume was 2.58 m^3. Shovel tests were placed in possible features. Cultural deposits were identified in several small (2 to 8 m in diameter) shallow depressions in the north and northeast areas of the site. These are likely additional occupation features (containing pottery, faunal remains, etc.) that may represent a different occupation of the site given their location below the main site area. TU 1, a 1 by 1–m square unit, was placed in a possible house or cache pit (Cache 4). Feature fill was thick in this deposit, indicating significant infilling of the probable occupation feature over time; total excavated volume was 0.51 m^3. TU 2, a 1 by 1–m unit, was placed between a possible house and another small depression feature (possibly a cache pit). Thick sandy deposits with a low density of cultural material were also identified here; total excavated volume was 0.38 m^3.

Artifact recovery from TEL-108 was limited, but it is unlikely that the occupation surface in the possible house/cache pit (Cache 4) was reached in TU 1. Modified artifacts were limited to a single ceramic rim sherd (see Table 3). A small collection of faunal material from the site is dominated by marine mammal (primarily seal) bone and shell, which is somewhat unusual in northwest Alaska (see Table 5). There were no previous dates from TEL-108; we obtained two dates on samples collected during testing. One sample, BETA-388178, yielded a contact-era age (see Table 4). However, the second sample (BETA-408917) yielded a far older age, 1065 to 935 cal BP (AD 885 to 1015). The site likely has multiple components, one of which dates the site to the Birnirk or early Thule phase.

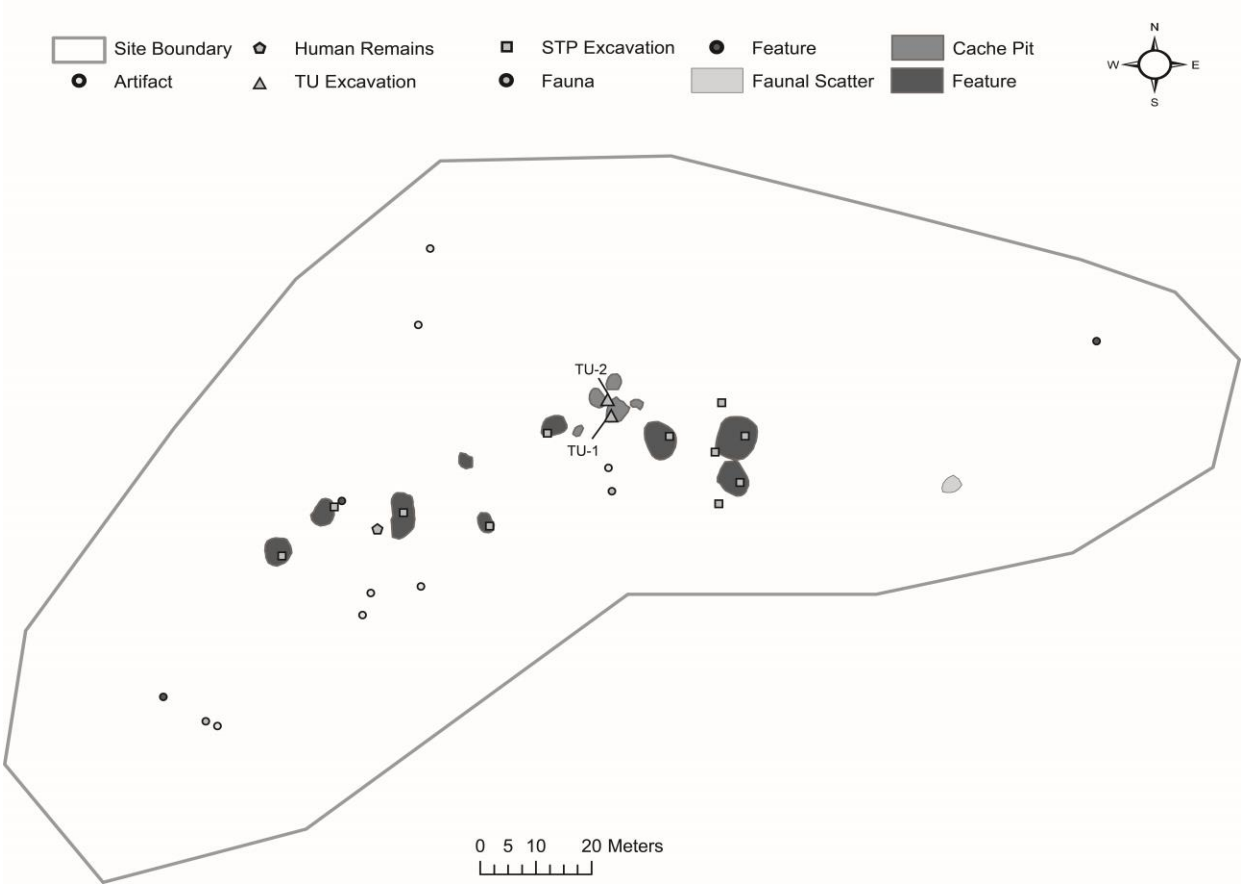

Figure 9. TEL-108 site map (figure by Justin Junge).

SITE TEL-103

In the 1980s Schaaf (1988b:575) recorded TEL-103, a cemetery site perhaps associated with nearby village site TEL-104. Five burials were identified, all of which were thought to be surface burials. No associated cultural materials were observed and a pre-contact age was inferred from the burial type. Our activities on-site were limited to mapping and photography. We were able to relocate four of the five burials recorded in the 1980s, as well as an additional burial that was not noted previously. This burial was observed eroding out of a dune, which confirms that the site has a buried component and may be much more extensive than is apparent

from the remaining surface burials. We also noted several items on the surface, including a red groundstone pendent with a triangular shape, a ceramic sherd, three jade adze fragments, and a schist manuport. None of the lithic materials are locally available.

SITE TEL-104

TEL-104, a large settlement, was identified by Schaaf in the 1980s and subsequently tested by Harritt (1994). The site included seven house depressions, at least 18 associated cache depressions, and various cemented sediment features and cultural material scattered across the site; a total of 63 features were recorded during testing activities in 1989. The site has two components, an eastern and western side, split by a thaw lake drainage. The number of houses as well as two different forms of house feature indicated a larger settlement with more than one temporal component. Radiocarbon dates produced a range of dates from late western Thule to the historic period. At the time of the survey the site had moderate dune deflation and animal burrowing present. We conducted survey at the site and identified, as well as the previously unknown burial, several temporally diagnostic artifacts and some modified wood by a nearby thaw lake that suggests the site area is larger than previously thought. In 2012 we recovered two bone Late Thule/Kotzebue phase harpoon point parts, a head and a head fragment, from the surface of TEL-104 (Giddings and Anderson 1986:plates 1a, 5k) (Fig. 10). These artifacts confirm the previous conclusion that the site has multiple components; four radiocarbon dates place the site occupation between 940 cal BP and the modern era (see Table 4).

Figure 10. Harpoon fragments from TEL-104: A) BELA 55846, B) 55847 (photos by Emily Rocha, figure by Justin Junge).

TEL-238

TEL-238 is a newly identified site on the barrier island system in the project area. The site is located on what is now active beach and is rapidly eroding due to both wave and wind action. Survey of TEL-238 identified a single feature of brown-black colored cemented sediments (Feature 1) with five wood posts within it, and a ground slate object. Feature 1 is approximately 4 m in diameter. It is located in the center of the site area and 1.5 m from the slate

object. Four wood posts protrude horizontally from the top of the center of the cemented sediment feature. The fifth post, a large piece of wood, is at the base of the central pile of cemented sediments on the surface of the dune. The ground slate object was found on the surface of the dune and collected for additional analysis. The ground slate object is a thin piece roughly 5 cm long and 1 cm wide. A sample of the wood associated with Feature 1 was collected for radiocarbon dating. The sample, BETA-408911, yielded a multiple intercept calibrated ages of 655 to 580 cal BP (AD 1295 to 1370) and 570 to 535 cal BP (AD 1380 to 1415). These results are interesting for two reasons: 1) the dates indicate a possible older occupation of the barrier islands than previously anticipated, potentially dating to the Thule–Late Thule/Kotzebue phase, and 2) the results indicate the potential of even badly eroded sites to yield important new information about past settlement patterns.

TEL-258

TEL-258 is a newly identified site that includes at least one eroding house feature. In 2013 we recorded numerous artifacts eroding out of the house and could still observe several structural features (posts, floor boards, etc.) despite significant erosion at the site. In the probable tunnel area of the house we noted large pieces of structural wood, mammoth ivory, worked bone, pottery fragments, and faunal remains eroding out onto the dune surface. A pottery sherd, vertical posts, and terrestrial mammal remains were noted on the ground surface at the probable junction of the house and tunnel. Ground slate and other lithic raw materials were noted on the dune surface in the house and tunnel areas. A concentration of eroding cemented sediments and wood debris located 95 m west of the first house feature is thought to be the remnants of a second occupation feature. We collected a single projectile point from the surface of TEL-258; the point is similar to an Early Western Thule arrow point identified by Giddings and Anderson

(1986:plate 39o) at Cape Krusenstern. Decorated ceramics from the site provide additional temporal information. A total of 766 body sherds, 17 rims, and 2 bases were recovered from the surface of TEL-258. Of these sherds, 54 were decorated in Seward Striated style and one in a Horizontal-lined style (Fig. 11); these styles were common over the last 550 years, although they are also present in somewhat older contexts as well (Anderson 2011). We obtained a single radiocarbon date for the site (Beta-388181) that further indicates a late pre-contact occupation of the site, 465 to 300 cal BP.

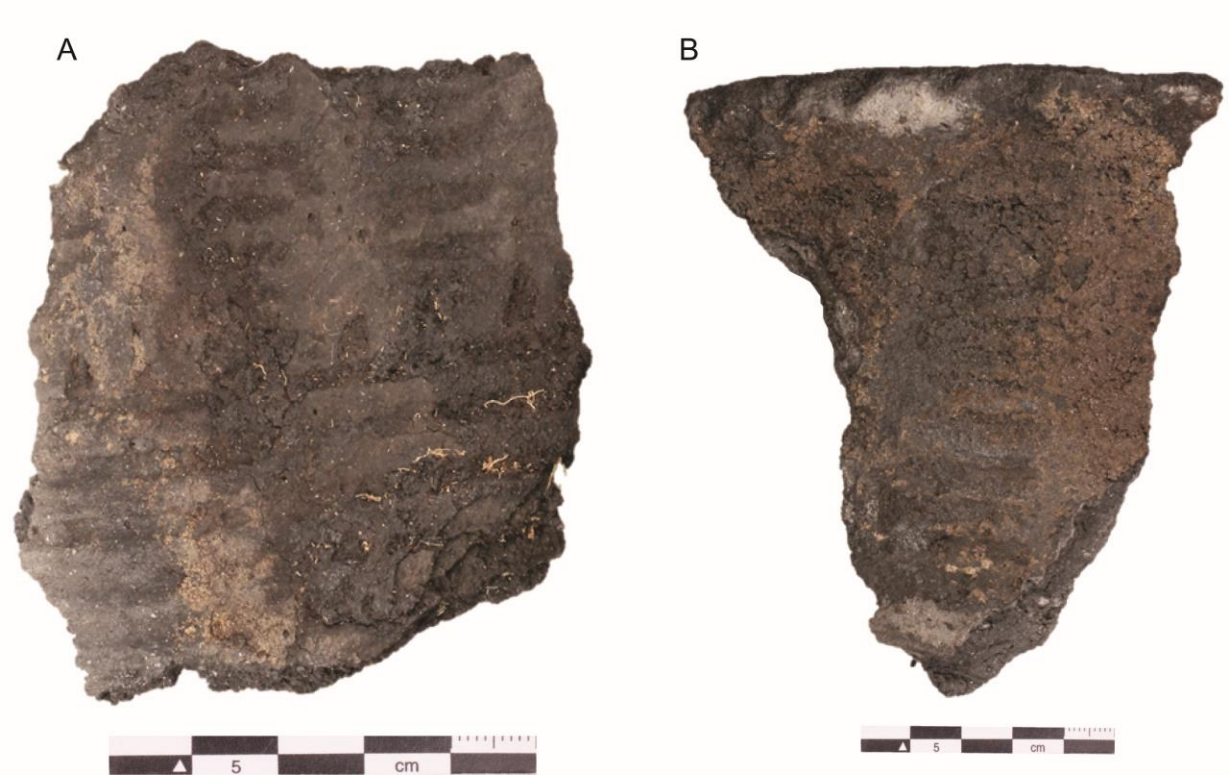

Figure 11. A) Decorated body sherd from a ceramic vessel (BELA 60976) and B) an everted Seward Striated rim sherd with pie-crust decoration along rim (BELA 60975) (photos and figure by Justin Junge).

SITE TEL-287

TEL-287 is a newly identified settlement site. We identified two occupation features and associated cultural material; the site is buried in a very rapidly eroding dune feature. The site is probably more extensive than was apparent based solely on what was exposed by erosion; it is also likely that the site is associated with another nearby probable settlement (TEL-262) and burial (TEL-235). Cultural material (grass matting, wooden sled parts, and several stone artifacts) and a single radiocarbon date from TEL-287 suggest a Thule or Late Thule/Kotzebue phase occupation at the site; BETA-408913 yielded a multiple intercept age of 630 to 600 cal BP (AD 1320 to 1350) and 560 to 515 cal BP (AD 1390 to 1435).

DISCUSSION

Regional Interaction Spheres

Analysis of local and regional interaction spheres was not our primary focus but several artifacts collected over the course of fieldwork point to broad regional connections between people living on the northern Seward Peninsula coast and other parts of northern Alaska. For example, a single amber bead was collected from TEL-105. While amber raw material could be collected from a variety of sources, including beach deposits, material of this grain size is not available locally on the northern Seward Peninsula and must have been brought into the area from elsewhere. A ground nephrite adze fragments was observed on the surface at TEL-103; there is no local nephrite (or jade) source. The closest known source is in the central Kobuk River Valley in the vicinity of Jade Mountain (Giddings 1952). A groundstone triangular-shaped pendent made from a non-local red stone material was also noted on the surface at TEL-103, further suggesting that people were importing stone raw materials from other locales. The designs on a decorated ivory object found at TEL-105 (see Fig. 6D) are similar to Birnirk or

Punuk (rather than Thule) linear decorative elements; the item may have been imported from the Bering Strait Islands, or the decoration may simply have been influenced by contact with people from outside the local area. Objects of the most common ceramic decorative type recovered in the project area, Seward Striated (n = 785), are most likely of relatively local origin, although no coastal northern peninsula clay sources have been identified to date (Anderson 2011, 2016; Anderson et al. 2011). The single Horizontal-lined ceramic identified by the Nuluk project is similar to those found in small numbers at Kotzebue Sound sites; this decorative style is more common in regions further to the south (Oswalt 1955) and its presence in the project area indicates a probable connection to people in the Norton Sound or Yukon-Kuskokwim regions to the south. Sourcing of ceramic material from several sites in the project area further indicates diverse connections among people living on the northern Seward Peninsula coast, Kotzebue Sound, and further afield (Anderson 2016; Anderson et al. 2016). Although limited, the evidence suggests that people living in the study area sustained these connections over at least the last 1,000 years, despite previously hypothesized shifts in settlement patterns beginning around 550 cal BP. It is possible that settlement patterns remained more constant in the southern Kotzebue Sound region than some have suggested, or that people invested in maintaining socioeconomic connections despite changing settlement patterns, mobility, and subsistence during the late pre-contact period.

Local and Regional Settlement Patterns

Our results provide some information about subsistence activities and season(s) of site use in this region although more research is needed to more firmly establish the patterns we identified. The majority of sites in the project area are semi-permanent occupation sites of various sizes, ranging from larger settlements of five or more houses to sites with a single

occupation feature. In general, the villages or settlements are located near freshwater sources and/or at lagoon access points (Fig. 12). Deep cold–season house features and associated caches identified at settlements point to semi-permanent and/or multi-season use of the larger villages in this area of the coast. Activity areas, cache sites, and burial locales are typically located in proximity to settlements and are likely associated with those settlements in many cases.

Data on subsistence and seasonality are limited at this point; however, the faunal information, artifacts, and cold-season occupation features identified at several of the investigated sites point to multi-season occupation of this area of the coast. Initial faunal and artifact analysis indicates that marine mammal hunting activities were coordinated from several sites in the study area; today and during the contact era these activities were primarily conducted in late spring to early summer (Koutsky 1981a, 1981b). The presence of abundant fish bone at TEL-105 suggests multi-season use of the village; ethnographically, fishing was an activity conducted year round in the Kotzebue Sound region (Burch 1998). More information about fish species could refine our understanding of the season of site occupation. The overall pattern of multi-season use of villages and adjacent areas corresponds with the ethnographic record of use of villages and associated camps and activity areas on the northern Seward Peninsula coast throughout the year (Burch 1998; Koutsky 1981a, 1981b; Ray 1975). The presence of post–550 cal BP components at many village sites in the study area does not support the hypothesis that people dispersed from population centers during the late pre-contact period. We do not, however, yet have enough information on subsistence activities to evaluate whether or not there is evidence of a shift in subsistence activities during the late pre-contact period.

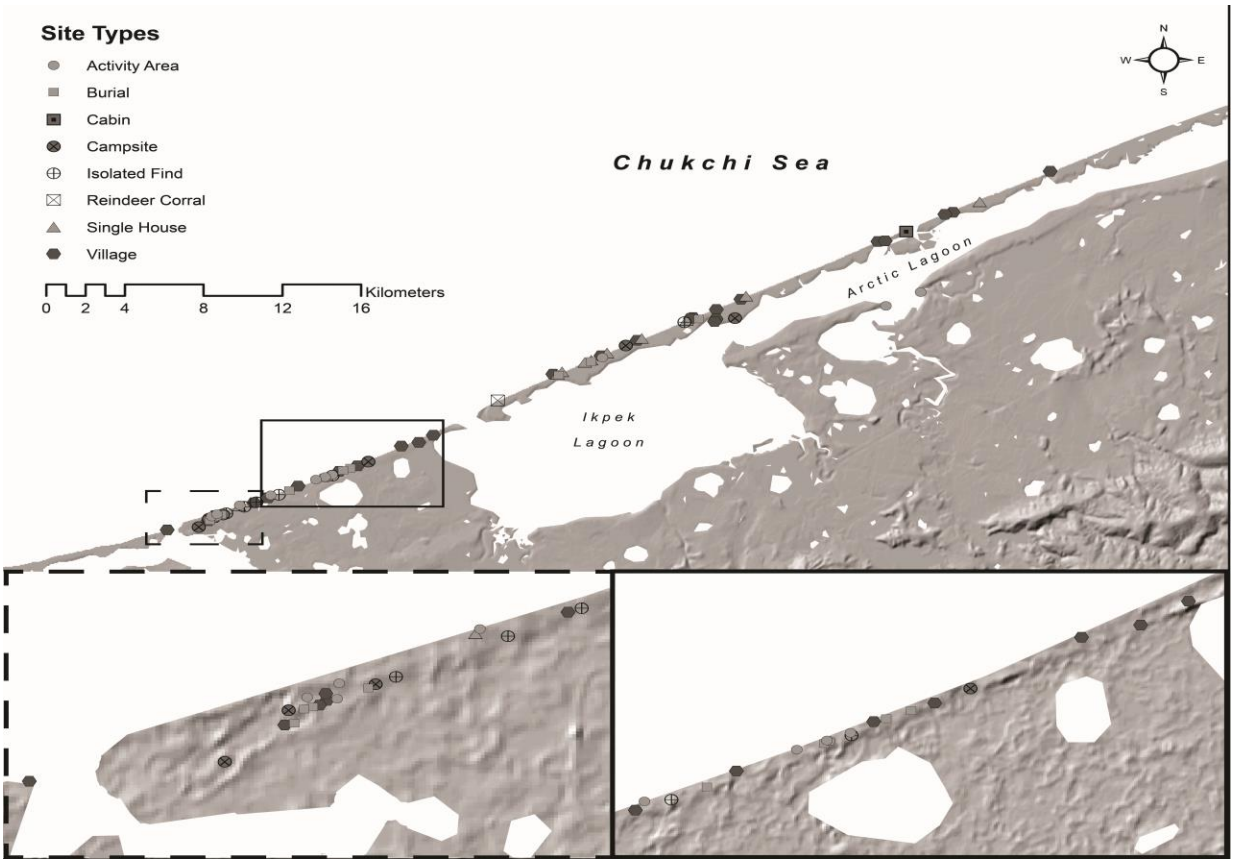

Figure 12. Site type distribution within the project area (figure by Justin Junge).

The majority of newly identified sites were found in the barrier island regions of the project area. All of these sites are significantly impacted by wind and water erosion; often all that remain are remnants of house floors in dune areas. In many cases we can therefore say little about these sites in terms of age or nature of the occupation. It is apparent, however, from the number of remnant houses identified that there was at one time widespread occupation of the barrier island systems along the northern Seward Peninsula. We were also able to obtain datable material from several of these sites and all of the resulting dates are relatively recent. Radiocarbon dates indicate that occupations of TEL-232, TEL-237, TEL-250, TEL-233, TEL-258, TEL-262, TEL-258, TEL-263, TEL-264, and TEL-265 all fall within the Late Thule/Kotzebue phase (see Table 4), the last 550 years. Radiocarbon dates from TEL-238 and

TEL-258 indicate slightly older, possibly Late Western Thule or transitional components with occupation of these sites perhaps as early as 650 cal BP (see Table 4). Prior researchers hypothesized that pre–550 cal BP deposits on the barrier islands were already eroded away (Jordan 1988). Our new dates suggest that slightly older Thule or transitional Thule–Late Thule/Kotzebue phase sites may still remain on the barrier islands but the existing data do support the hypothesis that pre–650 cal BP sites and areas of the barrier islands are now gone or never existed. Today the largest, most well-preserved, and oldest sites are found in the mainland area between Ikpek and Lopp Lagoons, where a combination of older landforms and slower erosive forces led to better site preservation. New dates for TEL-105 push the absolute age of site occupation back 400 years, to between 960 cal BP and the modern era, confirming Schaaf's hypothesis that the site has multiple components. Dates from TEL-108 indicate that this site also has an older component, perhaps as old as 935 to 1065 cal BP, with occupation continuing up to the modern era. Additional geomorphological research on the origins and potential age of the barrier island systems around Kotzebue Sound is needed to better understand potential taphonomic effects on the late Holocene settlement record.

Our new dates indicate that the northern Seward Peninsula coast was more densely occupied during the last 550 years than previously thought. Prior to the project, the generally accepted model of post–550 cal BP settlement patterns was of a more dispersed population than in the preceding 1,000 years, with people living in smaller houses and in previously unoccupied areas of the coasts and rivers (Giddings and Anderson 1986:20–33, 107, 113). This shift was thought, perhaps, to be due to changing subsistence resource distributions and a subsequent shift in focus from whale hunting to fishing (Giddings and Anderson 1986:20, 113; Harritt 1994), and/or related to competition at resource-rich coastal locations that pushed some people to

inhabit other areas of Kotzebue Sound (Mason and Barber 2003). The adoption of dog traction during this same time period could also be a factor in shifting settlement patterns (Hall 1978). These shifts in settlement pattern were also perhaps related in part to late Holocene climatic variability, including the onset of the Little Ice Age sometime between 550 and 300 years ago (Bird et al. 2009; Calkin et al. 1998). Recent research at Cape Krusenstern indicates a decline in local population during the last 500 years (Anderson and Freeburg 2013, 2014); this is supported by forthcoming analysis of a regional radiocarbon data set (Anderson et al., forthcoming). New data on post–550 cal BP population decline support Giddings' hypothesis that there was a decrease in settlement size on the interior rivers of the region at this time and a more seasonal occupation of winter houses in the more recent pre-contact period (Giddings 1952:112). In contrast to the patterns described above, prior research on the northern Seward Peninsula coast suggested greater continuity in settlement patterns before and after 550 cal BP (Schaaf 1995:279).

While the results of this research do not resolve the ambiguity in our understanding of demography and settlement patterns over the last 550 years, the discovery of new sites on the barrier islands that date to the late pre-contact period indicate that post–550 BP occupation of the northern Seward Peninsula coast was denser than previously understood. It is possible that, as Schaaf suggested, there is greater continuity in northern Seward Peninsula settlement patterns before and after 550 cal BP than observed in other areas of Kotzebue Sound. Local population may have remained constant while regional population declined after 550 cal BP. Conversely, our data could also support the hypothesis that subsistence patterns shifted after 550 cal BP and people began inhabiting previously underutilized areas of the coast while maintaining occupation of preexisting settlements. Additional dating of Late Thule/Kotzebue phase sites from around

Kotzebue Sound is needed to clarify the post–550 cal BP settlement pattern. Investigation of non-coastal areas is necessary to more fully understand seasonal subsistence patterns, the potentially shifting nature of past mobility, and the overall pattern of late pre-contact settlement in this region. Ethnographic research from the northern Seward Peninsula (e.g., Koutsky 1981a, 1981b), as well as limited archaeological evidence (Schaaf 1988q), point to extensive seasonal use of inland areas of the Peninsula. Prior research around the region was heavily focused on coastal areas; the antiquity of seasonal use of coastal margin and inland areas is poorly understood. Broader interpretations of late pre-contact settlement patterns changes will be limited until more regional survey in non-coastal areas occurs.

CONCLUSION

The discovery of many new sites indicates that occupation of the northern Seward Peninsula coast was more extensive than previously understood, particularly over the last 550 years. We added 16 new dates to the regional radiocarbon dataset and more firmly established that the majority of the sites in the project area date to the last 550 years, although several sites have older components dating back to at least 1,000 years ago. This age distribution is partially a function of local erosion patterns—older areas of the barrier island systems are likely eroded away—but may also reflect either stability or an increase in local or regional population over the last 550 years. This research provides new information about late pre-contact settlement patterns in northwest Alaska and contributes to broader debate about the changing nature of Arctic maritime adaptations during this dynamic period. Future work in this region should include further investigation of eroding late pre-contact sites to further inform our understanding of lifeways, and investigation of interior regions of the Seward Peninsula to more fully establish past settlement patterns and mobility. Another significant outcome of this research is our ability

to obtain chronological and settlement data from severely eroding coastal sites. This highlights the importance and potential of salvaging data from damaged sites, which will likely only become more common on Arctic coasts as global climate change continues in the future.

ACKNOWLEDGEMENTS

Many thanks to the communities of Shishmaref and Wales for their support of this research project. The Nuluk Project was funded by the National Park Service through a Cooperative Agreement (#P12AC10761) managed by the Pacific Northwest Cooperative Ecosystem Studies Unit. The hard work of 2012 and 2013 field crew members Jacob Adams, Hannah Atkinson, Thomas Brown, John Hardes, Justin Junge, Robin Gibbs, and Alfred Weyiouanna made this project possible. Numerous PSU undergraduate lab interns contributed to laboratory analysis. Michael Holt, Eileen Devinney, Rachel Mason, Jeannette Koelsch, Jane Lakeman, Walker Gusse, Jeanne Schaaf, and Nome NPS staff provided support throughout consultation, field, and analytical portions of this project. Rhiannon Held provided technical editing support.

END NOTE

[1] We use Koutsky's (1981a, 1981b) orthography for Native names; Koutsky used current Central Yupik and Inupiat orthography to the extent possible at the time of publication. When a place has multiple names, we use the primary name from Koutsky (1981a, 1981b) and place alternate names in parentheses.

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