REPORT

A 5000-YEAR-OLD ARCHAEOLOGICAL SITE AT SANAĜAN, AKUN ISLAND, EASTERN ALEUTIAN ISLANDS

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ABSTRACT

Sanaĝan (UNI-125) is an archaeological site on the southwestern coast of Akun Island in the Krenitzin group of the eastern Aleutian Islands. The site, situated on an eroded peninsular ridgeline, was identified in 2005. Testing in 2008 revealed intact cultural deposits, and preliminary excavations were undertaken in 2010. Artifacts and dating analyses indicate affiliation both with eastern Aleutian archaeological sites such as Margaret Bay and Sandy Beach Bay and also with Takli Alder/Ocean Bay I period sites from the Alaska Peninsula and the Kodiak Archipelago. Faunal materials from the site, among the oldest in the Aleutians, demonstrate a broad-based marine-oriented subsistence regime.

INTRODUCTION

Akun Island is in the Krenitzin Islands group of the eastern Aleutian chain (Fig. 1). The nearest neighbors are Akutan Island, just 2 km to the west across Akun Strait, and Rootok, Avatanak, and Tigalda Islands to the south and east (Fig. 2). Unimak Island is 60 km to the northeast, across the turbulent waters of Unimak Pass. Akun is irregularly shaped, with many indentations and several large bays. The island measures approximately 20 km north to south and 16 km east to west. Akun's highest point is Mt. Gilbert, at 818 m above sea level, although most of the island is low-lying and few high points exceed 300 m in elevation.

Sanaĝan is on the island's southwest coast, at the south end of Surf Bay. The site, identified by Michael Yarborough in 2005, is situated approximately 15 m above sea level along the top of a narrow, deeply eroded peninsula between two coves (Fig. 3). Severe aeolian erosion has deflated sediments and dramatically lowered the ground surface in the years prior to the site's discovery (which is probably why the Sanaĝan site was not identified in previous surveys of Akun, i.e., Turner and Turner 1974). Part of this erosion is attributable to natural coastal processes, although the bulk of the damage is due to the substantial numbers of imported cattle on Akun Island. Though faunal turbation (Rick et al. 2006) is just one of many taphonomic processes acting on Akun's cultural resources, the effects are severe. In addition to directly impacting archaeological sites by grazing, trampling, and wallowing

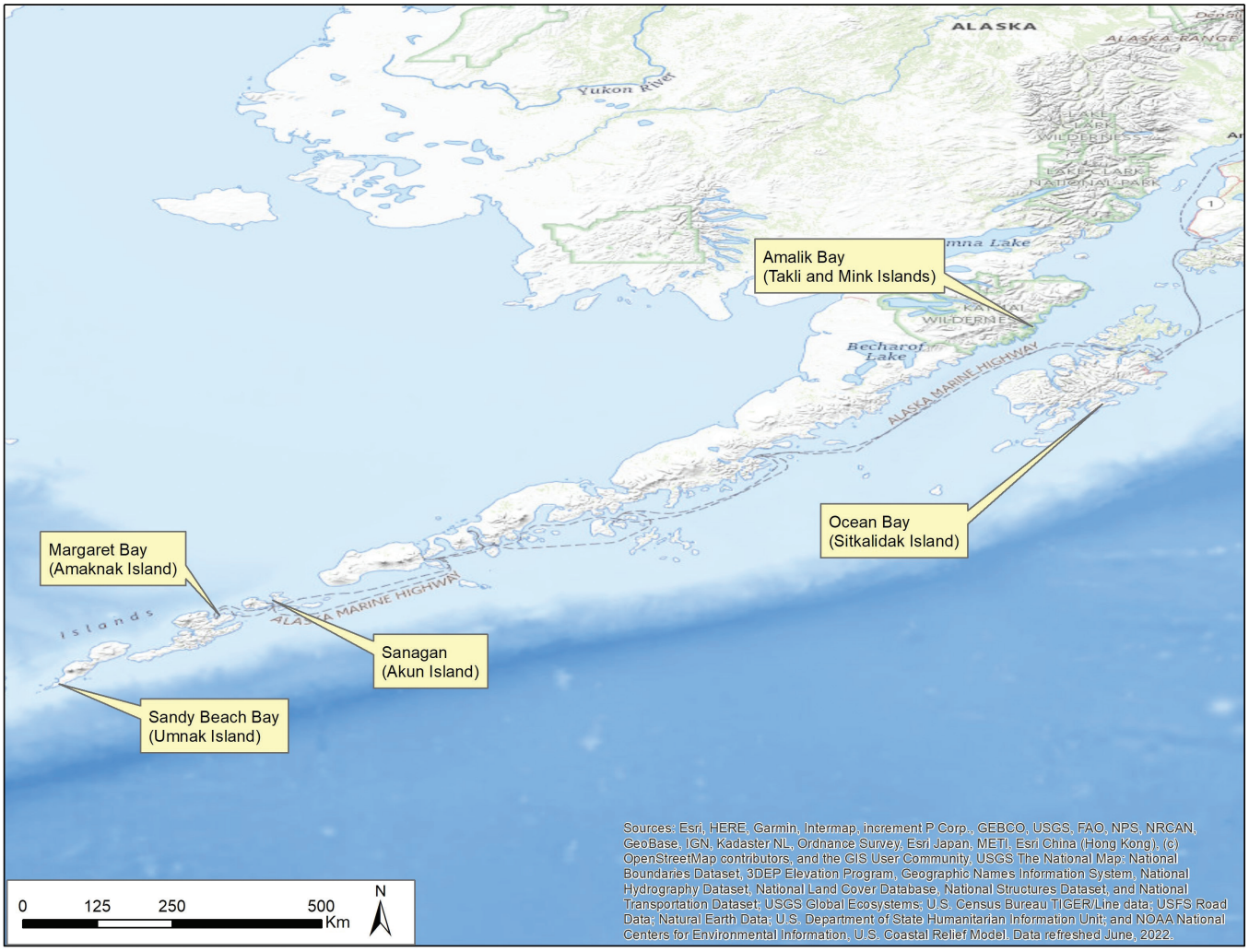

Figure 1. Sanaĝan (Akun Island) and other relevant site locations.

activities, cattle damage to tundra vegetation starts a cycle of erosion that can be devastating to buried cultural materials. Repeated trampling along steep bluffs and slopes penetrates the vegetation that covers and protects the ground surface, exposing sand and unconsolidated volcanic tephras to wind erosion. This results in the formation of deflation basins or aeolian blowouts, as sediment is scoured from the surface and depressions are excavated by the near-constant wind. Much of the ridge and peninsula where UNI-125 is located has been severely impacted by the combination of wind action and cattle.

Four radiocarbon determinations from Sanaĝan date the site to between 5000 and 6000 BP, placing it within the Late Anangula phase of the eastern Aleutian chronology, as defined by Knecht and Davis (2001). The Late Anangula phase links the core-and-blade-using Anangula Tradition with the bifacial lithic technology of the later Aleutian sequences (Davis et al. 2016; Rogers et al. 2009). Other significant archaeological sites on Akun Island include nearby Surf Bay Landing (UNI-104), Chulka (UNI-002), and Islelo Village (UNI-056) (for dating comparison, see Fig. 6).

EXCAVATION RESULTS: STRATIGRAPHY AND DATING

A single 1x1 m square was excavated at Sanaĝan in June 2010. Cultural deposits in the unit extended to a maximum of 101 cm below the surface. Twenty-nine formal lithic tools or fragments, two bone tools, and over 6000 pieces of lithic debitage were recovered from the excavation. As the site has suffered badly from the previously mentioned aeolian erosion, it is difficult to determine the original extent of deposits. However, the extent and density of surface artifacts (lag deposits) suggests extensive deflation. The ground surface and approximately upper

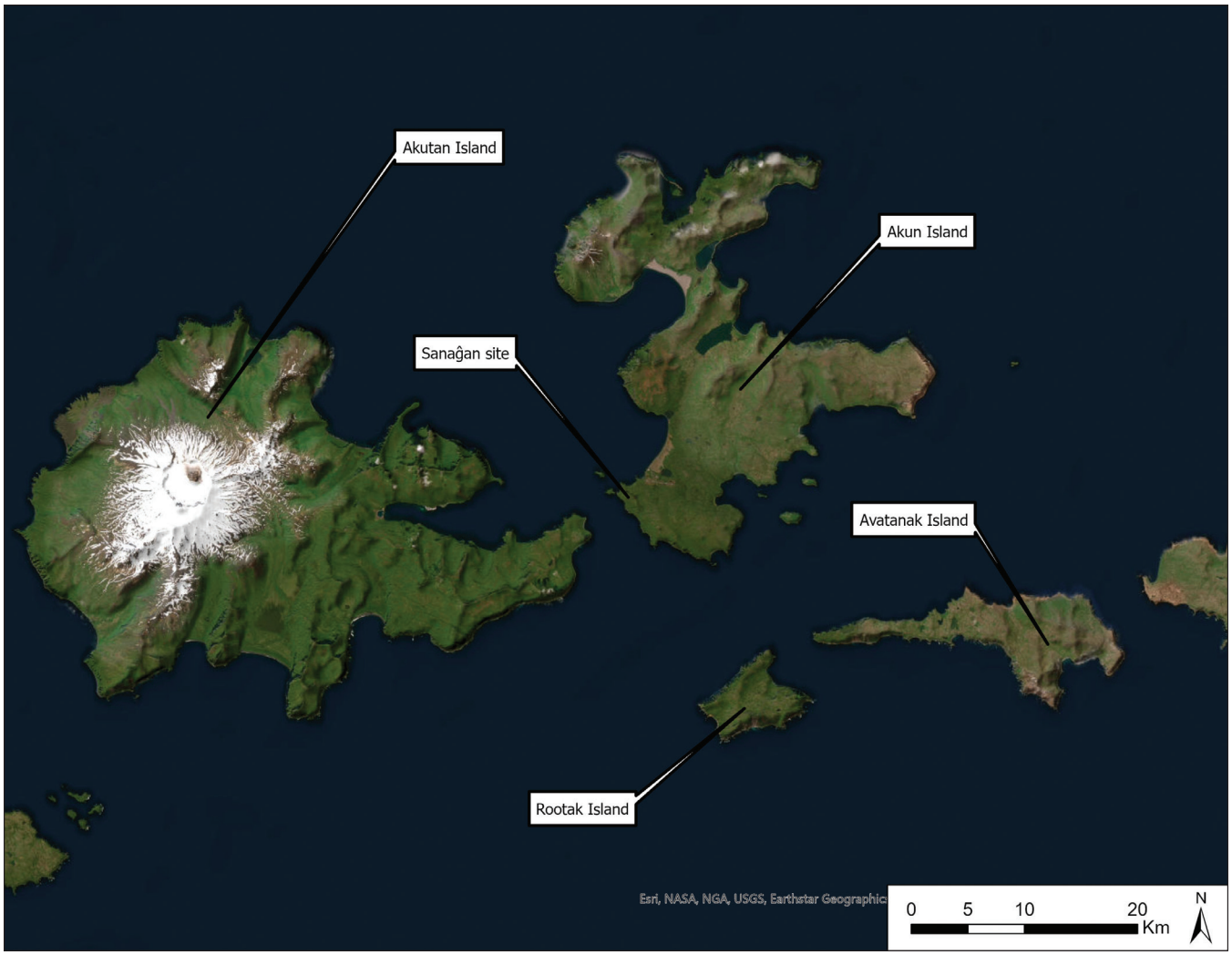

Figure 2. Akun and surrounding islands.

Figure 3. The badly eroded Sanaĝan site location, Akun Island.

5 cm are consequently composed of churned and turbated sediments, along with heavier artifacts pressed into the matrix. In situ cultural deposits consist of five distinct stratigraphic units overlying sterile sediments. Artifact frequency varies considerably by depth, as does the occurrence of faunal remains, ochre, and charcoal. Collections were accessioned at the University of Alaska Museum of the North, Fairbanks, under number UA2010-113.

Stratigraphic units consist of the following levels, from the surface to sterile sediments underlying the site's cultural deposits (Figs. 4–5):

I The uppermost undisturbed level consists of gritty light-colored bedded tephras with occasional pebbles. Lithic flakes are present although not frequent, and there are few tools. Wood charcoal from this level was radiocarbon dated at 4310±40 (Beta-289585).

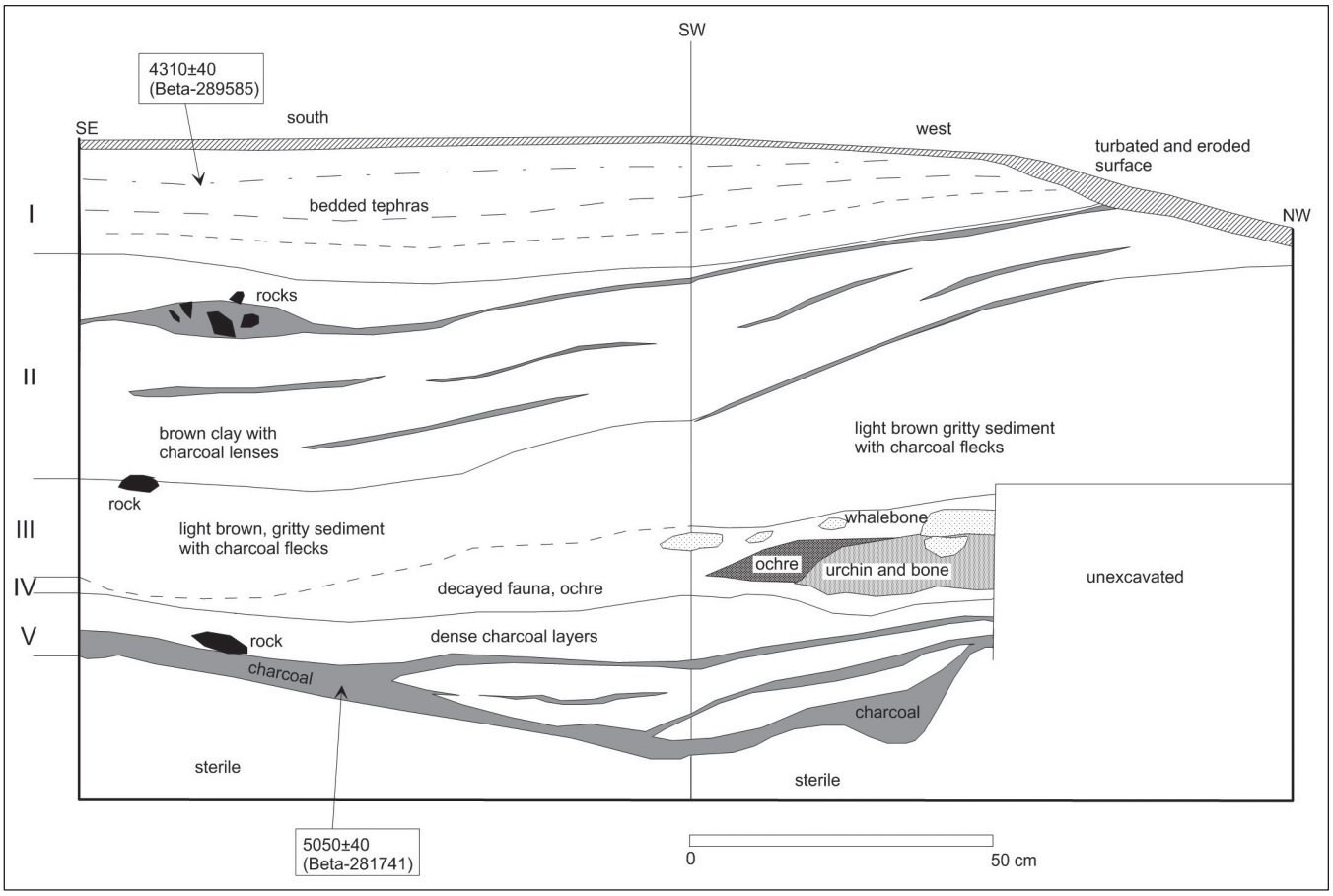

Figure 4. Stratigraphy of excavation unit 1, south and west walls.

Figure 5. Lower strata of the Sanagˆan unit, west wall, showing the bone deposit in Level IV.

II Level II consists of brown clayish matrix with numerous small pebbles (especially pumice). There are thin charcoal lenses, copious lithic flakes, and some tools. A charcoal sample from this level yielded a radiocarbon date of 4340±40 (Beta-247386).

III Level III consists of gritty light-colored tephras, with numerous pebbles smaller than 0.5 cm. Cultural material consists of copious amounts of lithic flakes and tools. Small amounts of decayed bone or bone shadow are apparent. Charcoal is present in small pieces or flecks, but there are few charcoal lenses.

IV Level IV contains dense faunal midden consisting of urchin, bird, sea mammal, and fish bones. There are also copious amounts of whale bone. The midden and matrix contain modest amounts of lithic flakes, but few or no tools. Ochre in the form of staining and pockets or chunks is common.

V The lowest cultural unit consists of charcoal lenses, dense and thick in places, separated by sediment similar to the underlying sterile layer. This level contains very sparse lithic flakes and few or no tools. A charcoal sample from this level yielded a radiocarbon date of 5050±40 (Beta-281741).

Sterile sediments below cultural levels are gritty and light brown in color and contain small pebbles (less than 0.5 cm in diameter).

Four radiocarbon dates have been obtained for UNI-125 (Table 1). All samples were wood charcoal, and AMS analysis was used for all samples. The initial date, on a sample from 10 cm below the surface, was obtained during testing in 2008. Further analyses were run on charcoal samples collected during excavations in 2010. Dates span approximately 700 years, and all dates are consistent within the stratigraphy of the site. These dates place the site within the Late Anangula phase of eastern Aleutian prehistory, ca. 7000–4000 cal BP (Davis et al. 2016).

Stratigraphy, dating, and recovered materials suggest that the intact portions of the Sanaĝan site represent a single cultural component with multiple or repeated occupations (possibly seasonal). Calibrated radiocarbon ages from Sanaĝan as well as other significant sites on southwest Akun Island are shown in Fig. 6.

BONE TOOLS

Just two bone tools were recovered from the Sanaĝan excavation: a harpoon point and whale-bone wedge (both from stratigraphic level IV). The wedge, made of extremely dense whale bone (possibly a rib), shows striation along the sides and crushing on the end opposite the point (Fig. 7). The harpoon (made of sea mammal bone) is bilaterally barbed, with a T-shaped or cruciform line guard at the base (Fig. 8). The shaft is square or nearly square in cross section (cf. Clark Type 1 harpoon, G. Clark 1977:170). Along with examples from the Margaret Bay site (UNL-048, Amaknak Island), these are the oldest bone tools known from the Aleutian Islands.

Similar bilateral harpoons with cruciform line guards were present at Margaret Bay, at Takli and Mink Islands off the Alaska Peninsula, and at sites on Kodiak such as Rice Ridge. This form is repeated with great similarity throughout the relevant sites. These tools have been called a "signature artifact type…for the period from 3000 to 2000 BC" (Maschner 2008:179), and as shown at both Sanaĝan and Margaret Bay, this type of artifact was clearly widespread and present even earlier, in the sixth millennium BP.

LITHIC TOOLS AND DEBITAGE

Raw materials used for stone tool manufacture at Sanaĝan were basalt, obsidian, and chert, with a very small percentage of obsidian. A variety of basalts were used, ranging from coarse-grained to nearly glassy, although the favored type is "staria basalt," fine-grained with crystalline inclusions. Basalts in general, presumably locally obtained, were

Table 1. Radiocarbon determinations from UNI-125.

Sample Location	^{14}c Years BP	2σ Calibrated Age*	Lab Number
10 cmbd (2008)	4340 ± 40	4840–4980 cal BP (94%)	Beta-247386
L1, 8 cmbd (2010)	4310 ± 40	4830–4975 cal BP (99%)	Beta-289585
Eroding face (2010)	4610 ± 40	5280–5470 cal BP (60%)	Beta-281742
L5, 83 cmbd (2010)	5050 ± 40	5710–5910 cal BP (98%)	Beta-281741

* All radiocarbon determinations were calibrated using OxCal v4.4 (Bronk Ramsey 2009) and the IntCal20 data set (Reimer et al. 2020).

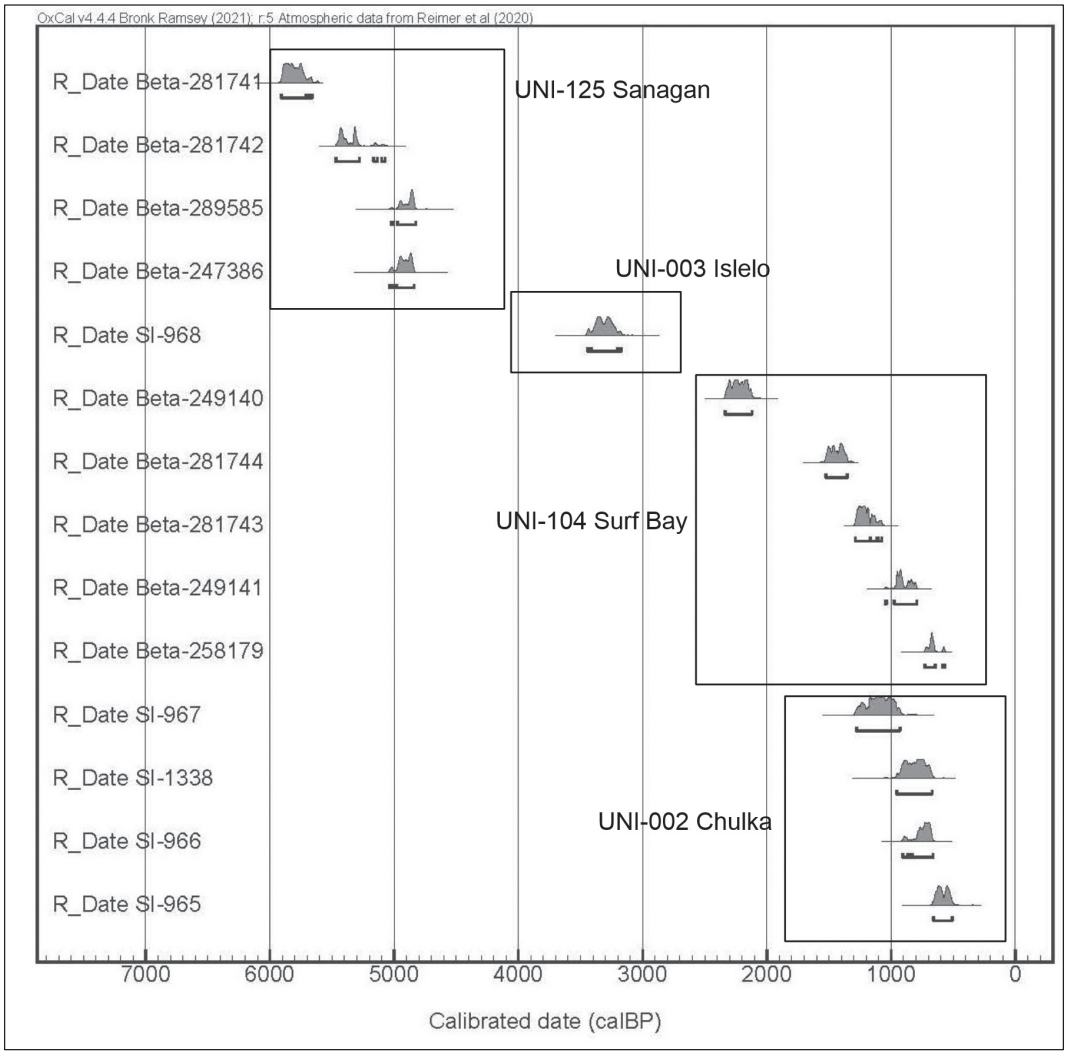

Figure 6. Radiocarbon age calibrations for UNI-002, UNI-003, UNI-104, and UNI-125.

Figure 7. Whale-bone wedge (UA2010-113-0069).

Figure 8. Bilaterally barbed cruciform harpoon (UA2010-113-0068).

the most common material, comprising 73% by count but 95% by weight of the recovered tools. Chert (15% by count but only 2% by weight) and obsidian (12% by count but 3% by weight) make up the remainder.

Debitage, interestingly, presents a different story. Basalt percentages remain similar (71% by count and 73% by weight), but chert accounts for nearly the entire remainder of recovered lithic debitage (28% by count and 26% by weight). Obsidian accounts for only approximately 1% of the recovered debitage by both count and weight. The paucity of obsidian debitage suggests that primary reduction of this material type was not occurring at the Sanaĝan site.

Eleven obsidian debitage samples were submitted for X-ray fluorescence (XRF) trace element analysis. This analysis, conducted by Jeff Rasic of the National Park Service/University of Alaska Museum, indicates that nearly all the obsidian at the site was obtained from the Okmok Caldera source on Umnak Island, 180 km west of Akun. The sole sample not from Okmok was determined to originate from the obsidian source on Akutan Island, just 25 km west of Sanaĝan (Jeff Rasic, pers. comm. 2024).

The shaped stone tool assemblage from UNI-125 is composed predominantly of large elongated leaf-shaped basalt bifaces, both projectile points and knives. Although some hafting elements are apparent, the bifaces are largely stemless or have weak tapering stems (Fig. 9). Only two fragments collected from surface lag deposits had evidence of well-developed basal stems. Smaller points are present, although fewer in number, as are scrapers and a single large sideblade (Figs. 10–11), very reminiscent of contemporaneous forms from Kodiak. Only two small flake tools were recovered at the unit, as was a single stone lamp fragment (Fig. 12).

This assemblage bears clear similarity to those from roughly contemporaneous archaeological sites elsewhere in the Aleutian chain. The lower levels of the Margaret Bay site, which date to ca. 6200–4500 BP, contained an assortment of large basalt bi-pointed knives and large bifaces, and also weakly stemmed laurel-leaf forms. End scrapers were present in small numbers. Unlike Sanaĝan, lower levels at Margaret Bay also contained large numbers of blades and microblades. Just one possible microblade was recovered from the excavations at Sanaĝan—possibly a sampling bias resulting from the single excavation unit. Raw material proportions for shaped tools at Margaret Bay Level 4 were quite similar to those from Sanaĝan: basalt comprised 70% of all tools, chert 23%, and obsidian just 7% (Knecht et al. 2001).

Sanaĝan chronology also overlaps with the Sandy Beach Bay site (SAM-040) on Umnak Island, dated to 4200–5300 radiocarbon years BP. Although relatively large, weakly stemmed or unstemmed symmetrical basalt bifaces are common, unifacial industry is still present at Sandy Beach Bay (Aigner et al. 1976). Hafted scrapers (nearly identical in form to those recovered at the Amaknak Bridge site, dating to approximately two millennia later) were common at Sandy Beach Bay; microblades, however, were completely absent.

Materials from Sanaĝan also show a clear affinity to lithic assemblages from the geographically more distant Ocean Bay tradition sites of the Alaska Peninsula and Kodiak archipelago. The Ocean Bay tradition, named after the type site on Sitkalidak Island in the Kodiak archipelago, appears to represent small, mobile populations of sea mammal hunters (D. Clark 1979; Fitzhugh 2004). Ocean Bay I period (7500–4500 BP) sites on Kodiak comprise predominantly flaked stone industries with a tendency toward leaf-shaped projectile points; these are clearly related to sites on the Alaska Peninsula such as Takli Island, Kukak Bay, and Mink Island (G. Clark 1968, 1977; Dumond 1971; D. Clark 1979; Tennessen 2009). The earliest components of Ocean Bay sites (for example, Tanginak Spring, Zaimka Mound, and Rice Ridge) include substantial proportions of microblades and blade cores (Fitzhugh 2004; Steffian et al. 2002). Sites of the Ocean Bay complex in general are characterized by "leaf-shaped, percussion-flaked knives or heavy projectile heads; relatively long and narrow percussion-flaked knives or projectile blades with weak tapering stems; and a variety of scrapers" (Dumond 1987:57). Characteristic stone artifacts of the Takli Alder phase include "symmetrically bipointed chipped points" and "large leaf-shaped and ovoid chipped bifaces" as well as scrapers on blade-like flakes (Dumond 1971:21). Ocean Bay II period (ca. 4500–3500 BP) assemblages are characterized by increasing amounts of ground slate tools (D. Clark 1982). No ground slate or schist was recovered from Sanaĝan, although slate was present in small amounts at Margaret Bay (Davis et al. 2016; Knecht et al. 2001).

FAUNAL RECOVERY AND ANALYSIS

The differential preservation of vertebrate remains was obvious during the excavation at Sanaĝan. Differences in sediment color and texture observed between 0 and 30 cm below the unit datum (cmbd) likely represent unrecoverable

Figure 9. Elongate basalt bifaces.

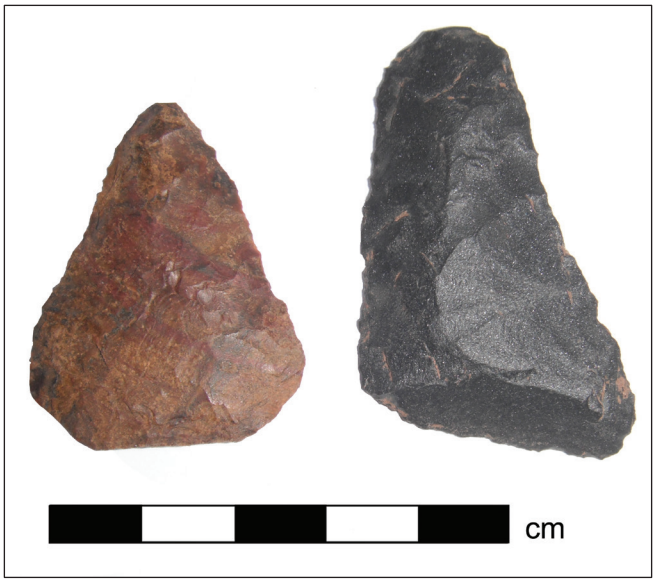

Figure 10. Scrapers (UA2010-113-0054, UA2010-113-0055).

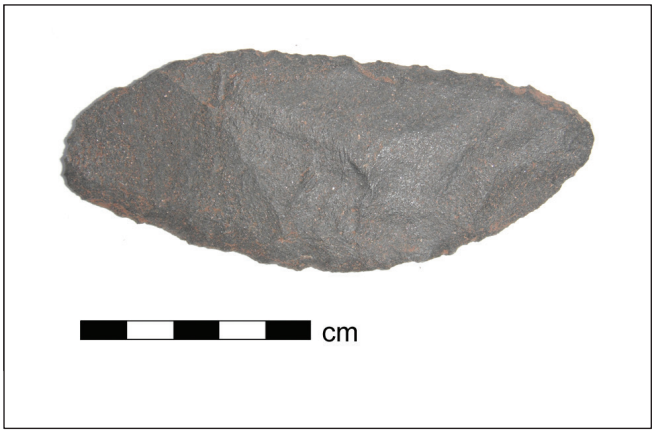

Figure 11. Basalt sideblade (UA2010-113-0056).

Figure 12. Stone lamp fragment (UA2010-113-0074).

deteriorated bone. Some of the bone "shadows" were possibly seal ribs and whalebones. Shadowy, mushy, and crumbly bone remains were also observed from 30 to 40 cmbd (Fig. 13). Animal bone remains in slightly better condition were found in Level 4 between 40 to 50 cmbd in association with sea urchin (*Strongylocentrus* sp.) remains, and all analyzed fauna was recovered from this level. Large remains were collected directly from the unit or from the ⅛-inch excavation screen. The remainder was collected in bulk and screened in the lab, where everything larger than 2 mm was included in the analysis. Only a small amount of the sea urchin and mussel shell matrix was collected and is not included in this analysis.

Level IV, which sloped generally from north to south and from west to east between about 50 and 80 cmbd (see Fig. 4), was characterized by a large amount of fauna, some ochre, and some charcoal. A consistent layer of charcoal, approximately 2 to 3 cm thick, underlays the fauna. The fauna was not, however, evenly distributed across the unit. The thickest part of the excavated bone deposit was in the northern half of the southwestern quarter of the unit. Here, beginning at about 55 cmbd, well-preserved and collectable bone occurred in conjunction with sea urchin and mussel remains (Figs. 4–5). Elsewhere in the unit, and below 80 cmbd, where no sea urchin remains were present, most of the fauna was too deteriorated to be collected.

Fifty-seven bones and bone fragments were collected between 55 and 60 cmbd. Of these, 13 were highly degraded Cetacea fragments that may have been from one larger bone. Most of the bones in the assemblage were collected from between 60 and 70 cmbd. By 70 cmbd, two large pieces of whale bone protruded from the east wall of the excavation, while the ochre patch expanded to about 38 cm wide in the northern third of the unit. Another large piece of whale bone was noted in the eastern wall between 70 and 80 cmbd. The bones in the walls were not collected and are not included in the number of identified specimens (NISP).

ANALYSIS METHODS

Faunal samples were separated by taxon, skeletal element, and side of the body and were rebagged and given catalog numbers. Most were identified using the Alaska Consortium of Zooarchaeologists' (ACZ) com-

Figure 13. "Shadow bone" in the upper strata of the Sanaĝan unit.

parative collection, housed at the University of Alaska Anchorage, although the limited nature of this collection resulted in the classification of most elements to genus or family level. The University of Alaska Museum of the North collection in Fairbanks was also consulted. Documentation also included information on the element, portion of the element, physical modification, age, sex (if known), and size. All specimens were identified to the lowest possible taxon, which in the case of large whales was order, Cetacea. Because it was concentrated in one identifiable cultural layer, for the most part in a 50-by-50-cm area of a single excavated unit, the recovered vertebrate faunal remains were analyzed together, even though they may have been deposited over a period of months or longer. For purposes of this report, NISP is the primary unit of quantification.

IDENTIFIED VERTEBRATE FAUNA

Of the 542 bones collected during excavation (Table 2), 118 are fish, 213 are bird, and 213 are mammal. The fish identified to family or lower taxa (n = 73) include cod, salmon, sculpin, and greenling. The identified birds (n = 72) include alcids, geese, ducks, cormorants, shearwaters, and albatrosses. The identified mammals (n = 73) include whale, sea otter, fox, fur seal, sea lion, and seal.

FISH REMAINS

Salmon (*Oncorhynchus* sp.) (n = 60) dominated the fish remains from Sanaĝan (Table 3). Eleven Pacific cod (*Gadus macrocephalus*) bones were identified, while greenling (*Hexagrammos* sp.) and sculpin (*Myoxocephalus* sp.) were

Table 2. Mammals, birds, and fish identified from Sanaĝan, to lowest taxon.

Order/Family	Genus/Species	Common Name
Fish		
Salmonidae	*Oncorhynchus* sp.	Salmon
Gadidae	*Gadus macrocephalus*	Pacific cod
Hexagrammidae	*Hexagrammos* sp.	Greenling
Cottidae	*Myoxocephalus* sp.	Sculpin
Birds		
Diomedeidae	*Phoebastria* sp.	North Pacific albatross
Procellariidae	*cf. Puffinus tenuirostris*	Short-tailed shearwater
Phalacrocoracidae	*Phalacrocorax* sp.	Cormorant
Anatidae	*Branta* sp.	Aleutian cackling goose?
Anatidae	*cf. Bucephala* sp.	Goldeneye?
Anatidae	*cf. Histrionicus histrionicus*	Harlequin duck?
Anatidae	*cf. Merginae*	Small eider
Laridae	*Larus* sp.	Gull
Laridae	*Rissa* sp.	Kittiwake
Alcidae	*Uria* sp.	Murre
Alcidae	*cf. Brachyramphus marmorata*	Marbled murrelet?
Alcidae	*Fratercula* sp.	Puffin
Mammals		
Cetacea		Whale
Canidae	*Vulpes* sp.	Red fox?
Mustelidae	*Enhydra lutris*	Sea otter
Otariidae	*Callorhinus ursinus*	Northern fur seal
Otariidae	*Eumetopias jubatus*	Steller sea lion
Phocidae	*Phoca* sp.	True seal

Table 3. Fish NISP from Sanaĝan (UNI-125).

Common Name	Total NISP	Frequency %
Salmon	60	82%
Pacific cod	11	15%
Greenlings	1	1%
Sculpins	1	1%
Total	**73**	**100%**

Table 4. Birds NISP from Sanaĝan (UNI-125).

Common Name	Total Nisp	Frequency %
Albatross	6	8%
Shearwater	3	4%
Cormorant	4	6%
Goose	3	4%
Ducks	4	6%
Gull	1	1%
Kittiwake	1	1%
Puffin	23	32%
Murre	2	3%
Large Alcids	18	25%
Murrelet	1	1%
Small-medium Alcids	6	8%
Total	**72**	**100%**

represented by only one bone each. The remaining 45 specimens are for the most part small unidentifiable fragments of fish bone.

BIRD REMAINS

Of the 213 bird bones from Sanaĝan, only 72 were identified to family or lower taxon (Table 4). Alcids comprised 70% of the identified bird bones. Most of the Alcids were further identified as puffin (*Fratercula* sp., *n* = 23). Two specimens were identified as murre, and one as a murrelet (cf. *Branchyramphus marmoratus*). Of the bird bones identifiable only as Alcidae, 18 appear likely to be murre, puffin, or possibly pigeon guillemot, and six are likely to be auklet or murrelet.

Seven specimens were identified as Anatidae. The three goose specimens are likely from species in the *Branta* genus, although no distinction could be made between brant, Canada goose, or Aleutian cackling goose. All are migratory and not present in the winter. The Anatid femur compares well with harlequin duck, a species that could have been available year-round or been present at nesting sites along inland lakes or streams. One of the

two carpometacarpal specimens compares well with long-tailed duck, while the other appears closer to eider. The single coracoid was attributed only to Anatidae.

None of the six identified albatross (*Phoebastria* sp.) elements were complete. The mandible and scapula fragments, and two humerus fragments, are larger than the black-footed (*P. nigripes*) specimen in the ACZ collection and may be short-tailed albatross (*P. albatrus*). Short-tailed albatross are currently a rare visitor to the Aleutian Islands in spring, summer, and fall and are not known to occur in the winter. However, short-tailed albatross remains are common in Aleutian archaeological sites and were likely much more prevalent in the past, prior to their near extinction. Black-footed and Laysan (*P. immutabilis*) albatross are considered common and uncommon, respectively, in the Aleutian Islands during spring, summer, and fall. Both are rare in the winter.

The four cormorant (Phalacrocoracidae) bones include a complete thoracic vertebra, a broken humerus shaft and the proximal portion of a humerus, and the proximal portion of a tibiotarsus.

The three shearwater bones are a right and left humerus and a left coracoid. The humeri compare well with short-tailed shearwater (*Puffinus tenuirostris*), the smaller of the two shearwaters present in the Aleutians.

The two gull elements represent two different birds. The mandible compares favorably with specimens of the genus *Larus*, while the vertebra appears to be from a kittiwake (*Rissa* sp.). Two species of kittiwake—the black-legged kittiwake (*Rissa tridactyla*) and red-legged kittiwake (*Rissa brevirostris*)—occur in the eastern Aleutians.

Although some of the unidentified Sanaĝan bird bones could be categorized as being from small (n = 6), small-medium (n = 19), medium (n = 7), or large (n = 4) birds, they lacked characteristics for morphological identification even to family. It was not possible to even assign a general size to 105 bird bones that were fragmented or in poor condition.

MAMMAL REMAINS

Two fox and 27 sea otter bones were identified. Twenty-two other specimens were only identifiable as "land mammal" (Table 5). Whale bones in the assemblage were generally in poor condition, and 19 of the 27 pieces generically identified as whale may be from what were originally two large bones. The 20 pinniped specimens include three fur seal, two Steller sea lion, and three phocid bones. While harbor seal is currently the most common phocid species in the eastern Aleutian Islands, Akun is within the spotted seal range. Based on epiphyseal fusion, three of the pinniped bones are juveniles, although no further morphological identification or age estimation was possible. Over half the mammal bones (n = 118) were only identifiable as "sea mammal," a category including both pinnipeds and whales.

MODIFIED BONE

In addition to the two complete bone tools, seven of the bones from Sanaĝan's stratigraphic Level IV show evidence of modification. Five are the result of the saw-and-snap technique used to fashion raw bone material into the necessary shape for a desired tool. Of these, two are bird long bones that have been sawn laterally across the diaphysis. One is the proximal portion of an albatross humerus. The other is a proximal portion of a tibiotarsus from an unidentified bird. Although highly degraded, the latter appears similar in size to a cormorant.

Of the three sawn and snapped sea mammal bones, two are from young animals. A humeral epiphysis segment from a large pinniped, possibly a sea lion, was sawn and snapped twice, at right angles. A vertebral fragment from a young sea mammal, as evidenced by the lack of fused epiphyses, was also cut across the centrum in two different directions. One end of a whale rib illustrates a variation of the saw-and-snap technique; it appears to have been chopped, rather than sawn, prior to being snapped. Two small burned fragments of bone could not be identified to a taxon other than mammal.

Table 5. Mammal NISP from Sanaĝan.

Common Name	Total NISP	Frequency %
Fox	2	1%
Whale	27	13%
Sea otter	24	11%
Fur seal	3	1%
Sea lion	2	1%
True seal	3	1%
Pinnipedia	12	6%
Sea mammal, undet.	118	55%
Land mammal, undet.	22	10%
Total	**213**	**100%**

FAUNAL SUMMARY

The 5000-year-old fauna identified from Sanaĝan are all species that are present either seasonally or year-round in the Aleutians today. This suggests that at least some of the subsistence activities associated with life at the site likely took place during the summer. However, it is possible that the site was also occupied at other times of the year, as many of the animals hunted or fished in the summer could have then been stored for later consumption.

While the conception of Ocean Bay tradition peoples as sea mammal hunters is undoubtedly correct, the faunal assemblage from Sanaĝan demonstrates the utilization of a wide range of faunal resources. The variety of fish, birds, and mammals present suggest that Sanaĝan residents fished in local streams and the adjacent bay, birded at lakes and rookeries, and hunted seals and sea lions at rookeries or haulouts in nearby waters. Whales could have been either hunted offshore in open waters or scavenged along beaches. Residents of Sanaĝan were certainly knowledgeable about the variety of species available in different habitats, not only on Akun Island but also in the surrounding region. The identified species also suggest that the faunal resources in the vicinity of Surf Bay have not changed significantly in the past 5000 years (Morrison 2016).

The species in the Sanaĝan faunal assemblage were undoubtedly important as food sources, and the bones from whales, birds, and pinnipeds were also important as the raw materials for tools. The use of saw-and-snap technology as a preliminary step in making bone tools was well known 5000 years ago and continued to be used into the historic period (Holland 1982).

DISCUSSION AND CONCLUSIONS

In 1971, Don Dumond noted the strong similarity between chipped stone implements from the Krugloi Point (Agattu Island in the far western Aleutians, see Spaulding 1962) and Takli Island (Alaska Peninsula) site collections. Despite the physical and temporal separation between the occupations—ca. 1300 miles and 3000 years—Dumond postulated that the close affinity in lithic materials was evidence of a relationship between the Aleutian Islands and the Takli/Ocean Bay complex of the Alaska Peninsula and Kodiak archipelago. According to this hypothesis, a single cultural affinity (the Ocean Bay tradition) existed along the Pacific coast of the Alaska Peninsula and the Aleutian Islands at around 7000 to 6000 BP, marking a period of cultural unity for ancestral peoples of Alaska's western Pacific coast (Dumond 1971:45, 1987:59).

The lithic assemblage excavated from Sandy Beach Bay on Umnak Island in 1972, dated to ca. 4200–5300 radiocarbon years BP (Aigner et al. 1976) supported Dumond's assessment, although significant questions remained. Most importantly, in the Aleutian context, what was the relationship of the bifacial Ocean Bay tradition to the exclusively unifacial core-and-blade Anangula culture? William Laughlin posited the ca. 6000-year-old Anangula Village site as a "transition culture" between the older Anangula core-and-blade culture and the biface-using Aleutian tradition (represented by the Chaluka site on Umnak Island, and others), progressing uninterruptedly from ca. 4000 BP until European contact (Laughlin 1975; Laughlin and Aigner 1975). Excavations and materials recovered from Anangula Village, however, were poorly reported, and many questions remain regarding this site (cf. Mason 2001).

In the late 1990s, excavations at various locations around Unalaska Bay provided a more solid link between Anangula and later bifacial traditions, although a stubborn gap in the sequence remained at around 7000 BP (Dumond and Knecht 2001; Knecht et al. 2001; Knecht and Davis 2001). This chronological gap was substantially filled by investigations in 2007 at the Amaknak Quarry Site (UNL-469; Rogers et al. 2009). The question remained, however, whether the younger bifacial technologies were intrusive to the Aleutians or whether perhaps they originated there and spread eastward to Kodiak and the Alaska Peninsula. In their research and excavations on Kodiak, Steffian et al. (2002) and Fitzhugh (2004) have found technological similarities between the microblade components of early Ocean Bay sites and materials found at the Anangula and Hog Island sites. The Anangula lithic component is undoubtedly derived from the interior Denali tradition, which is linked through genetics to the Ancient Beringian metapopulation (Flegontov et al. 2019; Gómez Coutouly 2015; Potter et al. 2017). This lineage is likely shared by the first peoples of Kodiak and the Alaska Peninsula as well. Thus, while the greater antiquity of Anangula and Hog Island (ca. 9000 cal BP) when compared to Takli Alder and Ocean Bay 1 period sites in Kodiak (maximally ca. 7500 cal BP) may indicate an eastern Aleutian primacy for these traditions, the data increasingly suggest a common origin for these culture areas rather than a "parent–child" relationship.

The Sanaĝan site is one of only three or four known Aleutian sites dating from the sixth millennium BP. But rather than just a chronological gap, this site helps to fill a geographic gap, between the earliest known site of the tradition (Anangula) and the eastern locus of the culture area (Kodiak). Other relevant sites along this geographic continuum are scarce; possibly just the Sandy Dunes site on Sanak Island has comparable material (although this site dates to only about 4100 BP) (Maschner 2008).

Although the excavations at Sanaĝan are preliminary, some initial conclusions can be drawn. When attempting to ascertain the site's place in the macro-regional cultural continuum, both similarities to and differences from contemporaneous sites are apparent. Important unresolved questions relate to the production of microblades and the use of slate (both present at Margaret Bay but absent, or nearly so, at Sandy Beach Bay and Sanaĝan). Why and how did the Aleutian and Kodiak cultural camps diverge, one turning toward polished slate and the other continuing to rely on an ever-wider array of chipped stone tools (cf. Dumond 1987)? This study is undeniably limited by the small excavation size. Future research at Sanaĝan (if possible, considering the deleterious impacts of ongoing erosion) would ideally open a larger area, to provide information on intra-site variability. Comparison in the wider region shows significant similarities between sites but also the development of localized differentiation within the larger Ocean Bay tradition. At the very least, we can say that the Sanaĝan site emphatically demonstrates the common ancestry of early and mid-Holocene peoples of the Aleutian Islands, Alaska Peninsula, and the Kodiak archipelago.

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