PEBBLE PROJECT
ENVIRONMENTAL BASELINE DOCUMENT
2004 through 2008

CHAPTER 50.
CULTURAL RESOURCES
Cook Inlet Drainages

PREPARED BY:
STEVEN R. BRAUND & ASSOCIATES

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

PHOTOGRAPHS

ACRONYMS AND ABBREVIATIONS

ACC	Alaska Commercial Company
AHRS	Alaska Heritage Resource Survey
AMS	accelerator mass spectrometry
BP	Before Present
CFR	Code of Federal Regulations
NDE	no determination of eligibility for the National Register of Historic Places
NPS	National Park Service
NRE	determined to be eligible for the National Register of Historic Places
NRHP	National Register of Historic Places
Section 106	Section 106 of the National Historic Preservation Act
SRB&A	Stephen R. Braund & Associates
VHF	very high frequency

50. CULTURAL RESOURCES

50.1 Introduction

This chapter summarizes information regarding prehistory, ethnography, and history relevant to cultural resources in the Cook Inlet drainages on lands in the Cook Inlet Study Area related to the possible Pebble Project. Stephen R. Braund & Associates (SRB&A) conducted a literature review, made two field trips in 2005 to conduct surveys and subsurface testing at beaches and terraces below Knoll Head, and made two field trips in 2007 to survey other possible Pebble-related sites.

Cultural resources may include historic buildings, structures, and landscapes; prehistoric and historic surface and subsurface sites; and traditional- and religious-use areas. The field survey crew discovered two cultural resource sites during the 2005 survey and recorded them as Alaska Heritage Resources Survey (AHRS) sites ILI-00185 and ILI-00186. No cultural resources were identified during the 2007 surveys.

50.2 Study Objectives

The objectives of this study were to describe the known cultural resources of the Cook Inlet drainages study area and, through the cultural resources 2005 and 2007 field surveys and 2007 interviews, to locate and identify archaeological, historic, and traditional cultural properties in the vicinity of possible Pebble Project facilities in the Cook Inlet drainages.

50.3 Study Area

The extent of the cultural resources study area in the Cook Inlet drainages is delineated in Chapter 22 on Figure 22-1. Researchers based the locations of the 2005 and 2007 field surveys on the vicinity of possible Pebble Project Components. Special attention was paid to the area around Knoll Head. Figure 22-1 depicts an overview of the Bristol Bay/western Cook Inlet area, including the Pebble Project vicinity. Figure 50-1 provides an overview of the Cook Inlet drainages study area with the locations of all AHRS sites, including those identified by the field crew. Figure 50-2 shows the extent of pedestrian surveys conducted in 2005. Figure 50-3 provides an overview of the sites surveyed in 2007.

50.4 Previous Studies

Cultural resources studies previously performed in the Cook Inlet drainages study area consist of the following surveys and reports. A survey of the road between Pile Bay and Williamsport was conducted in 2001 by the State of Alaska (DePew and Thompson, 2001). Steve Klingler conducted field surveys for the National Park Service (NPS) in Chinitna Bay in 1992 (NPS, 1993). NPS also commissioned an historic overview of Lake Clark National Park in 1994 (Unrau, 1994). Recent histories have addressed events near Iliamna Bay: Lloyd (2000) describes the wreck of the steamship *Farallon* at Black Reef, and

Goforth (2003) wrote a biography of that ship's postmaster, John E. Thwaites, who pioneered photography in coastal Alaska and photographed the wreck of that ship and her crew's camp (Photos 50-1 and 50-2). Pedestrian surveys of the Chinitna Bay area were conducted under the jurisdiction of the Bureau of Land Management's Outer Continental Shelf program (Dixon, Sharma, and Stoker, 1979). The NPS and the Bureau of Land Management surveys around Chinitna Bay revealed several cultural resource sites and areas of high potential for cultural resources.

The previous studies cited above served mainly to direct the Pebble researchers about what to look for during cultural resource field surveys, how to recognize culturally significant features, and how to determine the significance of those cultural resources identified during surveys.

50.5 Scope of Work

The scope of the cultural resources studies was to locate, identify, and describe documented and previously undocumented archaeological, historic, and ethnographic cultural resources in the Cook Inlet drainages study area. This work was conducted by SRB&A.

50.6 Methods

In order to characterize the cultural resources in the Cook Inlet drainages study area, the study team reviewed the AHRS database maintained by the Alaska Department of Natural Resources, Office of History and Archaeology (OHA), as well as relevant geological, archaeological, ethnographic, and historical literature, and archival data for a relatively broad region centered on Iliamna and southwest and southcentral Alaska; conducted cultural resources interviews; and conducted field surveys. The field crew conducted research and field work during May and June of 2005 and in July 2007. The field crew conducted the study, as described below, in accordance with the approach described in Chapter 14 of the study plan for the environmental baseline studies (a copy of which is provided in Appendix E of this environmental baseline document):

- AHRS files were examined for known cultural resources in the vicinity of the study area.
- A review of the geological, archaeological, ethnographic, and historical literature was conducted.
- Consultations with communities in the vicinity of the study area and cultural resources interviews with knowledgeable residents of those communities closest to the possible Pebble Project were conducted.
- A methodology was developed and implemented for identifying and surveying areas with a high probability of containing cultural resources and surveyed locations where geological investigations and other ground disturbing activities were planned..
- In 2005, the field crew made two trips to Knoll Head, in May and in June. Carbon samples were recovered from previously undocumented archaeological sites and submitted for testing to determine when the sites may have been occupied.
- The field crew made two trips to the Iliamna Bay area in July 2007.

In 2004, consultations were initiated with the State Historic Preservation Officer (SHPO), NPS, nearby Bristol Bay tribes, and other interested parties. (A list of tribes and other interested parties consulted is included in Chapter 22, Section 22.6.2.7.) Tribes and other interested parties were sent consultation letters on August 31, 2004. As of 2008, no response regarding those consultation letters has been received. Further consultation in the form of cultural resources interviews in area communities began during the winter of 2007 as an adjunct to the documentary and field components of the survey. Cultural resources interviews occurred in the communities of Kokhanok, Newhalen, Nondalton, and Port Alsworth. Efforts were made to conduct interviews in Iliamna, Pedro Bay, and Igiugig, but the study team was unsuccessful in scheduling interviews at times when appropriate elders would be present in those three communities. The methodology for the cultural resources interview is described in Section 22.6.2.7, and information about cultural resources obtained during these interviews is described in Section 22.7.7. Information derived from subsistence interviews conducted in area communities by Stephen R. Braund & Associates (SRB&A) in 2005, 2006, and 2007 informed the cultural resource field surveys.

In addition to review of the AHRS database and available literature and gathering information about cultural resources in the area through consultations and interviews, cultural resources field surveys were conducted along the southwestern shore of Iniskin Bay in 2005 (Figure 50-2). Surveys followed landforms, as dictated by the steepness of the landscape, and included parallel survey tracks along the slope face with two field personnel spaced approximately 20 meters apart angled along the beach heading upslope where possible from the beach and beach bluff to the cliff face and examining geological and topographic features with a higher probability for cultural resources. In 2007, field surveys were conducted at Williamsport, atop a peak in the Chigmit Range, at AC Point, and at North Head (Figure 50-3).

50.6.1 Literature Review

A review of the geology, glaciation, and prehistoric environment as well as the prehistory, ethnography, and history of western Cook Inlet and the Cook Inlet drainages study area establishes a potential maximum time depth of human occupation in the study area and an understanding of historical land-use patterns. These patterns suggest a possible range of artifacts and sites that might occur in the study area. The methods used during the literature review are described in more detail in Chapter 22, Section 22.6.1.

50.6.2 Field Survey Methods

50.6.2.1 2005 Field Season

Field surveys in the Cook Inlet drainages study area were confined to the Knoll Head area in 2005 (Figure 50-2). The 2005 surveys consisted of pedestrian survey tracks oriented nearly parallel to the beach line, frequent subsurface testing, examination of natural features with cultural resources potential (e.g., two natural exposures and one stream-cut bank), and examination of the cliff face for relict beaches isolated by isostatic rebound and seismic uplift. (See Chapter 22, Section 22.6.2.1, for a discussion of the probability survey methodology used to conduct the surveys.) The selection of locations for subsurface testing was based on the presence of soil, the characteristics of area landforms, and the potential for archaeological deposits. The field crew excavated test units on the limited areas of flat ground and shallow slopes, beachfront and bluff areas, and areas where bedrock and boulders may have served as

parts of structures or shelters. Further examination was made of cliff faces and the beachfront at low tide for indications of rock shelters, canoe-beaching lanes, petroglyphs, and caves.

50.6.2.2 2007 Field Season

Field surveys in 2007 were confined to possible sites for meteorological stations (Figure 50-3). These surveys included pedestrian surveys of the sites and subsurface testing in areas with evidence of soil development.

50.6.2.3 2007 Cultural Resources Interviews

A description of the methodologies used during the cultural resources interviews is provided in Chapter 22, Section 22.6.2.7.

50.7 Results and Discussion

50.7.1 Literature Review

Chapter 22, Section 22.7.1, includes a discussion of the prehistoric environment, prehistory, ethnography, and history of the Cook Inlet and Bristol Bay drainages study areas. Information specific to the Cook Inlet drainages is provided below.

50.7.1.1 Geology, Glaciation, and Prehistoric Environments

Periodic glaciations during the Quaternary period (geologic period from 1.8 to 1.6 million years ago to the present) formed and reformed the terrain in the vicinity of the Cook Inlet study area (Dixon, Sharma, and Stoker, 1979; Detterman and Hartsock, 1966). The steep cliffs of the Back Range drop precipitously to the waters of Iniskin Bay and Cook Inlet, with little beach in the vicinity of Knoll Head visible above high tide (Photos 50-3 and 50-4). Colluvial deposits (loose deposits of rock debris accumulated through the action of gravity at the base of a cliff or slope) from the structural failure of the bedrock of the Back Range are the basis for the sloped areas along the bay. Additional material includes decomposing bedrock, wind-deposited silt and loess, and volcanic ash deposits. Ash may have fallen from numerous nearby volcanoes in Cook Inlet including Hayes, Spurr, Double Glacier, Iliamna, Redoubt, Augustine, and those of the Alaska Peninsula, including Katmai (AVO, 2007). A belt of ash noted in nearly every test unit is likely attributable to the 1912 Katmai eruption, based on the relative thickness of the ash band in the stratigraphic profile.

Severe folding and faulting mark the geological strata of exposed rock in Iniskin and Iliamna bays, and the fractured bedrock is prone to cubate fractures resulting from folding, faulting, and freeze and thaw effects (Detterman and Hartsock, 1966). Long stretches of silt and sand tide flats cross-cut by deeply incised drainage streams from meltwater and glacier runoff occupy the ends of the fjord-like bays. The underwater areas show the effects of having once held tidewater glaciers with deeply incised gouges at former glacier termini and raised terminal and lateral moraines and eskers (Karlstrom, 1964; Detterman and Hartsock, 1966). Figure 22-1 in Chapter 22 shows the extent of the last glacial maximum in the Iliamna-Nushagak area. Iniskin Bay was deglaciated early in the Holocene Epoch, which has lasted from

approximately 10,000 years ago until the present, but no more specific dates have been deduced from available evidence.

Vegetation near Knoll Head includes spruce and cottonwoods to an elevation of 800 feet and a dense tangle of alders and understory plants to an elevation of 2,000 feet, with alpine tundra beyond (Detterman and Hartsock, 1966). The steep cliffs and limited terrain of shallow slopes favor cliff-nesting birds. Terrestrial animals are largely limited to brown and black bears; however, marine mammals, fish, mollusks, and seabirds are prolific in the area. On the Iniskin Peninsula, across the bay from Knoll Head, is an area with less severe vertical relief in places. "Indian Trails" are reported to cross the Iniskin Peninsula, and these trails were later developed into roads which supported oil and gas drilling and exploration on the peninsula from the 1890s through the 1960s (Detterman and Hartsock, 1966). Dena'ina people in the historic period named and used several mountain passes in the Chigmit Range, including the passes between Iliamna Bay and Iliamna Lake (*Tus Nuch'elyasht* or "the pass where we bring things back"), Iniskin Bay to Chinitna Bay (*Tus K'ghulk'et* or "something dragged pass"), Lake Clark Pass (*Qihjeh Vena Tustes*), and from Chinitna Bay via West Glacier Creek to the Pile River that feeds into Iliamna Lake at Pile Bay (*Tsayehtnu Tustes* or "cliff river pass"; Kari and Kari, 1982; Ellanna and Balluta, 1992).

50.7.1.2 Prehistory

A discussion of the prehistory of the Bristol Bay and Cook Inlet study areas is included in Chapter 22, Section 22.7.1.2. Limited archaeological survey work has been done near Knoll Had, and no large-scale survey has previously been conducted in the Iliamna region. The nearest documented prehistoric sites to the Cook Inlet drainages study area included prehistoric deposits discovered by researchers during reconnaissance work near Pedro Bay (Townsend and Townsend, 1961, 1964; Townsend, 1970a, 1970b, 1970c, 1973). More recent archaeological surveys have discovered more sites and features in the Pedro Bay area because of proposed airport, road, sewer, and waste-handling facilities (Yarborough, 1985a, 1985b, 1986a, 1986b, 1993). Neighboring bays on the coast, including Kamishak Bay, Chinitna Bay, and Tuxedni Bay, all have cultural resources of historic and prehistoric vintage (DeLaguna, 1975, Mobley et al., 1990; NPS, 1993). Known prehistoric resources in the Cook Inlet drainages study area are listed in Table 50-1. None of the known prehistoric cultural resources have been evaluated for the NRHP at this time

50.7.1.3 Ethnography

Three Native languages, Dena'ina, Yup'ik, and Alutiiq, were spoken in the vicinity of the Cook Inlet drainages study area during the late prehistoric through the historic periods. The ethnography of the Bristol Bay and Cook Inlet study areas is discussed in Chapter 22, Section 22.7.1.3.

50.7.1.4 Contact and the Historic Period

A discussion of the history of the study areas is included in Section 22.7.1.4. The Cook Inlet drainages were an important part of historic economic activity in this region. During the American period, ships landed nearly monthly at Iliamna Bay, landing passengers and goods at AC Point (named for the Alaska Commercial Company [ACC] warehouse located there) for travel over the Williamsport to Pile Bay Trail (Goforth, 2003; Lloyd, 2000). The first reference to the Williamsport-Pile Bay Road was by the U.S. Coast Survey in 1869. At that time, the road was described as a portage that led from a Russian American

Company post to Iliamna Lake. The road was a seven-mile-long trail through a mountain pass and past Summit Lakes. The trail was used primarily by the Dena'ina as a portage for seal and bear hunting, fishing, and trade at AC Point. Hannah Breece, a schoolteacher in the region, recorded her impressions of Iliamna Bay, Williamsport, and AC Point in her memoir for the years between 1906 and 1912 (Jacobs, 1995). Native use of this trail was documented in 1930 by Smithsonian researcher Aleš Hrdlička who described and photographed a "votive rock" with offerings at the pass (DePew and Thompson, 2001; Hrdlička, 1943).

American-period exploration retraced the paths of Russian explorers and entrepreneurs, who themselves followed Native trails to portages and pathways from the coast to the interior (Unrau, 1994). Most exploration of the outer shores of Cook Inlet and of the Chigmit Mountains took place from 1898 through the 1930s (Capps, 1935). This region was one of the least explored and least documented areas in Alaska at the time. Bush pilots made pioneering exploration efforts looking for shortcuts between Cook Inlet and Bristol Bay in the 1920s and discovering Merrill, Rainy, and Lake Clark passes, which allowed aircraft to take over mail and passenger transport in the region (Unrau, 1994).

Commercial fishing in the Cook Inlet drainages was based from the Kenai Peninsula. Ships servicing canneries on the Kenai Peninsula lay at anchor in Tuxedni Bay in Cook Inlet after dropping off supplies to the canneries at Kenai and Kasilof, which had no suitable anchorages (Unrau, 1994). The Surf Packing Company operated a cannery in Tuxedni Bay, on the west side of Chisik Island in Snug Harbor (in Cook Inlet).

A brief burst of prospecting for minerals in the early 1900s resulted in the construction of at least two mines in the valley behind Cottonwood Bay on the west side of Iliamna Bay, but no profitably recoverable minerals were found during several periods of exploration, excavation, and sampling (Martin and Katz, 1912; Jasper, 1956). A fur-trading post from the early Russian period may have been located at AC Point in Iliamna Bay and was later replaced by an ACC store open intermittently through the late nineteenth and early twentieth centuries (Branson, 1999; Jasper, 1956). Oil exploration and development began on the Iniskin Peninsula in the 1890s and continued through the 1960s (Detterman and Hartsock, 1966). No commercially exploitable oil deposits were found, but numerous wells were drilled and infrastructure, including roads and airstrips, was built on the peninsula. Miners and prospectors explored mineral deposits along Iniskin Bay, but they found no commercially feasible deposits (Roehm, 1941).

In 1910, survivors of the *Farallon* shipwreck were stranded in Iliamna Bay for 29 days (Lloyd, 2000). The survivors camped in the northern portion of Iliamna Bay to the northeast of Williamsport. Some of the survivors traveled over the Williamsport-Pile Bay portage in their search for provisions at Old Iliamna. They reported an abandoned settlement at the site of present-day Williamsport.

The portage from the head of Iliamna Bay to first Old Iliamna and later Pile Bay had its beginning in a network of Dena'ina routes over the Chigmit Mountains connecting the communities of western Cook Inlet to the Interior and Bristol Bay communities. Iniskin and Iliamna bays were used for bear and seal hunting and fishing and for trade with neighboring Dena'ina, Yup'ik, and Alutiiq speakers. Russian fur traders kept a storehouse on the bay for furs transported from their post on Iliamna Lake beginning in 1794, after Bocharov and other explorers had first traversed the Iliamna Lake area in 1786. In 1798, Native people attacked Russian fur-trading posts at Iliamna and Tyonek, exterminating the Russian fur traders and their Aleutian and Alutiiq employees. The newly consolidated Russian America Company rebuilt in the space of the old, and further expansion continued to the Interior through the Iliamna portage.

Following the American purchase of Alaska from Russia, the Iliamna portage continued to serve the Native people of the area, as well as the fur-trade industry, and by the end of the nineteenth century ships were calling on Iliamna Bay monthly during the ice-free period. Because of the shallow depth of the bay, goods from seagoing vessels had to be lightered in from offshore using rowboats. In the early twentieth century, warehouses and stores were constructed at AC Point by the ACC, at Cottonwood Bay by William Duryea, and at the modern location of Williamsport by the backers of a proposed railroad to the Nome goldfields. People traveling back from Iliamna Bay could wait weeks in these often-unattended structures, lending the name Camp Patience to the AC Point structures. Duryea acted as postmaster during his time in Cottonwood Bay and worked a series of copper claims in the area.

In 1916, John Zug of the Board of Road Commissioners examined the portage trail and recommended it be improved into a 12-mile-long, one- and two-lane gravel road. Work to improve the road was conducted in 1917, 1921, and 1927. After 1927 it was possible for horse-drawn wagons to go over the portage trail. The trail was further widened in 1934-1935 as far as Old Iliamna, and in 1937, the road was extended to Pile Bay on the shores of the Lake Iliamna, necessitating a 180-foot-long bridge over the Iliamna River. Carl Williams managed the road beginning in 1937, and his descendants have hauled freight and maintained the road since then. During World War II, a great deal of freight was hauled over the portage road to build the Iliamna airstrip and other defense-related facilities built in the region in response to the Japanese invasion of the Aleutian Islands. Later work served freight brought in for Cold War construction of communications and radar bases, as well as the forward operating base at King Salmon, and in 1955 the road was widened to 10 feet. It is assumed that the votive rock, where Dena'ina people had deposited offerings in the hopes of a safe journey (Hrdlička, 1943), was dynamited and pushed down slope at this time (Unrau, 1994). What is today called Williamsport is a location at the end of Iliamna Bay where the portage trail to Pile Bay begins. A house and equipment are there, but none of the historic structures remain. AC Point also has no surface remnants of the structures that once sheltered travelers and furs. Native people may still hunt in Iniskin and Iliamna bays as they did in the past; a popular account relates the tale of a hunting accident involving Iliamna area residents (Kaniut, 1999).

Historic materials near the possible port site in the Cook Inlet drainages include the wreckage remaining from the January 1910 *Farallon* shipwreck (Photo 50-1), and it is possible that some remains of the survivors' camp (Photo 50-2) in the Y-shaped valley behind Black Reef may yet be discovered (Lloyd, 2000). Other historic sites include the trading post and village sites at AC Point on Iliamna Bay; the copper mines of Dutton near Cottonwood Bay; historic structures and burials at Williamsport; and the oil boom communities, camps, and oil wells on the Iniskin Peninsula (Detterman and Hartsock, 1966).

50.7.1.5 Alaska Heritage Resources Survey Sites

Based on information from the AHRS and a review of available literature, the possible Pebble Project components in the Cook Inlet drainages are in the vicinity of four previously documented cultural resource sites. During pedestrian surveys conducted in summer 2005, the field crew identified two additional sites (ILI-00185 and ILI-00186) near Knoll Head (Table 50-1 and Figure 50-1). One of the previously documented cultural resources—the Williamsport to Pile Bay Road (ILI-00132), a traditional Native portage and trail and historic road—has been determined eligible for NRHP. The remaining three previously documented cultural resources have not been evaluated for eligibility for the NRHP. These sites are Dutton (ILI-00005, an historic mining camp), an oil exploration site near Oil Bay (ILI-00038), and AC Point (ILI-00052).

50.7.1.6 Place Names

The Cook Inlet drainages study area is located in territory where Dena'ina Athabascan, specifically Iliamna Dena'ina, is spoken (Figure 22-16 in Chapter 22). Locational place-name data relevant to the Cook Inlet drainages study area are available in Kari and Kari (1982), and Kari, Kari, and Balluta (1986). The existing published sources indicate that 24 place names, all of which are Dena'ina in origin, are located in the Cook Inlet drainages study area (Figure 50-4 and Table 50-2). Eleven place names are located in and around Iliamna and Cottonwood bays, and others are scattered around Iniskin Bay, Chinitna Bay, and throughout the study area. Translations or descriptions of each place name are included in Table 50-2. Very few of these place names are located in the vicinity of possible Pebble Project components; however, the collection of place-name data is ongoing; additional place names may be documented for this area following further study. (All documented place names in the Bristol Bay and Cook Inlet drainages are listed in Appendix 22A in Chapter 22 and the locations are shown on Figure 22-20.)

50.7.2 2005 Field Season

The pedestrian survey began from the shingle-covered beach and targeted several localities identified from photographs taken prior to field work that were believed to show potential man-made pit features. No surface artifacts were identified during the pedestrian survey; however, the field crew identified two locations with remnants from U.S. Coast and Geodetic Survey activities at the locations specified on the U.S. Geological Survey (USGS) topographic maps (USGS, 2004) for the area (stations Knoll and Entrance Rock). These remnants included lathe, wood scraps, guy wires and anchors driven into the rock face, and the base for a prefabricated triangular antenna aerial (Photos 50-5, 50-6, and 50-7).

Surveying in the area was challenging because of the terrain and vegetation (Photo 50-8). The field crew excavated 21 test units during the field survey (Table 50-3 and Figure 50-2). Persistent bands of gray to pink volcanic ash (tephra) were present in nearly every test unit (Table 50-3). Massive colluvial deposits from the cliffs of the Back Range underlie accumulations of smaller rubble; wind-deposited loess, sand, and silt deposits; and volcanic ash deposits. Soil deposits ranged in depth from inches to several feet, with many terminating in bedrock, boulders fallen from the cliffs above, or hard-packed glacial till (Table 50-3; Photo 50-9). Vegetation ranged from grasses and mosses in rockier areas to large alder and cottonwood patches with occasional spruces, many showing the signs of avalanche damage from the nearby cliffs. No rock art, surface depressions indicative of dwellings, or middens were found near Knoll Head. Avalanches had apparently damaged the larger trees near Knoll Station, a U.S. Coast and Geodetic Survey Station (Photo 50-8). Stratigraphy in the uplands, as exhibited in test unit TP-05-10 (Photo 50-9), shows the effects of proximity to the cliffs, while stratigraphy near the shore, as exhibited in test unit TP-05-18 (Photo 50-10), is influenced by both gravity deposition and wave action.

The field crew discovered two previously undocumented archaeological sites near Knoll Head (Figure 50-2): a lens shaped beachfront hearth (ILI-00186) and a rock shelter with crude lithic tools and a pronounced band of charcoal (ILI-00185). The field crew recovered carbon samples for radiocarbon dating, which were later sent to a laboratory for analysis. Both archaeological sites were relatively close to one of two shingle beaches on which a small boat could land and where fresh-water runoff flows from the cliff face above.

ILI-00185 is a rock shelter located in a widened niche formed in the crack of a massive, colluvially deposited (fractured from the cliff face) stone mass (Photos 50-11, 50-12, and 50-13). The field crew excavated one test unit (TP-05-06) to a depth of just over two feet in this rock shelter, revealing a two-inch-thick charcoal-stained layer 21 inches below the surface in a matrix of cube-shaped decomposed bedrock and silt (Table 50-3). Two artifacts were uncovered—a granite adze or wedge made from a stone from the nearby beach area and a burin made from a flake of material distinct from the local bedrock (Photo 50-14). The carbon sample from the identified layer dated to 1,560 ±80 BP (before present) using standard counting methods (Beta-208530). As the purpose of the testing was to locate and identify archaeological deposits, no further excavation was performed in the test unit.

ILI-00186 is a hearth that the field crew located in the course of testing the area above the shingle beach (Photos 50-15 and 50-16). Test unit TP-05-15 (Photo 50-17) roughly quartered the lenticular hearth, which had stone surrounding the burnt lens. The center of the charcoal deposit was a light gray ash, with a lens of black charcoal and stained soil above and below where the hot part of the fire would be. The prehistoric users likely dug the level fire pit into the soil on the slope face. The hearth is located above the highest storm-thrown rock bench at the top of the sloping bench. A stream of snowmelt water that falls from the cliffs of the Back Range behind the site and cuts through the beach bluff approximately 40 meters west of the hearth may be available during much of the spring and summer. A sample of the charcoal-stained soil and charcoal was carbon dated to 430 ±40 BP using accelerator mass spectrometry (AMS) method Beta-208531. The field crew found no artifacts associated with this hearth, although its close proximity to the shingle beach and a noted halibut fishing "hole" nearby are indicative that a systematic excavation using screening and floatation techniques might yield more evidence of human use, including artifacts, fish bones, berry hulls, and seeds. Systematic sampling could uncover other hearth deposits with small footprints in the vicinity of this beach. Areas beyond Entrance Rock (Photo 50-18) also may contain cultural resources including archaeological sites.

The two prehistoric sites identified in 2005 near Knoll Head are important contributions to the poorly known cultural history of this part of Cook Inlet. Little surveying or data recovery has been done in this vicinity, and it is likely that additional cultural material would be found at both of these sites if further excavations were conducted. Potential contributions to the understanding of Cook Inlet prehistory include resolution of questions about the sequence of archaeological cultures between Eskimo and Athabascan cultural remains, information about diet and activities of prehistoric people, and geological information about the rise and fall of land relative to the sea in this earthquake-prone area. Historic-period sites in this vicinity include the *Farallon* wreck site (Figure 50-1) and the abandoned communities at AC Point and Dutton, as well as at Williamsport.

50.7.3 2007 Field Season

In July 2007, the survey team, comprising personnel from SRB&A and from Hoefler Consulting Group (the meteorological consultant for Pebble Project), traveled to Iliamna Bay to examine possible locations for a VHF repeater site and two meteorological stations (Figure 50-3).

The first site examined was at Williamsport, between a stream outlet and the ramp, on private land recently cleared of alders and wood debris with a bulldozer (Photos 50-19 and 50-20). In the remaining alder patch were several empty, rusty drums (Photo 50-21). Test unit TH-07-04 was excavated in the undisturbed area between the creek and the debris pile pushed up by the bulldozer (Photo 50-22). Several

layers of silt, clay, and sand were identified in a cross-bedded deposit that appeared not to be stratified but rather to be composed of deposits of beach material interbedded with stream-deposit material (Table 50-4; Photo 50-23). General estimates of the locations of historic structures shown on a 1912 map and from historic photographs (Branson, 1999) put the Keyport Cash Store away from the possible location of the meteorology station, which is in an area prone to annual flooding from storm tides and runoff from rain and snowmelt (the meteorological station will be on stilts).

The possible VHF repeater site is located on top of an unnamed, 2,410-foot-high mountain in the Chigmit Range overlooking Iliamna Bay (Photo 50-24). As there was no soil on the bare rock at the possible equipment location, the vicinity was examined on foot for signs of historic or prehistoric human use, which could possibly include lookout sites, votive sites such as the nearby site of the votive rock on the portage trail, or pictographs and/or rock art. Approximately 85 meters southeast of the site was a loose mound of surface rocks collected into a small pile (Photo 50-25). The rock pile is at the limit of visibility from the possible repeater site. The pile did not resemble other types of stacked rock features (e.g., "pretend people" or stone food caches) in shape, structure, or size, and there were no other related features nearby to indicate its purpose.

The next site examined was at AC Point (Figure 50-3; Photo 50-26). The site is on top of a rocky promontory, with an historically used area on the flats at the base of the cliff (Photos 50-26 and 50-27). At least five structures of recent construction were visible from the site, including two Weatherport-style tent frames on wooden platforms and three plywood structures visible from the air. No evidence of the historic structures shown in historic photographs (Branson, 1999; Jacobs, 1995) were visible; however, some remains may be hidden in the alders and brush on the property. It is likely that vegetation and beach-soil deposits obscure other historic and contemporary structures at the base of the cliff. There was no evidence of human use on the rocky promontory. On the south side of the promontory, a soil slump was exposed (Photo 50-28). The exposed soils were examined for cultural deposits, including lithics, organic materials, or charcoal, but none were observed. A test unit (TH-07-05) was excavated in the northeast corner of the site and uncovered several angular cobbles to pebbles in a sand and silt matrix covered with a thin layer of moss and berry plants (Table 50-4; Photo 50-29). No cultural material was found in the test unit. The surface of the rocky promontory (Photo 50-30) showed evidence that high winds scoured the surface, retarding plant growth, and that the cliffs above were depositing boulders from the decaying cliff face on the surface of the promontory. A view from the end of the promontory on the cliffs above the beach (Photo 50-31) resembles a photograph (Photo 50-32) taken from the beach below by E.A. Hegg in 1902 while traveling to the mouth of the Yukon River. Photo 50-33, a panoramic composite of two images, shows the area below the rocky point where modern structures stand and where, around the turn of the twentieth century, a cabin and warehouse stood for several years. Photo 50-34 is an historic photograph of the same area showing the location of the historic structures and changes in the beach area in the last 100 years.

Historical accounts of AC Point and Williamsport indicate that there were cabins, a cache, and a warehouse at Williamsport (Branson, 1999) and a single cabin and warehouse at AC Point (Branson, 1999; Jacobs, 1995). Hannah Breece, a schoolteacher contracted to teach in several communities in Alaska from 1904 to 1918, described AC Point as follows (Jacobs, 1995:60-61):

> The A.C. Point was a desolate shore in a sort of alcove at the foot of bluffs and mountains. It boasted one surprisingly large building and a single cabin. The large

> building had been constructed as a station and warehouse by a company formed to lay a railroad. The first use of the capital raised had been to erect the building I now saw. When the enterprise failed for lack of further capital, the big building and the cabin had been abandoned and were now used as common property by trappers, prospectors, traders and other travelers when they disembarked from the *Dora* or were awaiting its arrival.

By 1912, when Breece was returning to Seattle between assignments, she was trapped by weather at the Keyport Cash Store cabin near modern Williamsport for nearly a week before traveling by boat to AC Point to wait for the next steamship. At AC Point, she waited 18 days with other travelers for the steamship *Bertha.* In her spare time, she hiked up the cliffs to a ledge from which she could watch the ocean. During these times, Breece claimed she felt strange earth movements, and while the *Bertha* was at sea en route to Seattle, the Novarupta volcano erupted, creating a strange suite of environmental effects (Jacobs, 1995).

Martin and Katz (1910, 1912) noted that the route from Iliamna Bay to the Interior was surveyed for a railroad route to the Yukon. The railroad survey took place from 1902 to 1908, the year before Martin and Katz's 1909 reconnaissance of the Iliamna region for the U.S. Geological Survey. The Alaska Shortline Railway intended to connect Iliamna Bay to the Yukon and Kuskokwim mining districts via the Newhalen portage, the Chulitna River, and the Mulchatna valley to the Kuskokwim River drainage. The Trans-Alaska Company made a related effort to carry mail and passengers over the route using horses and dogsleds in 1902 and built several cabins and improved miles of trails (Martin and Katz, 1912). The Trans-Alaska Company was chartered in San Francisco and intended, in 1903, to build roadhouses every 20 to 30 miles along a trail blazed from Iliamna Bay to Saint Michaels in order to profit from the then-ongoing gold rushes in Nome and along the Yukon River (Branson, 2003). One of the roadhouses the Trans-Alaska Company built, three miles from Roadhouse Bay on Iliamna Lake, was located halfway through the Newhalen portage and became an adjunct to Severson's Roadhouse in modern Iliamna (Branson, 2003).

After the conclusion of the 2007 site investigation at AC Point, a site at North Head replaced AC Point as a more likely location for a meteorological station. North Head extends southwesterly into the waters of Iliamna Bay and Cook Inlet, with three prominent benches or promontories (Photos 50-35, 50-36, and 50-37). The preferred location is the intermediate bench (Photo 50-38). The highest area is approximately 320 feet above sea level on a bare knob of glacier-grooved bedrock (Photo 50-39). The saddle behind the knob had a circular rock array nestled in moss and a stunted alder (Photos 50-39 and 50-40). This rock array was examined for evidence that it was a fire circle; however, excavation revealed a local fracture in the bedrock likely caused by freeze-thaw cycling with silt and tephra in the interstices between the rock fragments (Photo 50-41). Another nearby circular rock array in a mossy area in a saddle was likewise a local fracture of bedrock resulting from freeze-thaw cycling with silt and tephra deposits in the interstices between rocks (Photo 50-42). On the lowest bench was a rock concentration that may have been a cairn knocked apart by weather or bears (Photos 50-43 and 50-44).

Photo 50-45 shows the locations of the three benches, a cave, the beach, and an alder-filled chute connecting the benches. Photo 50-46 shows the cave mouth, beach, and chute closer up. The cave might have been a temporary shelter, because of its accessibility. Inside the cave are two large entrances and a floor of roof-fall material with little to no soil and with some moss on the surface inside (Photos 50-47 and 50-48). Near the mouth, in an alcove, was a recent fox den with recent feces and widespread bird-

bone and feather fragments. A small test unit (TH-07-06; Table 50-4, Photos 50-49 and 50-50) was excavated in soils near the den, but there were no indications of human use, and shallow indications of faunal remains were found in the root mat and on the surface. The soil was undifferentiated brown silt with a strong organic smell and color, with a grayish silt or tephra in the root mat. The excavation continued to the level of roof-fall deposits, which continued downslope from the cave mouth to the chute leading to the beach below. Because the cave faces the open ocean, it would make poor shelter when weather came from the south, but could be adequate shelter during mild weather and when weather blows down Iliamna Bay from the north.

50.7.4 Cultural Resources Interviews

Figure 22-23 in Chapter 22 shows cultural resources identified during the cultural resources interviews for Pebble Project. Figure 50-5 shows cultural resources identified in the Cook Inlet drainages study area during cultural resource interviews, as well as subsistence and traditional knowledge interviews. One cultural resource, the Williamsport to Pile Bay Road (also called the Iliamna Portage Route and the Williamsport to Pile Bay Portage), was reported in the Cook Inlet drainages study area during the cultural resources interviews (Figure 50-5 and Table 50-5). The remaining two cultural resources in the study area, which were identified during the subsistence and traditional knowledge interviews, are historic camps (Figure 50-5 and Table 50-5). (Appendix 22B in Chapter 22 lists all cultural resources identified during interviews for the region of the Bristol Bay and Cook Inlet drainages, and Chapter 22, Section 22.7.7, discusses the results of the cultural resources interviews for the region.)

50.8 Summary

The field crew conducted pedestrian surveys and subsurface testing in the area of Knoll Head in 2005 and in the vicinity of possible Pebble Project components in the Cook Inlet drainages in 2007. Field surveys at Knoll Head in 2005 uncovered two archaeological sites: ILI-00185 and ILI-00186. Knoll Head may hold more archaeological sites undiscovered during the reconnaissance survey. No cultural resources were identified during the 2007 surveys. Cultural resources work on Pebble Project has added to the base of knowledge regarding the prehistoric and historic uses of this, until now, sparsely explored area at the crossroads of the Alaska Peninsula, interior Alaska, coastal Alaska, and the lower Cook Inlet region. Cultural resources interviews conducted in Nondalton, Newhalen, Kokhanok, and Port Alsworth identified one cultural resource feature in the Cook Inlet drainages study area: the Williamsport to Pile Bay Road. Subsistence and traditional knowledge interviews identified two additional cultural resource features in the Cook Inlet drainages study area. The collection of place name data for the Cook Inlet and Bristol Bay drainages resulted in the identification of 950 place names, 24 of which were located in the Cook Inlet drainages study area.

50.9 References

Alaska Volcano Observatory (AVO). 2007. Alaska Volcano Observatory website. www.avo.alaska.edu. (accessed October 2007).

Branson, John B. 2003. Seversen's Roadhouse: Crossroads of Bristol Bay, Alaska; With the Diary and Writings of Myrtle and Jack Bailey. Edited by John Branson. The Cook Inlet Historical Society, Anchorage, AK

_____. 1999. Bristol Bay, Alaska: From the Hinterlands to Tidewater: A Grassroots Pictorial, 1885-1965. Lake Clark National Park and Preserve, and Alaska Natural History Association, Anchorage, AK.

Capps, S.R. 1935. The Southern Alaska Range. U.S. Geological Survey Bulletin 862. Washington, DC: U.S. Government Printing Office.

DeLaguna, Frederica. 1975. The Archaeology of Cook Inlet, Alaska, with a Chapter on Skeletal Material by Bruno Oetteking, Ph.D. Second edition. Alaska Historical Society, Anchorage, AK.

DePew, Alan D., and Daniel R. Thompson. 2001. Archaeological Survey of the Williamsport to Pile Bay Road (DOT&PF Project 55108) in Southcentral Alaska. Short Report 2001-3. Alaska Department of Natural Resources, Office of History and Archaeology, Archaeological Survey Unit.

Detterman, Robert L., and John K. Hartsock. 1966. Geology of the Iniskin-Tuxedni Region, Alaska. U.S. Geological Survey Professional Paper 512. Washington, DC: U.S. Government Printing Office.

Dixon, E. James, Jr., G.D. Sharma, and Sam W. Stoker. 1979. Lower Cook Inlet Cultural Resource Study: Final Report. Alaska Outer Continental Shelf Office, Bureau of Land Management, U.S. Department of the Interior, Anchorage, AK.

Ellanna, Linda J., and Andrew A. Balluta. 1992. *Nuvendaltin Quht'ana*: The People of Nondalton. Washington, DC: The Smithsonian Institution.

Goforth, J. Penelope. 2003. Sailing the Mail in Alaska: The Maritime Years of Alaska Photographer John E. Thwaites, 1905-1912. Cybrrcat Productions, Anchorage, AK.

Hrdlička, Aleš. 1943. Alaska Diary, 1926-1931. Lancaster, PA: The Jacques Cattell Press.

Jacobs, Jane. 1995. A Schoolteacher in Old Alaska: The Story of Hannah Breece. New York: Random House.

Jasper, M.W. 1956. "Folly" Copper Claim (Messrs. Pfaff, Sargent, Alsworth, and Gill, Owners) Paint River Area, Kamishak Bay Region, Kokhanok Precinct, Iliamna Quadrangle, Alaska Peninsula. Territory of Alaska, Department of Mines, Juneau, AK.

Kaniut, Larry. 1999. Danger Stalks the Land: Alaskan Tales of Death and Survival. New York: St. Marten's Griffin.

Kari, James, and Priscilla R. Kari. 1982. Dena'ina Ełnena: Tanaina Country. Alaska Native Language Center, University of Alaska, Fairbanks, Alaska.

Kari, Priscilla Russell, James Kari, and Andrew Balluta. 1986. "Dena'ina Place Names in the Lake Clark National Park and Preserve Study Area." *In:* Linda J. Ellanna, ed., Lake Clark Sociocultural Study: Phase I. National Park Service, Lake Clark National Park and Preserve, AK.

Karlstrom, Thor N.V. 1964. Quaternary Geology of the Kenai Lowland and Glacial History of the Cook Inlet Region, Alaska. U.S. Geological Survey Professional Paper 443. Washington, DC: U.S. Government Printing Office.

Lloyd, Steve K. 2000. *Farallon*: Shipwreck and Survival on the Alaska Shore. Pullman, WA: Washington State University Press.

Martin, G.C., and F.J. Katz. 1912. A Geological Reconnaissance of the Iliamna Region, Alaska. U.S Geological Survey Bulletin 485.

———. 1910. Outline of the geology and mineral resources of the Iliamna and Clark Lake region. *In* Mineral Resources of Alaska: Report on Progress of Investigations in 1909, by Alfred H. Brooks and Others. Department of the Interior, United States Geological Survey, George Otis Smith, Director. Bulletin 442. Government Printing Office, Washington DC

Mobley, Charles M., James C. Haggarty, Charles J. Utermohle, Morley Eldridge, Richard E. Reanier, Aron Crowell, Bruce A. Ream, David R. Yesner, Jon M. Erlandson, and Paul E. Buck. 1990. The 1989 *Exxon Valdez* Cultural Resource Program. Exxon Shipping Company and Exxon Company, USA, Anchorage, AK.

National Park Service (NPS). 1993. Archaeological Reconnaissance in Lake Clark National Park and Preserve: Chinitna Bay to Tuxedni Bay, Cook Inlet, August 1992. NPS Alaska Regional Office, Division of Cultural Resources, Anchorage, AK.

Office of History and Archaeology (OHA). 2009. Alaska Heritage Resources Survey Database. Alaska Department of Natural Resources, Anchorage, AK. http://www.dnr.state.ak.us/parks/oha/ahrs/ahrs.htm. (accessed October 2009).

Roehm, J.C. 1941. Summary Report of Mining Investigations and Itinerary in the Iliamna and Iniskin Bay Districts, Iliamna Precinct, Alaska, May 20 to June 10, 1941. Report MR-103-0. Alaska Division of Geological and Geophysical Surveys, Fairbanks, AK.

Townsend, Joan B. 1973. "Ethnoarchaeology in Nineteenth Century Southern and Western Alaska: An Interpretive Model". Ethnohistory. Vol. 20, No. 4. Pp 393-412.

_____. 1970a. Tanaina Archaeology in the Iliamna Lake Region, Alaska. Canadian Archaeological Association Bulletin. No. 2.

_____. 1970b. "Tanaina Ethnohistory: An Example of a Method for the Study of Cultural Change." *In:* Margaret Lantis, ed., Ethnohistory in Southwestern Alaska & the Southern Yukon: Method and Content. Lexington, KY: University Press of Kentucky.

_____. 1970c. The Archaeology of Pedro Bay, Alaska. Paper for meeting of the Society for American Archaeology, Mexico City, Mexico. April 30.

Townsend, Joan B., and Sam-Joe Townsend. 1964. "Additional Artifacts from Iliamna Lake, Alaska." Anthropological Papers of the University of Alaska. Vol. 12, No. 1. Pp. 14-16.

_____. 1961. "Archaeological Investigations at Pedro Bay, Alaska." Anthropological Papers of the University of Alaska. Vol. 10, No. 1. Pp. 25-58.

Unrau, H.D. 1994. Lake Clark National Park and Preserve Alaska: Historic Resource Study. U.S. Department of the Interior, National Park Service, Anchorage, AK.

U.S. Geological Survey (USGS). 2004. Alaska Resource Data File for the Iliamna 1:250,000 Quadrangle, Open File Report 2004-1057. Alaska Region, Anchorage, AK. http://ardf.wr.usgs.gov (accessed October 2005).

Yarborough, Michael R. 1993. Cultural Resource Consultants. Letter to Larry W. Strain, Alaska Area Native Health Service, Office of Environmental Health and Engineering. August 23.

_____. 1986a. Archaeological Survey of Two Access Road Routes and the Proposed Sites of a Powerhouse and Penstock for the Tazimina River Local Power Project. Submitted to Dames & Moore Consulting Engineers by Cultural Resource Consultants, Anchorage, AK. May 21.

_____. 1986b. Cultural Resource Consultants. Letter to Merlyn L. Pain, Environmental Coordinator, Alaska Department of Transportation and Public Facilities. June 1.

_____. 1985a. Additional Archaeological Work in the Vicinity of the Proposed Pedro Bay Airport: DOT&PF Project 53245. Submitted to the Alaska Department of Transportation and Public Facilities by Cultural Resource Consultants, Anchorage, AK. November 5.

_____. 1985b. Archaeological Survey of a Proposed New Airport and Access Road, Pedro Bay, Alaska: DOT&PF Project D91022. Submitted to the Alaska Department of Transportation and Public Facilities by, Cultural Resource Consultants, Anchorage, AK. August 26.

50.10 Glossary

Esker—a sinuous ridge formed from sand and gravel deposited in tunnels running through a glacier.

In situ—in its natural or original position.

Lenticular—lens shaped.

Loess—loosely consolidated, fine, windblown soil deposit derived from glacial processes.

Moraine—an accumulation of material that has been transported on the surface of ice, within ice, or beneath ice.

Tephra—volcanic ash.

TABLES

TABLE 50-1
Documented Cultural Resources in the General Vicinity of Iniskin and Iliamna Bays

This table corresponds with Figure 50-1.

AHRS Number	Site Name	Description	Period	NRHP Status
ILI-00005	Dutton	Mining camp	Historic (AD 1905)	NDE
ILI-00038	Oil Bay Drilling Site	Oil seepages were noted here by the Russians in 1853; oil samples were taken in 1882; Pomeroy & Griffen staked claims in 1896, organized Alaska Petroleum Company and drilled three wells between 1900 and 1903, two with minor production. Drilling stopped in 1906 and the oil claims were abandoned in 1908. Little evidence is believed to remain. Edwin Eddlemann, a Finn who came as a miner to Juneau in 1885, noted oil seeps and staked claims in 1889.	Historic	NDE
ILI-00052	AC Point	Site		NDE
ILI-00132	Williamsport to Pile Bay Road	Seasonal road that follows a traditional Den'aina Athabascan trail/portage over the Chigmit Mountains. Road originally built in the 1930s by the Alaska Road Commission.	Historic (circa AD 1920s to present)	NRE (9/2/03)
ILI-00185	Rock Shelter	A hearth and two lithics in a widened niche formed in the crack of a massive colluvially deposited stone mass at the base of the Back Range. A 2" thick charcoal-stained layer was located 21" below surface. The surrounding matrix was cube-shaped, decomposed bedrock and silt. A granite adze and a burin were found at the same depth.	Prehistoric (1,560 ±80 BP)	NDE
ILI-00186	Beach Bench with Hearth	A hearth surrounded by stones. At the center of the hearth was light gray ash with a lens of black charcoal and stained soil above and below the ash. The fire pit was level with the surrounding ground, indicating the hearth was dug into the ground. A charcoal sample was dated to BP 430 ±40 BP. No artifacts were found, but site may have buried cultural materials.	Prehistoric (430 ±40 BP)	NDE

Notes:

AD = anno Domini

BP = before present.

NDE = no determination of eligibility for the National Register of Historic Places (NRHP).

NRE = determined to be eligible for the NRHP.

Source: OHA, 2009.

TABLE 50-2
Documented Place Names in the Cook Inlet Drainages Study Area

This table shows the 24 place names for the Cook Inlet drainages study area (see Figure 50-4). All documented place names in the Bristol Bay and Cook Inlet drainages are listed in Chapter 22, Appendix 22A, and those with locational data are shown on Figure 22-20.

Place Name No.	Place Name [a]	Description/Translation
34	*Bentudush Bena*	Lake and marsh at mouth of Johnson River
42	*Ch''naqal'in*	Iliamna Volcano; Iliamna Mountain
47	*Ch'ak'elyashtnu*	Chinkelyes River
109	*Chaqelchin*	Tilted Hills
111	*Chaqulchin*	Tilted Hills
136	*D'anlcha Nut'*	A. C. Point
178	*Esdghuk'a T'el'iht*	Diamond Point in Iliamna Bay
210	*Hkaytaghi'u*	Cottonwood Bay
441	*Nilavena Hkaytghi'u*	Iliamna Bay
522	*Nuquk'denghilyasht*	South Head
548	*Q'anlcha Nul*	Beach on Iliamna Bay
567	*Qahetldildelt*	Williams Creek Trail from Iliamna Lake to Iliamna Bay on Cook Inlet
589	*Qaqelchix*	Site on south side of Cottonwood Bay
686	*T'usi*	Slope Mountain
757	*Tsanitnu*	Chinitna Bay and River
765	*Tsayehtnu Tustes*	Pile River Pass from Iliamna Lake to Chinitna Bay
800	*Tuniljun*	Johnson River
805	*Tus K'ghulk'et'*	Portage Pass from Iniskin Bay to Chinitna Bay
807	*Tus Nuch'k'elyasht*	Iliamna Portage
914	*Vetudil'i*	Creek below *Ulcha Tsayeh*
916	*Vighuk'di'ushi*	Mountain on Iliamna Bay
925	*Viqidin Ts'iznigitnu*	Iniskin Bay and River
930	*Yaha Nlin*	Whitegill Island
937	*Yis Ggihtna*	West Glacier Creek

Notes:

a. All place names are in the Dena'ina language.

Sources: Kari and Kari, 1982; Kari, Kari, and Balluta, 1986.

TABLE 50-3
Summary of Test Unit Data in the Cook Inlet Drainages Study Area, 2005

The corresponding test pit locations are shown on Figure 50-2.

Test Pit/ Exposure Number	Latitude (Decimal Degrees [a])	Longitude (Decimal Degrees [a])	Elev. (ft)	Date	Way-point No.	Cultural Material	Surface Vegetation	Total Depth (in.)	Root Mat Thick-ness (in.)	Level No.	Thick-ness (in.)	Description	Comments
TP-05-01	59.65167	-153.46981	52	5/23/05	010	No	Grass root mat	30	1	1	1	Loose, loamy brown soil and forest floor	Well-developed, stratified soils with clear tephra layer near surface
										2	1	Gray-pink fine tephra	
										3	2.5-7.5	Black silt loam, slightly compacted	
										4	0-3	Compact gray loam	
										5	7	Brown compacted silt loam	
										6	3	Dark brown loam	
										7	8	Light brown to tan silt loam	
TP-05-02	59.65127	-153.47081	79	5/23/05	011	No	Grass, berry canes	30	0	1	1	Forest duff, leaf matter	Stratigraphy indicates long-term stability and in situ soil development with one gap possibly due to fire. Dead spruce roots and wood were in and on the buried root/black soil layer.
										2	2-3	Gray-pink fine tephra	
										3	5-7	Black silt loam, mixed with ash layer	
										4	6-8	Rust-colored silt loam	
										5	2-3	Black compressed silt loam	
										6	10-1.5	Light brown silt loam	
										7	2	Coarse brown-stained gravel to cobbles	

Test Pit/ Exposure Number	Latitude (Decimal Degrees [a])	Longitude (Decimal Degrees [a])	Elev. (ft)	Date	Way-point No.	Cultural Material	Surface Vegetation	Total Depth (in.)	Root Mat Thick-ness (in.)	Level No.	Thick-ness (in.)	Description	Comments
TP-05-03	59.65237	-153.4677	56	5/24/05	012	No	Crowberry plants with old berries	18	4.5	1	3	Crowberry plants with berries	
										2	1.5	Pink-gray volcanic ash beneath the peat mat	
										3	2	Black, moist, organic-rich soil	
										4	7	Brown to tan silt loam with angular fractured gravels and cobbles	
TP-05-04	59.65267	-153.4682	75	5/24/05	013	No	Crowberry plants	22	2-4	1	2	Forest duff and crowberry plants	
										2	1	Gray-pink fine tephra	
										3	8-13	Brown silt loam	
TP-05-05	59.65217	-153.47001	66	5/24/05	014	No	Forest duff and root mat typical of forest floor	12	4	1	4	Forest duff, crowberries and ferns	
										2	1	Gray-pink fine tephra	
										3	3	Brown silt loam	
TP-05-06	59.64967	-153.47261	66	5/24/05	017	Yes	Some ferns, grasses, devil's club	28	0	1	21	Angular fractured rock from cave roof, silt	
										2	2	Gray soil with black carbon flecks, adze or wedge-shaped granite object, possible burin	
										3	5	Angular shattered roof material and silt	

Test Pit/ Exposure Number	Latitude (Decimal Degrees [a])	Longitude (Decimal Degrees [a])	Elev. (ft)	Date	Way-point No.	Cultural Material	Surface Vegetation	Total Depth (in.)	Root Mat Thick-ness (in.)	Level No.	Thick-ness (in.)	Description	Comments
TP-05-07	59.65157	-153.46951	33	5/24/05	018	No	Berry canes, devil's club, other shallow-rooted plants	30	3	1	3	Surface duff including some silt, root mat from berry canes	
										2	27	Subangular rounded beach shingles and unsorted round granite cobbles and gravels	
TP-05-08	59.64617	-153.47551	23	5/24/05	024	No	Crowberries, salmon-berries, sorrel	36	5	1	3	Crowberries, salmonberries, sorrel root mat with 3 inches of peat and soil beneath	Did not reach bedrock. Area has promise for cultural material further back but no surface indications (e.g., depressions, mounds, pits)
										2	2	Pinkish gray fine tephra deposit	
										3	5	Dark brown organic silt with angular gravel	
										4	4	Dark organic soil horizon with large angular cobbles, almost black	
										5	15	Tan silt loam or loess, mottled, unstratified, with large angular blocky cobbles, unrounded	
										6	2	Brown to tan loess with larger sand grains	

Test Pit/ Exposure Number	Latitude (Decimal Degrees [a])	Longitude (Decimal Degrees [a])	Elev. (ft)	Date	Way-point No.	Cultural Material	Surface Vegetation	Total Depth (in.)	Root Mat Thick-ness (in.)	Level No.	Thick-ness (in.)	Description	Comments
TP-05-09	59.65707	-153.4685	436	5/24/05	031	No	Grass, moss, berries	24	2	1	7-8	Loose black loam	Water infiltration ended this test unit. Area quite high above modern sea level.
										2	1	Gray-pink fine tephra	
										3	2-3	Active layer: silt loam mixing with tephra	
										4	12	Brown silt or loess with large angular fractured bedrock cobbles	
TP-05-10	59.656969	-153.4687	436	6/6/05	030	No	Crowberries	8	4	1	0.5-1	Pink-gray tephra	Very thin soil mixed with fractured bedrock beneath the tephra and peat layer. No indication of bedrock having been submerged at any time in the past.
										2	1.5-2.5	Brown silt loam with organic staining from peaty root mat, fractured bedrock fragments	
TP-05-11	59.654369	-153.469	207	6/6/05	034	No	Crowberries	19	3-6	1	1	Pink-gray tephra	No patination or barnacle bases on bedrock; no other indications of having been below or at sea level.
										2	12	Brown silt loam with sorted angular fractured bedrock gravels to cobbles	

Test Pit/ Exposure Number	Latitude (Decimal Degrees [a])	Longitude (Decimal Degrees [a])	Elev. (ft)	Date	Way-point No.	Cultural Material	Surface Vegetation	Total Depth (in.)	Root Mat Thick-ness (in.)	Level No.	Thick-ness (in.)	Description	Comments
TP-05-12	59.654269	-153.469	207	6/6/05	036	No	Shallow-rooted ground cover	22	2	1	8	Loose black loam	
										2	1.5	Pinkish gray fine tephra deposit	
										3	10.5	Brown silt loam or loess with large angular fractured cobbles	
										4	0.5	Bedrock base of colluvially deposited massive slump rock	
TP-05-13	59.652369	-153.4683	66	6/6/05	037	No	Grass and peaty moist root mat	31	9	1	2	Pink-gray tephra	
										2	12	Banded brown silt loam	
										3	8	Tan silt loam	
TP-05-14	59.651869	-153.46911	23	6/6/05	038	No	Alders, berry canes, devil's club, other shallow-rooted plants	25	4	1	1	Pink-gray tephra	
										2	10	Dark brown silt loam with angular fractured bedrock cobbles and gravels	
										3	12	Tan silt loam with poorly sorted angular fractured gravels and cobbles	

Test Pit/ Exposure Number	Latitude (Decimal Degrees [a])	Longitude (Decimal Degrees [a])	Elev. (ft)	Date	Way-point No.	Cultural Material	Surface Vegetation	Total Depth (in.)	Root Mat Thick-ness (in.)	Level No.	Thick-ness (in.)	Description	Comments
TP-05-15	59.651869	-153.46901	36	6/6/05	039	Yes	Grass, berry canes	24	2	1	2	Loose black loam	
										2	1.5	Pinkish gray fine tephra deposit	
										3	1	Grayish brown loess	
										4	12	Compacted brown loess with large angular fractured cobbles and gravel	
										5	4	Charcoal chunks, ash, blackened soil. Lenticular hearth, light gray along center, black top and bottom	
										6	3	Coarse angular gravels in brown loess matrix	
TP-05-16	59.651869	-153.46891	26	6/6/05	040	No	Alders, berry canes, devil's club, other shallow-rooted plants	15	3	1	4	Well-rounded small beach-thrown cobbles and gravels	
										2	2	Pinkish gray fine tephra deposit	
										3	6	Rounded beach-thrown gravel with no matrix, loose	

Test Pit/ Exposure Number	Latitude (Decimal Degrees [a])	Longitude (Decimal Degrees [a])	Elev. (ft)	Date	Way-point No.	Cultural Material	Surface Vegetation	Total Depth (in.)	Root Mat Thick-ness (in.)	Level No.	Thick-ness (in.)	Description	Comments
TP-05-17	59.644072	-153.47752	43	6/7/05	043	No	Crowberry plants	35	6	1	2	Black moist organic soil	
										2	1	Pinkish gray fine tephra deposit	
										3	11	Black to red silt loam	
										4	3	Sand and rounded pebbles, likely beach-throw from a storm event	
										5	8	Tan silt loam or loess, mottled, unstratified	
										6	3.5	Sand and rounded pebbles	
										7	0.5	Compacted dense green clay	
TP-05-18	59.643872	-153.47752	33	6/7/05	044	No	Crowberry plants	22	4	1	3	Loose black loam	
										2	6	Brown loam	
										3	3	Tan silt loam	
										4	1	Coarse angular gravel	
										5	5	Brown compacted silt loam	
										6	1	Gray loess	
										7	0.5	Large angular fractured rock, likely colluvial	

Test Pit/ Exposure Number	Latitude (Decimal Degrees [a])	Longitude (Decimal Degrees [a])	Elev. (ft)	Date	Way-point No.	Cultural Material	Surface Vegetation	Total Depth (in.)	Root Mat Thick-ness (in.)	Level No.	Thick-ness (in.)	Description	Comments
EXP-05-01	59.652869	-153.4674	46	5/24/05	009	No	Alders, berry canes, devil's club, other shallow-rooted plants	40	2	1	1	Pink-gray tephra	
										2	38	Brown silt loam with rounded gravel and cobbles	
EXP-05-02	59.652869	-153.4674	46	5/24/05	009	No	Alders, berry canes, devil's club, other shallow-rooted plants	30	3	1	2	Pink-gray tephra	
										2	6	Black loam	
										3	6	Brown loam	
										4	9	Tan loam	
											7	Angular coarse gravel	
CB-05-01	59.65077	-153.47361	72	5/25/05	019	No	Alders, berry canes, devil's club, other shallow-rooted plants	25.5	2	1	2		
										2	4	Tan silt loam	
										3	1	Pinkish gray fine tephra deposit	
										4	18	Tan silt loam with poorly sorted angular fractured gravels and cobbles	
										5	0.5	Angular rounded gravel and cobbles with some sand and silt matrix cut by stream	

Notes:

a. North American Datum 1983.

TABLE 50- 4
Summary of Test Unit Data in the Cook Inlet Drainages Study Area, 2007

The corresponding test pit locations are shown on Figure 50-3.

Test Unit	Latitude (Decimal Degrees [a])	Longitude (Decimal Degrees [a])	Elev. (ft)	Date	Cultural Material	Surface Vegetation	Total Depth (in.)	Root Mat Thick-ness (in.)	Level No.	Thick -ness (in.)	Description	Comments
TH-07-04	59.682778	-153.631944	30	7/12/07	No	Beach grass	14	5	1	7	Interbedded sand and silt	In zone of conflict between outwash stream and beach.
									2	2	Packed beach gravel	
TH-07-05	59.65238	-153.59477	174	7/12/07	No	Moss	10	2	1	8	Decayed bedrock with silt and sand matrix	Ends in bedrock
TH-07-06	59.624167	-153.56	92	7/19/07	No	Beach grass	12	3	1	9	Dark brown organic-enriched silt	Cave mouth, fox feces on surface, base is roof-fall boulder

Notes:

a. North American Datum 1983.

TABLE 50- 5
Summary of Cultural Resource Data Obtained during Interviews for the Cook Inlet Drainages

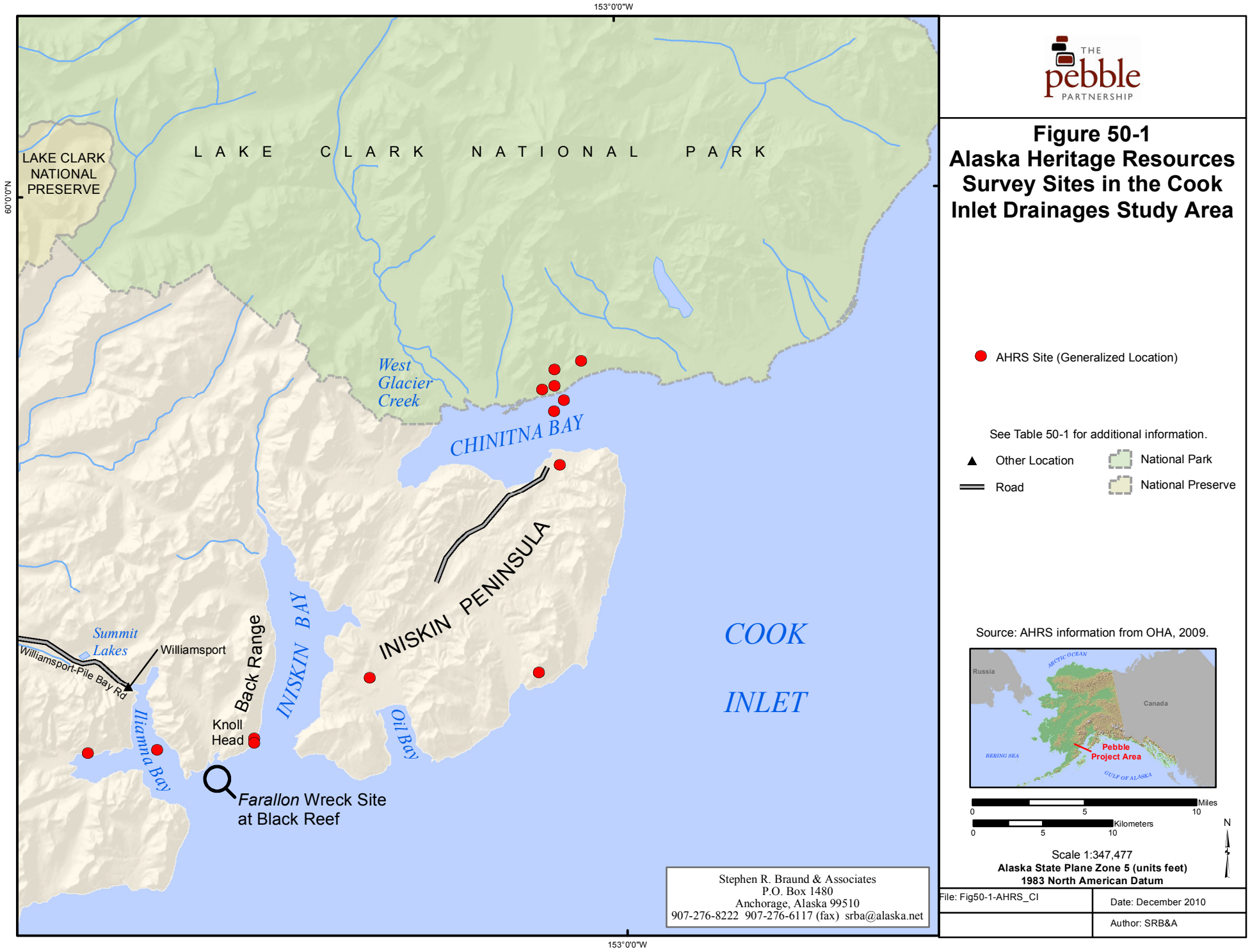
This table shows the cultural resource features identified in the Cook Inlet drainages study area. All cultural resource features in the Bristol Bay and Cook Inlet drainages are listed in Chapter 22, Appendix 22B, and are shown on Figure 22-23.

Feature Number	Figure that Shows Feature	Feature Type	Feature Type Subcategory	Feature Name/ Description	Time Period
CMP-219	50-5	Cultural Resource	Camp	Old family camp	50 plus years
CMP-223	50-5	Cultural Resource	Camp	Old trapping camp	50 plus years
TRL-024	50-5	Cultural Resource	Trail/Route	Iliamna portage route	50 plus years
TRL-126	50-5	Cultural Resource	Trail/Route	Williamsport to Pile Bay portage	50 plus years
TRL-127	50-5	Cultural Resource	Trail/Route	Williamsport to Pile Bay Road	50 plus years

Notes:

TRL-024, TRL-126, and TRL-127 are slightly different descriptions for a single road.

FIGURES



THE pebble PARTNERSHIP

Figure 50-1
Alaska Heritage Resources Survey Sites in the Cook Inlet Drainages Study Area

AHRS Site (Generalized Location)

See Table 50-1 for additional information.

Other Location

Road

National Park

National Preserve

Source: AHRS information from OHA, 2009.

Miles 0 5 10

Kilometers 0 5 10

N

Scale 1:347,477

Alaska State Plane Zone 5 (units feet)

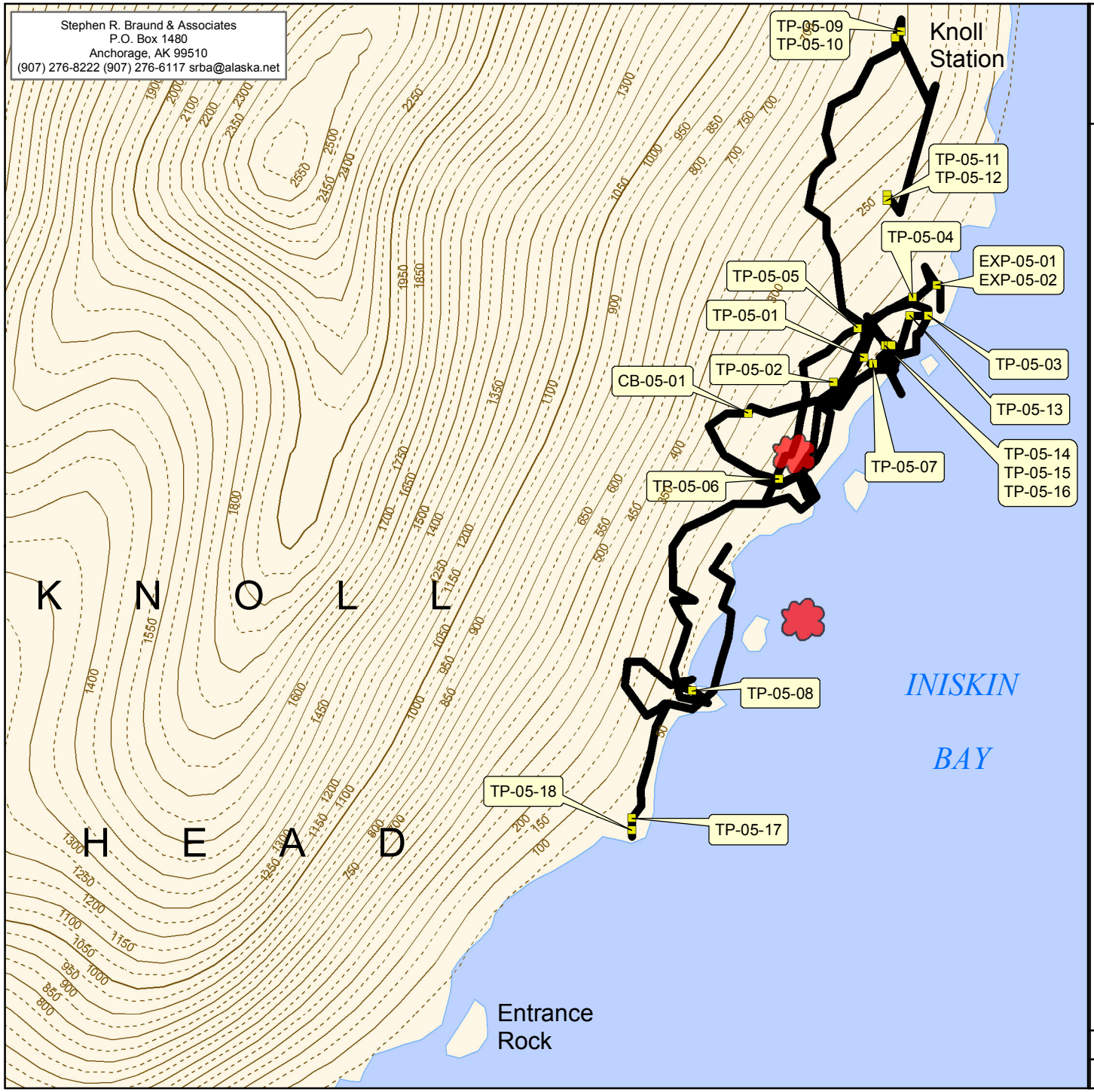
1983 North American Datum

File: Fig50-1-AHRS_CI

Date: December 2010

Author: SRB&A

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, AK 99510
(907) 276-8222 (907) 276-6117 srba@alaska.net



THE pebble PARTNERSHIP

Figure 50-2
2005 Cultural Resources Field Survey, Cook Inlet Drainages Study Area

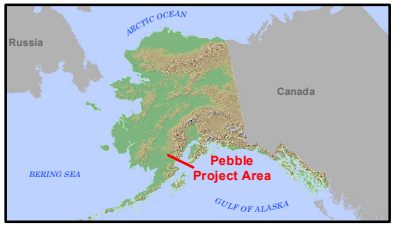
Test Unit

Survey Track

AHRS Site Identified during 2005 (Generalized Location)

See Table 50-1 for more information about AHRS sites and Table 50-3 for more information about test units.

Source: AHRS information from OHA, 2009.



Feet
0 250 500 750 1,000

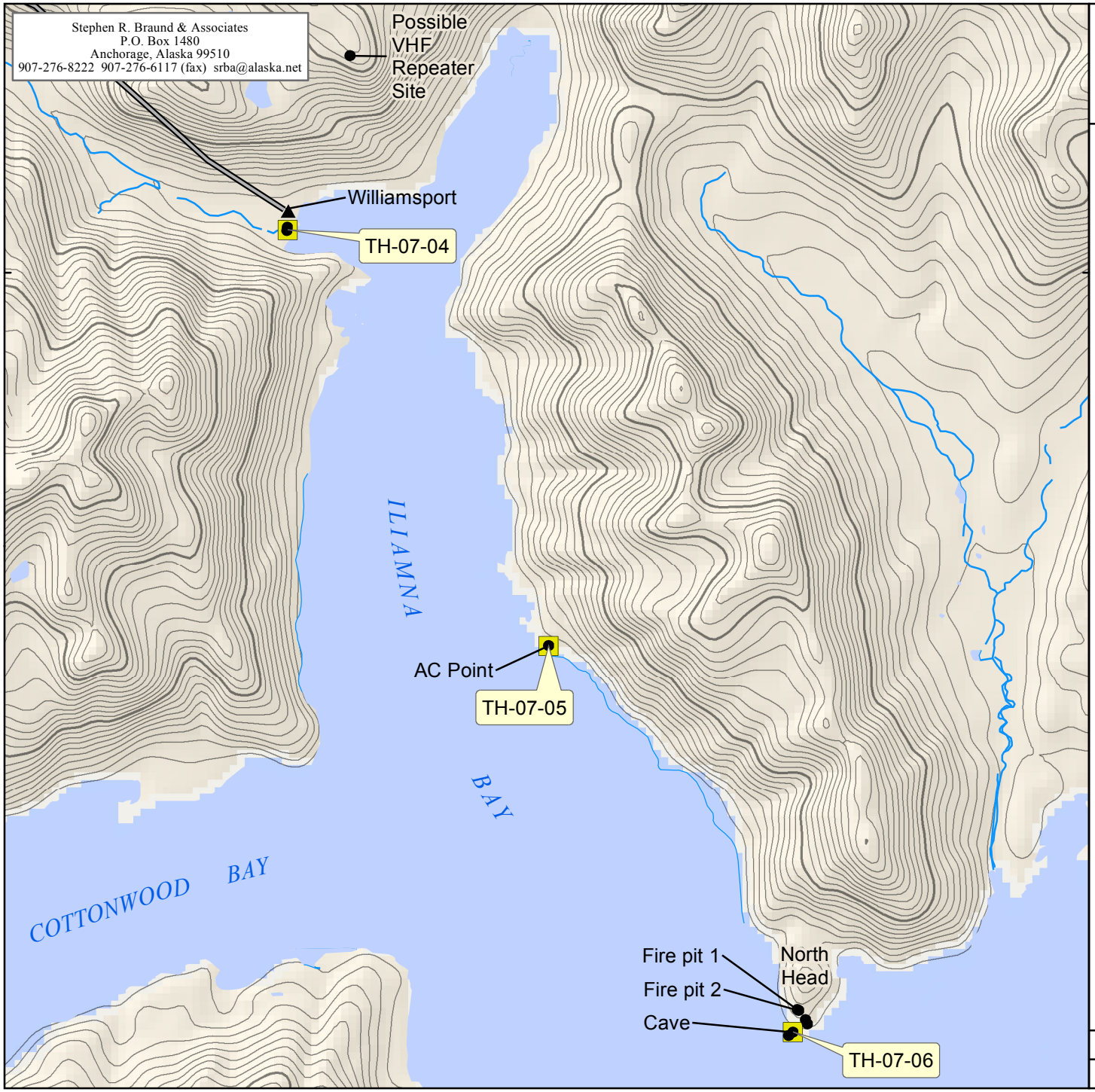
Meters
0 100 200 300 400

N

Scale 1:10,500

Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: Fig50-2-port_Sum05.pdf	Date: December 2010
	Author: SRB&A

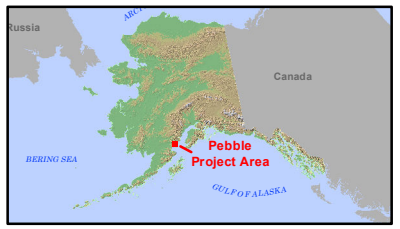


THE pebble PARTNERSHIP

Figure 50-3
2007 Cultural Resources Field Survey, Cook Inlet Drainages Study Area

- Test Unit
- Survey Location
- Road

See Table 50-4 for more information about test units.

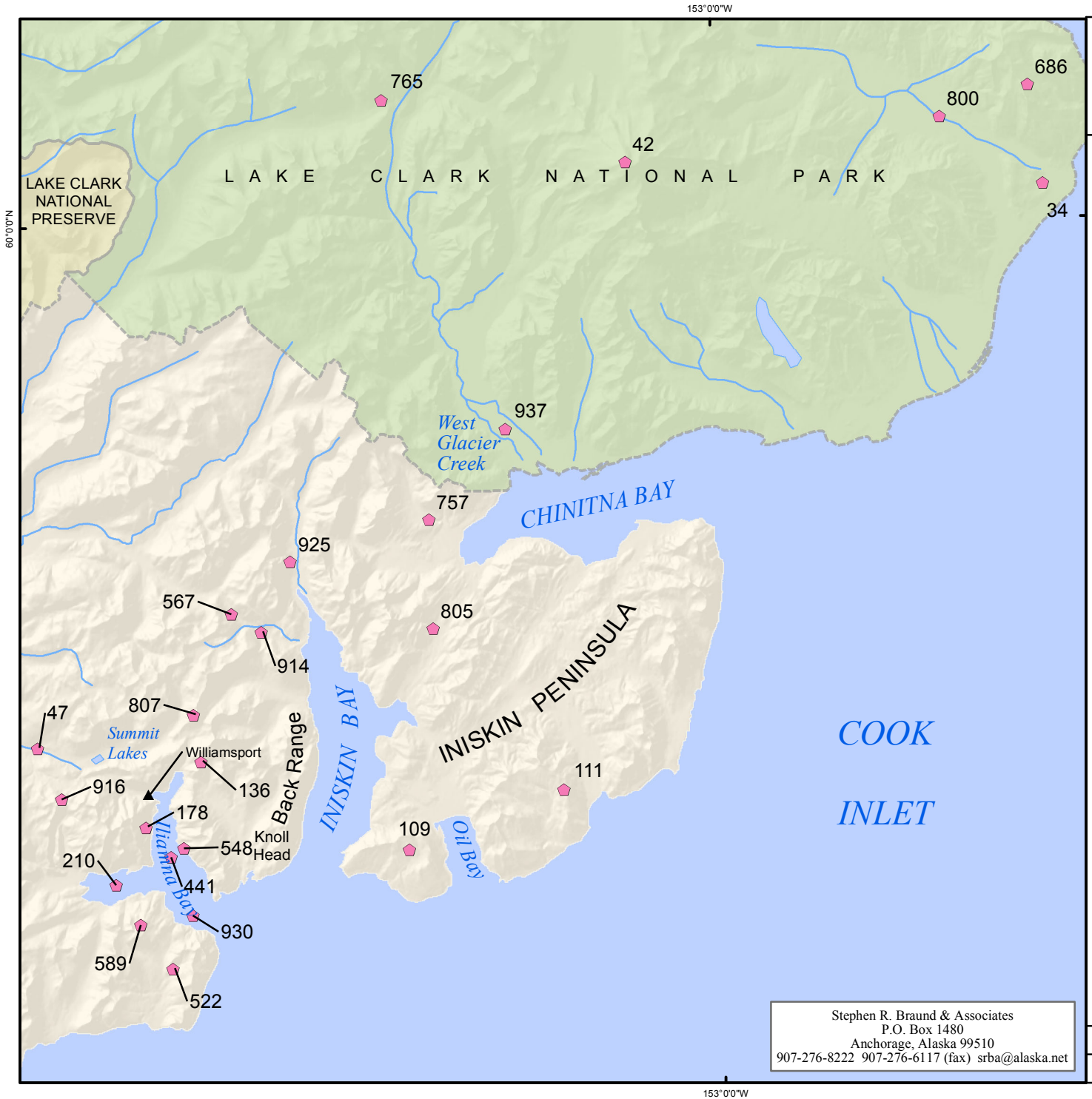


Mile 0 0.25 0.5 0.75 1
Kilometer 0 0.25 0.5 0.75 1

N

Scale 1:46,169
Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: Fig50-3-Met_CI	Date: December 2010
	Author: SRB&A



Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
907-276-8222 907-276-6117 (fax) srba@alaska.net

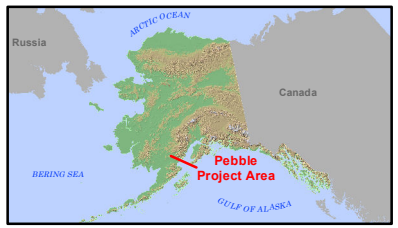
THE pebble PARTNERSHIP

Figure 50-4
Locations of Place Names in the Cook Inlet Drainages Study Area

- Place Name Location
- Other Location
- National Park
- National Preserve

See Table 50-2 and Appendix 22A for additional information.

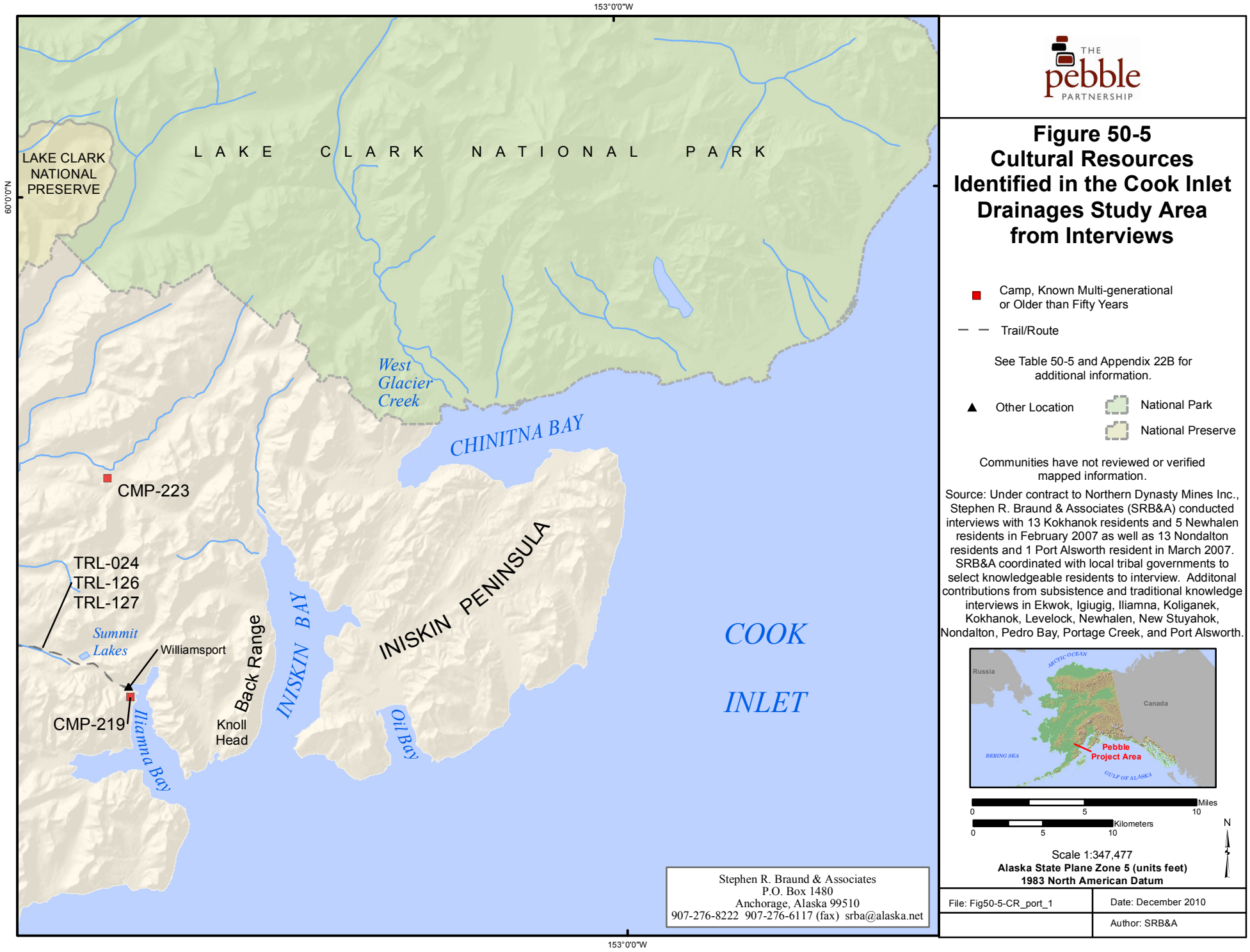
Sources: Kari, Kari, and Balluta, 1986; Kari and Kari, 1982.



Miles 0 5 10
Kilometers 0 5 10
N

Scale 1:347,477
Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: Fig50-4-PN_port_1	Date: December 2010
	Author: SRB&A



THE pebble PARTNERSHIP

Figure 50-5
Cultural Resources Identified in the Cook Inlet Drainages Study Area from Interviews

Camp, Known Multi-generational or Older than Fifty Years

Trail/Route

See Table 50-5 and Appendix 22B for additional information.

Other Location

National Park

National Preserve

Communities have not reviewed or verified mapped information.

Source: Under contract to Northern Dynasty Mines Inc., Stephen R. Braund & Associates (SRB&A) conducted interviews with 13 Kokhanok residents and 5 Newhalen residents in February 2007 as well as 13 Nondalton residents and 1 Port Alsworth resident in March 2007. SRB&A coordinated with local tribal governments to select knowledgeable residents to interview. Additonal contributions from subsistence and traditional knowledge interviews in Ekwok, Igiugig, Iliamna, Koliganek, Kokhanok, Levelock, Newhalen, New Stuyahok, Nondalton, Pedro Bay, Portage Creek, and Port Alsworth.

Miles 0 5 10

Kilometers 0 5 10

N

Scale 1:347,477

Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: Fig50-5-CR_port_1	Date: December 2010
	Author: SRB&A

PHOTOGRAPHS

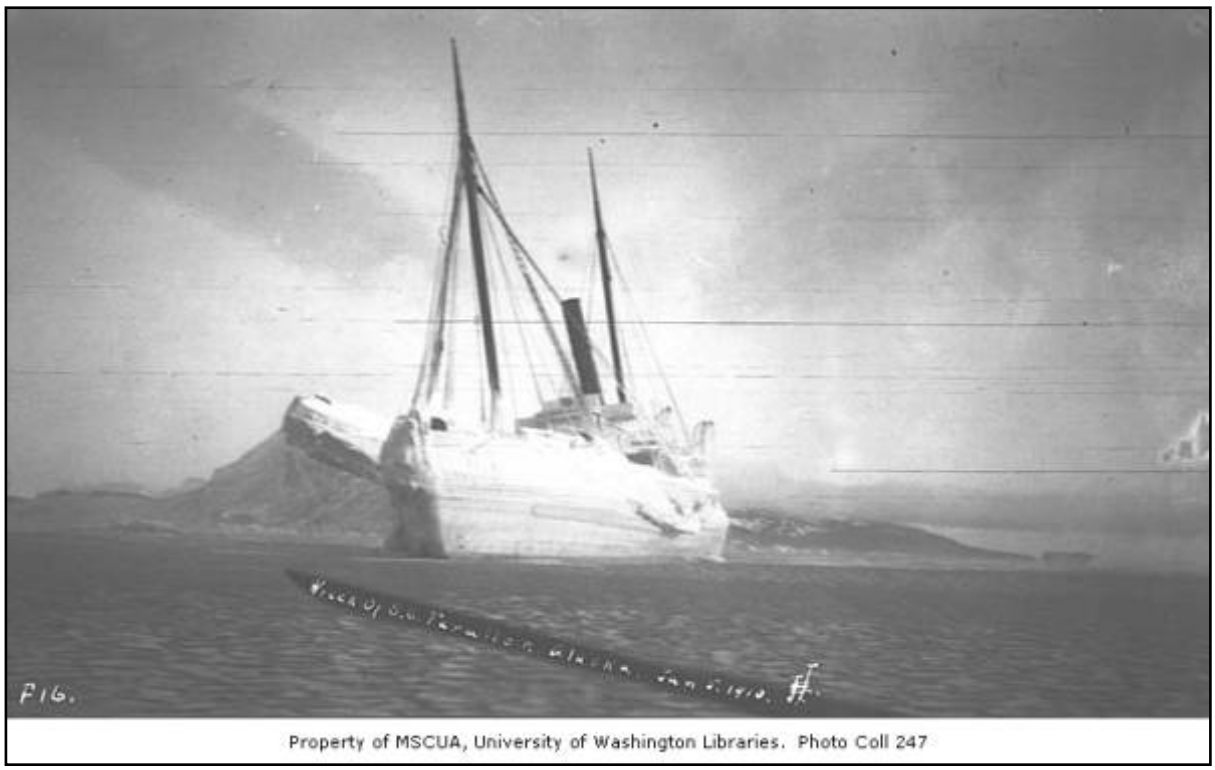


Photo 50- 1: Wreck of the *Farallon* on Black Reef, January 5, 1910. University of Washington photo collection (Thwaites 247.95).

Photo 50- 2: Photo of the camp of the shipwrecked *Farallon*, January 5, 1910. University of Washington photo collection (Thwaites 247.79).

Photo 50- 3: Compiled panoramic overview Knoll Head area as viewed from Iniskin Bay. May 2005.

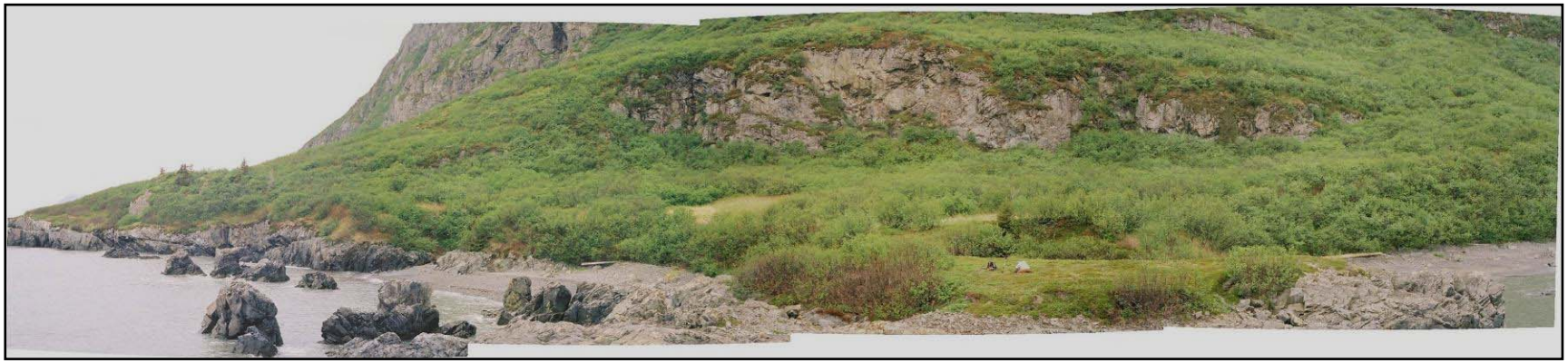


Photo 50- 4: Compiled panorama of the Knoll Head vicinity looking northwest from Entrance Rock. June 2005.

Photo 50- 5: Stone pile used to anchor guy wire at Knoll Point. June 2005.

Photo 50- 6: Spike, wire, and wood-splint tensioner for guy wire (center), Knoll site. June 2005.

Photo 50- 7: Antenna base on Entrance Point. Three anchors for guy wires were located in triangle array. June 2005.

Photo 50- 8: Knoll site overview to west showing cliffs and vegetation. June 2005.

Photo 50- 9: Test unit (TP-05-10) shows a typical upland soil profile, with a one inch tephra layer sandwiched between a few inches of silty soil and colluvially deposited pebbles and cobbles. Below the soil is colluvially deposited boulders to giant blocks of fractured blocks of bedrock from the Back Range Mountain cliffs. June 2005.

Photo 50- 10: Test unit (TP-05-18) shows a more typical soil profile of areas near and above the waters of Cook Inlet. Alternating layers of silt, tephra, beach thrown pebbles and sand, and large blocks of angular cobbles to boulders indicate the competing depositional forces at work. May 2005.

Photo 50- 11: The rock shelter (ILI-00185) from above. May 2005.

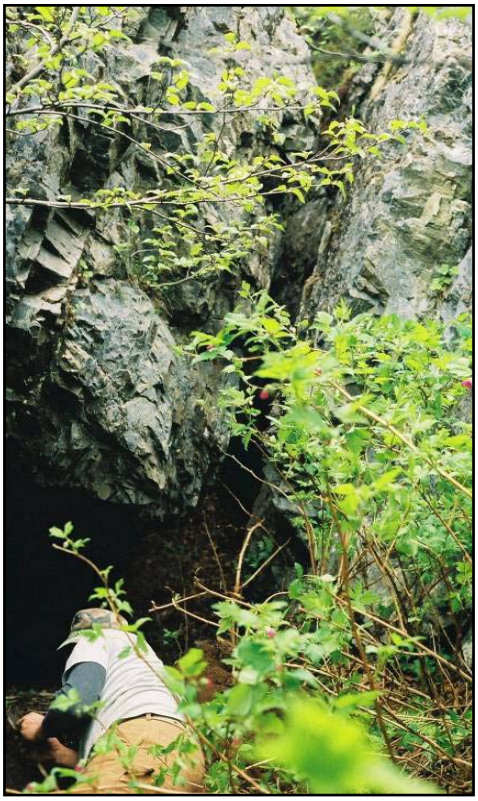


Photo 50- 12: A test unit (TP-05-06) was excavated in the rock shelter (ILI-00185). May 2005.

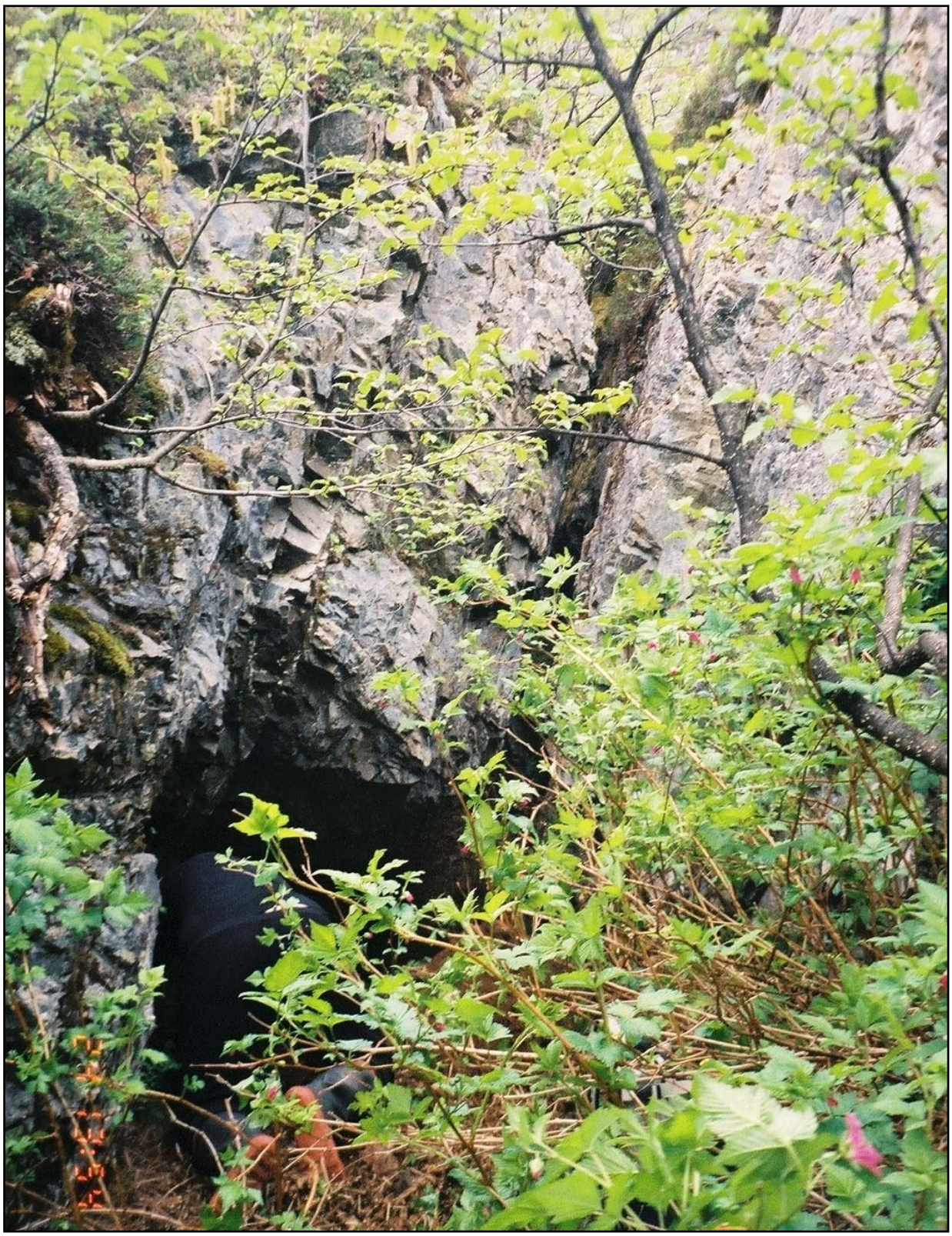


Photo 50- 13: Carbon was extracted from the test unit excavated in the rock shelter (ILI-00185) for radiocarbon dating, May 2005. The area was examined for petroglyphs and other cultural material. May 2005.

Photo 50- 14: Three views of the artifacts found in test unit TP-05-06, 21 to 24 inches below the surface in the charcoal layer, May 2005. The carbon in the layer with the tools was dated to 1,560 ± 80 BP (Beta-208530), putting it in the range of Kachemak III. May 2005.

Photo 50- 15: The beach below ILI-00186 with exposed bedrock and vegetation. A snowmelt-fed creek (out of frame to the left) disappears into beach rock. June 2005.

Photo 50- 16: Shingled beach in front of ILI-00186 with a steep but relatively smooth possible boat landing area. June 2005.

Photo 50- 17: Test unit TP-05-15 shows a stone surrounded, lens shaped fire pit. A grey ash layer is surrounded by black charcoal stained soil. This hearth was radiocarbon dated to 430 ± 40 BP using the AMS method (Beta-208531). No artifacts were located in the fire pit, but further testing along this beach ridge is likely to produce more evidence of human use because the shingle beach is the only practical landing for small boats on the west side of Iniskin Bay near Knoll Head. May 2005.

Photo 50- 18: Entrance Rock at low tide demonstrates the typical Iniskin Bay waterfront. May 2005.

Photo 50- 19: Williamsport aerial view. Area examined was on the left where exposed soil appears brown, with a squared corner of the alder patch leading to the green roofed cabin beyond. July 2007.

Photo 50- 20: The location of a proposed meteorological station to be located in the orange square marked with pink flags. July 2007.

Photo 50- 21: Metal drums in the alders indicate the possibility that the area had previously been cleared and the alders grown up around items in this part of the property. July 2007.

Photo 50- 22: Test unit TH-07-04 (see shovel handle right of yellow notebook) located in undisturbed soil next to cleared plot. July 2007.

Photo 50- 23: Test unit TH-07-04 at Williamsport, showing grass root mat and several inches of sand and silt mixed with organic matter above a dense layer of beach run pebbles and sand at the bottom. July 2007.

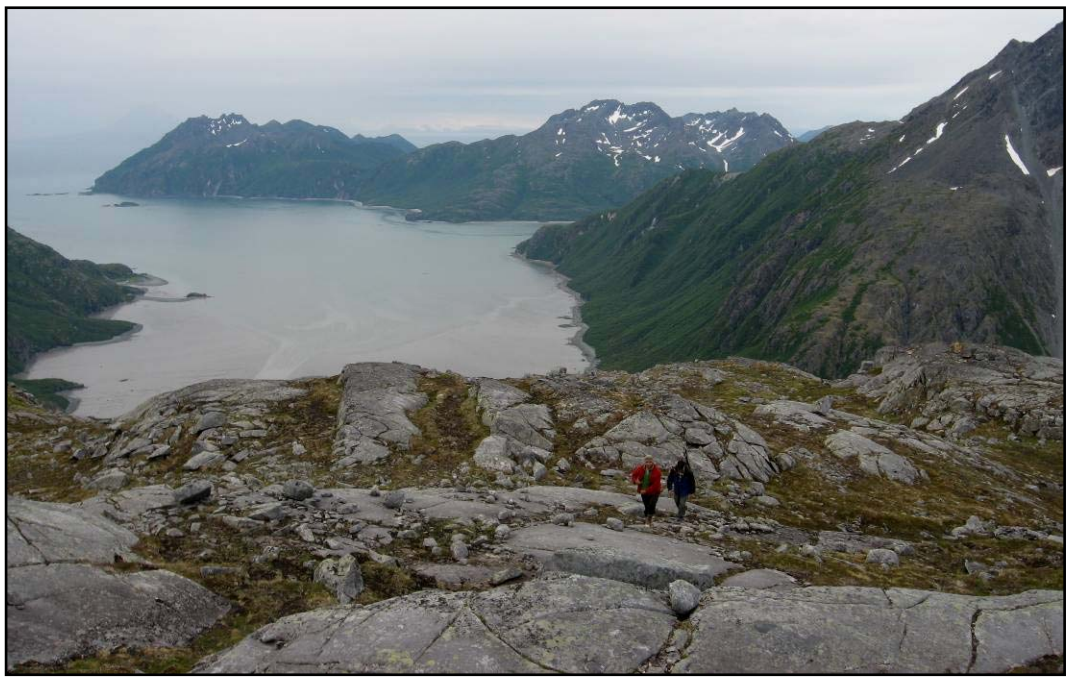


Photo 50- 24: Overview of Iliamna Bay from the proposed VHF repeater site. AC Point is the point on the center left, extending into the bay. July 2007.

Photo 50- 25: This rock pile appeared to be a man-made grouping. It is at the limit of visibility from the repeater site. July 2007.

Photo 50- 26: Aerial overview of AC Point, Iliamna Bay, Alaska. The meteorology station was proposed to be placed on top of the rocky finger on the left side of the photo. Modern structures are present on the beach level at the base of the rocky point. July 2007.

Photo 50- 27: Overview of the beach area north of the rocky point. At least five standing structures were present and visible from above. Historic structures were located at the base of this ridge on the left where alder patch is present today. July 2007.

Photo 50- 28: Soil on the south side of the rocky point had slumped, revealing a culturally sterile soil profile. The slump was examined for charcoal, artifacts, and midden deposits, but no cultural material was observed. July 2007.

Photo 50- 29: Test unit (TH-07-05) on the surface of the area proposed for the main structure. Sand and silt matrix filled the interstices between deposits of shattered rock from the cliffs above. July 2007.

Photo 50- 30: The top of the rocky point shows several large boulders that have fallen into place from the steep slopes above. The orange polygon in the right foreground was the proposed location for the main meteorology building, with the two additional towers to be bolted directly to the bedrock with anchored guy wires mounted to the bedrock as well. Testing in the visible corner of the polygon resulted in no evidence of human activity. July 2007.

Photo 50- 31: Photo taken at the end of the rocky peninsula resembles a photo taken from the beach below in 1902 by E.A. Hegg, Gold Rush era photography pioneer. July 2007.

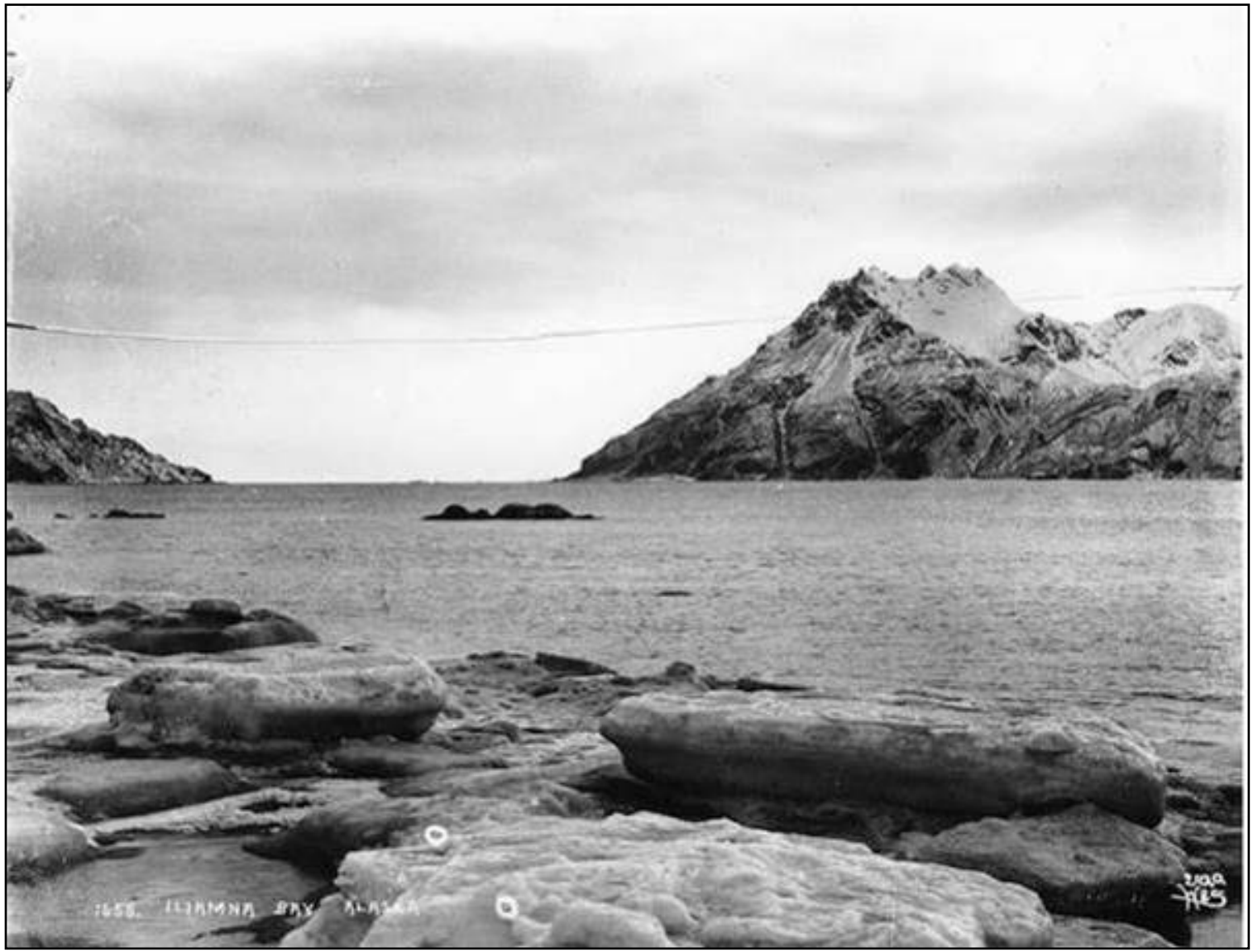


Photo 50- 32: E.A. Hegg photo of Iliamna Bay, likely taken from the beach below the rocky promontory in 1902, demonstrates ongoing use of AC Point at the turn of the 20th century. University of Washington Libraries, Special Collection Division, Eric A. Hegg Collection, Photo Collection 274, Negative Number Hegg 1558.

Photo 50- 33: Panoramic overview of the AC Point flats. The historic structures were located behind the rocky features here shrouded with alders. Photo 50-34 shows the same area from the same approximate location in a photo taken when the structures were still standing. July 2007.

Photo 50- 34: This photo, reproduced from P148-40 Alaska State Library, Arthur S. Tulloch Photograph Collection, shows a view from the rocky point towards Williamsport, where another group of structures served as storage for freight and waiting areas for passengers hoping to catch the mail boats that stopped monthly if possible. Ships anchored offshore used rowboats to lighter goods and people to AC Point, above, from which they would then row to Williamsport and traverse the portage trail to Old Iliamna some 12 miles away. Landmarks from Photo 50-33 are visible in this photo; however, some details of the gravel beach have changed, such as the amount of vegetation and the gravel spit pointing to the rock offshore.

Photo 50- 35: Overview looking southwards of the North Point area showing the benches of bare bedrock and saddles with accumulated soil and vegetation. July 2007.

Photo 50- 36: Two proposed sites for a meteorological station in the center and on the lower left. The preferred location is at the altitude of any proposed emissions sources and ideally closer to the water. July 2007.

Photo 50- 37: A lower bench area proposed for use as a meteorology station location. July 2007.

Photo 50- 38: Surface of the intermediate bench with orange painted stone and pink flag marking the preferred location for the radio and instrument mast of the station. July 2007.

Photo 50- 39: Highest proposed meteorological site with possible rock fire ring in saddle by backpack. July 2007.

Photo 50- 40: The first of two possible fire rings with moss pulled from center. July 2007.

Photo 50- 41: Excavated possible fire ring one showed no charcoal or heat fractures, indicating that the feature is a byproduct of decaying bedrock. Tephra filled the interstitial cracks in a distinct deposit. July 2007.

Photo 50- 42: Possible fire ring two with moss partly removed. No evidence of charcoal or heat damage to bedrock, and the interstices were tephra-filled, likely from the Katmai eruption. July 2007.

Photo 50- 43: On the lowest bench was a disturbed rock cairn, possibly a USGS reference point. July 2007.

Photo 50- 44: Disturbed cairn showing proximity of cliff edge. July 2007.

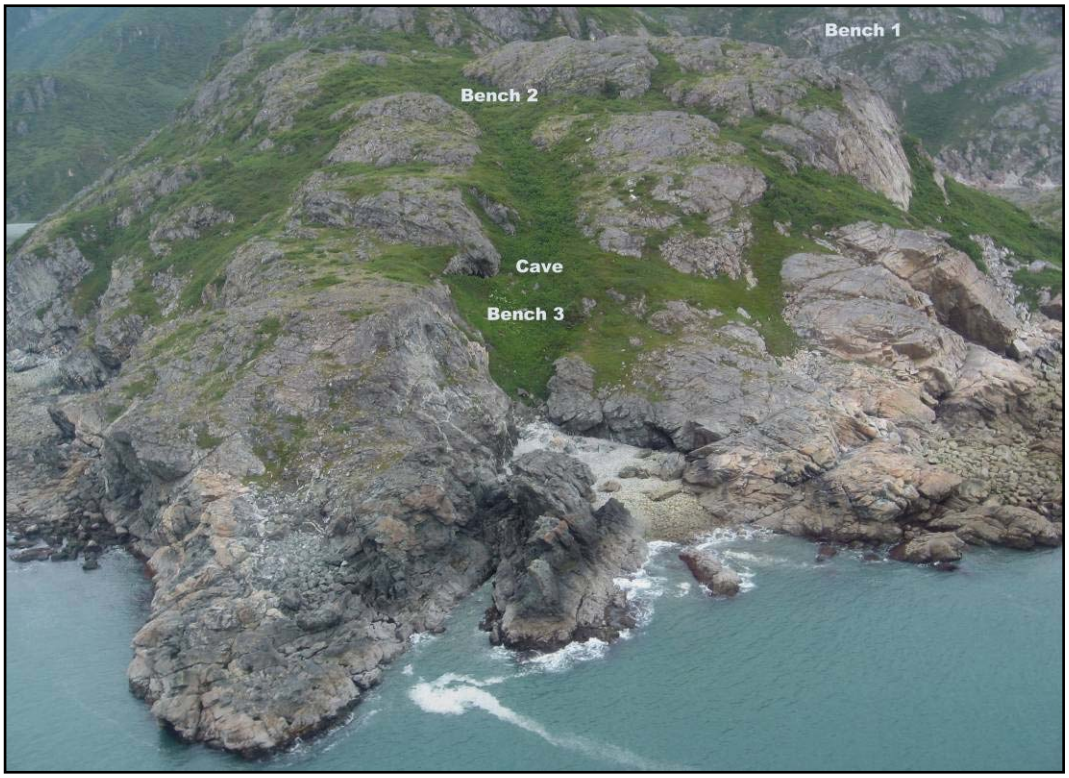


Photo 50- 45: Overview shows three benches and the location of the cave. The cave mouth faces southeast with a direct fetch to Kennedy Entrance and the Pacific Ocean. July 2007.

Photo 50- 46: The cave mouth showing the chute to the beach below. The cave could have been a temporary shelter but would not protect against weather from the direction of the ocean. July 2007.

Photo 50- 47: Inside the cave, with two passageways facing out and an alcove with a fox den in the center right. July 2007.

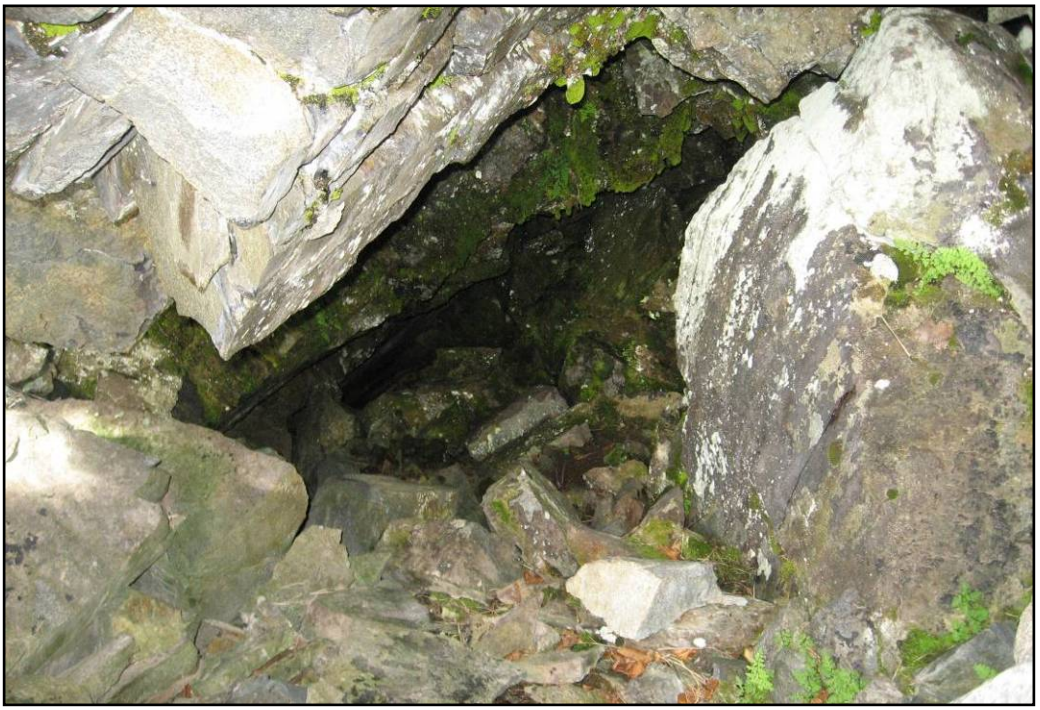


Photo 50- 48: View down the largest passage shows mossy ceiling and floor of roof-fallen cobbles and boulders. July 2007.

Photo 50- 49: Test unit (TH-07-06) excavated in cave mouth area with fox den deposit in upper right. Fox feces and animal bones covered an area of pressed-down grass hidden by a boulder in the cave opening. The soil in the test unit is primarily rich, organic silt with some tephra in the root mat. No cultural material was found in the test unit. July 2007.

Photo 50- 50: Close-up view of cave test unit (TH-07-06) showing soil colors. Grey in upper right may be Katmai ash. July 2007.