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The Western Aleutians: Cultural Isolation and Environmental Change

Debra G. Corbett,¹ Christine Lefevre,² and Douglas Siegel-Causey³

Recent research in the western Aleutians addresses two primary issues: the nature and extent of cultural exchange along the Aleutian chain, and Holocene environmental change and its effects on the development of Aleut culture. Cultural isolation is a major paradigm of researchers working in the Aleutians. Review of the distribution of several cultural traits suggests the Aleuts adopted many cultural elements originating outside the chain, but the distribution of these to the western islands was uneven.

KEY WORDS: Aleutian Islands; subarctic; cultural exchange; Holocene; environmental change; maritime adaptations.

INTRODUCTION

In 1991, an interdisciplinary team of archaeologists, biologists, paleoecologists, and geologists began a multiyear project in the western Aleutian Islands, Alaska. The goals of the project are twofold: (1) to examine the issue of cultural isolation in the western Aleutians, and (2) to document Holocene environmental changes and their effects on the development of Aleut culture.

Cultural isolation has long been a paradigm of Aleutian archaeology. The Near Islands, the westernmost group in the chain, are the most isolated and the people the most culturally divergent Aleut group. This paper examines the distribution of several typically Aleutian cultural traits, burial and artifact types, and social and ideological features to outline the extent

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and nature of western Aleutian isolation. Constructing a basic chronology and developing a standardized artifact typology are necessary to allow meaningful comparisons with neighboring areas.

The second component of the project to be discussed documents environmental changes in the western Aleutian region in an effort to define environmental influences on Aleut culture. Mason and Gerlach (1995) correlate changes in social complexity and technological innovation in North Alaska to changes in regional climate patterns during the late Holocene. This research seeks in part to evaluate the potential of this approach for explaining Aleutian prehistory.

SETTING

The Aleutian Islands stretch nearly 1700 km west from the tip of the Alaska Peninsula to the Near Islands, so named for their proximity to Kamchatka (Fig. 1). The more than 200 islands of the chain are broken into six groups separated by rough ocean passes. The islands are the emergent peaks of a submarine volcanic arc marking the subduction zone between the North American and Pacific Plates. Earthquakes are common, the islands are being uplifted, and tsunamis commonly batter the southern coasts of the islands. The chain boasts 46 active volcanoes.

Biologically, the islands are extensions of both Asia and North America. Access to the chain is channeled through the two end points. Biotic communities are young, having arrived about 7000 years ago, after the last glacial retreat (Hulten, 1968). Colonization by both plants and animals continues from both ends of the chain, with greater diversity at the ends than in the center (Hulten, 1937). Several species of willows (*Salix*), an alder (*Alnus crispa*), salmon berries (*Rubus spectabilis*), and strawberries extend as far west as Umnak. Asiatic plants are strikingly represented by Kamchatka thistles (*Cirsium kamschaticum*), mountain ash (*Sorbus sambucifolia*), and *Cacalia auriculata*. Unimak Island, at the east end, supports resident populations of brown bears, caribou, foxes, and ground squirrels (Murie, 1959). The western islands support no native resident land mammals; both foxes and rats have been introduced since the eighteenth century. Fauna from Asia included several species of birds, especially during fall and spring migrations, and rare occurrences of Stellers Sea Cow (*Hydrodamlia gigas*) and Pallas' Cormorant (*Compsohalieus perspicillatus*), both now extinct (Turner, 1886).

At the time of Russian contact, in 1741, the islands supported an estimated human population of around 16,000 people (Lantis, 1984). Small and rugged, the islands lack most resources necessary to support human

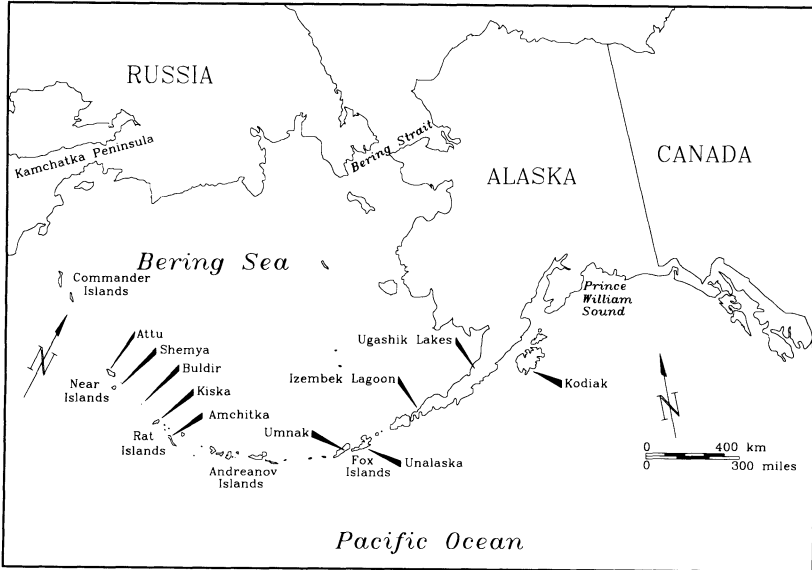


Fig. 1. The Aleutian Islands.

life. Aleut culture was supported almost exclusively by exploitation of the marine environment. A combination of submarine topography, ocean currents, winds, and the mixing of waters from two oceans make the waters surrounding the Aleutian Islands incredibly rich in resources (Favorite *et al.*, 1976). Warm west-flowing currents south of the islands, and cold easterly currents to the north mix in the inter-island passes creating conditions of greater biological productivity than in either of the surrounding oceans. Summer plankton in the nutrient-rich waters sustain an abundance of fish, marine mammals, sea birds, and shellfish on island reefs. These resources were sufficient to support a large population with complex social, religious, and political institutions.

REEVALUATING THE ISOLATION HYPOTHESIS

Positioned between North American and Asia, the Aleutian Islands have interested anthropologists and archaeologists on both continents for over 100 years. Once considered a possible bridge between the Old and New Worlds, the dominant American paradigm today views Aleut culture as a product of isolation in a geographic dead end. This model maintains

that after the ancestors of the Aleuts developed a unique sea mammal hunting culture, at least 6000 years ago, the culture essentially matured in isolation. Influences are admitted from the east, especially in the late prehistoric period; in general, however, "isolated self-sufficiency seems always to have characterized their history" (Dumond, 1987, p. 78).

A few American scholars have postulated not only direct interaction with people from mainland Alaska but also with the maritime cultures of Kamchatka, the Kurile Islands, and even Japan. De Laguna (1940) considers the islands a "port" from which voyagers regularly traveled between continents. Desautels *et al.* (1970) considered the possibility of at least one-way contact with Asia. Dumond and Bland (1995) consider it likely Eskaleuts from the North Pacific sparked fully maritime adaptations in the Bering Sea and Sea of Okhotsk around 3500 years B.P. Russian scholars view the Aleutians as an extension of Asia and believe the Aleuts maintained intercontinental contacts throughout their history. The intensity of this contact waxed and waned with a peak from about 500 B.C. to a few centuries A.D. and from after 1000 A.D. to the historic period (Black, 1983, 1984). The latter period coincides with widespread cultural change throughout Alaska.

The biggest problem in resolving issues of cultural contact and isolation is the lack of a cultural historical framework for interpretation. Many key developments, such as changes in burial patterns and house styles, and the appearance of new artifact types, are poorly documented and lack chronological control. A few artifact typologies exist but inter-island variation is poorly studied. Aleut artifact assemblages show little obvious variation through time.

In addition, there are few strong artifactual similarities with neighboring peoples. Where stylistic similarities do exist they have been explained as convergent development by people with similar economic adaptations (McCartney, 1974, 1984). The Aleuts had a sophisticated tool kit well adapted to their circumstances. There may have been little benefit in adopting functionally similar but stylistically different tools from their neighbors.

Other cultural elements, such as social and ideological symbols, may provide better indications of the extent of external contacts. These types of changes are far more difficult to document archaeologically than changes in artifact types and frequencies.

Evidence of Interactions with the Alaskan Mainland

Finding antecedents to Aleutian archaeological traditions has been hampered by a lack of evidence from surrounding regions and by the para-

digim of cultural isolation. The first evidence of occupation in the chain, the 8700 to 8200-year-old Anangula tradition, is known from a single site of the same name near Nikolski village on Umnak Island. Though possessing a unifacial core and blade technology similar to the widespread American Paleoarctic tradition, the techniques used in manufacturing the blades are sufficiently different to make Anangula unique (Aigner, 1970). At Ugashik Narrows, on the Alaska Peninsula, a site with technology transitional between Paleoarctic and Anangula has been found (Henn, 1978; Dumond, 1987). The age of Ugashik Narrows, roughly 9000–8500 years old, makes it a likely precursor to the Anangula tradition.

Later archaeological finds in the Aleutians belong to the Aleutian tradition (McCartney, 1984). The bifacial flake technology is radically different from the earlier Anangula materials. The earliest phase of the Aleutian tradition, 6000–4200 years B.P., is still very poorly defined but several sites from southwest Umnak and the Margaret Bay site yield artifacts considered transitional from Anangula (Aigner *et al.*, Aigner, 1983; Yesner and Mack, 1993). Some researchers consider the assemblages to have strong ties to the Ocean Bay tradition of Kodiak and the Alaska Peninsula (Dumond, 1987).

The early midden period, dating between 4000 and 1000 years B.P. is widely known in all island groups. In the lower level of the Chaluka site, on Umnak Island, dating between 1500 and 1000 B.C., Denniston (1966) reported a very few artifacts resembling Giddings' (1951) Denbigh (Arctic Small Tool tradition) materials from Norton Sound. These examples indicate that, while they may have been tenuous, cultural developments from Alaska trickled into the Aleutians.

About 1000 A.D., widespread cultural change occurred throughout the North (Dumond, 1986). There is evidence of a population increase and increasing social complexity. The mechanism for change is not well understood but in North Alaska it is linked to whale hunting and a possible influx of people from Asia. About the same time iron became available in larger quantities, sparking an artistic florescence. New forms of symbolic expression appeared and flourished. A suite of artifacts, including ground slate tools and thick walled pottery, associated with Thule Eskimo culture, spread throughout Alaska and across Canada to Greenland (Anderson, 1984). A Late Aleutian Trait Complex including ground slate and iron knives, has obvious similarities to Thule. This complex spread west through the Aleutians around 1000 A.D. Some, but not all, of the elements of this complex, including ground stone and nipple-ended needles have been found in the Near Islands. The timing of their advent in those islands is unknown (McCartney, 1971; Spaulding, 1962).

Some of these changes in population and social institutions are apparent on the Alaska Peninsula, Kodiak, and in the eastern Aleutians. On Kodiak and the northern Alaska Peninsula, villages increase in size and multiroomed houses appear (Dumond, 1981; Jordan, and Knecht, 1988). In the eastern Aleutians, single-family dwellings give way to long houses up to 50 m long, sheltering whole villages under one roof. The largest and most numerous longhouses are found in the eastern islands, but they are found west to the Central Aleutians and east on the Alaska Peninsula, to Ugashik Lakes, more than 320 miles from the islands (U.S. BIA, 1990). This reflects a spread of Aleut influences into areas far from their traditional homeland. Communal houses are reported as far west as Adak Island in the central Aleutians but some of these may be associated with historic population shifts during the Russian period (U.S. BIA, 1983). All communal houses on Amchitka are in sites with historic remains (U.S. BIA, 1985). No large communal houses are known from the Near Islands.

New forms of religious and symbolic expression are reflected in the development of mask ceremonialism and elaborate bentwood hats. Several centers of mask-making developed in Alaska, independent traditions reacting to technological and social change. The eastern Aleutians formed one of the earliest Alaska mask-making centers, nearly 2000 years old (Ray, 1967). By late prehistoric times, a variety of regional styles had proliferated. Some Aleut masks shared traits with other regions, for example, the use of geometric bangles, or attachments, is common on Kodiak and in southwest Alaska. An unusual type of plank mask, large enough to cover the wearer, was very common on Kodiak. Mask fragments from burial caves suggest use of composite masks with the face enclosed within concentric hoops, the predominant type from southwest Alaska. Design elements on others suggest ties with Alaska Peninsula people. Masks have been found through the central Aleutians but have not been found in the Rat or Near Islands (Black, 1982).

Bentwood hunting hats are another element of the increasing social complexity evident around 1000 years ago. They are found throughout southern and western Alaska from Prince William Sound to Bering Strait (Black, 1991). The hats incorporated traits from the Indians of southeast Alaska and the Yup'ik Eskimos of southwest Alaska and reached their greatest elaboration in Kodiak and the eastern Aleutians. Several styles using different construction techniques are found in the eastern islands. On Kodiak and elsewhere the hats appear to be part of whale hunting paraphernalia. Although Aleut hats included the bird iconography of other cultures, they were apparently used as badges of rank and were not specifically related to whale hunting. Only one type of wooden hat is known from the Rat Islands and none are reported for the Near Islands (Black, 1983).

Burial patterns provide additional illustration of widespread social and ideological change occurring throughout Alaska. Between 500 B.C. and 500 A.D., burial customs grew increasingly complex on Kodiak, with such practices as dismemberment and skull curation. The eye sockets of some skulls were inlaid with shell and jet. After 500 A.D., practices on Kodiak simplified but wealthy people were mummified and buried in caves (Clark, 1984).

Aleut burial practices were correspondingly complex and varied but the lack of chronological information inhibits understanding of the development of this complexity. Spread throughout the chain, bundled burials in burial houses, isolated extended burials, and evidence of dismemberment and skull curation (Jochelson, 1925; Hrdlicka, 1945) may represent the oldest burial types. Apparently, later developments included cremations, bundled and extended cave burials (Bank, 1948; Hrdlicka, 1945), inhumations in above ground log sarcophagi (Weyer, 1931), and stone and whalebone crypts covered by mounds of earth, called *umqan* (Aigner and Veltre, 1976). There are few specific dates for any of these methods. By 1200 A.D., Aleut burial customs included intentional mummification of important people (L. Johnson, personal communication; Hrdlicka, 1945). The most elaborate and diverse burials are concentrated in the east with an irregular spread to the central islands. Cremations and sarcophagi are the most restricted, being found in the Islands of the Four Mountains and the Fox Islands, respectively. Cave burials, probably limited by topography, are known from the Fox to the Delarof Islands. Mummification extends from Kodiak down the Alaska Peninsula through the Aleutians to Atka, and possibly into the Delarofs (Hrdlicka, 1945). None of these later developments are found in the western islands.

These examples clearly indicate that the eastern Aleuts participated in broader cultural trends from the Alaska mainland. However, many cultural developments did not reach the western edge of the Aleut world. There appears to be a strong cultural boundary separating the Rat and Near Islanders from the central and eastern Aleuts. Distance certainly had a role in the diffusion of traits from east to west but political and cultural factors must have played a part in filtering ideas.

Contract with Asia

Cultural imports from Asia are more difficult to detect in the western islands as less is known about the prehistory and ethnology. Influences from Asia are considered unlikely by American researchers primarily due to the apparent lack of prehistoric occupants on the Commander Islands. These islands, 225 km from Kamchatka and nearly 400 km from the Near Islands, would have been essential landfalls for intercontinental voyagers.

Russian researchers believe the Commander Islands were occupied, albeit with long interruptions, prior to Russian discovery (Black, 1984). Jochelson (1933, p. 31) reported the Russians learned of the Commander Islands from the Itel'men of Kamchatka who, however, had never visited them. The first Russians in the Near Islands, in 1745, found the Aleuts knew of islands to the west (Black, 1983, pp. 32, 72). However, archaeological work has been inconclusive.

A 1930s Smithsonian expedition to the islands found only historic settlements (Hrdlicka, 1945). Subsequent excavation in 1984, of the 1741 Bering Expedition winter camp, recovered stone artifacts from depressions used by the shipwrecked sailors for shelter. The excavators concluded the shelters used by the expedition survivors were apparently excavated into older pit houses (Len'kov *et al.*, 1992). If the pits predate Bering's voyage the evidence still suggests only ephemeral occupation.

The presence of sea cows and the nearly flightless Pallas' cormorant is the strongest evidence for the lack of intensive human use of the Commanders. Though both are sporadically reported by Aleuts in the Near Islands in historic times (Turner, 1886) they occurred in large numbers only in the Commander Islands. Intense human hunting pressure caused the extinction of both within a few decades of discovery (Stejneger, 1896).

No artifacts which show undoubted Asian influence have been recovered from the Aleutians. Bank lists several Aleutian traits said to be derived from Asian sources and lacking from the Bering Sea region. These include roof entry to houses, refuge islands, certain mortuary practices (in the eastern islands) and aconite poison whaling (Bank, 1977). The Near Islanders shared a number of Eskimoan traits with the people of southwest Alaska and Siberia. These include Raven mythology featuring Raven as trickster/creator (Bergsland and Dirks, 1990) and large chiefs' houses, used for ceremonies, analogous to Yup'ik Eskimo *gasgigs*. Raven mythology and ceremonial houses are not found in the central or eastern islands (Black, 1984). Finally, some Near Island art, particularly ivory figurines, shows strong resemblances to carvings produced by peoples living on the Sea of Okhotsk littoral (Black, 1982).

Available evidence is too incomplete to be able to add much to the debate on Asian influences directly into the Aleutian Islands.

Cultural Contacts Within the Aleutians

The movement of people, goods, and ideas within the islands is no better documented than influences from outside the chain. Each island cluster was occupied by one or more independent polities, often with cul-

tural and linguistic differences accenting political autonomy. Intergroup contacts within the Aleutians took place through warfare, marriage, intervillage feasting, and trade.

Internecine warfare was epidemic (Veniaminov, 1984), and an important part of being an Aleut male. Raiders traveled long distances for revenge, captives, and glory. Raiding for wives and captives for slaves would have promoted homogeneity of language and culture along the chain as the captives became integrated into the captors' villages. Historically, the Near Islanders were under heavy military pressure from the Andreanov Islanders, based at least 500 km to the east (Black, 1984). After initial hostilities with the Russians, the Near Islanders reached accommodation, in part to gain advantage over their stronger traditional enemies.

Formal trade mechanisms are also poorly known. Exchange apparently took place between sets of near neighbors. Probably many items were exchanged during intervillage feasting (McCartney, 1977). Exotic trade goods included obsidian, dentalium, birch bark, caribou fur, spruce roots, and amber. In general, these are more common in the eastern islands and extremely rare or nonexistent in the Near Islands. One commodity, iron, is relatively common in the Rat Islands after about 1000 A.D., and may have been acquired from Chinese or Japanese shipwrecks. The Rat Islanders maintained tight control over access to iron, which is rare in neighboring island groups.

There is, however, evidence of exchange between the western Aleuts and the east. McCartney (1971, 1977) compared artifact assemblages throughout the chain and found that, while every island group possessed distinctive artifacts, overall similarities were more important. The Near Islands were the most divergent group with about 20 characteristic traits. He concluded the different island groups had been in more or less continuous contact for at least 4000 years.

About 1600 A.D., another cluster of artifacts, including rod-like unilaterally barbed harpoon points, long socketed foreshafts, small bilaterally barbed harpoon points, and bear figurines, appeared in the eastern islands and spread west. Again some, but not all, elements of this complex, including bear figurines, spread to the Near Islands by 1750. McCartney (1971) believes this indicates an accelerated period of inter-island contacts after 1600 A.D.

THE WESTERN ALEUTIAN ARCHAEOLOGY AND BIODIVERSITY PROJECT

Since 1991, an international team of archaeologists, zooarchaeologists, biologists, and geologists, has been involved in a multidisciplinary study of the western Aleutian Islands. The project has three primary goals: (1) to

examine evidence for contact between the Rat and Near Islands to determine the nature and extent of cultural exchange between politically and culturally independent Aleut subgroups, (2) to document Holocene environmental change in Beringia and determine to what extent observed changes can be ascribed to natural factors or to anthropogenic factors (James, 1995), and finally, (3) to study Aleut economic strategies to understand the effects of regional environmental change on the culture. The project has analyzed materials from excavations on Amchitka (Desautels *et al.*, 1970) and Shemya Islands (Corbett, 1990), and excavated sites on Buldir in 1991 and 1993 (Siegel-Causey *et al.*, 1991; Siegel-Causey *et al.*, 1993), Little Kiska in 1992, and Shemya in 1994 (Siegel-Causey *et al.*, 1995).

The western Aleutians are an ideal region for this type of study. The geographic circumscription allows control over the sources of borrowed cultural elements. Preservation of hard organics in Aleut midden sites is generally excellent, and in rare cases, more fragile materials are also well preserved. Yesner (1981), comparing past abundance of faunal materials derived from archaeological evidence with modern abundances, has shown the Aleuts harvested seabirds in the proportions they occurred in the environment. While cultural biases toward larger birds existed, these are relatively easy to isolate (White, 1953). This allows accurate reconstruction of past diversity and relative abundance of the marine coastal avifauna using materials unearthed from middens (Dinesman, 1986; Savinetsky and Knyazev, 1990).

During the Holocene the Bering Sea region experienced rapid climatic change combined with geological restructuring of the landscape which produced environmental changes on a scale almost unsurpassed anywhere else on the planet (Hopkins, 1972, 1979). Most marine organisms have narrow limits of tolerance for changes in temperature and salinity (Odum, 1959). Even minor changes in ocean conditions therefore would have a clear measurable effect on sea life, including sea birds. Paleobiological investigation of faunal remains, especially birds, connected with anthropological study of the human context, can give us a richly detailed picture of Holocene environmental changes in Beringia.

In the earliest stage of the project, faunal material from previous archaeological work at Amchitka in the late 1960s (Desautels, 1970) and Shemya (Corbett, 1990) was analyzed. The Amchitka materials were excavated in a salvage project for the Atomic Energy Commission from sites 49 Rat 31 and 49 Rat 36. To increase sample sizes for analysis several excavation units in Rat 31 were combined; dates are therefore broad estimates. All strata in Rat 36 were combined into a single analytical unit with a single date. All species are reported as Minimum Number of Individuals (MNI) (Table I). The Amchitka samples had several problems which limited their

reliability. The collections had been divided into at least three samples and sent to different Universities. Provenience information was lacking or confused on many of the bags. Keeping these limitations in mind the Amchitka samples analyzed still provide invaluable preliminary data.

Amchitkan avian faunal remains clearly demonstrated changes in the distribution and abundance of breeding seabirds over the last 2650 years B.P. (Harrington, 1987; Siegel-Causey *et al.*, 1991). Relative abundances of three cormorant species, Pelagic Shag (*Stictocarbo pelagicus*), Red Faced Shag (*S. urile*), and Double-crested Cormorants (*Hypoleucus auritus*) have remained similar throughout this period, and their numbers remained relatively constant for the last 1800 years. In contrast, Kenyon's Shag (*S. kenyonii*) appear to increase, the greatest jump occurring in the last 200 years. A single wing bone of Pallas' Cormorant, previously known only from the Commander Islands, suggests this species was more widespread in the past.

Combined analysis of all bird species recovered from Amchitka middens revealed other patterns (Table I). Aleutian Canada Goose (*Branta canadensis minima*) numbers fluctuated widely during the 2650-year occupation of Rat 31. Peak abundances corresponded with climatic maxima; all but one of the population lows corresponded with climatic minima. The single exception to the pattern was for goose bones recovered from the upper strata, laid down in historic times (Desautels *et al.*, 1970). Although global climate was warming during this period, goose numbers were ex-

Table I. Amchitka Bird Fauna^a

Bird species	Rat 31 level	Rat 31 level	Rat 36 level	Rat 31 level IV
	I 890 ± 95 years b. p.	II 1890 ± 90 years b.p.	III 2250 ± 100 years b. p.	2650 ± 95 years b. p.
Short-tailed Albatross	21	12	NA	8
Northern Fulmar	5	6	NA	12
Shearwater	10	6	NA	15
Canada Goose	20	37	NA	8
Eider Duck	21	16	NA	13
Harlequin Duck	12	9	NA	8
Gulls (<i>Larus</i> sp)	10	10	NA	8
Pelagic Shag	53	57	25	32
Red-Faced Shag	11	14	6	12
Kenyon's Shag	5	3	4	8
Double-Crested Cormorant	3	2	2	3
Uria spp.	19	13	NA	8
Aethia spp.	65	36	NA	45
Other	104	66	NA	57

^aAll numbers are minimum number of individuals (MNI). NA—these species were not analyzed in this sample (from Harrington, 1987; Siegel-Causey *et al.*, 1991).

tremely low. Of all species present, goose and Short-tailed Albatross (*Diomedea albatrus*) numbers were significantly lower than expected. Apparently, the introduction of Arctic Fox by Russian and American trappers and traders had profound effects on some bird populations, in particular those that nest on flat ground, such as geese and albatross (Siegel-Causey *et al.*, 1991).

Other species contrast sharply with the pattern noted for the Aleutian Canada Goose. A goose population high seen roughly 1000 years ago is associated with population lows in Slender-billed Shearwaters (*Procellaria tenuirostris*) and auklets (*Aethia spp.*). Similarly, a low population of geese 1800 years B.P. is associated with peak abundances for Northern Fulmar (*Fulmarus glacialis*) and auklets. This leads us to suspect these changes in relative bird abundance reflect environmental, not human, perturbations.

Preliminary analysis of remains from Little Kiska, Shemya, and Buldir, suggests patterns observed on Amchitka hold true elsewhere in the western Aleutians. Abundant remains of Aleutian Canada Geese and Short-tailed Albatross were found in middens on these islands. On Little Kiska and Shemya, numbers decline drastically in historic levels. We found no such drop in abundance on Buldir, where Arctic foxes were never introduced. We can only conclude population declines in these and other species are due entirely to the actions of Europeans in introducing foxes (Siegel-Causey, personal communication).

Buldir Island Fieldwork

Two years of fieldwork focused on Buldir Island (Siegel-Causey *et al.*, 1991) located 110 km from both Kiska and Shemya Islands, and the only landfall in a wide stretch of stormy ocean (Fig. 2). This rugged island has one landing beach fronting the only flat area suitable for human settlement (Fig. 3).

As one of very few islands with no introduced foxes or rats, Buldir hosts over four million breeding seabirds. It is considered a "relatively pristine remnant of the Aleutian ecosystem" (Byrd and Day, 1986). This made Buldir an excellent place to compare modern fauna to past seabird numbers from the midden. The modern fauna includes 32 breeding species, of which 65% are seabirds. Over 99% of the total population are storm petrels (*Oceanodroma furcata* and *O. leucorhoa*). Twelve species of Alcids make up 88% of the remaining bird population, with gulls and kittiwakes the next largest group.

The only known site on Buldir is a small- to medium-sized midden situated on two parallel beach ridges. The main occupation area is between

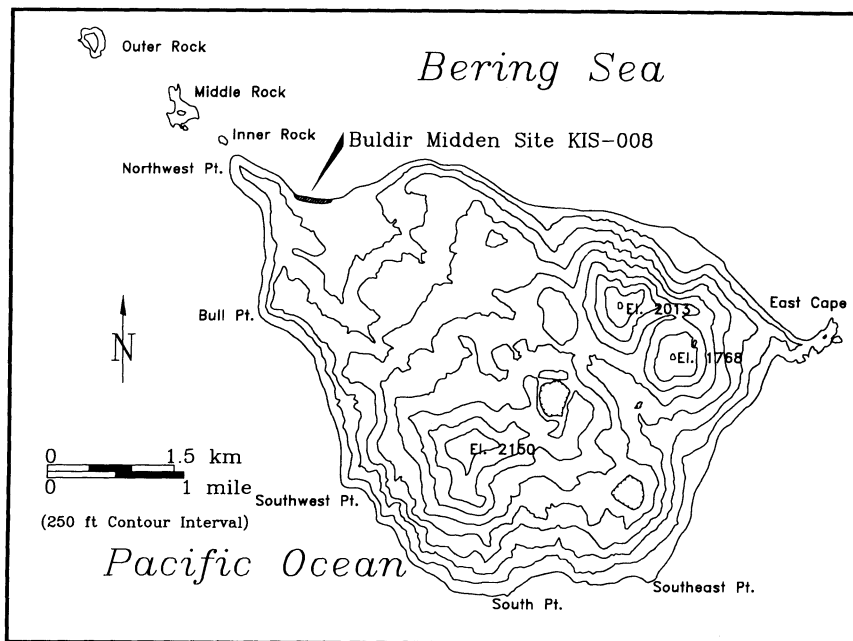


Fig. 2. Buldir Island.

two small steams but the site extends across the mouth of the valley. Nearly a meter of windblown sand covers the site obscuring surface features but six possible housepits were defined along the rear beach ridge and one was visible in an eroding beach profile.

Unusual depositional and preservation factors enhanced the value of the site for study. First, occupation layers are generally thin discrete layers, separated by sterile sand. This eliminated the problem of mixed deposits associated with most Aleut middens. Second, the preservation is excellent, especially in the upper level at the west end of the site. Here organic clay soils kept wet by flanking streams and an inland marsh have preserved quantities of wood, seeds, bark, leaves, eggshells, hair, feathers, and fish scales.

In 1991, two 1 m² test pits excavated into the eroding beachfront revealed up to seven alternating cultural and sterile sand layers. Site occupation spans a 1000-year sequence from 1160+-B.P. to 28+-50 B.P. (Corbett *et al.*, in press). The upper level, dated to between 460 and 280 B.P., was intensively sampled, with three 2 x 2 meter pits, during 1993. Analysis of these pits is not yet complete.

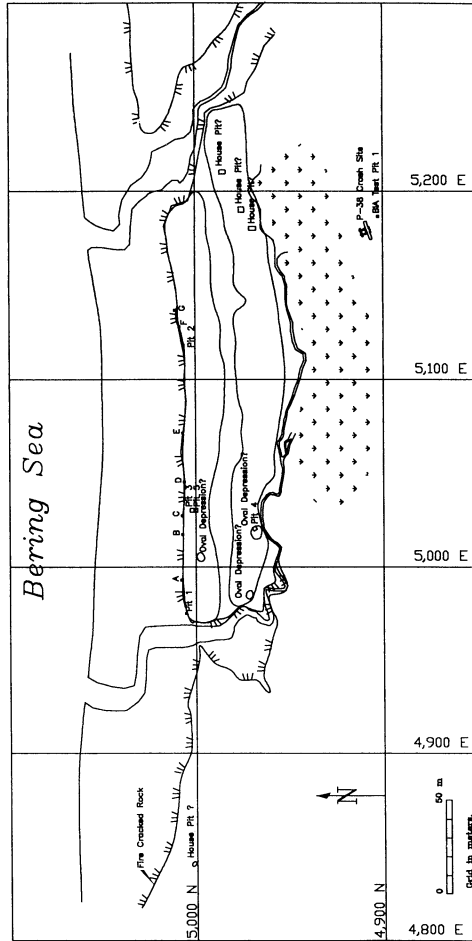


Fig. 3. Buldir midden site map, Buldir Island, AK.

We recovered 6000 bird bones from the two 1991 test pits, nearly 75% from Pit 2. The subfossil assemblage represented in the midden includes 23 species, of which 21 are seabirds (Table II). In looking at the total assemblage, there are some interesting differences between modern and past abundances. Kittiwakes, well represented in the modern fauna, are not found in Pit 2, the older part of the site. Least auklets (*Aethia pusilla*), the second most abundant modern Alcid, make up only 2–3% of archaeological specimens (Lefevre and Siegel-Causey, 1993). Murrelets (*Brachyramphus*

sp.) and Glaucus gulls (*Larus hyperboreus*) are poorly represented or absent in the modern fauna. Murrelets make up nearly 7% of the individuals in Pit 2, while Glaucus gulls are a small but consistent component of the past fauna.

Whiskered auklets (*A. pygmaea*) are the most common species in Pit 1 with 28% of MNI. In Pit 2, the most abundant remains belonged to crested auklets (*a. cristatella*) with 25% MNI, Cassin's auklet (*Ptychoramphus aleuticus*) with 20% MNI, and rhinoceros auklets (*Cerorhinca monocerata*) with 10% MNI (see Tables I and II in Lefevre *et al.*, in press). Crested auklets are currently the most abundant alcid on Buldir. Whiskered auklets make up less than 1% of the modern fauna. Cassin's auklet is represented by 200 breeding pairs while only 12 pairs of Rhinoceros auklets bred on Buldir (Lefevre and Siegel-Causey, 1993; Lefevre *et al.*, in press).

In order to compensate for human hunting choice as a bias in the sample, we compared size and weight of the different species (Lefevre and Siegel-Causey, 1993; White, 1953). For example, the small size of Least auklets may have made them less economically attractive than the less abundant larger auklets. On the other hand, the high incidence of crested and whiskered auklets in the midden, in spite of their small size, could indicate an interest in the ornamental feather crests for decorating clothing (Lefevre *et al.*, in press).

Accessibility of colonies was also analyzed in order to factor out human choice from environmental process. The different ratios between murrelets (*Uria sp.*), about 3% of remains, and puffins (*Fratercula sp.*), 5–9% of remains, may be due to easier access to puffin burrows. The clearest evidence of a change in species numbers is suggested by Rhinoceros auklets. The large size of these auklets, over 500 gm, coupled with low modern numbers, may suggest these birds were more abundant in the past.

Inter-island Contacts: Buldir Island as a Crossroads

Determining which Aleut group(s) used Buldir and the nature and extent of any contacts between the Rat and Near Islands was a major focus of our work. Russian traders in the 1780s reported two mutually antagonistic groups on Buldir (Black, 1984). Good comparative material exists for both the Rat and Near Island material culture. McCartney identified 20 or so unique traits for the Near Islands. Identifying the occupants of Buldir should have been easy.

About 294 artifacts, 194 stone, and 100 bone or ivory, were available from the two seasons on Buldir and useful for comparisons with Rat and Near Island collections. Bone tools, especially harpoon heads, are the

Table II. Buldir Bird Fauna^a

Bird species	Pit 1	Pit 2						
		L1	L2	L3	L4	L5	L6	L7
Short tailed Albatross	2			1				
Northern Fulmar	1							
Storm Petrel	13					19	1	
Cormorant	5			1				
Canada Goose	7			2		21		
Larus spp.	1							
Glaucus Gull	9		1			5		
Glaucus-Wing Gull	4							
Black Leg Kittiwake	16							
Red Leg Kittiwake	3							
Uria	2							
Thick Billed Murre	3	1		1				
Common Murre	1							
Pigeon Guillemot	5							
Murrelet				24				
Ancient Murrelet	35	1	5		1		3	4
Cassins Auklet	7	1	2		1	54	3	4
Parakeet Auklet	15			1			1	
Least Auklet	7		1	2	1		1	2
Crested Auklet	18	2	4	30	3	42	3	3
Whiskered Auklet	65					22		
Rhinoceros Auklet	3	1	2	6		21	1	3
Puffin							1	
Tufted Puffin	2		1	4	2	8		1
Horned Puffin	2		2	3	1	10		
Song Sparrow						5		

^aAll numbers are minimum numbers of individuals (Lefevre *et al.*, 1993).

most sensitive to minor stylistic change and are most often used in comparisons. Our bone assemblage is small and contained only five harpoon points, all forms common along the chain. the rest of the bone assemblage consisted of awls and wedges in forms common all along the chain, or were unique, such as a button, paddle, and decorated albatross humerus. The only bone artifacts suggesting affiliations with either Rat or Near Islands were three dense bone or ivory blunts characteristic of the Near Islands—those found elsewhere in the chain tend to be lighter bone (McCartney, 1971).

All stone tools recovered were made of locally abundant phyllite or siliceous phyllite. Phyllite is easily shaped but brittle and unsuitable for the decorative flaking, incising, and regular edge serrations that distinguish

Near Island collections from other Aleutian materials. The one Near Island trait apparent in the Buldir materials was an emphasis on linear forms with parallel sides. Of the 194 complete or nearly complete stone tools, nearly 35% (68) tended toward linearity. Rat Island tools tend to be more triangular; of 41 classes described by Desautels (1970), 30 were for triangular points and knives. We recovered 27 (14%) triangular points displaying stylistic similarities to Rat Island points. While neither linear nor triangular forms are exclusive to the Rat or Near Islands, the styles do indicate trends.

We then examined lithic material types, hoping to identify materials imported from either the Rat or Near Islands. Aleuts overwhelmingly used local materials for tool-making. In the Near Islands fine quality, silicified argillites and greenstone (propylitized andesite) were favored. In the Rat Islands, people relied on basalts and andesites. On Buldir, phyllite, a fine-grained, low temperature metamorphic rock, dominated the collection (Corbett *et al.*, in press). Compared to the materials from the Rat and Near Islands this is a poor tool stone. It was apparently used on Buldir because it was extremely abundant. Of over 12,000 flakes analyzed, only 71 flakes, of three varieties of andesite, are probable imports. Propylitized andesite, with 14 flakes on Buldir, is the most common tool material on Shemya, suggesting a possible connection to the Near Islands.

Though far from definitive, evidence from Buldir suggests the occupants during the late prehistoric period were from the Near Islands. Although not exclusive to the Rat Islands, the presence of a sizeable number of triangular points suggest Rat Islanders may have also used the island. This period in late prehistory corresponds to the spread of a cluster of artifact styles from the eastern islands to the west. Contact between the Rat and Near Islanders on Buldir may have allowed transmittal of the new cultural traits to the west.

CONCLUSIONS

Our project is in the early stages of a long-term effort to document environmental change in Beringia and to revisit the issue of cultural isolation in the western Aleutians. With most of our recently excavated material undergoing analysis, our results are preliminary. Buldir has proven a critical link for understanding environmental change, including changes in the regional biota.

Middens in the Aleutians have the potential to address a wide range of environmental and cultural questions. Environmental changes through time are measured by changes in the regional avian fauna recovered from

Aleut midden deposits. Excavations on Buldir have allowed us to compare this fauna with a relatively pristine modern fauna to factor out cultural biases in the collection.

Faunal samples from earlier excavations were analyzed as a precursor to fieldwork. Most previously excavated samples are capable of providing some information but are fraught with problems in sample size and quality which severely limit their value. Nonetheless, preliminary results of the faunal analysis suggest (1) changes in the distribution and abundance of breeding seabirds in response to warmer or cooler climates, and (2) a sharp change in the distributions of ground nesting seabirds in the historic period due to the introduction of foxes on many islands.

It is possible to isolate cultural biases for particular avian species by the prehistoric Aleut. Hunters took a wide variety of species but tended to focus on larger birds, or those in more accessible locations. On Buldir, we found evidence that nonfood preferences could dramatically influence hunting choice: large quantities of small auklets were captured, apparently for feathers to decorate clothing.

Ethnographic and archaeological examples clearly indicate the Aleuts participated in broad cultural trends emanating from the mainland of Alaska. Intensity of contact diminished to the west and many traits did not reach the Rat or Near Islands. The strong cultural boundary separating the Rat and Near Islanders from the central and eastern Aleuts suggests political and cultural factors had a role in filtering ideas. There is too little evidence to comment on possible contacts with Asia via the western Aleutians in prehistory but the unique culture of the Near Islanders, with clear Eskimoan aspects, begs an explanation.

Buldir is an excellent place to study intergroup interactions as all activity on the island was restricted to a single locus, and the island is a convenient and necessary stopping point between the groups. The late prehistoric period was a time of accelerated inter-island contacts, and we have a large, well-preserved sample dating from that time on Buldir. This sample suggests both Rat and Near Islanders used Buldir concurrently in the latest prehistoric period, though we do not know if the contacts were friendly or hostile.

The emphasis placed on isolation by Aleutian researchers should be discarded in favor of a new paradigm focusing on cultural interaction to try to understand why and how traits are borrowed and rejected. Given that the entry points for cultural influences are circumscribed by geography, Aleutian researchers are well placed to study cultural exchange between different cultures. Within the chain also there are bottlenecks through which the spread of cultural traits throughout the chain would have been funneled. Buldir is the westernmost, but Seguam Island in the Central

Aleutians is another relatively isolated frontier zone. These islands provide unique laboratories to study the mechanisms of cultural exchange and borrowing within a single ethnic cultural group.

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