



WILDERNESS SUITABILITY REVIEW

INTRODUCTION

A review of all lands within the monument and preserve regarding their suitability or unsuitability for preservation as wilderness has been accomplished in accordance with section 1317 of ANILCA and section 3 of the Wilderness Act.

The Wilderness Act created a national wilderness preservation system to be made up of federally owned lands designated by Congress. The intent was to "secure for the American people of present and future generations the benefits of an enduring resource of wilderness." The act defines wilderness as follows:

A wilderness, in contrast with those areas where man and his own works dominate the landscape, is . . . an area where the earth, and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is . . . an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Recommendations on whether to designate suitable areas as wilderness will be made following completion of the general management plan. An environmental impact statement will be prepared as part of the wilderness recommendation process. The public will have the opportunity to review and comment on these recommendations, and public hearings will be held. Upon completion of the EIS and secretarial review, the president will make his recommendations to the Congress.

Wilderness suitability is based generally on conditions as they currently exist. Because of the delay between the general management plan and the wilderness recommendation, there is a possibility that proposed use and development, if implemented, could adversely affect areas to be included later in a recommendation. All lands determined suitable for wilderness designation will be managed under the terms of ANILCA to maintain the wilderness character and values of the lands until designation recommendations have been proposed and Congress has acted on these proposals.

WILDERNESS SUITABILITY CRITERIA

Wilderness suitability criteria have been developed that reflect the definition of wilderness contained in the Wilderness Act and the provisions

of ANILCA specific to wilderness areas in Alaska. These criteria were applied to all lands in the preserve and monument to determine their suitability for designation. These criteria relate to the physical character of the land and current land status. Other factors such as appropriateness for management as wilderness and state and local concerns with wilderness management will be considered during the formulation of the recommendation which follows completion of the general management plan. All future wilderness recommendations will recognize valid existing rights including rights-of-way under RS 2477.

In determining suitability, a particular tract of land is judged against the following criteria:

| <u>Description of Land or Activity</u> | | <u>Suitable for Wilderness</u> | <u>Not Suitable for Wilderness</u> | <u>Suitability Pending</u> |
|--|---|--|--|--------------------------------|
| Land status | Federal | X | | |
| | Federal: under application or selection | | | X |
| | State and private land, patented or tentatively approved | | X | |
| | Private ownership of subsurface estate | | X | |
| Mining | Areas with minor ground disturbances from past mining activities | X | | |
| | Areas with major past ground disturbances from mining activities | | X | |
| | Current mining activities and ground disturbances | | X | |
| Roads and ORV trails | Unimproved roads or ORV trails that are unused or little used by motor vehicles | X | | |
| | Improved roads and ORV trails regularly used by motor vehicles | | X | |
| Landing strips | Unimproved or minimally improved and maintained | X | | |
| | Improved and maintained | | X | |

| | | | |
|--------------|--|---|---|
| Cabins | Uninhabited structures; hunter, hiker, and patrol cabins | X | |
| | Inhabited as a primary place of residence | | X |
| Size of unit | Greater than 5,000 acres adjacent to existing wilderness, or of a manageable size | X | |
| | Less than 5,000 acres or of unmanageable size | | X |

SUITABILITY DETERMINATION

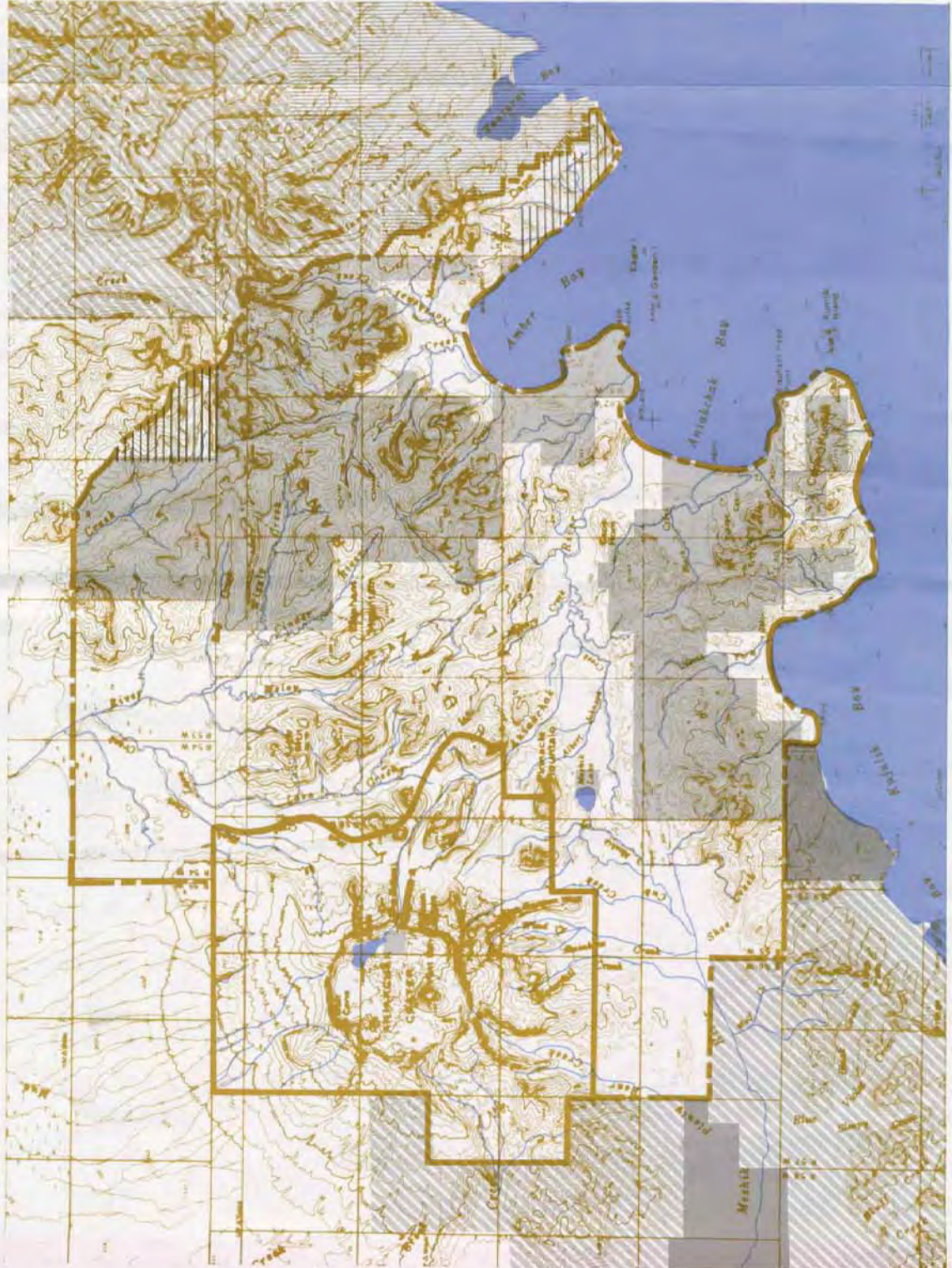
Using the above criteria, all of the federal lands within Aniakchak have been determined suitable for wilderness designation based on their present undeveloped and unimpaired state. There are no past or current major mining developments, improved roads or ATV trails, improved or maintained airstrips, or inhabited cabins on the federal lands subject to this review. However, approximately 197,817 acres (including surface and subsurface) have been selected by and/or conveyed to regional native corporations, individuals, and the state of Alaska. Whether or not these selections will be transferred out of federal ownership is uncertain at this time. For purposes of this suitability review, three preliminary wilderness study areas have been identified and analyzed (see Wilderness Suitability map). These include federal lands under selection (suitability pending), those lands that will definitely remain in federal ownership (suitable), and those lands selected and already conveyed to private or state ownership (not suitable). A determination of suitability does not affect any pending selections or other prior existing land disposal actions.

Area 1 (about 185,310 acres - 31%) - These are lands selected by or interimly conveyed to Koniag, Inc., which include the subsurface oil and gas rights. They consist mainly of the coastal areas along portions of Amber, Aniakchak, and Kujulik bays. They are currently undeveloped and would, if ultimately retained in federal ownership, complement the adjoining preserve land to the west. Therefore, these lands or any portions thereof are suitable if retained in federal ownership and unsuitable if conveyed out of federal ownership. These lands are shown as "Suitability Pending" on the Wilderness Suitability map.

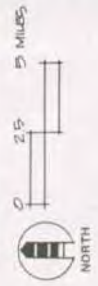
Area 2 (about 404,962 acres - 67%) - These lands encompass the remainder of the federal land within Aniakchak. They are undeveloped and therefore suitable for further consideration as wilderness. These lands are shown as "Suitable" on the Wilderness Suitability map.

Area 3 (about 12,507 acres - 2%) - These lands have been selected and conveyed to native corporations or to the state of Alaska. They are located in the extreme eastern and northeast portion of the preserve. Due to the nonfederal ownership, these areas are considered "Not Suitable" as indicated on the Wilderness Suitability map.

Changes in land status occurring or likely to occur between now and when future wilderness recommendations are made to the Congress will be reflected in those recommendations. All future wilderness recommendations would be made subject to valid existing rights.

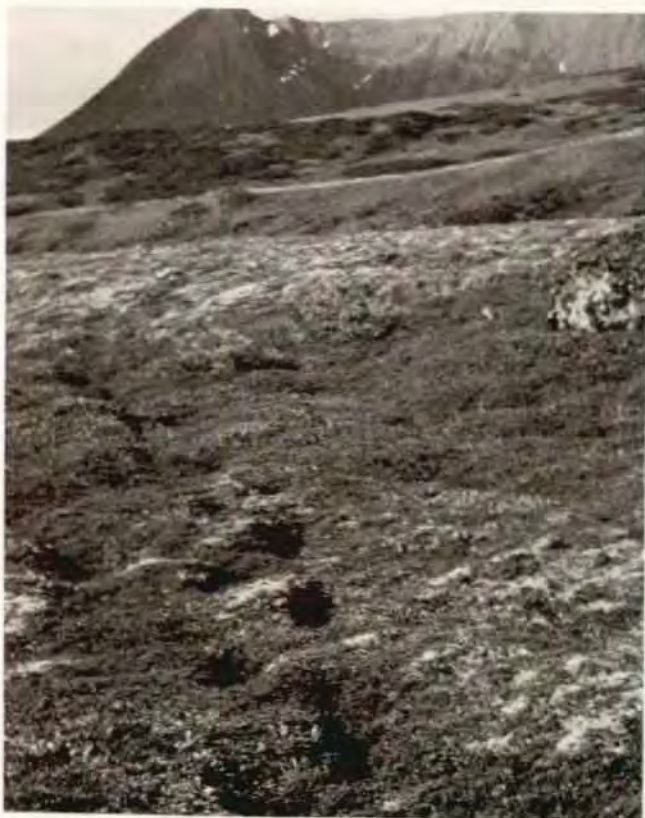


- SUITABILITY PENDING (AREA 1)
- SUITABLE (AREA 2)
- NOT SUITABLE (AREA 3)
- AREA IN WILDLIFE REFUGE FOUND SUITABLE IN FWS DRAFT CONSERVATION PLAN
- AREA IN WILDLIFE REFUGE FOUND UNSUITABLE (IF OIL AND GAS RIGHTS CONVEYED) IN FWS DRAFT CONSERVATION PLAN
- AREA IN WILDLIFE REFUGE FOUND UNSUITABLE (IF PENDING STATE OR NATIVE SELECTIONS CONVEYED) IN FWS DRAFT CONSERVATION PLAN
- MONUMENT BOUNDARY
- PRESERVE BOUNDARY



WILDERNESS SUITABILITY
ANIAKCHAK
 NATIONAL MONUMENT AND PRESERVE
 UNITED STATES DEPARTMENT OF THE INTERIOR
 NATIONAL PARK SERVICE
 101 20025 C
 DSC AUG 85

ON MICROFILM



THE ANIAKCHAK ENVIRONMENT

NATURAL RESOURCES

Geology

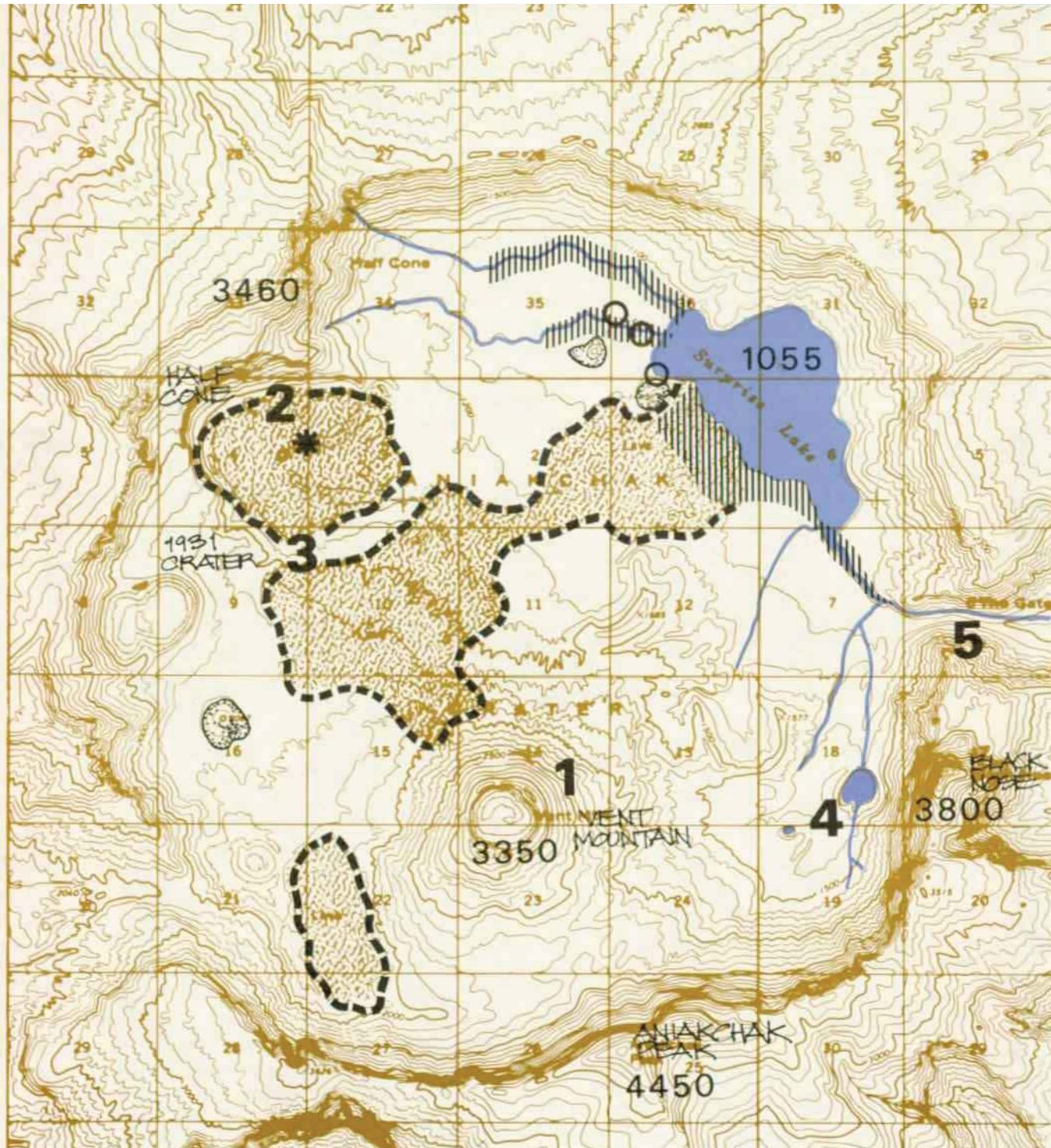
General. The rugged Alaska Peninsula is today and has been for thousands of years an area of considerable volcanic and tectonic activity. It is a part of the great "rim of fire" which surrounds the Pacific Basin and is caused by drifting of the giant Pacific crustal plate up against the surrounding continental plates. The deep Aleutian trench off the Pacific coast of the Alaska Peninsula represents a zone of great stresses and strains where the Pacific Ocean plate is being forced below the continental plate. Other regional structural features include a series of northeast-trending folds and faults.

The oldest exposed bedrock in the monument/preserve consists of a sequence of Jurassic and Cretaceous sedimentary formations of sandstone, shale, conglomerate, and limestone obviously deposited during a long period of tectonic stability. Tertiary time was marked by widespread uplift and volcanic activity throughout the region. The Aleutian Range was formed early in this period by a massive outpouring of volcanic material. Uplift, erosion, intrusion, and volcanism continued through the Tertiary, resulting in the deposition of thick sections of volcanic rock. Tertiary sedimentary and volcanic rock and much older sedimentary formations are evident throughout the Aleutian Mountains east of the Aniakchak caldera. A few scattered intrusives are exposed in the monument/preserve. Continued volcanic activity into recent times resulted in the volcanic rock, ash, and debris flows that form Aniakchak caldera, cover the caldera flanks, and are found in isolated outcrops. Surficial alluvial and glacial deposits mantle the Bristol Bay lowlands including the Meshik and Cinder River drainages.

Volcanic Features. Aniakchak caldera is a spectacular geologic feature and the most outstanding single resource in the monument/preserve (see Geologic Features - Aniakchak Caldera map). In 1967 the Aniakchak caldera was designated as a national natural landmark. The landmark program was established in 1962 by the secretary of the interior as a natural areas survey to identify and encourage the preservation of geologic features and biotic communities that best illustrate the natural heritage of the United States. Aniakchak is unique among volcanic areas in the national park system in that it is larger than most, it is the site of extensive recent activity, and it is essentially a dry-bottomed caldera.

The caldera is the result of the collapse of a large andesitic structure and has a total internal relief of approximately 3,000 feet and a diameter of about 6 miles. The precaldra cone from which it was formed was approximately 7,000 feet high.

The basic caldera was probably formed more or less in a single massive eruption about 3,500 years ago. On a worldwide scale, the eruption ranks as one of the largest in such recent times, but there are nearly a dozen other calderas up and down the Alaska Peninsula that have a roughly similar geologic history. Since the initial formation of the



- 1 LARGEST, OLDEST VOLCANIC SPATTER CONE
- 2 YOUNGER, INCOMPLETE SPATTER CONE
- 3 MOST RECENT ERUPTION (1931)
- MINOR SPATTER CONE
- RECENT LAVA FLOW
- WARM GROUND TEMPERATURE
- 4 WATER-FILLED EXPLOSION PITS
- 5 ERODED RIVER CANYON
- PIONEER VEGETATION ON ASH
- WARM MINERAL SPRINGS

GEOLOGIC FEATURES ANIAKCHAK CALDERA

ANIAKCHAK
NATIONAL MONUMENT AND PRESERVE
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE



NORTH



1 MILE

181 | 20032
DSC | DEC 04

caldera, a number of less spectacular volcanic events have occurred that have resulted in the varied modern features of the caldera floor: a large spatter cone called Vent Mountain dominates the southeastern half of the area, several ash and lava flows of different ages cover the floor, collapsed small explosion pits pockmark its surface, and a substantial explosion appears to have blown out part of the northwest rim at Half Cone. The most recent explosion pit was apparently created in a 1931 ash eruption that blanketed not only the interior of the caldera with 1 to 2 feet of ash, but also deposited substantial ash layers as far as 40 miles away in the Chignik villages.

The caldera rim averages about 3,000 feet in elevation compared to its floor at 1,100 feet but rises in places to nearly 4,500 feet. It appears that initially the rim was complete and that probably the caldera filled to a substantial depth with water, creating a deep lake similar to Crater Lake in Oregon. Some of the postcaldera events appear to have taken place during that lake-filled period since some flows seem to have been erupted underwater. Eventually a lower, weaker portion of the rim was breached by rising lake waters, and in what appears to be very rapid erosion, the resulting outflow has cut through perhaps 1,500 feet of both fossil-bearing sedimentary and volcanic layers to create the modern-day "Gates" through which the Aniakchak River now exits the caldera.

Outside the caldera the Aniakchak area shows evidence of ash flowing over formidable topographic barriers (Miller and Smith 1977). Ash flow tuffs, probably emplaced during the period of caldera-forming eruptions, are found in thick continuous exposure near the caldera and in isolated outcrops at considerable distances from their source. Ash flows moved down the sides of the precaldern cone, filling glacial valleys next to the volcano to a thickness of 220 feet or more. To the north and west there were no obstructions, and the ash flows swept across the Bristol Bay lowlands to the sea. To the south of the caldera ash flows were channeled down glaciated valleys, crossed the Meshik River lowlands, and continued on through mountain passes of the Aleutian Range into the Pacific Ocean. Just west of the Aleutian Range flows passed and filled intervening valleys to probable depths of 300 feet. Ash flow tuff outcrops indicate that originally the flows covered an area of at least 900 square miles.

Mineral, Oil, and Gas Resources

The monument/preserve and immediately surrounding area have no recorded mineral production, and there are no recorded mineral claims within the monument or the preserve. The nearest valid and active mineral claims are approximately 15 to 18 miles southwest of the preserve. Five inactive claims are located east of these active claims in an area north of Chignik Bay about 12 miles south of the preserve.

The evaluation of metallic mineral resources in Aniakchak that follows is based on information provided by the U.S. Geological Survey (1981 and 1984). Rocks of Tertiary and Quaternary volcanic-intrusive environment

are widely distributed in the area and may contain porphyry copper and molybdenum deposits. No such deposits have been discovered in either the monument or the preserve, although there is the potential for their existence. Areas containing anomalous copper and molybdenum, which have been identified as having considerable mineral potential, occur within and near the boundaries of the preserve in three locations (see Mineral, Oil, and Gas Potential map). These areas also contain values of silver, lead, zinc, tungsten, bismuth, and arsenic. Another area with considerable mineral potential is the mountains between Pumice and Old creeks, where several small Tertiary intrusives are known to be mineralized. Streams that drain the mountainous areas between these creeks contain sites that show high values of lead, zinc, copper, and silver. As a general conclusion, however, there are no known major mineral resource areas within the monument or the preserve.

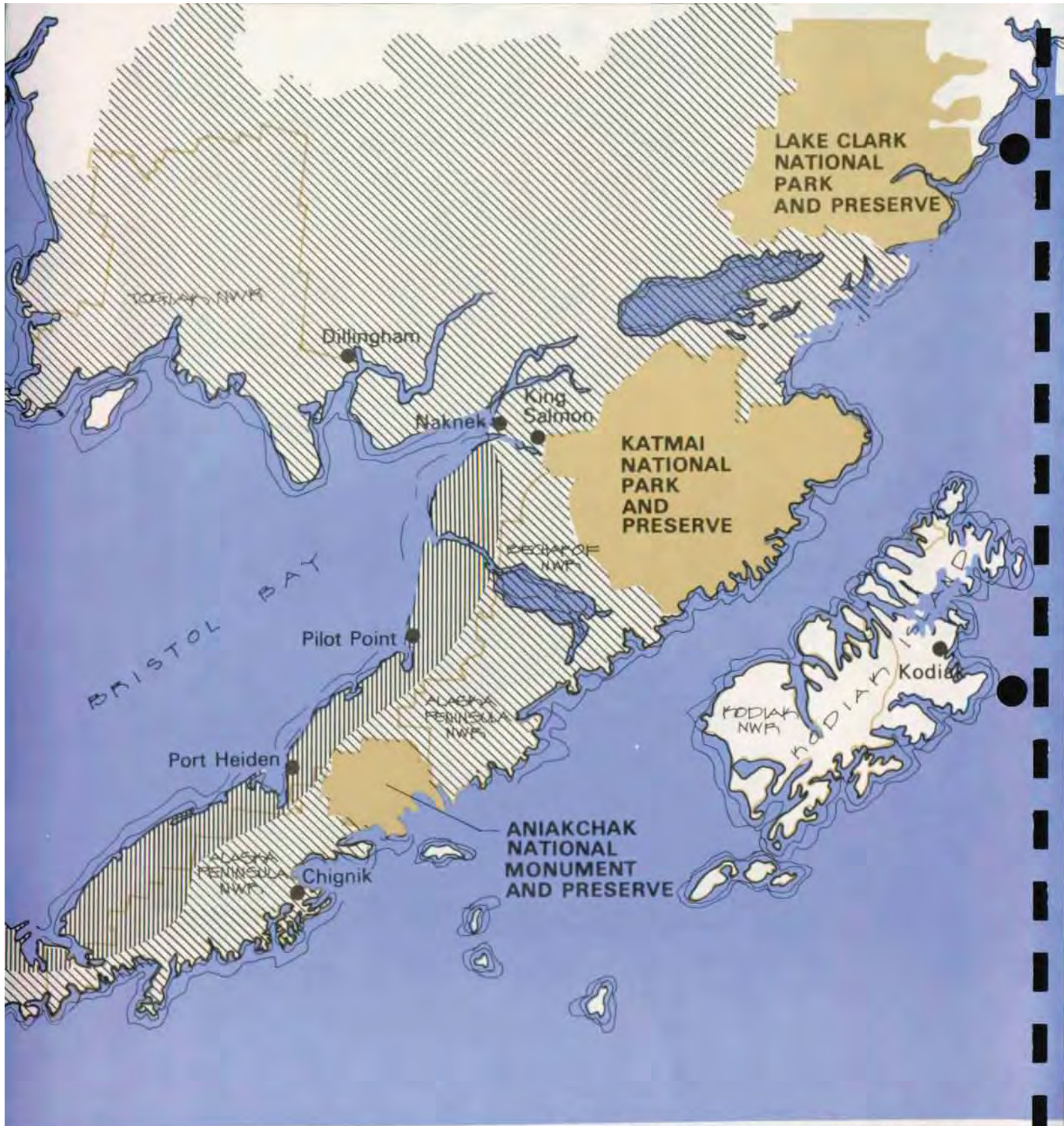
Thin seams of coal-bearing rocks are known within the preserve but are not believed to be of minable quality (Geological Survey 1984). Coal deposits have been identified south of the monument/preserve in a belt 3 miles wide and 25 miles long on the west shore of Chignik Bay, where coal was mined for local use from 1899 to 1915.

The Alaska Peninsula lies within two petroleum provinces (see Oil and Gas Potential - Bristol Bay Region map). The north side of the peninsula is in the Bristol Bay province and the south side is in the Alaska Peninsula province. Virtually all of the monument/preserve lies in the latter province. Because of insufficient data and an earlier conflicting analysis, it is difficult to evaluate the potential for finding oil and gas resources on the Alaska Peninsula. Based on information to date, the petroleum potential is considered low to moderate for onshore and out to the 3-mile limit offshore in the Bristol Bay province, and low or unknown for onshore and out to the 3-mile limit offshore in the Alaska Peninsula province (Alaska Department of Natural Resources 1983). This conclusion is in agreement with the original "Bristol Bay Cooperative Management Plan" (State of Alaska and USDI 1983) text description of oil and gas potential, but the BBCMP map of such potential is apparently derived from earlier studies that suggest a low to moderate potential on the Pacific side of the peninsula.

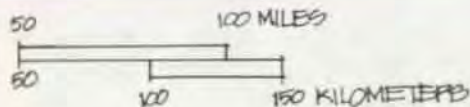
The U.S. Geological Survey has identified only one area within the boundaries of Aniakchak that they believe has some oil and gas potential. This area includes a portion of the Meshik River drainage and extends into the southwest section of the preserve, all of which is on federal land (see Mineral, Oil, and Gas Potential map). The extent of potential oil and gas resources offshore has not been determined, but most interest has been focused on the Bristol Bay province.

Topography and Soils

The Pacific coastline of the preserve is rugged, with numerous cliffs and offshore rocks and islands. Peninsulas jut into the ocean, creating large bays and protected coves. Rising abruptly from the Pacific shoreline and



NORTH



LOW TO MODERATE OIL AND GAS POTENTIAL

LOW OR UNKNOWN OIL AND GAS POTENTIAL

SOURCE: ALASKA DEPARTMENT OF NATURAL RESOURCES 1983

OIL AND GAS POTENTIAL BRISTOL BAY REGION

ANIAKCHAK

NATIONAL MONUMENT AND PRESERVE
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

101 20039B
DEC JULY 85

ON MICROFILM

more gradually from the Bristol Bay side, the Aleutian Range passes generally east of the centerline of the Alaska Peninsula. Peaks in this range seldom exceed 3,000 feet. To the northwest of these mountains and almost isolated from them lies Aniakchak caldera, the rim of which ranges from 2,000 to 4,000 feet in height. The northern and western flanks of the caldera grade gently down to the Bristol Bay lowlands. Several small streams wash and erode the far steeper southern flank of the caldera, creating extraordinarily rugged terrain characterized by deep ravines, steep escarpments, and waterfalls.

In contrast to the mountainous upland terrain are the Meshik and Aniakchak River valleys that interrupt the Aleutian Range. The Aniakchak drainage is a narrow, rocky corridor near its origin at the caldera, but gradually widens out and changes into a flat tundra/shrub-covered valley. The valley of the Meshik River, a more mature stream, is quite broad, flat, and marshy. The other major river drainage in the monument/preserve, the northward-draining Cinder River, originates on the caldera's northeastern flanks and in the mountains to the east and descends immediately into the Bristol Bay lowlands (see Topography and Soils map).

The majority of soils within the monument/preserve have been formed in well-drained, gravelly layered volcanic ash. The deepest, most developed soils occupy the footslopes of Aniakchak caldera, as well as below drainages in steep mountainous areas and in the nearby coastal plains. The shallowest soils occur on recently deposited volcanic ash and cinder flows primarily on the western and northern slopes of the caldera. This loose ash is easily disturbed by wind because there is little or no vegetative covering. Deep, very poorly drained organic soils occur along the wide, flat Meshik River valley. These soils consist of fibrous peat derived mostly from sedges and moss interspersed with several layers of volcanic ash. Little or no soil can be found on mountain peaks and ridges, rock escarpments, and talus slopes, which includes much of the higher elevation of the caldera and other mountainous terrain of the Aleutian Range. There are no prime or unique farmlands in the monument/preserve (Soil Conservation Service 1983).

Climate

The two sides of Aniakchak lie within two different climatic zones, a maritime one and a transitional one. The Aleutian Range has a major influence on local climate, acting as a barrier to the prevailing moist winds off the Pacific Ocean from the south. As a result, weather along the Pacific side of the Alaska Peninsula is maritime, i.e., characterized by heavy precipitation, moderate temperatures, and strong winds. Annual precipitation in the coastal community of Chignik averages 127 inches, including the moisture derived from 59 inches of snowfall. Annual snowfall at higher elevations averages more than 100 inches. Temperatures are relatively mild. The average summer temperatures in Chignik range from 39°F to 60°F, and the average winter temperatures range from 21°F to 36°F. High winds are common along the coast and in mountain passes and valleys.

The climate along the Bristol Bay side of the Alaska Peninsula is transitional between maritime and continental; the weather typically exhibits a wider temperature range, less precipitation, and clearer skies.

Annual precipitation at Port Heiden averages 13 inches, including moisture from 29 inches of snowfall. Average summer temperatures range from 40°F to 59°F, and average winter temperatures range from 13°F to 31°F.

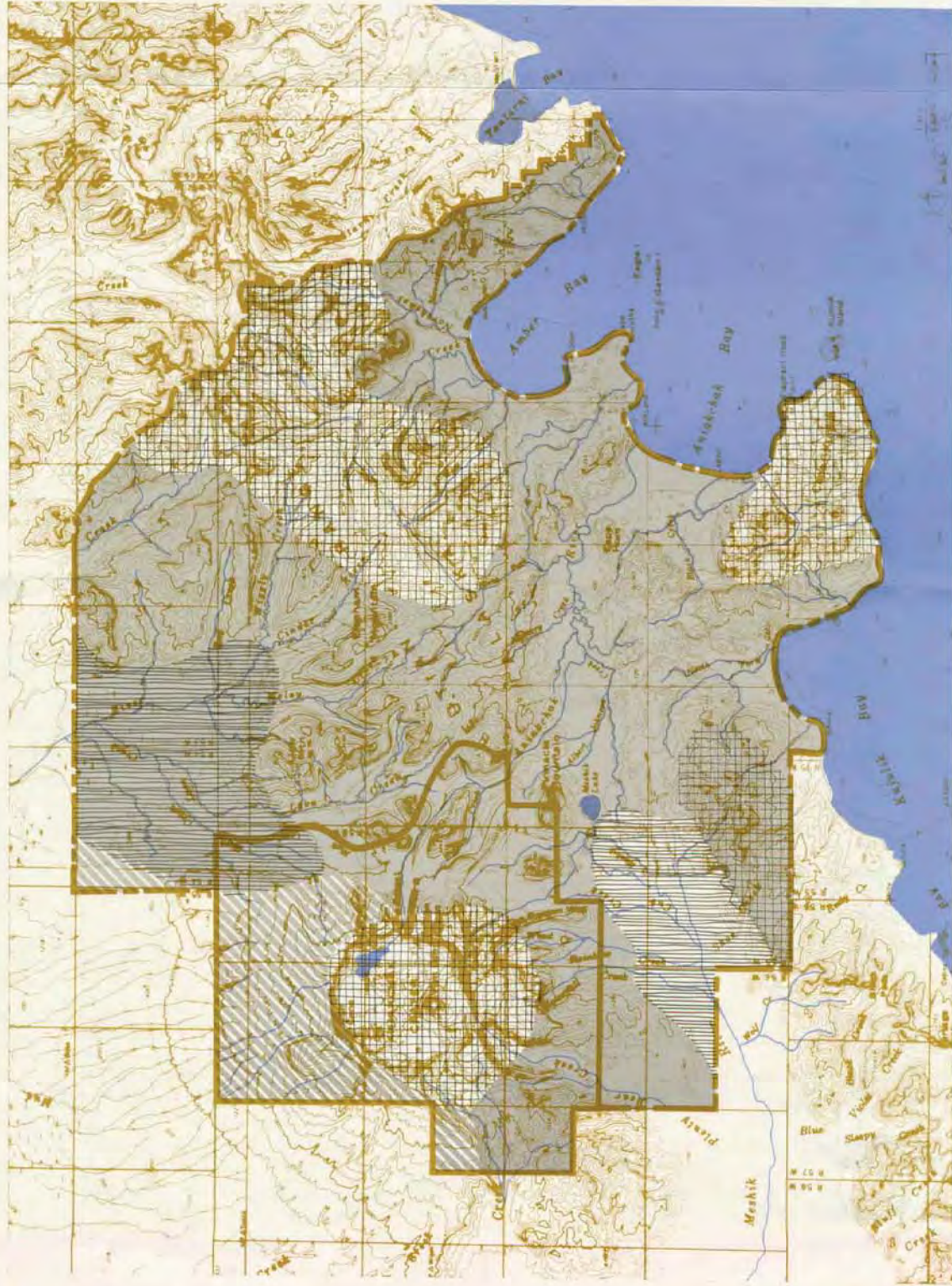
Summers are characterized by fog, drizzle, and protracted cloud cover on both coasts. Weather records for Port Heiden show a 45 to 60 percent frequency of fog and a 70 to 80 percent frequency of rain or drizzle during the summer. Cloud ceilings obscure the caldera rim for most of the summer, and even on days when it is possible to see the caldera from the air, turbulence and strong downdrafts can occur. Because of its topography and location, the caldera creates its own microclimate. As strong downdrafts form over the caldera rim, a phenomenon known as "cloud niagaras" frequently occurs, with clouds rapidly flowing over the rim and down onto the caldera floor. The interior of the caldera is subject to violent windstorms, even when the weather is relatively calm outside. Particularly strong winds may channel through the narrow "Gates," making entry by aircraft extremely hazardous.

Hydrology

Surprise Lake is nestled in the Aniakchak caldera on the north side. It is fed by several iron-soda springs issuing from northwest of the lake and by snowmelt from surrounding highlands. The lake is the major identifiable source of the Aniakchak River.

The Aniakchak River is the only major watercourse within the monument/preserve that drains eastward into the Pacific Ocean. Originating in Surprise Lake, it flows through the 2,000-foot Gates and runs approximately 31 miles to its mouth on Aniakchak Bay. The river is shallow, rocky, and has low falls as it drops 70 feet per mile for the first 13 miles. The remaining 18 miles of the river meander slowly through flatlands to Aniakchak Bay. Surprise Lake and the Aniakchak River form the primary passageway through which animal life finds its way from outside into the caldera.

Originating on the south slopes of the caldera is the Meshik River, which turns westward to flow into Bristol Bay. The river is fed by a number of short tributaries that drain the southern flanks of the caldera and northwest slopes of the Aleutian Range as well as Meshik Lake, a shallow, circular lake approximately 1 mile in diameter. The other major watercourse in the monument/preserve is the Cinder River, which originates in the mountains northeast of the caldera. The river enters the Bristol Bay lowlands at the footslopes of Aniakchak caldera outside the monument/preserve boundaries. Numerous short, fast-running streams originate on the southeast slopes of the Aleutian Range and drop rapidly toward the Pacific Ocean.



- RECENTLY DEPOSITED ASH
- POORLY FORMED SOILS
- ORGANIC PEAT SOILS
- VOLCANIC SOILS

SOURCE: SOIL CONSERVATION SERVICE 1979



TOPOGRAPHY AND SOILS
ANIAKCHAK
 NATIONAL MONUMENT AND PRESERVE
 UNITED STATES DEPARTMENT OF THE INTERIOR
 NATIONAL PARK SERVICE
 101 20026-A
 DSC MAR 86

ON MICROFILM

The 100- and 500-year floodplains have never been mapped for any of these rivers. Until more hydrological data become available, suspected floodplains must be assumed, taking into consideration identifiable high water marks, areas of obvious erosion potential, and narrow river sections where ice jamming could occur.

Air and Water Quality

The air quality of the monument/preserve remains virtually unaffected by human activity. Aniakchak is currently a class II airshed under the Clean Air Act. This classification allows some degradation of air quality from its existing condition.

The water quality in streams and lakes of the monument/preserve is also essentially unaffected by human activities and is considered to be good. Springs feeding into Surprise Lake are known to have high iron-soda content. Comprehensive data on streamflow, chemical quality, or suspended sediment are not available for Aniakchak.

Vegetation

Over the past several years an extensive program to map the vegetation of the Bristol Bay region using satellite data was commissioned by the BBCMP (1983).

Information obtained from this land cover mapping project has provided assistance in evaluating the vegetative communities within Aniakchak, but the extremely broad range of the classifications adopted for the regional study makes it inappropriate to adopt either the classification or the map for the small specific area represented by Aniakchak. Continued field inventory efforts within the monument/preserve will eventually produce information to better interpret regionwide Landsat data.

Vegetation at Aniakchak can be divided into three major types--tundra, shrubland, and strand (beach). Tundra, which generally dominates over vast stretches of the monument/preserve, can in turn be subdivided into three separate plant communities--wet, moist, and alpine tundra. Shrublands and strand (beach) communities have a more limited distribution in Aniakchak.

Each of the five general plant communities encompasses a wide variety of individual plant species. Small differences in elevation, exposure, drainage, slope, or substrate may result in marked vegetational differences over small distances, commonly resulting in interspersed and overlapping of plant community types.

The wet tundra community occurs on poorly drained organic soils on level terrain or open depressions. Standing water is generally present. The dominant plants are typically water-tolerant wildflowers or sedges rooted in a mat of sphagnum moss. Slightly drier peat mounds support dwarf

birch and heath shrubs such as crowberry and Labrador tea. Wet tundra primarily covers the broad flat lowlands of the Meshik and Cinder River drainages, with limited occurrence on Pacific Coast lowlands.

The moist tundra community occurs in areas of greater relief and better drainage than does wet tundra. It is found on level terraces, subalpine slopes, and coastal lowlands and is dominated by a plant mat of heath shrubs or grass-forb species. A kind of hummocky heath, generally 1 to 4 inches in relief, and most extensive on well-drained rocky soils is also found covering poorly drained peat mounds within the wet tundra habitat.

Terraces bordering the Aniakchak River commonly support this vegetation. Also found in moist tundra are bluejoint grass with various forbs; these are most extensive on well-drained subalpine slopes where they are often intermixed with tall shrub stands. Bluejoint/forb mixes also occur along coastal lowlands where drainage is moderate to poor.

The sparse, low vegetation of the alpine tundra community is found on exposed slopes and the summits of ridges and knolls near sea level, as well as at elevations above 1,000 feet in the Aleutian Range. Despite heavy rainfall, arid conditions may locally prevail due to strong drying winds and rapidly draining, poorly developed soils. Typical vegetation includes various dwarf forbs and heath shrubs such as aster, cinquefoil, mountain avens, bearberry, dwarf blueberry, and crowberry. Steep mountainous terrain and areas of recently deposited volcanic ash and cinder flows support some pioneering vegetation in protected areas and drainages, but are primarily barren.

Apparently devoid of vegetation after Aniakchak's eruption in 1931, the caldera and its flanks now display primary succession steps of revegetation on a barren volcanic landscape. Although much of the caldera floor remains unvegetated, plants have gained tentative inroads in favorable microenvironments. Pioneer plants such as mosses and lichens continue to spread and create more hospitable conditions for successive invasion by other floral associations. Plant cover is concentrated near moist areas around Surprise Lake, along the Aniakchak River, and on nearby low hills. Vegetation includes such species as lyme grass, sedges, and horsetail near the lake. Adjacent terrain is covered by mosses, lichens, lupine, dwarf fireweed, Kamchatka rhododendron, aster, mountain bluebell, and some dwarf willow. In these extreme environmental conditions, areas undergoing only ecological succession are quite fragile and sensitive to disturbance. Soil recovery and vegetation regeneration of affected areas is marginal and extremely slow.

The shrublands community covers moderately well-drained lowlands, slopes, and hilltops up to about 1,000 feet in elevation. Open stands of low willow are usually found lining streambanks and covering lowlands and gentle lower slopes. On rounded summits and progressively higher slopes, tall alder-willow becomes common and typically appears in a belt around mountainous areas, just below the alpine tundra. This coverage is most commonly a mosaic of shrub and grass-forb types.

In the strand (beach) community, very well drained coastal sand dunes support a vegetative cover of beach rye grass and forbs. A broad strip of this vegetation type stretches along the beach west of Kujulik Bay lagoon and occurs along other bay coastal strips as well.

Wildlife

Wildlife is varied and abundant in the Aniakchak area (see Wildlife Distribution map). Most human use of the area both past and present involves either sport or subsistence harvest of the area's wildlife resources. The monument/preserve includes habitat essential to the maintenance of a number of wildlife populations. These essential wildlife habitats have been designated as "critical" by the Alaska Department of Fish and Game in recognition of their particular significance as wildlife areas. Use of the state's term "critical habitat" should not be confused with that same term used elsewhere in conjunction with the federal Endangered Species Act.

Terrestrial Mammals. Within this century, moose have extended their range onto the Alaska Peninsula. Populations apparently peaked during the mid-1960s and have declined by one-third to one-half since that time. Brown bear predation as well as habitat changes are thought to be the most important causes of moose population declines on the peninsula. Although during the period of peak abundance when overuse of the available browse contributed to the decline in moose numbers, recent observations indicate that range quality is not currently a limiting factor. Consistently poor calf recruitment, primarily due to brown bear predation, seems to be the major factor limiting population expansion. Moose primarily range over the lower willow- and alder-lined slopes and valleys, with concentrations along the upper Meshik and Cinder River valleys and at the head of Amber Bay.

The Alaska Peninsula supports one of Alaska's major caribou herds. The peninsula herd is composed of three subherds. The largest, the Northern Alaska Peninsula herd, located between Naknek River and Port Moller, uses the monument/preserve and numbers about 19,000 animals. This herd ranges widely across most of the lowlands and follows general migratory routes in spring and fall. Calving normally occurs on the Bristol Bay lowlands, but within Aniakchak, calving is known to also occur south of Meshik Lake to the Aniakchak River drainage.

Brown bear move seasonally through many habitat types in the region. Within Aniakchak, spring bear concentrations occur along coastal grass flats at the heads of Aniakchak and Amber bays where they feed on newly emerging sedges. In late summer and early fall, concentrations shift to salmon-spawning streams. In the comparatively mild climate of the peninsula, the long period of food availability, and the abundance and quality of food, particularly salmon, are responsible for the large size and abundance of brown bear in Aniakchak. Areas of denning are usually located in alder, willow, or grassy areas on hillsides and mountain slopes. Denning within Aniakchak is known to occur on the slopes of the caldera and areas on the east side of the Aleutian Range.

Small numbers of wolves range throughout the region. Wolverines and lynx are also widespread but scarce. More common furbearers in the region include beaver, river otter, mink, short-tailed and least weasel, and red fox.

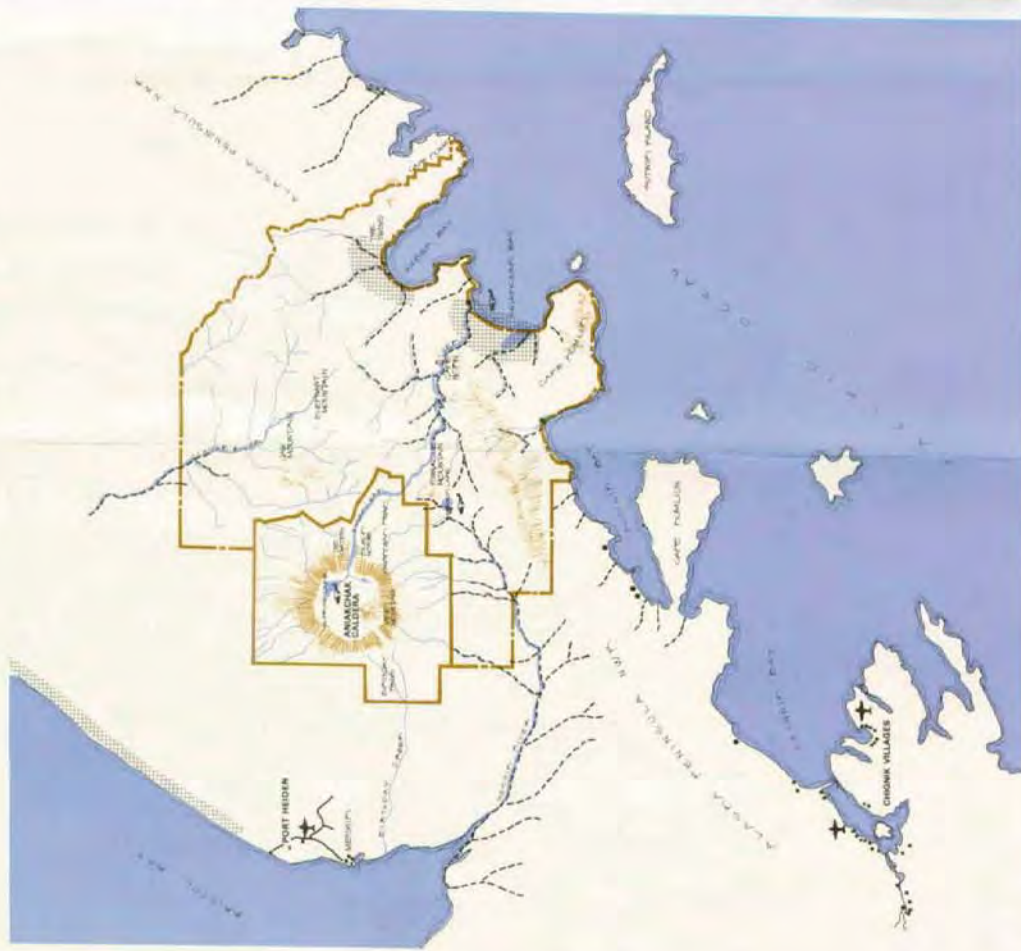
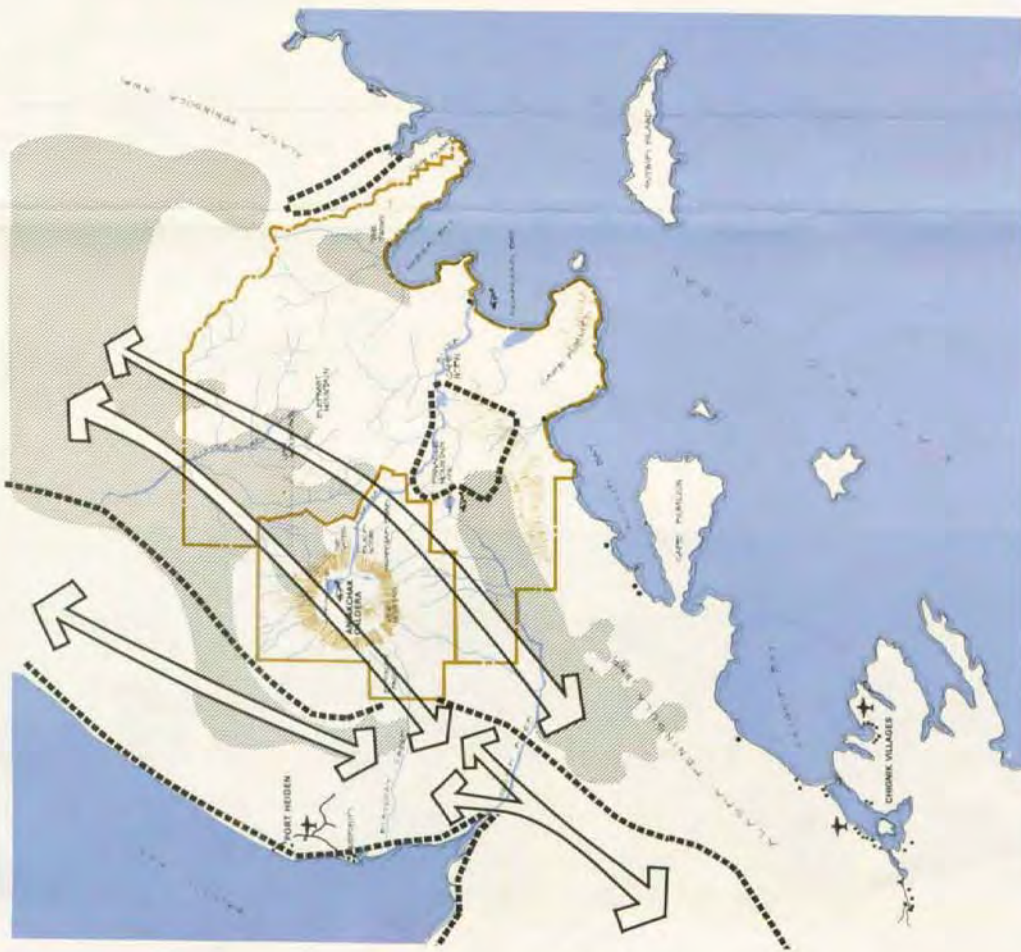
Marine Mammals. Sea otters, Dall porpoise, harbor porpoise, harbor seals, and northern sea lions inhabit coastal waters along the Pacific side of the Alaska Peninsula and probably occur along Aniakchak's coast throughout the year. A high/medium density sea otter area has been identified within the waters off the southern coast of Cape Kumlik. Harbor seals haul out in small groups along portions of Cape Kumlik, Cape Kunmik, and small islands off Aniakchak. Northern fur seals are probably near the coast in small numbers during most months of the year, with peaks in abundance when they are migrating southward in winter and northward in spring.

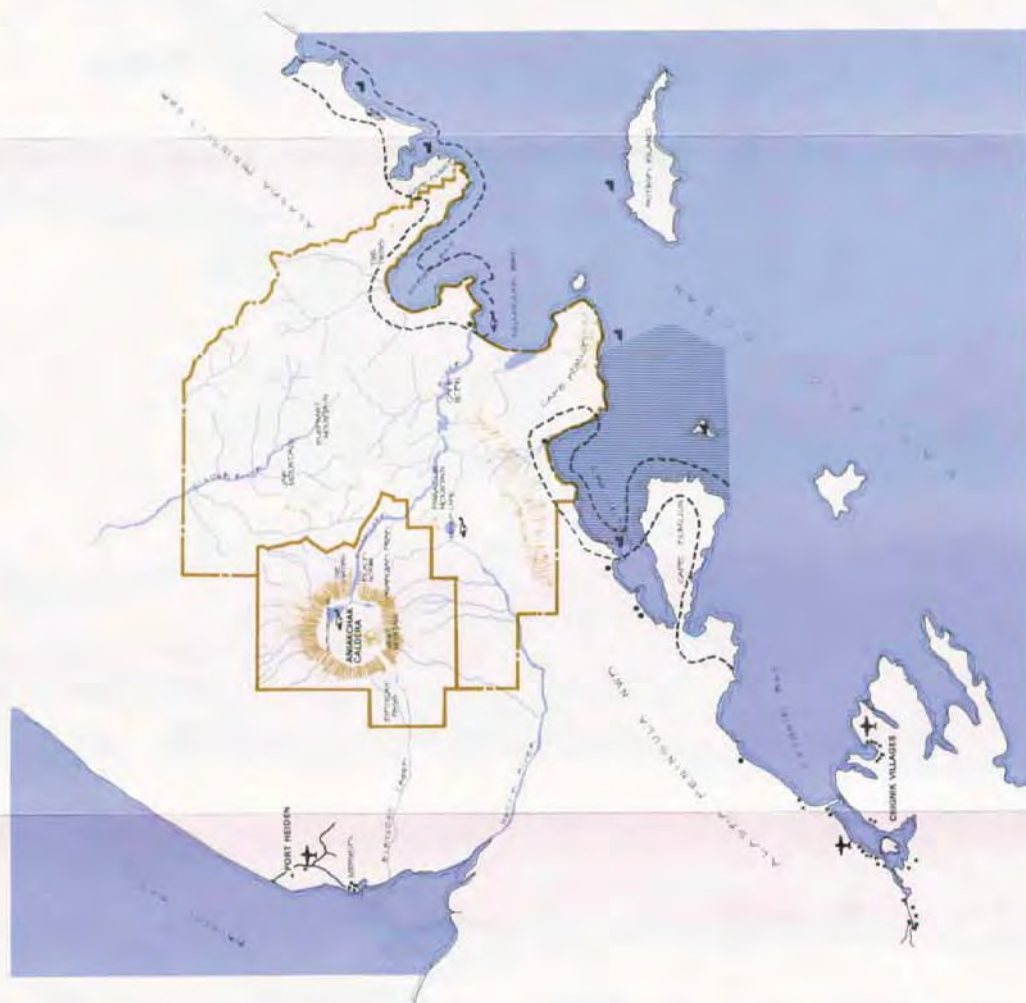
Generally speaking, eight species of whales occur in Alaska waters, some of which are endangered. Those species most frequently observed in coastal waters just outside the monument/preserve boundary are the humpback, gray, and fin whales. Sei, blue and Pacific right whales only occasionally occur near Aniakchak; sperm whales would be uncommon in these waters. The bowhead has not been reported in the Gulf of Alaska (National Marine Fisheries Service 1983).

Fish. The fresh and salt waters of the region support a number of valuable fish species that provide the basis for major commercial fisheries. Five species of salmon (sockeye, chum, pink, coho, and king) are harvested for commercial and subsistence use. The largest sockeye salmon run in the world occurs along the Bristol Bay coast of the Alaska Peninsula and into its lakes and rivers, primarily in June, July, and August.

On the Bristol Bay side on the peninsula, the Meshik and Cinder River systems support runs of sockeye, chum, coho, and king salmon. Other smaller streams support runs of sockeye and chum. On the Pacific side, sockeye salmon runs largely occur in the Chignik River system south of the preserve, although a small sockeye run exists in the Aniakchak River and its tributaries. In addition to sockeye salmon, the Aniakchak River system and other shorter Pacific side streams in the preserve provide spawning grounds for pink and chum salmon. Sockeye salmon are the only salmon species known to spawn in Surprise Lake. Streams on the Pacific side of the peninsula generally appear unsuitable for supporting king salmon, with the Chignik River system being a notable exception. The freshwater systems to which salmon return are obviously essential to the maintenance of salmon populations and the health of the fishery on which most area residents depend. The majority of the streams in the monument/preserve have been designated by the state as salmon critical habitat (see map).

Freshwater streams in the Aniakchak region also support Dolly Varden, arctic char, steelhead, and other freshwater species. Marine fish and shellfish that inhabit coastal waters off Aniakchak include halibut, cod,





RAPTORS AND MARINE MAMMALS

- SEA OTTER HIGH / MEDIUM DENSITY AREA
- HARBOR SEAL HALLCOT AREA
- RAPTOR MEETING / USE AREA

- MONUMENT BOUNDARY
- PRESERVE BOUNDARY
- COMMERCIAL AIRSTRIP
- AMPHIBIOUS AIRCRAFT LANDING
- VILLAGE BUILDINGS
- CABINS

SOURCE: ALASKA DEPARTMENT OF FISH AND GAME 1983



WILDLIFE DISTRIBUTION ANIAKCHAK

NATIONAL MONUMENT AND PRESERVE
 UNITED STATES DEPARTMENT OF THE INTERIOR
 BUREAU OF LAND MANAGEMENT

ON MICROFILM

herring, flounder, crab (dungeness, tanner, king), shrimp, and clams. Most of these species are seasonally harvested and are very important elements in the area's commercial and/or subsistence economy.

Birds. The Bristol Bay side of the Alaska Peninsula provides habitat for some locally breeding bird populations but more significantly for the vast numbers of waterfowl (ducks, geese, and swans) and shorebirds that breed north of Bristol Bay. Millions of waterfowl and shorebirds migrate through the area, including large populations of emperor geese, cackling Canada geese, and black brant. Nesting and feeding and spring and fall staging areas are generally associated with productive estuaries, lagoons, river deltas, and tidal flats where extensive tidal flats provide plentiful food and protective vegetation types are present. Some of these areas have been designated by the state as critical to the maintenance of waterfowl populations, including the Cinder River delta and Port Heiden Bay north and west of Aniakchak. Many shorebirds use this same habitat, although principally during fall migration. The monument/preserve itself does not contain habitat designated critical to the maintenance of these populations.

The rugged terrain and relatively deep inshore waters of the south side of the Alaska Peninsula are not as attractive to waterfowl and shorebird nesting and staging as the Bristol Bay side. In the fall the Pacific bays' rocky shores are probably important for black oystercatchers, rock sandpipers, surfbirds, and black turnstones. Bays along this side of the peninsula are also used extensively by Steller's, king, and common eiders as wintering areas. In addition to waterfowl and shorebirds the region supports millions of seabirds, primarily on the Bristol Bay side of the peninsula. There are no major seabird colonies along Aniakchak's Pacific coastline. Species observed along the coastline and sometimes inland include black-legged kittiwakes, pelagic and red-faced cormorants, glaucous-winged gulls, murres, pigeon guillemots, and horned puffins. Nearby offshore islands also provide protected nesting habitat for a relatively small number of breeding pairs.

Bald eagles can be commonly found nesting and feeding along rivers and the coastline of Aniakchak. They have also been observed within Aniakchak caldera and on the cliffs north of Meshik Lake. Other raptors of the region include rough-legged hawks, gyrfalcons, ospreys, short-eared owls, and peregrine falcons. Peregrine falcons are probably present in the Aniakchak area but are likely to be of the nonendangered Falco peregrinus peali subspecies.

Endangered and Threatened Species

It is unlikely that any animals listed under the federal Endangered Species Act as a candidate, threatened, or endangered species occur in the Aniakchak area. There has been no positive identification of the endangered subspecies of peregrine falcon (Falco peregrinus anatum) or the threatened subspecies F. p. tundrius within the monument/preserve. The endangered Aleutian Canada goose (Branta canadensis leucopareia)



- MONUMENT BOUNDARY
- - - PRESERVE BOUNDARY
- ✈ COMMERCIAL AIRSTRIP
- 🛥 AMPHIBIOUS AIRCRAFT LANDING (UNIMPROVED)
- 🏠 VILLAGE BUILDINGS
- CABINS
- FRESHWATER STREAMS AND LAKES

SOURCE: ALASKA DEPARTMENT OF FISH AND GAME 1983



0 20 40 MILES

SALMON CRITICAL HABITAT

ANIACHAK

NATIONAL MONUMENT AND PRESERVE
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

101 | 2002/04
2002/04/01

ON FILM

nests on Aleutian islands far to the west and possibly migrates through Aniakchak, but no data exist to substantiate this. None of the 29 plant taxa being considered for possible future listing pursuant to the Endangered Species Act have been recorded from the area (Fish and Wildlife Service 1984).

Scenic and Wilderness Resources

Although great natural beauty can be found throughout the monument and preserve, the scenic focus is the caldera, the Aniakchak River, and the rugged Pacific shoreline (see the "Introduction"). Spectacular in dimension and awesome in its record of volcanic power, Aniakchak caldera is far beyond the ordinary scenic experience of visitors from elsewhere in Alaska or the Lower 48. The Aniakchak River's origin within the caldera and its tumultuous first miles are dramatic visual counterpoints to the river's gentle flatland nature as it approaches the Pacific.

Though a technical determination of wilderness is not being made here, wilderness-like character is a reality in Aniakchak. Access to the interior is only by aircraft or arduous overland backpacking, or to the Pacific Coast by boats that must travel 50 miles or more through often difficult waters. Weather is a frequent and even life-threatening challenge to the unwary or unprepared; the need for self-reliance and self-sufficiency in both normal and emergency situations is extremely high.

CULTURAL RESOURCES

Archeology and Prehistory

Today, as apparently in the past, the Alaska Peninsula is a sparsely settled region. Geographic isolation and a harsh climate have limited formal scientific study; the scattered nature of early human occupation has meant few archeological sites are known and even fewer have been well analyzed. This is particularly true in the central portion of the peninsula near Aniakchak; most survey work has been done farther north in the Katmai region, on Kodiak Island, or at the southern tip of the peninsula and southward in the Aleutians.

Although it is well accepted that the native peoples of the Aleutian Islands and Alaska Peninsula ultimately originate from forebearers in Siberian Asia, it is still uncertain as to the time and circumstances of arrival of the earliest groups.

Generally up until European contact the Aleutian Islands and the extreme western tip of the Alaska Peninsula were occupied by Aleut people; the central and eastern Peninsula contained Eskimo groups. The earliest physical evidence for occupation is about 8,000 years ago* for the Aleutian Islands and 9,000 years ago for the peninsula, but despite the similarity in dates it is probable that the Aleutian Islands and peninsula groups were not similar at that time.

More recent sites in the Aleutians are archeologically very distinct from the contemporary Eskimo sites on the northern peninsula. The modern Aleut language is also now very distinct from the southern Yupik spoken by peninsular Eskimo peoples. Although the two languages are related, it is estimated that divergence from a common ancestral language took place some 3,000 to 4,000 years ago.

The Eskimo component on the peninsula is derived from two major archeological traditions: a southern group of people who occupied the Pacific coast of the peninsula as well as Kodiak Island and eastward into the Kenai Peninsula area; and a northern-originating assemblage that occupied the Bering Sea Coast from the Bering Straits to the Alaska Peninsula. For several thousand years these two cultures coexisted on the peninsula yet remained distinct, with the boundary between them being the rugged Aleutian Range, mountainous backbone of the Alaska Peninsula. It was not until about A.D. 1000 that this boundary was fully breached and a convergence of the northern and southern cultural spheres took place. Although not obvious from archeological evidence, it is likely that the Eskimo language of the resultant convergent culture was derived from the northern component.

Though the Aleut and southern Yupik (Eskimo) languages are very distinct, and the geographic boundary between the two at the time of European contact can be drawn fairly clearly, there does not appear to have been such a clear line between the two based on their material cultures.** In fact, it is the Aniakchak area--although no evidence has been discovered in the monument/preserve itself--which appears to be a zone of gradual transition from Aleut to Eskimo culture. An important site at Port Moller (southwest of Aniakchak) is apparently transitional in

*This 8,000-year figure is far more recent than the 15,000 to 13,000 years commonly believed to be the most recent period when Alaska was connected to Siberia via the Bering Land Bridge. This suggests that the peninsula and the Aleutians were originally populated by proto-Eskimos (Eskaleutians) moving southward from their logical point of entry nearer the Yukon Delta or Seward Peninsula. However, some European and Russian archeologists maintain that the Aleut ancestors might have come by sea directly to the Aleutians even after the land bridge no longer existed.

**A confusion in terminology exists between native people who consider themselves Aleuts and Eskimos. The Russians, who occupied the Aleutians as well as the peninsula, failed to distinguish between Aleut speakers and southern Yupik (Eskimo) speakers and thus gave the generic (and foreign) name Aleut to both groups. Therefore, several generations of southern Yupik speaking people such as those in the Chigniks and Meshik have considered themselves Aleut even though their language and cultural heritage is quite distinct from the native peoples of the Aleutians.

terms of physical artifacts, suggesting that trade and contact between Aleut and Eskimo peoples along the juncture between the two groups resulted at least in a sharing of skills in tool-making and lifestyles, although not necessarily in language. Certainly both groups had a primary orientation toward coastal resource use and a secondary, but critical, dependence on terrestrial wildlife and berries. This tradition continues today.

Another indication of the transitional character of the Aniakchak region between Eskimo and Aleut is the archeological evidence that the Chignik area was peopled by Aleuts (i.e., people whose artifacts are clearly related to the Aleutian Island tradition) as late as A.D. 1000. Yet, by A.D. 1800 (European contact), the Chignik area was linguistically Eskimo, suggesting that up to the recent past the Eskimo culture was expanding southward down the peninsula.

Thus, the ancient history of the central Alaska Peninsula around Aniakchak involves the point of contact between at least two major groups. These groups, though archeologically quite distinct at the two ends of their territory (i.e., in the Aleutians for the Aleuts and the upper peninsula for the Eskimos) and linguistically distinct even into modern times, appear to have been transitional in material culture, reflecting similar lifestyles and relatively frequent contact. (Note: The principal references for this section were Dumond, n.d. and Dumond, Cotton, and Shields 1975.)

Eighteenth Century and Modern History

As elsewhere in Alaska, great changes began to occur on the peninsula soon after the Russians first began exploiting the Pacific Coast after Vitus Bering's initial voyage of discovery in 1741. The fur trade, focused at first on sea otter, was the driving force.

Until the 1780s, the Russian fur trade along the peninsula was based on independent traders and hunters sailing from Siberia's Kamchatka Peninsula. They roamed the Alaska Peninsula hunting, or forcing local natives to hunt. In 1783 the first permanent fur-trading company on the peninsula, a private operation called Shelikov-Golikov, was established on Kodiak Island. This corporation, later known as the Russian-American Company, exerted a tremendous influence over native life in villages throughout the Pacific coast of the peninsula far into the 19th century until Russia's sale of Alaska to the United States.

Despite movement of the colonial administrative center from Kodiak to Sitka in 1805, Kodiak's influence on the Pacific side of the mainland peninsula continued, both as the regional trading center and as the supporting center for the other major agent of change, the Russian Orthodox Church.

Specific details of Russian impact on Pacific coast villages in the Aniakchak area are not known for the early period. Permanent Russian

settlement on the mainland peninsula was apparently resisted with some hostility, at least until a strong presence was established on Kodiak. Undoubtedly both missionaries and fur traders traveled throughout Aniakchak's Pacific Coast, bringing Christianity as well as the gradual introduction of a commercial sector to the local economy, whereby locally harvested furs were exchanged for trade goods. Though probably not directly influenced in the earliest years of Russian trading, the Chignik-Aniakchak coast villages show some definite signs of Russian ancestral heritage, suggesting permanent residence and integration of Russian traders at some point.

In the latter half of the 19th century, Russia experienced difficulty in maintaining its position in the eastern Pacific and eventually sold its Alaskan interests outright to the United States in 1867. The strong government-monopolized trading firm approach of the Russians was replaced by independent competitive U.S. merchants. The result was not only an accelerated decline of the major furbearers,* but also a decline in social intermixing and integration between traders and natives. Competing economic attractions outside the peninsula (e.g., sealing in the Pribilof Islands, gold discovery in interior Alaska) began to provide stimulus for local residents to move away, or seasonally spend time away from their traditional villages; a cash economy began to replace what had become the traditional fur-based trading economy.

Following the decline of fur trading, the U.S. contribution to local socioeconomic change was in development of salmon and later crabbing fisheries and associated canneries. Though concentrated at first in southeastern Alaska (Sitka) or north in Bristol Bay, smaller operations began as early as 1890 in the Chigniks. Even though experiencing various up and down cycles, these cannery operations have persisted for the past 90 years, and are today the economic mainstay of Pacific coast villages. Because of a poor harbor situation, the Bristol Bay village of Meshik on Port Heiden has not become a cannery site, although many residents there have traditionally fished. Initially based on a fish-trapping technique involving nets on fixed poles at the mouths of spawning streams, the salmon fishery later shifted in Bristol Bay to the drift gill net (a floating net deployed from small boats). On the Pacific side in deeper waters the shift was to purse seines, which has led to present-day fleets of wide-ranging seining boats able to exploit fish populations far from shore.

*Although there is some evidence that the Russian American Company tried to maintain the fur trade by limiting hunting to sustained yields, the end result was severe scarcity even before 1867. The unorganized, competitive nature of the American independent traders left little opportunity for moderation in hunting. General conservation practices only came into effect after the U.S. Fish and Wildlife Service assumed control over sealing in 1910.

Though canneries dominated the Chigniks economically, native village people did not participate very actively. Instead, much of the cannery labor was imported, and the resulting seasonal influx of Chinese, Mongolians, Hawaiians, Filipinos, and others has brought considerable cultural diversity to Chignik villages. Some newcomers stayed, married local native women and, as a result, descendants of many nationalities are living in the Chignik villages today.

During the 1900-1930 period, while the canneries were expanding with imported labor, native lifestyles centered more on the limited fur trapping that was still available in the bays and lower drainages around Aniakchak. For a number of local families, fox farming supplemented a subsistence lifestyle, with small islands off the Chigniks and Aniakchak being used as unfenced farms where a few transplanted foxes were allowed to multiply and then trapped out. Trapping in winter and fishing in summer, either privately for subsistence or as a paid crew member, became and has continued to be a successful seasonal mix for many native Pacific Coast villagers.

By the 1940s, the small animal fur industry had essentially collapsed in this area, and many families that had previously led a very mobile lifestyle with only a few extended periods of residence in the villages began a more permanent residential pattern. Schools became common in the villages, and since the schools operated in the winter, this was a strong stimulus to establish permanent residence. Government assistance programs and seasonal employment with the fishing industry provided the necessary cash to exist within the cash economy, but subsistence activity to supplement cash purchases continued, as it does today.

The rugged Aleutian Range continued to exert a de facto separation between the events of the Pacific Coast and the Bering Sea side. On the Bristol Bay side, there was far less influence on the fur-trading industry simply because the marine furbearers did not occur there in large numbers. Historically, few villages existed on the Bristol Bay side of the lower and central peninsula at the time of first European exploration. In fact, Meshik village on Port Heiden appears to have been the westernmost Eskimo settlement on this side of the peninsula, with a large uninhabited gap extending farther west until the easternmost Aleut settlements are encountered.

The name Port Heiden was adopted when the village was incorporated, although there still remains a local distinction between the traditional Meshik village development and the newer developments associated with the Port Heiden airfield. Port Heiden evolved in several phases. By the late 19th century it was an active participant in the Bristol Bay cod fishery. This activity attracted a number of Scandinavian immigrants, whose surnames still appear in modern families. But much of the modern population is derived from persons relocated to Port Heiden from other settlements (like Unangashak) that had suffered great losses in the influenza epidemics of the early 1900s.

Social influences on Port Heiden in historic times have derived mostly from other communities of the Bristol Bay region such as Naknek and farther north to Dillingham.

Though lacking its own cannery, salmon fishing has been an important element in Meshik's economic history, with the catch going to Egegik for canning or, in recent times, fresh frozen locally and sent out by air. As in the Chigniks, a pattern of trapping in winter (for land animals rather than marine species) and fishing in the summer became common for native people.

In the 1940s, an important airfield was established on Port Heiden a few miles east of Meshik village. This provided a service and refueling stop for aircraft supporting various military bases farther out on the Aleutians. Though considerable temporary development accompanied the airfield, most was abandoned following World War II. The 6,200-foot gravel strip has been maintained and is the best such field in the lower third of the peninsula.

(Note: The major reference for this section was Tuten 1977.)

Archeological and Historic Sites and Structures

The National Register of Historic Places does not list any historic sites within Aniakchak National Monument and Preserve. However, a variety of sites have been identified for further study and evaluation for their national, regional, or local significance.

No prehistoric archeological sites are known within the monument/preserve, but such sites have been found in the Chignik drainage 40 to 60 miles to the southwest. The potential for future discoveries around Aniakchak at elevations below 1,000 feet is rated by the National Park Service as moderate to high. Obviously, many sites may have been buried by volcanic activity.

The 1976 Alaska Heritage Resource Survey did list three sites that are relatively recent--the Eskimo village of Kuiukuk (year 1880) and an old Russian fur-trading station (year 1790), both on Sutwik Island; and the Eskimo village of Aniakchak, somewhere on the Aniakchak coast.

Two additional reported historic sites of potential significance are the ruins of an unsuccessful razor clam cannery operated about 1932-35 on Aniakchak Lagoon, and the fish trap and Alaska Packers Association bunkhouse site at the mouth of the Aniakchak River. The latter operation began in 1917 and apparently was used seasonally until the 1940s. A native family living on Kumlik Island ran a tender between the traps and the cannery at Chignik, remaining in the Aniakchak area to trap small furbearers during the winter months.

These and other known historic cabin sites are shown on the Cultural Resources map.



MONUMENT BOUNDARY

PRESERVE BOUNDARY

COMMERCIAL AIRSTRIP

AMPHIBIOUS AIRCRAFT LANDING (UNIMPROVED)

VILLAGE BUILDINGS

CABINS

SITES LISTED BY ALASKA HISTORIC RESOURCE SURVEY (LOCATIONS APPROXIMATE)

- 1 KULIKUK ESKIMO VILLAGE
- 2 RUSSIAN TRADING STATION
- 3 ANIAKCHAK ESKIMO VILLAGE

OTHER HISTORIC OR CULTURAL SITES

- 1 ALASKA PACKERS BUNKHOUSE
- 2 CLAM CANNERY
- 3 POTENTIAL ARCHEOLOGICAL SITES BELOW 1,000 FEET ELEVATION
- 4 WWII AIRFIELD



0 100 200 YARDS

CULTURAL RESOURCES

ANIAKCHAK

NATIONAL MONUMENT AND PRESERVE
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

181 1 200000
1000 OCT 80

ON MICROFILM

SOCIOECONOMIC ENVIRONMENT

Regional Land Use, Economy, and Future Development

In a socioeconomic sense, the Alaska Peninsula is usually considered part of the Bristol Bay region. An extensive study of that region has resulted in two areawide plans: one dealing with state lands (Bristol Bay Area Plan, State of Alaska 1984), and the other concerning federal lands (Bristol Bay Regional Plan, Fish and Wildlife Service 1985).

These two recent Bristol Bay plans provide extensive regional data on land use, population, and future development and are excellent references to understanding the regional context for the monument/preserve. Since Kodiak Island (a separate borough) was excluded by the Bristol Bay Area Plan for State Lands, it does not treat economic and social ties between Kodiak and the Chignik villages. The region has also been arbitrarily defined to exclude both Aniakchak National Monument and Preserve and Katmai National Park and Preserve, but much of the data presented includes these two federally managed areas, which are important and integrated elements within the region.

Regional land status, use, and village location are shown on the Adjacent Land Status and External Influences map in the "Land Protection Plan."

Though widely distributed, the population of the Bristol Bay region is relatively small (in 1980, 38 communities totaling 7,815 persons); the population of Kodiak Island Borough was 9,939 in 1980. From 1970 to 1980 both areas have shown a tendency for population to shift from the smaller villages to the larger towns (Dillingham in Bristol Bay, Kodiak on Kodiak Island), which are becoming regional centers in the sense of transportation and economy. The dominant ethnic background is native (Aleut, Yupik Eskimo, and Indian), although there are many Caucasians in the regional centers and in certain smaller villages where they are involved in the commercial fishing industry.

The traditional economic base and subsistence lifestyle orientation of regional residents has been towards the resources of land and sea. Despite many changes and pressures in the historical past, this orientation persists, modified by external influences and channeled into sectors of the regional economy that seem suited to the tradition. The fishing industry is the region's largest employment source; it is highly seasonal and attracts many transient workers from elsewhere in Alaska and especially the Pacific Northwest states of Washington and Oregon. The permanent residents of the smaller villages have a very substantial reliance on subsistence activities to supplement their seasonal cash income, whereas in the regional centers a more diversified economy provides at least a part of the population with year-round cash employment.

In the Bristol Bay region, the commercial fishing industry (1979) provides about 47 percent of the employment base, government provides 33 percent, and support services provide 19 percent. More than one-third

of the world's entire annual sockeye salmon harvest comes from Bristol Bay and the south shore of the peninsula, with a value sold from the vessel (i.e., before processing) in excess of \$100 million.

For individuals actually owning and operating fishing vessels, a large capital investment is involved: several hundred thousand dollars may be invested in a seining vessel and nets for a Chignik family, but much less for a Port Heiden fisherman and his smaller drift gill net vessel. Such high investment in a seasonal industry leads to extremely intense activity for short periods (summer for salmon, fall and winter for crab) and long winter periods of quieter equipment maintenance or alternative economic activities. For individuals working as crew members or in processing plants, the intense summer activity is similar, and for many families the entire yearly cash income is earned in a short two-month period. Boat owners have the highest household income, which is needed to support the capital investment of their industry. Chignik Bay village, with its large proportion of boat owners, and an extended season that shifts from salmon to crab, has the highest household income (over \$45,000 in 1980). The lowest household income in the immediate area is in Port Heiden (about \$5,000). King Salmon, with its combination of boat owners and year-round employment in state and federal jobs has an average household income of over \$55,000.

Future development in the region, as foreseen by the Bristol Bay Area Plan, would concentrate on continued managed harvest of fish and wildlife resources both for commercial and subsistence purposes. Even if there should be major discovery and development of oil, gas, or hard-rock mineral resources, it is anticipated that the basic regional dependence on commercial fishing would continue. Whether village populations would continue to decline in favor of regional center growth is speculative.

The potential for finding commercially extractable quantities of oil and gas in some parts of the region (i.e., the Bristol Bay side) is rated low to moderate. Should discoveries be made, a considerable amount of associated development would likely occur, although this would take place gradually over a period of years. In addition to physical aspects of the drilling operations (which would differ significantly if the reserves were under tidal or submerged lands or on onshore lands), there would likely develop a support infrastructure for industry employees, including expanded housing and social services in some nearby villages. Transportation of the extracted product might well necessitate some sort of pipeline across the peninsula to a potential deep-water port on the Pacific side, the location of that pipeline and port being dependent on the actual location of the discovered reserves.

Discovery and extraction would undoubtedly bring economic change to some sectors of the regional population. Specific villages might see substantial change if development happened to occur in or near them. The Bristol Bay study addresses the long-term dependence of the region's residents on healthy renewable natural resources. The preferred oil and gas development alternative in the Bristol Bay Area Plan would encourage leasing and development to avoid environmentally sensitive lands in accordance with guidelines that would minimize impacts on wildlife.

Some future expansion of existing settlements on the peninsula is foreseen in response to local requirements, with land needs to be met from state, municipal, or native corporation holdings. Development of new settlements on remote lands is a possibility, with lands provided by the state (Department of Natural Resources) or federal government (Bureau of Land Management). However, no new remote area settlement near Aniakchak is imminent, nor is any proposed in the preferred alternative of the Bristol Bay Area Plan.

One potential land exchange involving state lands in the northeastern corner of Aniakchak is a part of the Bristol Bay Area Plan's preferred alternative (see the "Land Protection Plan").

Transportation and Access

There are no existing roads, railroads, or landing strips (other than unimproved ash field and gravel bar strips) within Aniakchak nor are there any known summer trails. Travel by foot is possible throughout Aniakchak except for areas of tussocky tundra and willow and the steeper snow-covered mountain peaks.

During the summer, access for recreation, subsistence, and research is generally by riverboat or aircraft (subsistence use of aircraft is limited to the preserve). Most use is believed to occur along the coast via riverboat and/or foot. Riverboats also provide access to some coastal rivers depending on water levels.

Aircraft can land on the ash fields near the river or on lakes for subsistence (in the preserve only), research, recreation, and access to private lands. Helicopters are generally not allowed except by permit from the superintendent.

During winter after freeze-up and sufficient snow cover, travel within Aniakchak is by snowmachine and aircraft.

A potential trans-peninsula transportation and pipeline corridor from Port Heiden to Kujulik Bay, immediately south of Aniakchak, has been identified in the Bristol Bay Area Plan. An alternate route might travel through the preserve to Kujulik Bay or Aniakchak Bay.

Similar to many remote Alaska areas that lack road connections, transportation and access among the villages around Aniakchak can be costly and difficult. Bulky supplies and fuel must arrive by barge, having been anticipated and ordered well in advance. The deep-water approaches to Chignik Bay and Lagoon allow fairly easy (monthly) barge service to these locations whereas lack of a port and shallow approaches limit larger boat access to Port Heiden. Travel by residents to outside the immediate area is by ferry, by boat incidental to fishing operations, or by aircraft. Reeve-Air Aleutian links Anchorage, King Salmon, and Port Heiden with large prop-jet aircraft, taking advantage of the 6,200-foot gravel runway. Small single-engine and twin-engine,

nonscheduled, wheeled aircraft offer daily charter or "seat-fare" service between King Salmon, Pilot Point, Port Heiden, and the Chigniks. Seat-fare service from Kodiak to the Chigniks operates seasonally. Charters on floats or with Goose and Widgeon amphibious aircraft are available from King Salmon. Charter costs (1985) are high (but similar to other Alaskan areas): \$200 to \$450 per hour for a 5-passenger floatplane or 10-passenger Goose, respectively. Aniakchak caldera is about 1½ hours' flying time from King Salmon, less than one-half hour from Port Heiden. King Salmon is served daily from Anchorage by jet.

Weather conditions frequently affect air transportation and access. At any time of the year, low clouds or fog can close these small runways, and adequate ground instrumentation is not available for low visibility landings.

See also table 1, appendix F, and "External Conditions Affecting Land Protection" section. The discussions under "Public Use Patterns," which follows, addresses areas used for subsistence and recreational activities.

Local Village Populations and Lifestyles

Six villages--Chignik Bay, Chignik Lake, Chignik Lagoon, Port Heiden (Meshik), Pilot Point, and Ugashik--lie within 15 to 40 miles of the monument/preserve. Residents of these villages have long used parts of Aniakchak for subsistence purposes. A summary of village population statistics is given in table 4.

The Chigniks. These three villages interact to form a distinct subgroup within the Bristol Bay region. The commercial focus among the Chigniks is on purse seining for salmon, and later crab fishing, and processing the product within the communities of Chignik Bay and Chignik Lagoon. Strong economic ties connect the Chigniks to Kodiak, despite the fact that all three villages are technically within the Bristol Bay Regional Corporation area.

Over 100 local boats participate in the salmon fishery in the Chigniks from May through September, with most of the catch being brought back either to the Sea Alaska (formerly Alaska Packers Association) cannery at Chignik Bay, or to floating processors. Some salmon for freezing is delivered to Kodiak. Some 30 local boats also participate in the fishery for herring and herring roe in June and July. Crabbing (king, tanner, and dungeness) is also important, with much of this activity taking place in fall and winter after the salmon runs. This provides boat owner/operators and crew a longer period of cash-based employment than if it were only a local salmon run being exploited. Summer, however, is the most intensely active time, with some 600 to 700 outside laborers moving into Chignik Bay and Lagoon for cannery work and hundreds more seasonally employed at Columbia Ward. In the summer much of the population of Chignik Lake leave their permanent homes to move into the fish camp at the Columbia Ward cannery opposite the village of Chignik

Table 4: Population Statistics of Villages Near Aniakchak

| Village | Permanent Population | | | Avg. Annual Growth Rate (%) 1970-80 | Population vs. Households 1980 | Ethnicity % Native | | Avg. Household Income 1980 | Limited Entry Fish Net Permit 1980 | | |
|----------------|----------------------|------|------|--|--------------------------------------|-----------------------|--------|----------------------------------|--|----------|-----|
| | 1980 | 1970 | 1960 | | | Earlier (year) | 1980 | | | 1970 | |
| Chignik Bay | 178 | 83 | 99 | 253 (1950) 224 (1939) 193 (1890) | 7.9 | 3.0 | 178/47 | 53.4 | 80.7 | \$46,726 | 9+ |
| Chignik Lake | 138 | 117 | 107 | Estab. 1950s | 1.7 | 1.3 | 138/38 | 90.6 | 98.3 | \$14,678 | 9+ |
| Chignik Lagoon | 48 | NA | 108 | NA | NA | -4.1 | 48/14 | 85.4 | NA | \$12,379 | 11+ |
| Port Heiden | 92 | 66 | 74 | 51 (1930) 30 (1920) 75 (1890) 40 (1880) | 3.4 | 1.1 | 92/29 | 66.3 | 87.9 | \$ 4,973 | 30* |
| Pilot Point | 66 | 68 | 61 | | -0.3 | 0.4 | 66/16 | 86.4 | 85.3 | \$11,283 | 34* |
| Ugashik | 13 | NA | 36 | | NA | -5.2 | 13/8 | NA | NA | NA | 8* |

*Drift or set gill net

+Purse seine

Lagoon. Recent closure (1983-84) of the formerly lucrative king crab fishery all along the Pacific and Bristol Bay coasts may have serious consequences on some fishing operations in the Chigniks.

Chignik Bay is in the process of being incorporated as a second-class city; the other two are currently unincorporated. Each is represented by traditional councils recognized by the Bureau of Indian Affairs. Unless or until the communities incorporate, title to townsite lands cannot be obtained. However, each respective native village corporation has already received interim conveyance (working title) to much of its share of selected lands near the village. Title to the subsurface estate on those lands, as provided by ANCSA, is held by the Bristol Bay Regional Corporation. None of these interimly conveyed lands lie within the monument or preserve.

Many Chignik residents are still very involved in and dependent on hunting, fishing, trapping, and berry picking to supplement purchased foods. Marine and freshwater fish and invertebrates are taken throughout the year both locally and at some distance from the villages. Moose, caribou, ptarmigan, ducks, and geese are also taken in season. Berry picking (blueberry, cranberry, mossberry, and salmonberry) is important in the fall. A portion of this subsistence activity takes place along the coast and lower drainages of Aniakchak (described in more detail later in the section on public use patterns).

Bristol Bay Villages. These three bayside villages--Port Heiden, Pilot Point, and Ugashik (as well as a fourth, Egegik to the north)--form an interacting subdivision just as the Chigniks do on the Pacific side. The strongest economic ties between these villages and larger population centers are with Naknek and King Salmon. Social and family ties exist between Port Heiden and the Chigniks.

Commercial activity in these villages focuses on drift and set gill netting for salmon runs in the mouths of rivers near the villages (as contrasted with purse seining on the Pacific side). As elsewhere, entry into the fishery is limited to permit holders, and since only a fixed number of permits exist, there is a limit to expansion of the fishery. Permits may be bought and sold. Boat size (32 feet) is also limited. Most salmon caught in this fishery are delivered for canning principally to small-scale facilities in Ugashik and Egegik. Substantial amounts go out as fresh-frozen fish through operators in Pilot Point and Port Heiden.

These Bristol Bay communities have a greater seasonal dependence on short-lived salmon runs than the Pacific villages because there is less opportunity to progress to exploitable winter or fall fisheries. Recent years have been particularly productive, however, and the dollar value of the permits as well as profits have risen accordingly. Port Heiden has only a small natural harbor that is now silted in so as to be unusable except for shallow-draft vessels. No docks are publicly maintained at Pilot Point.

Port Heiden has been incorporated since 1972 and has an elected city council; the city provides utility services to residents. A major effort is underway to relocate many of the buildings and families from historic Meshik townsite to a less-confining site nearer the airport. The original site is crowded between a small lake and the eroding seacoast.

Both Pilot Point and Ugashik are unincorporated but have recognized traditional councils representing their inhabitants. Both have active native village corporations that have selected and received interim conveyance of title to nearly all lands to which they are entitled. None of these lands are within Aniakchak National Monument and Preserve. Ugashik is too small to qualify for state revenue sharing funds, although Pilot Point does. The 3,500-foot runway at Pilot Point experiences much small plane use. A new strip at Ugashik has recently been completed.

The highly seasonal nature of the cash-producing salmon fishery on the Bristol Bay side leads to a strong dependence on subsistence activity by residents of these three villages. Besides salmon retained from commercial activities, Port Heiden villagers use caribou, moose, waterfowl, shellfish, and berries. Similar use is made by people from Pilot Point and Ugashik, who reportedly also use ptarmigan, bear, and a wider variety of berries. Some subsistence activity from these three villages does take place within Aniakchak's boundaries.

Public Use Patterns

Subsistence Use. As indicated earlier, residents of nearby villages continue to depend in varying degrees on subsistence activities, including hunting, fishing, trapping, berry picking, and collecting other plant products. The actual number of animals taken and the specific areas from which they are taken vary from year to year. To village residents, subsistence activity is an integral part of existence regardless of his or her ability to substitute cash-purchased food and clothing. Therefore, to village residents around Aniakchak, it is essential that lands traditionally used for subsistence, although not necessarily used every year, continue to be available for such use.

ANILCA, in its establishment of Aniakchak and elsewhere (section 201(1) and title VIII), makes clear that the opportunity for continued subsistence use is guaranteed in both the monument (where traditional) and preserve. The state of Alaska is given the responsibility to monitor and regulate subsistence harvest; in Aniakchak, subsistence hunting is currently undertaken under the same seasonal closures and bag limits as sport hunting.

Sport hunting is not allowed in the monument, but may be allowed under state regulations within the preserve subject to the broad provision that where there is conflict with subsistence use, the latter will be given priority. Sportfishing is permitted in both the monument and the preserve under state regulations.

To the extent specific information exists, areas used for subsistence by the villages nearest Aniakchak are shown on the Subsistence and Sport Harvest map and described below. The indicated ranges primarily reflect broad areas where caribou and moose hunting occurs; other uses (e.g., waterfowl harvesting) would have a much more limited distribution inside the same general areas.

Subsistence users from the Chignik villages are active primarily on the southern slopes of the Aleutian Range down into the Pacific coastal lowlands and bays. There is some distinction between the three Chigniks: Chignik Lake residents apparently limit themselves to the taking of caribou and moose in this general area; Chignik Bay and Chignik Lagoon users engage in a wider variety of activities in Aniakchak, including taking caribou and moose in the lowlands, gathering marine invertebrates along the coast of Aniakchak Bay, and harvesting waterfowl along the northern coast of Kujulik Bay. Some trapping is done along the coast of Aniakchak Bay, with Chignik Lagoon residents also trapping along Black Creek, the lower Aniakchak River, and the north coast of Kujulik Bay. Chignik Bay and Chignik Lagoon residents also harvest marine mammals throughout Aniakchak, Amber, and Kujulik bays.

Subsistence users from west of the monument in Port Heiden take caribou and moose from the monument (including the caldera at times) and southwestern parts of the preserve west of the Aleutian Range. Moose are taken along the Meshik drainage, including the upper tributaries west of Meshik Lake in the preserve.

Subsistence users from Pilot Point and Ugashik take caribou and moose along the northern boundaries of both the monument and preserve. Trapping occurs along the Pumice Creek drainage; waterfowl are taken in both the Cinder River and Pumice Creek drainages.

Commercial Fishing. Although commercial fishing on the Pacific Coast takes place in waters outside the boundaries of the preserve, it is a pattern of public use of considerable importance because of its proximity. In the summer fishing season, Chignik and Kodiak seining boats operate in Amber, Aniakchak, and Kujulik bays. These vessels spend many days either working or anchored in bays whose coastal resources are within the preserve. While not actually fishing, boat crews go ashore for subsistence or sport hunting or gathering invertebrates, or they take the small high-powered boats used to set the nets up the lower portions of the rivers in search of wildlife or for exploration.

Recreational Use. Recreational use in the Aniakchak area includes sport hunting and fishing, as well as nonconsumptive leisure activities such as backpacking, rafting, camping, exploration, photography, and nature study. Guided recreational use is considered an element of recreational use.

Sport Hunting and Fishing. Local reports suggest that a small number of private unguided parties or individuals (perhaps four or five

EXISTING USES

COMMERCIAL

important salmon fishery; also crab and shrimp

SUBSISTENCE

users from Port Hedden

users from Chignik

users from northern villages

SPORT HUNTING/ FISHING

may occur throughout preserve; hunting guide areas assigned but not mapped

RECREATION

Caldera exploration

Whitewater rafting

SOURCE FOR SUBSISTENCE, WILDLIFE AND FISHERIES: ALASKA DEPARTMENT OF FISH AND GAME 1983

RESOURCE VALUES

SCIENTIFIC AND SCENIC

designated wild river

geologic/scenic areas

WILDLIFE

Note: only areas critical in species life cycles are shown

broken bear: spring use (also summer along streams)

moose: winter use

caribou: spring calving

caribou: migration corridors

harbor seal: haulout area

Not shown: bald eagle, nest along stream

No endangered species known

FISHERIES

Note: most major streams are salmon fresh water habitat



EXISTING USES AND RESOURCE VALUES

ANIAKCHAK NATIONAL MONUMENT AND PRESERVE

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

ON MICROFILM

1981 2002 2003
DPO 1/14/03



per year) will enter the preserve by small plane and land on ash fields at higher elevations on Aniakchak's slopes (hunting caribou), gravel bars in the Cinder River drainage (moose or caribou), or Pacific-side river drainages (moose, caribou, brown bear, and river fishing). The extent to which these private parties might be local village residents engaged in subsistence use versus nonresident sportsmen is not clear. However, the use of aircraft for subsistence activities is not permitted in Aniakchak National Monument.

The Alaska State Guide License Control Board has assigned eight hunting guide areas that include parts of the monument or preserve. (Only those in the preserve actually have legal status because sport hunting is not allowed within the monument.) Assignment of an area does not, however, necessarily mean active use within the preserve. During 1983-84, only one of the eligible (i.e., assigned) hunting guides has applied for and received his annual \$50 commercial use license. In this instance, no activity was reported in 1983.

It is possible that the remaining eligible hunting/fishing guides are either inactive or not aware of the requirement to obtain a separate commercial use license now that the area is a monument/preserve. Some guided hunting/fishing in the preserve may therefore be going unreported. Apparently there are about five guides who operate at times from Port Heiden; several operators out of King Salmon are capable of offering trips into the Aniakchak area for hunting/fishing or other recreational activities.

Backpacking, Rafting, Etc. Statistics for nonconsumptive recreational use are also scarce, principally because such use may have gone unreported by guides or private parties. Private parties are not actually required to report activities within the monument/preserve, and most of the information on this use category comes indirectly from informal reports of the air-taxi operators who provide transportation.

In the six seasons since Aniakchak became a unit of the national park system (first as a monument in 1978), fewer than 25 nonconsumptive recreational visitors are known to have entered the area. Most of those have been transported by amphibious aircraft into Surprise Lake in Aniakchak caldera and picked up sometime later after hiking and exploring within the caldera. A few parties have landed on Meshik Lake for camping and local exploration.

Although the caldera and the Aniakchak River and Meshik River corridors are currently attractive resources for nonconsumptive recreational visitors, and are expected to see increased use, there may be other areas of interest in the future. The entire Pacific Coast is extremely scenic and, with care, is probably accessible by seagoing kayak in challenging trips beginning with an airplane entry somewhere in Amber or Aniakchak bays and ending at the Chigniks.

Three persons currently hold commercial use licenses for river running in the monument and preserve, but none of these reported activity in the 1983 season.

Air-taxi service or a private aircraft is essential in gaining access to interior parts of the monument/preserve for recreational use. However, it is possible to gain access to the caldera overland from Port Heiden in a one or one and a half day backpack if the correct route is followed. Access to the Pacific Coast by boat is technically feasible from the Chigniks or Kodiak, but the distances are substantial.

One air-taxi operator (from King Salmon) is currently licensed to operate within Aniakchak, and it is this service that has provided the majority of access to recreational visitors over the last five years.

Trends and Projections in Recreational Use. There are simply no reliable statistics on which to base trends and projections in recreational use. The following discussion provides some theoretical considerations that may apply.

For sport hunting and fishing, the area's attractiveness may well increase if and when native corporation selected lands are conveyed and public hunting on native lands is restricted or is subject to payment of fees. If that occurs, an unknown proportion of the annual hunting and fishing parties currently guided out of Port Heiden or the Chigniks may shift to preserve or refuge lands. How many would actually choose the preserve is unknown, but only four or five more groups per year would double the estimated present use.

Rafting and backpacking use, now thought to be only one or two groups (less than 10 persons) per year, could very well increase. Remote, challenging wilderness tourism--particularly in small guided parties--has increased dramatically elsewhere in Alaska and worldwide in the past decades.

Scientific Research and Resource Survey Use. A fourth distinct use category is that of the scientific research and survey group. Historically, there have been more scientific expeditions than recreational ones, focusing in particular on the remarkable volcanic features of the caldera and the ash flows that radiate from it. Emphasis has shifted more recently to groups surveying for potential oil, gas, and mineral resources. Though the latter survey work will undoubtedly continue until the potential is well-evaluated, increasing emphasis will be placed on habitat and vegetation study in support of more effective wildlife resource management.