WESTERN ARCTIC NATIONAL PARKLANDS

Arctic VIEWS

WESTERN ARCTIC NATIONAL PARKLANDS

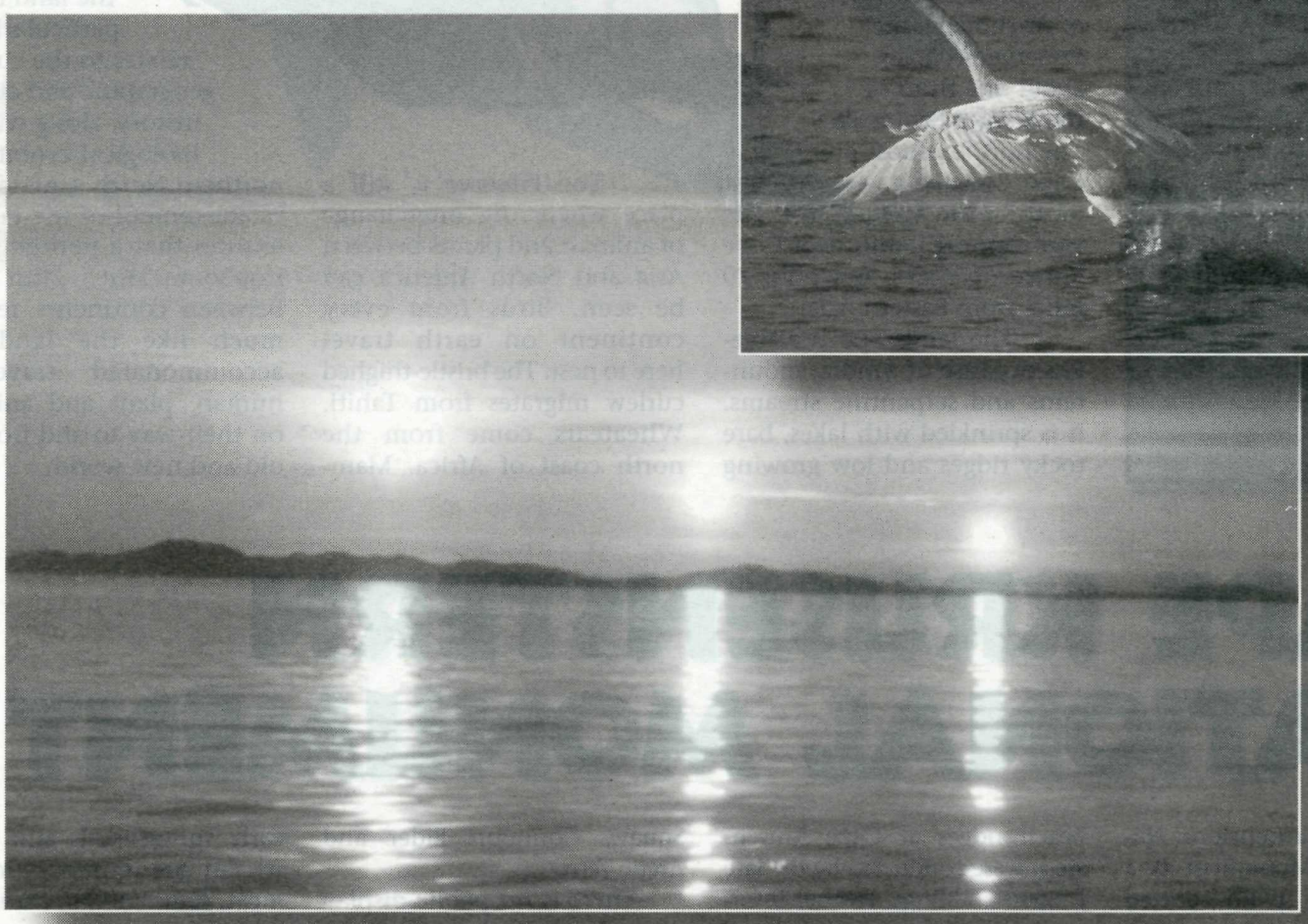
WELCOME

by David Spirtes
Park Superintendent

As Superintendent of Western Arctic National Parklands and on behalf of our entire staff, I welcome you to Northwest Alaska.

Recently, America celebrated the 125th Anniversary of the establishment of Yellowstone, the world's first national park. The idea of creating national parks to preserve land in its natural and unaltered state has spread to over 150 nations around the world. Northwest Alaska contains four National Park Service areas: Kobuk Valley National Park, Krusenstern National Monument, Bering Land Bridge National Preserve, and Noatak National Preserve.

Tundra swan



Land of the Midnight Sun

These areas were included in the national park system because of their national significance, rich diversity, and extraordinary beauty. They encompass a vast panorama of tundra, mountains, coastal beaches, lakes, river valleys, lava flows, and even an Arctic desert. They protect a diversity of waterfowl and wildlife including nearly a half million caribou who still move across the landscape on a ceaseless migration. Since the founding of Yellowstone, the national park idea has continued to evolve.

Western Arctic National Parklands not only protects the natural landscape but also provides the backdrop for the ancient subsistence lifestyle, where Native people continue to live off the land as they have since time immemorial. These public lands belong to you, and I encourage you to stop by one of our offices in Nome or Kotzebue to find out informaion about them or to get more involved in their management. ■

BERING LAND BRIDGE NATIONAL PRESERVE

SERPENTINE HOT SPRINGS

by Jeanette Cross
Park Interpretive Specialist

Serpentine Hot Springs is known throughout the Seward Peninsula as a place of healing and relaxation, as well as a place of beauty. The hot springs are located in a remote and isolated valley surrounded by mountain-like ridges called tors. The tors were formed during the Cretaceous Age, 160-70 million years ago. They continue to change shape through the process of wind and water erosion. The tors are said to have once had individual names. Iñupiat Eskimos call Serpentine "Iyat," meaning "cooking pot" or "a site for cooking."

The Iñupiat utilize Serpentine Hot Springs as a traditional healing place and an important subsistence location. The area is associated with the training of shamans, the traditional spiritual leaders. For hundreds, maybe even thousands of years, the Iñupiat have used the area, and continue to use the area, as a place of traditional curing for the spirit and the body.

Charles McLennan is believed to be the first non-native to see the hot springs. He arrived in May, 1900 and staked mining claims. A small settlement and resort, called Arctic Hot Springs, developed and became popular with miners during the early 1900's.

Today, people come to the hot springs to bathe, relax, hike and observe wildlife. Facilities include a public use cabin and a bathhouse. Summer access is available by bush plane and on foot. There are no roads to the hot springs and all terrain vehicles are prohibited. Winter access is possible by snowmachine or dog team.

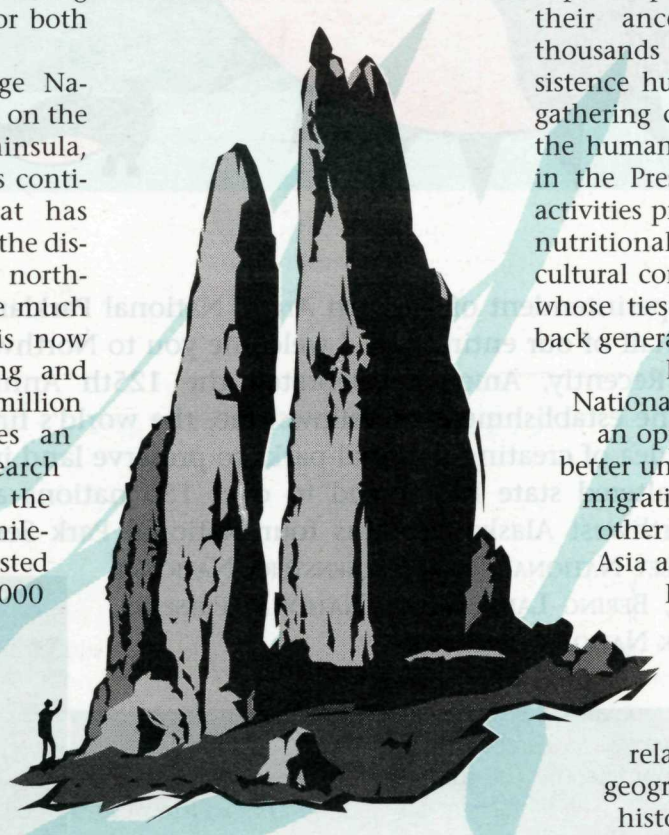
For more information about Serpentine Hot Springs, contact the National Park Service Visitor Information Center in Nome.

As vast ice bodies locked up large portions of Earth's water during the ice ages, sea levels dropped by as much as 350 feet in the Bering Straits region. At such times a land bridge across the Bering Sea was exposed, connecting the two continents and providing a migratory corridor for both plants and animals.

Bering Land Bridge National Preserve, located on the northern Seward Peninsula, lies at the heart of this continental crossroads that has profoundly influenced the distribution of life in the northern hemisphere. While much of the bridge itself is now overlain by the Bering and Chukchi Seas, the 2.8 million acre Preserve provides an opportunity for research and interpretation of the intermittent, 1,000 mile-wide land link that existed as recently as 10,000 years ago.

Approximately 500 miles northwest of Anchorage, the Preserve occupies about one-third of the Seward Peninsula. The northernmost point, Cape Espenberg, extends just north of the Arctic Circle. The westernmost point, near Cape Prince of Wales, lies only 70 miles from Eastern Asia.

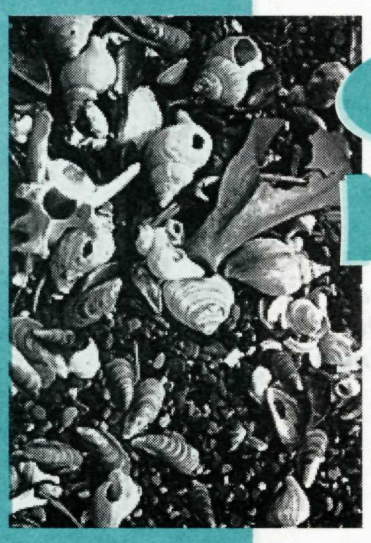
The landscape is a treeless expanse of tundra, mountains and serpentine streams. It is sprinkled with lakes, bare rocky ridges and low growing willow shrub. The land is home to a variety of arctic and subarctic wildlife including moose, bears, muskoxen and caribou. Many species of mammals that lived here during the ice ages are now extinct. Others have simply left the area.



The Preserve is still a place where the interchange of animals and plants between Asia and North America can be seen. Birds from every continent on earth travel here to nest. The bristle-thighed curlew migrates from Tahiti. Wheatears come from the north coast of Africa. Mammals, including polar bear, walrus, Gray and Bowhead whales, travel to and from the region, oblivious to international or political boundaries.

Iñupiaq Eskimo residents of local villages continue to depend upon the land, just as their ancestors had done thousands of years ago. Subsistence hunting, fishing and gathering comprises much of the human activity occurring in the Preserve today. These activities provide for both the nutritional needs and the cultural continuity of peoples whose ties to the region go back generations.

Bering Land Bridge National Preserve provides an opportunity to seek a better understanding of the migration of humans and other life forms between Asia and North America. Research continues to uncover the significance of the land bridge, particularly as it relates to the cultural, geographic and climatic history, along with the biological evolution of northern North America. The establishment of the Preserve ensures that a portion of the not-so-ancient land link between continents remains much like the land that accommodated travelers—human, plant and animal—on their way to and from the old and new world.



CAPE KRUSENSTERN NATIONAL MONUMENT

Cape Krusenstern National Monument is a coastal plain—dotted with lagoons and rolling hills—that borders the Chukchi Sea and Kotzebue Sound. The monument is home to archeological resources that trace an estimated 4,000 years of prehistoric human use of the coastline.

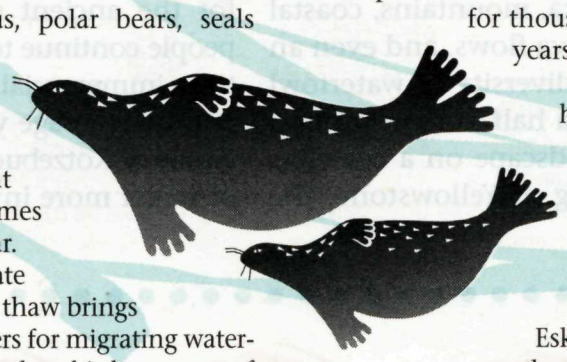
The southeastern tip of the 560,000 acre monument is 10 miles across Kotzebue Sound.

Cape Krusenstern was set aside as a National Monument to protect and interpret a series of archeological sites depicting every known cultural period in Arctic Alaska. Its mission as a monument also includes habitat protection for seals and other marine mammals, populations of birds, other wildlife and fish resources.

The most important archeological investigations of the beach ridges at Cape Krusenstern were conducted by the late J. Louis Giddings. Further information on the area's cultural resources can be found in his book, *Ancient Men of the Arctic.*

Wildlife found in the monument include caribou, grizzly bears, wolves, red foxes, lynx, wolverine and much more.

Walrus, polar bears, seals and whales are found offshore at various times of the year.



The late spring ice thaw brings open waters for migrating waterfowl and shorebirds, many of which remain to nest. Golden eagles are found in the rugged uplands of the monument. Other common birds include the Sandhill Crane, Arctic Loon, American Golden Plover, Old Squaw, Common Eider and Arctic Tern.

There is no public display of archeological artifacts in the monument. People who visit are chiefly interested in backpacking, hiking and camping.

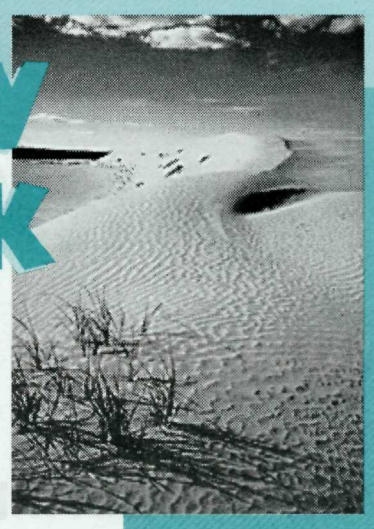
The primary human use of Cape Krusenstern today, as for thousands of years, is subsistence hunting, fishing and gathering by the Iñupiaq Eskimos of nearby villages.

Sheshalik Spit, in the monument's southeastern corner, extends into Kotzebue Sound and is the focus of seasonal marine mammal hunting by the Iñupiaq. In late winter and early spring, seals and beluga whales are hunted for their meat, skins and oil. During the summer, seasonal camps are set up along the coastline for net fishing, berry picking and other seasonal subsistence activities. In the fall, there is ice fishing on the rivers and on Kotzebue Sound. Fall is also the time to hunt caribou as they move to their winter range south of Kobuk Valley National Park.

Legislation for this and other Western Arctic National Parklands provides the opportunity for local residents engaged in a subsistence way of life to continue to do so, consistent with the purposes for which each conservation system unit was established.

When visiting this and other areas in our region, please be courteous and do not interfere with subsistence camps, fishnets and other equipment.

KOBUK VALLEY NATIONAL PARK

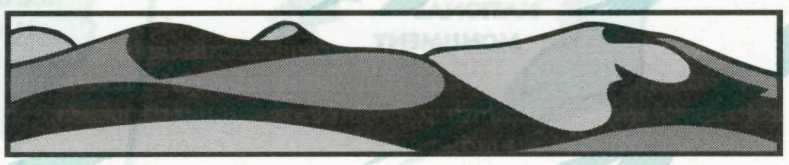


Stretching from the Baird Mountains in the north to the Kobuk Sand Dunes in the south, Kobuk Valley National Park occupies a broad valley along the central Kobuk River in Northwest Alaska.

The park's 1.7 million acres of land sit in a semi-enclosed bowl, ringed by the Baird Mountains to the north and by the Waring Mountains on the south side, about 30 miles north of the Arctic Circle.

The boreal forest reaches its northern limit here, resulting in an open woodland of small trees in a mat of thick tundra. The Western Arctic caribou herd travels through this and the other two park areas during its migration. The herd is estimated to include more than 500,000 caribou.

Kobuk Valley National Park was established to maintain the environmental integrity of the valley's natural features in an



undeveloped state and, in cooperation with local Natives, to protect and interpret archeological sites associated with Native cultures. As such, natural and archeological objects are protected and cannot be removed from the park.

Native people have lived along the Kobuk for at least 9,000 years. Their history is best recorded at the Onion Portage archeological site, situated along the Kobuk River in the southeastern corner of the park. Within the many stratified layers of silt deposited by the Kobuk River at Onion Portage are featured, in chronological order, artifacts from every known Eskimo occupation of North America.

Today, five of the ten villages in Northwest Alaska are found along the banks of the Kobuk River—from Noorvik, only 30 miles from where the river pours out into Hotham Inlet (known locally as Kobuk Lake) to Kobuk, more than 200 miles inland. In between, the villages of Kiana, Ambler and Shungnak can be found.

The upper villages are often used as starting points for float trips.

THE GREAT KOBUK SAND DUNES

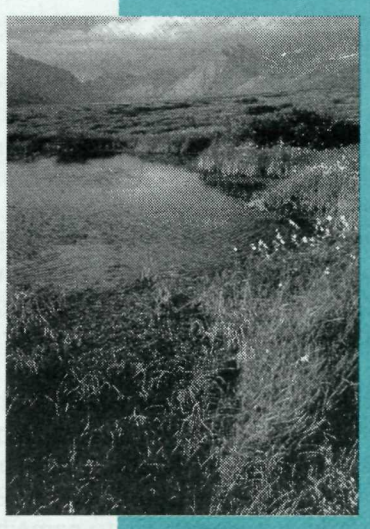
by Diane Hunt
Park Resource Management Specialist

The Kobuk Valley Wilderness Area, which is 190,000 acres, encompasses the southern portion of the Kobuk Valley National Park. Within the Wilderness boundaries, one mile south of the Kobuk River, lies one of the region's most popular destinations, the Great Kobuk Sand Dunes. The Great Kobuk Sand Dunes, an active, eolian, sand dune system, covers about 23.5 square miles and consists of transverse and barchan dunes that swell to a height of 250 feet or more. They are bordered on the south by the Waring Mountains and on the west by Kavet Creek. The Dunes are slowly migrating to the west, pushed by easterly winds. The Little Kobuk Sand Dunes are located further southeast and cover about 2.3 square miles. The dune fields formed after the last glaciers melted, over 10,000 years ago, and uncovered vast amounts of land no longer protected by vegetation. The lack of vegetation allowed the soils to be moved by winds, creating large, semi-arid deserts. The existing dune fields could be a relict of a much larger, post-glacial dune field. Most of this ancient dune field has since been covered by stabilizing vegetation and it is unknown how large it once was. However, geological research in the Kobuk Valley has suggested that vegetation presently covers more than 300 square miles of ancient dune fields.

Geologists have studied these sand dunes in search of clues to the formation of present arctic geological features. Archeologists search the dunes and surrounding areas for evidence of ancient human habitation. Palynologists study pollen and other fossils found in ice-cores taken from soils that were frozen during glaciations, in search of evidence of plant and animal life that existed before and between the glacial periods. Palynologists think that the plant species living in the present arctic dune systems could represent relict steppe-tundra vegetation that once covered the area during the Pleistocene Epoch (between 11,000 and 2,000,000 years ago). The sand dune systems that exist today in Alaska's arctic and subarctic could provide us with a link between pre-glacial ecosystems and our current ecosystem. Perhaps the scenery created by the plant species seen on the Kobuk Sand Dunes today closely mimics the scenery which human ancestors saw as they migrated across the continent after the glaciers melted.

Many wildlife species visit the sand dunes including black and brown bears, porcupines and wolves. Caribou migrate throughout the area in the fall months after crossing the Kobuk River enroute to their wintering grounds. Ravens, Sandhill Cranes, Arctic Terns, Gray Jays and many song-birds are also frequent visitors to the dunes. Flora found on the dunes include many colorful species: Siberian Asters, Yellow Chrysanthemums, Wormwood, Northern Parsley, Eskimo Potato, Wild Carnations, White Spruce, Wooly Louseworts, Bearberry, Lime grass, and Balsam Poplar. The area surrounding the dunes is vegetated with White spruce, Paper birch, Alder shrubs, Blueberry bushes, Willow shrubs, Quaking Aspen and many species of lichens and moss.

NOATAK NATIONAL PRESERVE



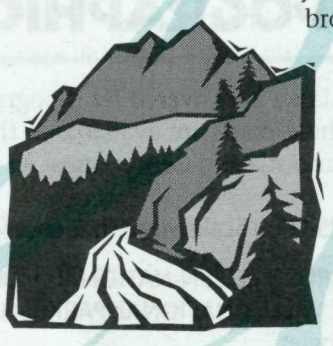
Encompassing 6.5 million acres of land, Noatak National Preserve is the largest park area within the Western Arctic National Parklands. The preserve was established to maintain the largest undisturbed watershed in North America—the Noatak River.

The Noatak River basin, one of the world's finest remaining vast wilderness areas, has been named an International Biosphere Reserve; the river itself has been designated a National Wild River for most of its length.

The clear-running, medium-sized Noatak River flows within a broad and gently sloping valley stretching in an east-west direction from deep in the Brooks Range to the tidewater of the Chukchi Sea. The river itself flows 300 miles west, then takes a sharp turn south for another 100 miles before pouring into the sea.

The preserve lies almost completely enclosed by the Baird and DeLong Mountains of the Brooks Range. It is within the preserve that the boreal forest ends, merging into treeless tundra on the valley's southern edge. Hundreds of thousands of caribou cross this broad expanse, migrating to and from their calving grounds.

In addition to protecting the Noatak River valley and adjacent lands, the preserve also serves to protect the fish, wildlife, waterfowl and archeological resources within its boundaries.



The entire Noatak River is located above the Arctic Circle. The glacier-fed headwaters of the Noatak are found in the rugged Gates of the Arctic National Park and Preserve. This is where the swiftest and most hazardous water of the river is found.

The upper Noatak flows through a series of glacial moraines, characterized by stretches of broad floodplain and gentle gradient alternating with boulder choked rapids and steep bluffs.

Farther along, as the river enters Noatak National Preserve, the valley floor widens into the broad plateau of tundra country. Here, the landscape is dotted with ponds and marshes inhabited by moose, grizzly bears, wolverine, caribou, wolves and nesting waterfowl. Distant mountains border the valley.

In this, the middle section of the river, the Noatak maintains a swift current, averaging between five and eight miles per hour. In contrast, the lower portion of the river is slow and braided.

Whitefish, grayling, arctic char, salmon, and pike are among the fish which inhabit the waters of the preserve area.

The most common method of visiting the preserve is by floating the Noatak River. The larger tributaries of the Noatak—the Cutler, Kelly, Nimiuktuk and Kugururok Rivers—are also suitable for floating.

Folding boats and rubber rafts are the most practical for a floating trip, as they can more easily be fit into a small plane for transport to the river.

The Native village of Noatak is several miles downriver from the preserve's southwestern boundary. With a current population of about 350, Noatak is the only village on the Noatak River. It was originally a hunting and fishing camp, and developed into a permanent settlement in the 19th century.

As they have been for thousands of years, the lands encompassed by Noatak National Preserve are today still used by the Iñupiaq Eskimo people of the region for subsistence hunting, fishing and gathering.

WESTERN ARCTIC NATIONAL PARKLANDS

WELCOME TO ALASKA'S NATIONAL PARKS

If you're visiting Alaska, welcome to this national park and to a state that is awe-inspiring in its vastness and grandeur. If Alaska is home, you know first-hand some of the treasures in this Great Land. But to all, we invite you to experience your national parks and amid your relaxing and having fun, soak in lessons of migration, discovery, and the unrivaled array of wildlife and cultural treasures that are in these parks.

Alaska is home to 16 of the 379 pieces that make up America's mosaic of national parks. Befitting the largest state in the union, Alaska's parks contain some two-thirds of the acreage of all national park units and hold the continent's tallest mountains, vast herds of caribou, wolves, bald eagles, salmon, and marine mammals. But this inheritance set aside by the American people is shortchanged if we only consider record book facts.

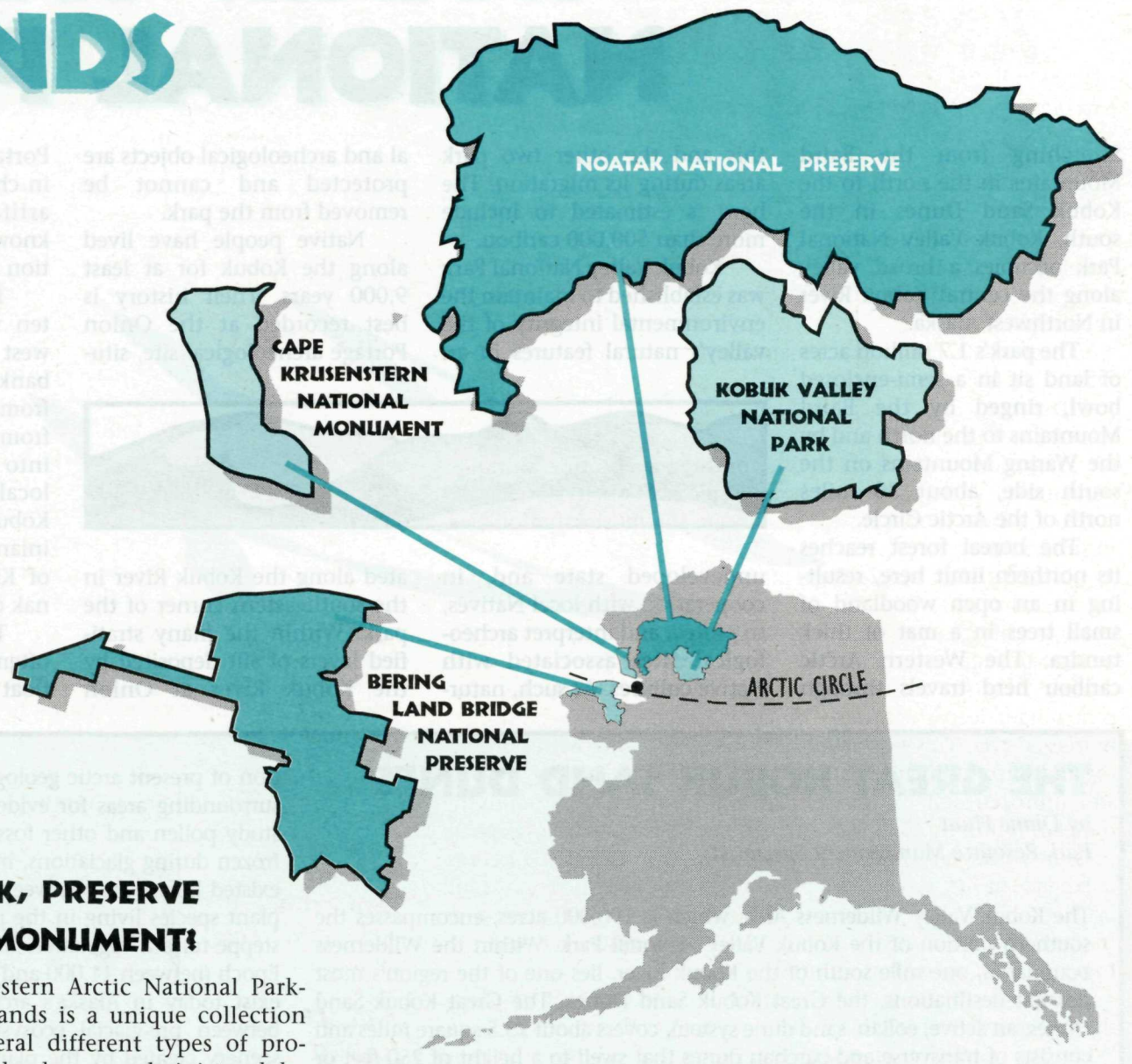
These parks, like those in the Lower 48, represent a common path of national heritage that belongs to all of us—whether we trace our roots to the earliest Native Americans, immigrants to colonial America, or recent arrivals from around the globe.

As you look today at one of Alaska's national park units, you are a chapter in a long and yet-unfinished account of the American story. Beach ridges, lakeshores, and low passes in Northwest Alaska parks hold the artifacts of some of the earliest North Americans. In Skagway, the story moves forward 11,000 years to the buildings and trails of the last great gold rush in the American West. Elsewhere, parks tell the story of Russian America, of geologic wonder, and of the qualities of unrivaled wilderness lands. The park employees you may meet today are the stewards of those stories.

National parks have been likened to a great university with hundreds of campuses. The lessons we teach are not virtual reality but vitally real. Like Gettysburg, or Ellis Island or Yellowstone, to name just three National Park Service areas in the Lower 48, Alaska's parks enrich our lives with the heritage, landscape and, yes, mistakes, that are part of the American story.

So we welcome you to Alaska's national parks—certainly to relax and have fun, but also to reflect on how these special places set aside for future generations can continue to teach important lessons.

—Bob Barbee, National Park Service Director, Alaska Region



PARK, PRESERVE OR MONUMENT?

Western Arctic National Parklands is a unique collection of several different types of protected land areas administered by the National Park Service.

Generally, lands administered by the Park Service are thought of as national parks. But a national park is just one of many types of federally protected land areas.

Included in Western Arctic National Parklands are a national park (Kobuk Valley), a national monument (Cape Krusenstern) and two national preserves (Noatak and Bering Land Bridge).

Generally, a national park contains a variety of resources and encompasses large land or water areas to help provide adequate protection of the resources.

A national monument is intended to preserve at least one nationally significant resource. It is often smaller than a national park and lacks its diversity of attractions.

The land category of national preserves was established primarily for the protection of certain resources. Activities such as sport hunting and trapping are permitted in preserves.

ACCESS

Northwest Alaska cannot be reached by road. Daily commercial flights serve Kotzebue and Nome from both Anchorage and Fairbanks. There are connecting flights via several commuter airlines to villages in the region, and charter flights into the parks are available from Kotzebue and Nome and several villages.

Most visitors travel within the public lands of Northwest Alaska on foot or by boat. In order to access the parks from Kotzebue or Nome, visitors must arrange transportation by plane or by boat.

On trips into the parks, aircraft land on very primitive airstrips, beaches or, if the aircraft is float-equipped, on lake or river waters. Private boats may sometimes be available for charter.

Information on transportation services can be found on page 18, or by contacting the NPS.

PRIVATE LANDS

There are private inholdings and Native village corporation lands within federal land areas in Northwest Alaska. You are required to obtain owner permission before using these lands.

If you are unsure about which lands are private, please check with the National Park Service offices in Kotzebue and Nome. Otherwise, you may be trespassing. Do not disturb cabins, camps, drying racks, wood supplies, boats, fish nets, or other equipment, even if they look abandoned.

Thank you for respecting the rights of others.

TOPOGRAPHICAL MAPS

The public lands of Northwest Alaska are covered by topographic maps produced by the U.S. Geological Survey (USGS). Although some of these maps are available at the National Park Service main office in Kotzebue or at the Kotzebue Public Lands Information Center, most all of them can be obtained by contacting the USGS.

USGS - Map Sales
4230 University Drive
Anchorage, Alaska 99508
(907) 786-7011

Branch of Distribution
Federal Center
P.O. Box 25286
Denver, CO 80225
(303) 236-7477

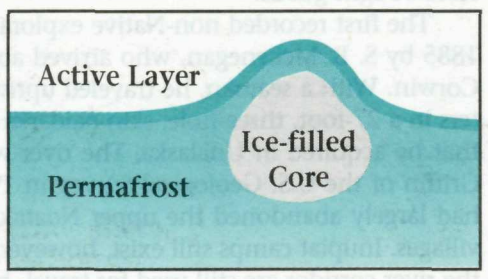
The 1:250,000 Scale Maps that cover the public lands of Northwest Alaska are as follows:

CAPE KRUSENSTERN NATIONAL MONUMENT AND KOTZEBUE: Noatak quadrangle
KOBUK VALLEY NATIONAL PARK: Baird Mountains, Ambler River, Shungnak and Selawik quadrangles
NOATAK NATIONAL PRESERVE: DeLong Mountains, Baird Mountains, Misheguk, Howard Pass and Ambler River quadrangles
UPPER NOATAK/WESTERN PORTION OF GATES OF THE ARCTIC NATIONAL PARK AND PRESERVE: Killik River and Survey Pass quadrangles
SELAWIK NATIONAL WILDLIFE REFUGE: Selawik, Shungnak, Candle and Kateel River quadrangles
SQUIRREL RIVER AREA: Baird Mountains and Selawik quadrangles
SALMON RIVER AREA: Baird Mountains quadrangle
BERING LAND BRIDGE NATIONAL PRESERVE AND NOME: Kotzebue, Shishmaref, Teller, Bendeleben, Nome and Solomon quadrangles

PINGOS & POLYGONS AND OTHER GEOLOGICAL FORMATIONS

Excerpted from Alaska Department of Fish & Game's "Alaska Wildlife Curriculum: Alaska's Tundra and Wildlife".

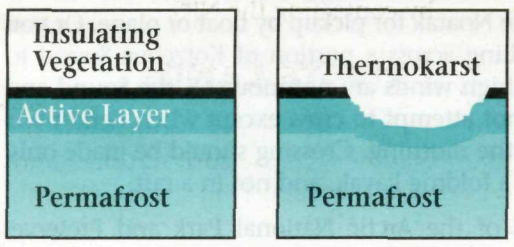
PINGOS



The word *pingo* comes from an Iñupiaq name for a cone-shaped hill or mound of soil with a core of ice. A pingo may be a few feet to 230 feet high and up to 2000 feet in diameter. Pingos occur in areas of both continuous and discontinuous permafrost. There are two types of pingos—open system and closed system. Closed system pingos are the most common type in tundra areas.

Closed-system pingos form after drainage or sedimentary fills in a tundra lake. The wet soil underlying a deep tundra lake remains unfrozen year-round because the overlying water retains heat and insulates the soil during winter. However, when a lake is drained, or when it fills partially with sediments so that the water is no longer deep, the surface layer of soil on the lake bottom slowly freezes over. This new layer of frozen soil, along with underlying and surrounding permafrost, traps water in the underlying, but still unfrozen soil. As permafrost slowly advances around the trapped, unfrozen core, the water in the soil is forced inward by pressure through soil pores. When the trapped water itself freezes, it expands in the only direction possible-upward. This creates a hill or mound. The size of the pingo depends upon the amount of trapped water. Pingos form in other ways whenever water is trapped under permafrost ground.

Pingos form and grow by as much as 5 feet per year, and continue to grow slowly (1 to 1½ feet per year) for thousands of years. When the vegetation on top of the pingo is disturbed, or pressure from the expanding ice, itself, cracks the surface soil, the ice core is exposed to air and warm summer temperatures. If the exposed ice melts, the top of the pingo collapses, creating a crater. The crater may or may not contain a lake.

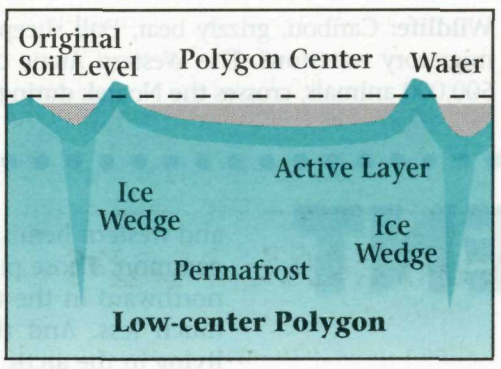


Thermokarst Development caused by the removal of insulating vegetation.

THERMOKARST

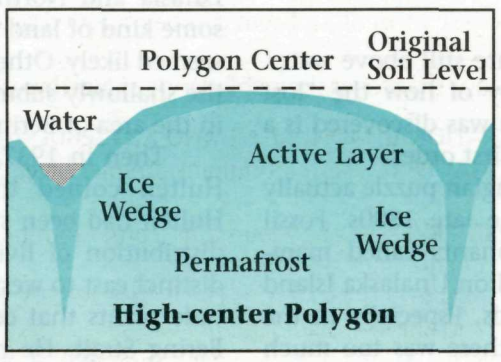
Frozen water takes up more room than liquid water. Thus, when permafrost in water-filled soil melts, the remaining wet soil takes up much less room than it did when frozen. This creates a surface depression, or thermokarst. Thermokarsts may be pits, funnel-shaped sink-holes, valleys, ravines, or in early stages of melting, caves. Permafrost melting is caused by removal of surface vegetation (by fire or human activities), flooding with water, or warming of the climate.

POLYGONS



Polygons form in areas with permafrost and seasonal frost. Most polygons in permafrost areas are the result of contraction cracks that form ice wedges.

The pressure created by an ice wedge forces the soil around the crack upward to form two small ridges (up to 1½ feet tall). This creates a polygonal shape of raised edges, or a low-center polygon.



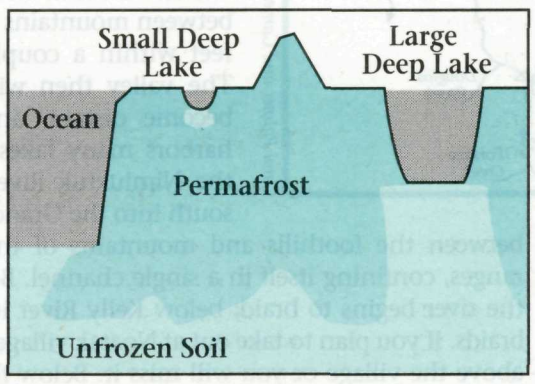
In poorly-drained sites, water fills the center of the polygon and the center of the ice wedge troughs. Collected water efficiently conducts heat from sunlight so it melts underlying permafrost, which causes additional slumping. As the water-filled troughs and centers enlarge and deepen, they eventually meet to form a small lake. When the lake is drained, or filled in with organic material, new low-center polygons form. Over a period of hundreds of years, poorly-drained sites gradually cycle between flooded, low-center polygons, and small lakes.

In well-drained soil, the troughs around a low-center polygon enlarge and sink, while the center remains in place. It appears that the center of the polygon has raised, when actually, the troughs have sunk. The center may be five feet above the bottom of the troughs. As the thermokarst slumping caused by the growing troughs continues, the mound may eventually collapse, too.

PERMAFROST

Permafrost is perennially frozen ground, or ground in which a temperature below 32°F has existed continuously for two or more years. Permafrost may contain chunks of ice or have little or no ice. The upper surface of permafrost is called the permafrost table. Almost no water can penetrate this table, so that it acts as a barrier to water movement (percolation) through the ground.

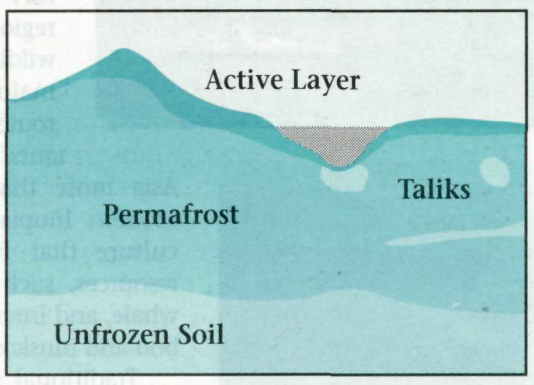
Continuous permafrost underlies the tundra of Arctic and Northwestern Alaska.In these regions, the ground is frozen everywhere except under those lakes and rivers that do not freeze solid in winter. Permafrost can extend to 2,240 feet below the soil surface. Below this, heat from the earth's core keeps the ground thawed. Discontinuous permafrost underlies the tundra and forests of Interior and Southwestern Alaska. In these regions, the ground is perennially frozen in some places, but is permafrost free in others. Permafrost may not be present in south-facing slopes, sites where vegetation has been disturbed, and under lakes and rivers.



The occurence and depth of permafrost is affected by the presence of deep lakes, hills, and the ocean. Small deep lakes are underlain by a bulb of unfrozen soil. Permafrost is absent from beneath large deep lakes, and most ocean areas.

ACTIVE LAYER

The active layer is the surface layer of soil that thaws and refreezes every year. It lies on top of permafrost soil. The depth of the active layer varies from about 12 inches to 10 feet depending upon the local climate. Near Barrow, the active layer is about 12 inches deep.

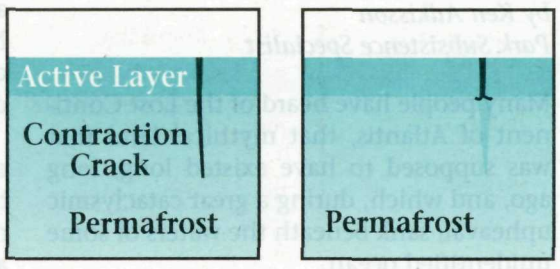


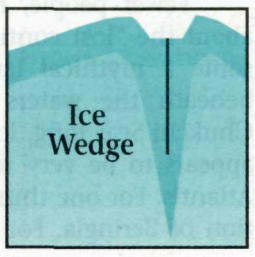
TALIK

Layers and pockets of unfrozen soil that occur within permafrost soil are called taliks.

ICE WEDGES

Soil contracts, or shrinks, during periods of intense winter cold. As the soil contracts, cracks form. Often, the cracking makes a loud sound. The winter that it first forms, a contraction crack is small—only 3/8 inch wide. During spring snowmelt and summer rains, water flows into the crack and is trapped and frozen by surrounding permafrost. Freezing water expands and forces the surrounding soil upward and outward. Over many years, the crack gradually enlarges through the freezing and expansion of trapped water, and repeated winter cracking. Ice wedges grow to be as much as 33 feet across, and extend 33 feet below the surface. Some large ice wedges may have taken 1000 years to form. Together, the cracks usually form a polygon (a many-sided geometric shape).

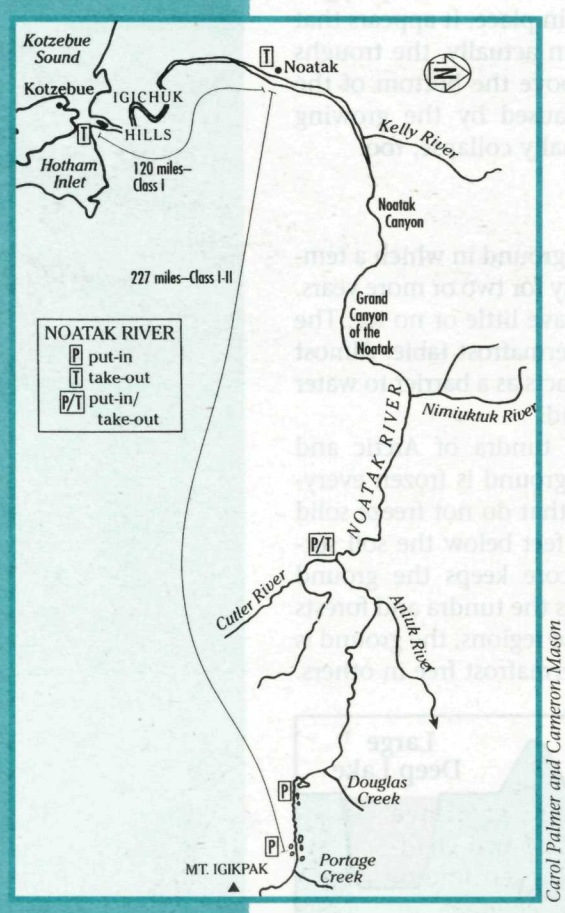




Ice wedges are formed by drainage of water into a contraction crack in the soil, followed by winter freezing and expansion. The ice wedge grows larger each year, forcing surrounding soil out and upward.

NOATAK RIVER

The following description is quoted from Karen Jettmar's book, The Alaska River Guide (Alaska Northwest Books, 1993).

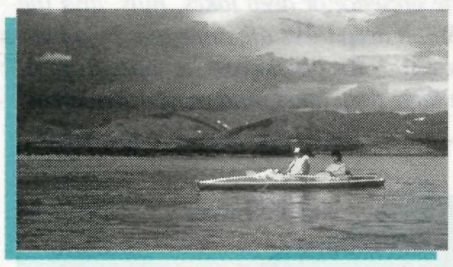


Carol Palmer and Cameron Mason

The Noatak provides an excellent wilderness expedition for intermediate boaters with backcountry skills. Entirely above the Arctic Circle, the Noatak drains the largest river basin in North America that is still virtually unaffected by human activities. From its headwaters on Mount Igikpak, the Noatak flows 396 miles from the mountains to the sea, arcing westward across the Western Arctic, then south along the DeLong Mountains to spill into Kotzebue Sound, after draining an area of 12,600 square miles.

The Noatak traverses six distinct regions: alpine tundra and mountains, the Noatak basin with its rounded mountains and vast tundra, the 65-mile-long Grand Canyon of the Noatak, the 7-mile-long Noatak Canyon, the plains and rolling Igichuk Hills, and the flat coastal delta.

The first 60-mile stretch of the Noatak courses through a narrow valley between mountains that rise thousands of feet within a couple miles of the river. The valley then widens, the mountains become distant, and a wetland tundra harbors many lakes and marshes. Below the Nimiuktuk River, the Noatak swings south into the Grand and Noatak canyons between the foothills and mountains of the DeLong and Baird ranges, confining itself in a single channel. Below Noatak Canyon, the river begins to braid; below Kelly River it becomes a tangle of braids. If you plan to take out at Noatak village, stay to the right well above the village or you will miss it. Below the village, the river is relatively confined as it flows to its mouth, where it spreads into a delta 15 miles across as it enters Kotzebue Sound.



Noatak means "passage to the Interior." Migratory peoples traversed the region seasonally, hunting wildlife, particularly along major caribou migration routes. The earliest inhabitants came from northern Asia more than 12,500 years ago. Modern Iñupiat culture emerged, a culture that fully utilized marine resources, such as seal, walrus, and whale, and Interior resources like caribou and muskoxen.

Traditional Iñupiat life began to change in 1850 with non-Native contact. An emphasis on fur trading and new technologies, and establishment of trading posts, schools, and post offices, changed patterns of movement and settlement. In 1908 the Friends Church established a federally supported mission school at what is now Noatak village, and Eskimos embraced the Christian faith of the Friends. The culture of shamans, taboos, spirits, and the rich Inupiaq language was replaced by Western medicine, ceremony, the English language, and store-bought goods.

The first recorded non-Native exploration of the Noatak was in 1885 by S. B. McLenegan, who arrived aboard the revenue steamer Corwin. With a seaman, he traveled upriver to the Noatak headwaters in a 27-foot, three-hole, skin baidarka (Eskimo and Aleut kayak) that he acquired in Unalaska. The river was later mapped by C. E. Griffin of the U.S. Geological Survey in 1911. By 1915, the Iñupiat had largely abandoned the upper Noatak, moving permanently to villages. Iñupiat camps still exist, however, and historic trails within the river corridor are still used for travel, hunting, and fishing.

The Noatak basin is designated an International Biosphere Reserve. Under this United Nations scientific program, the area's ecological and genetic components are monitored to establish baseline data for measuring changes in other ecosystems worldwide. Information is also being collected on sustainable uses of natural resources by the Iñupiat and other Natives who have lived off the land for thousands of years.

Rating: Class I-II, with 8 to 10 miles of Class II water below Douglas Creek and a Class II ledge just above Noatak Canyon. At certain water levels, boaters can encounter 3-foot standing waves in the Grand Canyon of the Noatak.

Cautions: At low water, the river is rocky, with many shallow gravel bars. Strong upriver winds can prevent downstream progress at times. Sweepers and submerged masses of sod are a hazard on the lower river. The water level in the Noatak changes dramatically during spring breakup and after rainfall, when it can rise several feet in a few hours.

Trip length: 347 miles or less; 7 days to 3 weeks. Allow 10 days to paddle from headwater lakes to Cutler River; 16 to 18 days from headwater lakes to Noatak village.

Season: June through September.

Watercraft: All.

Access: In-Scheduled air from Fairbanks to Bettles or Kotzebue; put in at one of the lakes in the upper river by charter floatplane from Bettles or Kotzebue. Out-Take out at prearranged spot by floatplane or wheelplane, or float to Noatak village. You can also float all the way to the mouth of the Noatak for pickup by boat or plane. Or you can continue on, paddling across a portion of Kotzebue Sound to Kotzebue. But beware: high winds are notorious on the Sound and can capsize boats. Do not attempt to cross except when conditions are very calm, early in the morning. Crossing should be made only in a sleek boat, such as a folding kayak, and not in a raft.

Land manager: Gates of the Arctic National Park and Preserve; Noatak National Preserve; NANA Regional Corporation; private. The Noatak is a National Wild River.

Maps: Survey Pass C-5, C-6; Ambler River C-1, D-1, D-2, D-3, D-4, D-5, D-6; Howard Pass A-3, A-4, A-5; Misheguk Mountain A-1, A-2, A-3, A-4, A-5; Baird Mountains D-3, D-4, D-5, D-6; Noatak A-1, A-2, B-1, B-2, B-3, C-1, C-2, C-3, D-1, D-2; Kotzebue D-1, D-2.

Fish: Arctic char, arctic grayling, northern pike, whitefish, chum salmon.

Wildlife: Caribou, grizzly bear, Dall sheep, wolf, peregrine falcon, migratory waterfowl. The Western Arctic caribou herd, numbering 500,000 animals, crosses the Noatak during migration.

THE LOST CONTINENT OF BERINGIA

by Ken Adkisson
Park Subsistence Specialist

Many people have heard of the Lost Continent of Atlantis, that mythical land that was supposed to have existed long, long ago, and which, during a great cataclysmic upheaval, sank beneath the waters of some unidentified ocean.

Fewer people, however, have heard about the "lost continent" of Beringia, to some a mythical land that disappeared beneath the waters of the Bering and Chukchi Seas long, long ago. Yet, Beringia appears to be very much more real than Atlantis. For one thing, we know the location of Beringia. For another thing, there are parts of it which are still above water. Nevertheless, the story of how the "lost continent" of Beringia was discovered is a detective story of the first order.

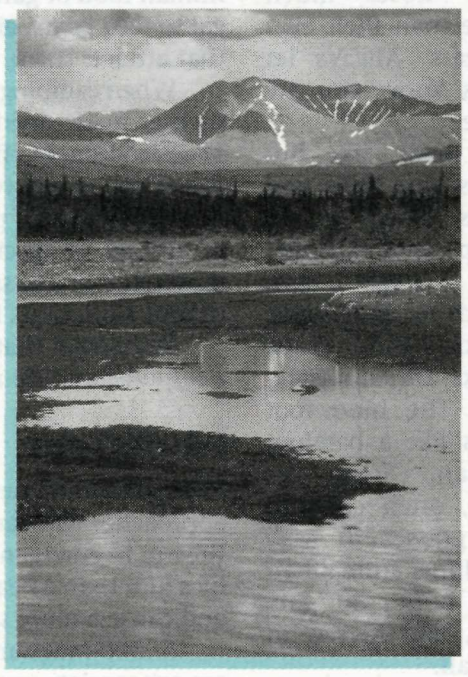
Pieces of the Beringian puzzle actually existed as early as the late 1800s. Fossil bones of extinct elephants called mammoths had been found on Unalaska Island and the Pribilof Islands. Especially in the case of the Pribilofs, there was too much open water for the animals to have swum from the mainland of Alaska. In 1887, a scientist named Heilprin commented on the patterning in the distribution of plants and animals in both the Old and New Worlds. He observed that the plants and animals living in the tropics of the eastern and western hemispheres had very little in common. Those plants and animals living northward in the temperate zone differed much less. And the plants and animals living in the arctic were nearly identical in Eurasia and North America. The idea of some kind of land link laying to the north seemed likely. Others began to look toward the shallowly submerged continental shelf in the area of Bering Strait.

Then in 1937, a botanist named Eric Hultén coined the term Beringia. Dr. Hultén had been studying the geographic distribution of living plants. He noted a distinct east to west trend line in high latitude plants that centered roughly on the Bering Strait. He noticed that there were many identical or closely related species of plants that were found both in Alaska and in northeastern Asia. Some of these were found nowhere else in the world. There were just too many species to be accounted for by some accident such as a few seeds being transported over great distances by

KOBUK RIVER

The following description is quoted from Karen Jettmar's book, The Alaska River Guide (Alaska Northwest Books, 1993).

From headwaters on the southern slopes of the Arrigetch Peaks, the Kobuk's 347-mile course lies north of and just about parallel to the Arctic Circle. This normally clearwater stream begins swiftly, flowing through tall forests of birch and white spruce for about 40 miles before joining an unnamed tributary originating at Walker Lake. Rarely is the upper 30 miles of the Kobuk floated; most trips begin at Walker Lake or below the Upper and Lower Kobuk River canyons. Below the confluence of the Kobuk with the Walker Lake tributary, the Kobuk flows into deep canyons, then becomes a broad channel that meanders through a wide forested valley. Moving from the headwaters to the coast, the forests become thinner and the trees stockier.



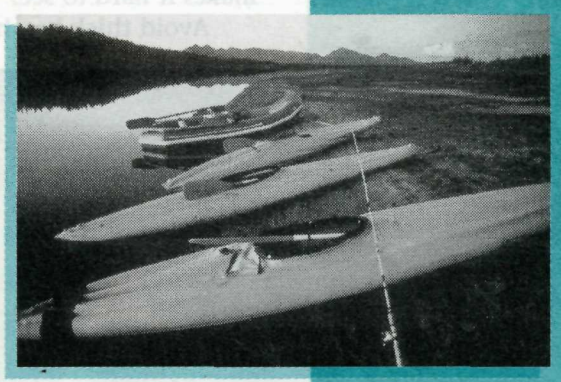
In the upper Kobuk (its name means "big river") and its tributaries, hiking opportunities are excellent. The trees are widely spaced and the forest floor forms a soft mat of lichens. The upper and middle regions are scenically spectacular. South of the river lie the wind-sculpted Kobuk Sand Dunes, covering more than 25 square miles, and beyond, the rounded hills of the Waring Mountains offer a contrast to the snow-capped peaks to the north. Downriver, willows create short, entangled, near-impenetrable jungle.

Below the Mauneluk River, the Kobuk's current slows and it forms huge oxbows. Near the coast, the river forms a wide delta at Hotham Inlet, with the current flowing at less than 3 miles per hour. Here it is joined by the smaller Selawik River, flowing out of the Lockwood Hills, and by the Noatak River, flowing out of bare, rugged mountains to the north. The combined waters of these three rivers form a channel 6 miles wide that opens into Kotzebue Sound and the Chukchi Sea.

The Kobuk has been a major trade and travel route for centuries. Natives continue to hunt, fish, and gather foods along the river. The people of the Kobuk, or the Kuvuungmiit, are Eskimo-speaking dwellers of the forest. The Kobuk people have apparently always traveled freely between the coast and the Interior. Formerly, they traveled in skin boats, or umiaks, often using dogs to help pull the boats upriver. Groups of families gathered to fish at favorite bends in the river or formed temporary winter settlements. At other times, small groups scattered for hunting and gathering.

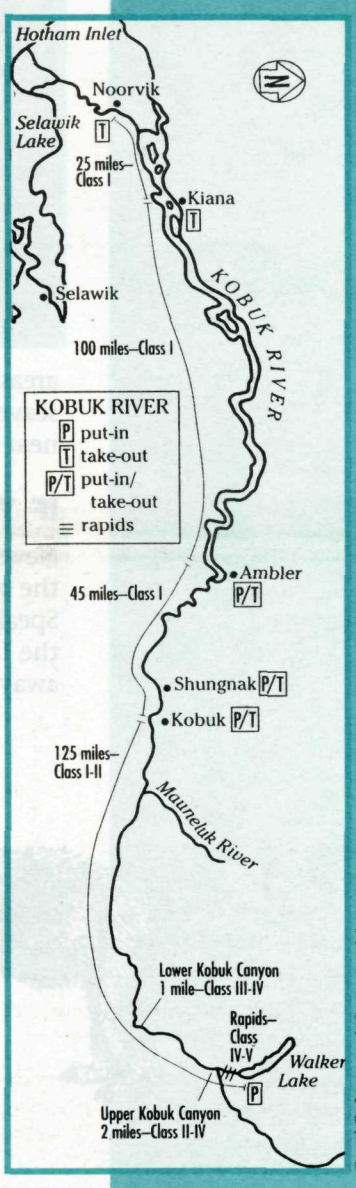
With the establishment of trading posts, schools, and missions, four villages were founded along the Kobuk: Noorvik, Kiana, Shungnak, and Kobuk. Navy Lieutenants G. M. Stoney and John C. Cantwell were part of a U.S. government survey team sent up the Kobuk River Valley to its source in 1884. They used gas-powered boats as far up the river as Kobuk village, then took canoes all the way to Walker Lake in a quest for information about the region. Today motorized boats ply the lower 250 miles of the Kobuk when water levels are sufficient.

Rating: Class I below Lower Kobuk Canyon; Class IV-V rapids just below outlet of Walker Lake; Class II-IV rapids through Upper and Lower Kobuk canyons. Cautions: One-third of a mile of Class IV-V rapids is encountered less than a mile below the outlet of Walker Lake, with four major drops of several feet, boulders, haystacks, serious hydraulics, and no clear chutes. Portaging is essential. Pull out on the left side of the river as soon as you see the first boulder on the left. Fifty yards below here, the river bends to the left. Carry boats and gear one-third mile through the forest, Below the falls is a half-mile of Class II whitewater through rocks and riffles. Upper Kobuk Canyon (Class II-IV) is encountered about 10 miles below Walker Lake.



A canyon wall on the left and a huge boulder mid-river signify the canyon. Scout and/or line boats on the right for one-quarter mile. Lower Kobuk Canyon (Class III-IV) is about a mile long and is 18 miles below Upper Kobuk Canyon. This section can be lined on the right on a shale ledge; rock cliffs downriver of the ledge on the last section of rapids make for tricky lining conditions.

The lower canyon consists of three sections of rapids. The first is 150 yards long and consists of a chute with 2-foot standing waves and rock outcrops. The second section is a quarter-mile farther down the river and consists of two chutes, the second of which drops 5 to 6 feet with a big hydraulic at the end. The third section is one-third of a mile downriver and consists of two channels divided by an unbroken line of boulders. Within each channel are several drops within a stretch of about 100 yards. Conditions may change dramatically depending on water levels.



Carol Palmer and Cameron Mason

Trip length: 125 miles from Walker Lake to Kobuk village; allow 6 to 7 days. Or paddle all the way to Kiana or anywhere in between. From Walker Lake to Ambler is about 175 miles and takes about 10 to 14 days; from Walker Lake to Kiana is about 260 miles and takes 15 to 20 days.

Season: June through end of September.

Watercraft: Folding kayak or canoe, canoe, inflatable kayak.

Access: In-Scheduled air to Bettles or Ambler; put in by floatplane on Walker Lake. Out-Take out at Kobuk or any of the other villages along the Kobuk. All have scheduled air service to Bettles, Kotzebue, or Fairbanks.

Land manager: Kobuk Valley National Park; Gates of the Arctic National Park and Preserve; private; NANA Regional Corporation. The Kobuk is a National Wild River.

Maps: Survey Pass A-3; Hughes C-5, D-3, D-4, D-5, D-6; Shungnak D-1, D-2, D-3, D-4; Selawik D-3, D-4, D-5, D-6; Ambler River A-4, A-5, A-6, D-1, D-2, D-3, D-4; Baird Mountains A-1, A-2.

Fish: Arctic grayling, northern pike, whitefish, and arctic sheefish.

Wildlife: Caribou, grizzly and black bear, moose, beaver, and many forest mammals and birds. The Western Arctic caribou herd has several migration routes through the Kobuk River Valley.

wind or birds. Dr. Hultén hypothesized that there must have once existed a land link between North America and Asia in the vicinity of the Bering Strait, across which were spread many of these plants and on which perhaps some of them evolved. He went on to hypothesize that during the Ice Ages, ice free portions of Alaska served as a refuge for many of these plants. To that hypothetical land link, he gave the name Beringia.

Other scientists began to map out the distribution of the massive ice sheets that blanketed much of the northern hemisphere during the Ice Ages, and to identify the mechanism that worked to expose the "Bering Land Bridge". In 1934, R. A. Daly popularized the concept that sea level fluctuated drastically during the Ice Ages.

Since the 1940s, many scientists have worked to unlock the mystery of Beringia by adding pieces to the puzzle. Their work has sharpened the clarity of the picture that we form in our minds of this long lost land. It is a picture of a large continental sized landscape centered in the vicinity of the Bering Strait. It stretched from the Mackenzie River in northwestern Canada, westward to the Kolyma River in northeastern Asia. It reached about 1,000 miles north to south, from the Arctic Ocean to the Aleutian Islands. It was a land mass that was home to a very unique array of plants and animals. And it served as the entry way for mankind to enter the New World.

However, mysteries remain. Conflicts occur over interpreting the few pieces of the puzzle that we are lucky to have. Still, scientists continue each year to slowly and painstakingly discover and piece together other clues that help tell more of the story and answer more questions.

To learn more about Beringia, read ***The Bering Land Bridge*** edited by David M. Hopkins, or ***Crossroads of Continents*** edited by William W. Fitzhugh and Aron Crowell. The National Park Service Offices in Nome and Kotzebue also offer a good place to start your exploration of the "lost continent."

BEAR SAFETY

AVOIDING CLOSE ENCOUNTERS

Bears don't like surprises. When traveling in bear country, advertise your presence by whistling, singing, clapping or with noisemakers. Make noise especially where the terrain or vegetation makes it hard to see.

Avoid thick brush. If you can't, try to walk with the wind at your back so your scent will warn bears of your presence.

Contrary to popular belief, bears can see almost as well as people, but trust their noses much more than their eyes or ears. Always let bears know you are there.

Bears, like humans, use trails and roads. Don't set up camp close to a trail they might use. Watch for bear signs: tracks and scats. Tracks are unmistakable. The hind foot looks like a barefoot human. Scats are large, often containing grasses in May and June, animal hair and bones at any time, and berries in the fall.

Detour around areas where you see or smell carcasses of fish or animals, or see scavengers (ravens and magpies) congregated. Avoid camping near salmon streams when the fish are running.

IF YOU SEE A BEAR

Never run! Running may encourage a bear to pursue you. Help the bear to recognize you as a human, but don't threaten the bear. Speak to the bear in a firm but calm voice. Do not stare them in the face. Bears may interpret this as aggressive. Turn your head away slightly and wave your arms slowly or clap your hands. Retreat slowly and diagonally. However, if a bear follows, stop and hold your ground. A standing bear is usually serious, not threatening.

Grizzlies may bluff charge, sometimes to within a few feet. However, if a grizzly actually touches you, fall on your stomach or curl up in a ball with your hands behind your neck. Typically, a grizzly will break off its attack once it feels the threat has been eliminated. Remain motionless. If you move, the bear may return and renew its attack and you must again play dead.

If you are attacked by a black bear, fight back vigorously.

CAMPING IN BEAR COUNTRY

Bears are always looking for something. Don't let them learn human food or garbage is an easy meal. It is both foolish and illegal to feed bears, either on purpose or by leaving food or garbage that attracts them.

When camping in bear country, pack foods with minimal odors such as freeze dried meals. Keep a clean camp. Wash your dishes. Keep food smells off your clothing. Pack out all garbage and store it just as you would your food—at least 100 yards from your tent, out of reach of bears if possible. If no trees are available, store your food in airtight or specially designed bear-proof containers (found at most outdoor and sporting goods stores). Burying garbage is a waste of time since bears have keen noses and are great diggers.

Remember that as a visitor to these protected areas, you have a responsibility to respect bears in their habitat.

PROTECTION

Firearms should never be used as an alternative to common-sense approaches to bear encounters. If you are inexperienced with a firearm in emergency situations, you are more likely to be injured by a gun than a bear. Also, a misplaced bullet may enrage the bear and cause a more severe attack.

A .300-Magnum rifle or a 12-gauge shotgun with rifled slugs are appropriate weapons if you have to shoot a bear. Heavy handguns such as a .44 -Magnum may be inadequate in emergency situations, especially in untrained hands.

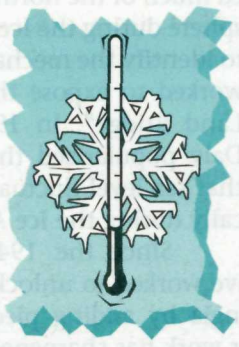
State law allows a bear to be shot in self-defense if you did not provoke the attack and if there is no alternative. The hide and skull must be salvaged and turned over to authorities.

Defensive aerosol sprays which contain capsicum (red pepper extract) have been used with some success for protection against bears. These sprays may be effective at a range of 6-8 yards. If discharged upwind, however, they can disable the person using them. These canisters are under high pressure; if you fly with one, be sure to inform the pilot so they can store it properly.

WEATHER CONDITIONS

Northwest Alaska is characterized by long cold winters and short cool summers. The coastline areas are primarily a maritime climate, while the interior areas are more of a continental climate. The interior has greater seasonal variation in temperature and precipitation.

The Bering and Chukchi Seas provide the primary source of precipitation for the region. Precipitation varies greatly with elevation, and more so inland. In Nome, the average yearly precipitation is about 15 inches. On the coast, Kotzebue averages 10 inches of precipitation a year, while the inland village of Kobuk averages 16-20 inches a year. Heavy inland rain can cause erosion of riverbanks and soils, but can increase normally unnavigable rivers into transportation routes.



Temperatures vary throughout the region with a year-round average in Nome and Kotzebue of 21 degrees Fahrenheit. Summer temperatures along the coastline are quite pleasant, with an average July temperature in the 50s. Because of the lack of sunset for much of the summer—which keeps the temperatures up during the night—the daily temperature range has relatively little fluctuation. The average summer temperature increases as you travel inland; at the Kobuk Valley Sand Dunes, temperatures can reach into the 90s.

During the winter months, snowfall is moderate. The first snow usually falls in October and stays on the ground until May. Winter temperatures in Kotzebue typically range from 10-20 degrees below zero. However, the temperature can plummet to -65 degrees Fahrenheit, and the wind chill factor can push the temperature even lower.

Freezeup, when the water freezes solid in the winter, and breakup, when the ice breaks into pieces and moves down river or out to sea, varies among each of the main bodies of water in the area. Freezeup generally occurs in mid-October, and breakup occurs in late May. Breakup along the coast can be as late as the third week in June depending on the fog and storm patterns in the area.

BACKCOUNTRY SAFETY

CAMPING INFORMATION

In Kotzebue and Nome, there are several lodging options. But in the four park areas, there are no accommodations or campgrounds (an exception is a facility at Serpentine Hot Springs). Backcountry camping is permitted in the parklands. Camping is not permitted where it would interrupt subsistence activities, or on private inholdings without the owner's consent.

Tundra and river bars are normally used for camping. Caution is required when using river bars. Rivers and their tributaries are commonly subject to flash flooding, and the water can rise and fall dramatically in a short period of time. Camp only where escape routes are available to safe, higher ground. Keep all gear well above the river level and secure all floatable items. It is essential that clothing and camping gear be of good quality. Rain gear is often needed. Tents should be able to withstand strong wind and should have rain flies. Always carry extra food and water in case your transportation cannot pick you up as scheduled.

You should be familiar with your gear before your trip, and should also be competent in backcountry hiking, camping and survival skills.

A camp stove is recommended. Campfires are permitted but downed wood can be difficult to find. Live tree cutting is not permitted.

Nome and Kotzebue have a number of small stores where some basic goods can be purchased. Fairbanks and Anchorage offer all the usual merchandise.

PRECAUTIONS

The public lands of Northwest Alaska are vast, and a number of dangers may confront you here.

Northwest Alaska is a vast area subject to harsh weather, high winds, rain and snow. Guard against hypothermia.

Wild animals can be dangerous if startled or approached—please view from a distance. Mosquitoes and biting flies can be fierce during the summer months; a head net or repellent are needed.

Giardia could be a problem in some bodies of water, so drinking water should be boiled for at least one minute before use. For some backcountry trips, water sources may not be available and you will need to carry water with you.

You should know and test your gear before you arrive. You should possess good backcountry skills for wilderness survival.

Private lands are located within all the parklands. These lands are normally located along the rivers and beaches. Please practice courtesy and respect property and privacy.

GETTING LOST

While hiking, take careful note of the direction you are traveling, of prominent landmarks and approximate distances you have walked. Keep in mind that low clouds, rain or snow are common. Frequently ask yourself if you could find your way back under such conditions. Take careful compass bearings on the next day's proposed route before retiring. Inform all members of your party of the planned route, campsite, and general direction of travel in the event you become separated. If you become lost, don't panic; stop and plan carefully. If you become separated from your group, stay where you are or move a short distance to the point where you were last in contact with the group. If alone, climb high to look for familiar landmarks. If you find no familiar landmarks or rivers, stay in one place. Remain in the open. Bright signals or objects placed in sequence of three are widely recognized as a distress sign.

Leave your itinerary and expected time of return with your family or a friend.

ACCIDENTS

If you encounter someone who is injured or ill, remain calm. Quickly give whatever first aid is required to stabilize the person and protect them from the elements. It may be some time before assistance will arrive.

Mark the location with brightly colored material in the open so that the person can be located from the air.

Write down the following details and quickly go or send for help:

- Nature of injury/illness
- Condition and name of person, home address, phone number, sex and age
- What first aid or rescue equipment is needed
- Exact location and type of terrain
- Information from Medic-Alert tag, bracelet or wallet card, and ID number

If you are ill or injured, conserve your energy and body heat. Stay near a water supply. Remain calm, think, plan and organize.

HYPOTHERMIA

Arctic summers often present conditions in which hypothermia is a danger: low air temperatures; cold river waters; and frequent rain and snow showers.

Exposure to cool temperatures, wet clothing, wet sleeping gear and wind, in combination with physical exhaustion, can cause even the strongest hiker to lose heat faster than he/she can produce it, resulting in a decline in core body temperature. Be aware that if you get wet, hypothermia is likely to follow.

Early symptoms of hypothermia include slurred speech, trembling, exhaustion, stumbling and impaired judgment.

The objective of hypothermia treatment is to keep warm and dry. Stop hiking and find a warm, dry spot, out of the wind, rain or cold. Remove wet garments and add layers of dry, warm clothing. Drink warm liquids (not alcohol). In more advanced cases, remove clothing and climb into a dry sleeping bag, stay awake, and share body heat with others. Remember—advanced hypothermia is difficult to treat properly, creating a very serious situation.

Prevention is always the best treatment, and that means careful planning and preparation.

- Take plenty of warm clothes, and enough food, water, clothing and equipment for at least one extra day.
- Take at least one complete change of warm clothes in case one set becomes wet. Pack clothes, sleeping bags and sleeping pads in waterproof bags.
- Eat high calorie foods.
- Dress in layers, and remove outer layers to ventilate when you start sweating.
- Make sure all members of your party are aware of the symptoms of hypothermia and look out for each other.

LEAVE NO TRACE OUTDOOR ETHICS

PLEASE PRACTICE LEAVE NO TRACE OUTDOOR ETHICS

- Plan Ahead and Prepare
- Travel and Camp on Durable Surfaces
- Dispose of Waste Properly
- Leave What you Find
- Minimize Campfire Impacts
- Respect Wildlife
- Be Considerate of Other Visitors

Check with rangers for more information on how you can have a safe and low impact visit.

CAPE KRUSENSTERN DIARY

The following is an excerpt from the monthly resources diary kept by William R. (Bob) Uhl. Bob and his wife, Carrie Uhl, have lived in what is now designated as Cape Krusenstern National Monument for the last 50 years (more for Carrie). Bob regularly shares his observations on life in Krusenstern with us, and we are grateful for his contribution.

December 1994

One may wonder, if, out of the twelve months of the year, December might be there to test the durability, the "suitability" of the various species (including man) for their environment. December 1994 was a great example of this possibility. It was a test for creatures great and small.

There were 9 days of wind blowing to 30 K or more. On the 23rd the daily high was a -38 degrees F. The low a -44 degrees F. On the 11th wind velocity reached 51 K and got up to 45 K on the 1st, 25th and 28th all from the E and SE. Considering chill factors and drifting snow (blizzards) one can understand that the resident species which can survive these conditions will probably find the other 11 months easier to live with. Sunlight of course has a place in this December equation, being the very sustainer of life on earth. We had as little as 1 hour and 43 minutes on the 20th and 21st. The great and remarkable upswing in the daily length of life sustaining sunlight-time comes within the same week that we celebrate the Birth of Christ. We stand in awe, in this week of December, at the importance of Light in our life. All we creatures, great and small.

THE CARIBOU CYCLE

by Brad Shults
Park Wildlife Biologist

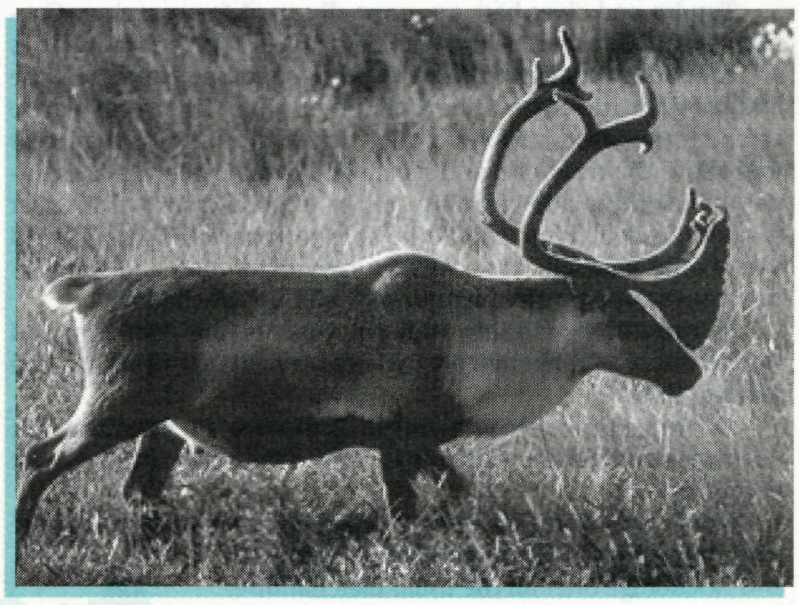
With well over 450,000 animals, the Western Arctic Caribou herd is the second largest herd in North America. (The George River caribou herd in the Canadian provinces of Quebec and Labrador numbers approximately 600,000).

Ranging over an area of 140,000 square miles—more than half the size of Texas—the herd wanders from the north slope of the Brooks Range south to the Yukon river and as far east as the Trans-Alaska pipeline corridor.

The caribou's timeless, annual migration cycle begins in June with calving on the northern slopes of the Brooks Range. After calving, the herd forms into separate groups and disperses in search of relief from the summer's heat and pestering insects. As summer passes and the days grow shorter, the fall migration begins; this time also marks the onset of the breeding season. During this time, the herd begins its long journey through the passes of the Brooks Range and across the Noatak and Kobuk Rivers, heading to the wintering grounds in the south. In late March and early April—following the long, Arctic winter—the caribou begin their spring migration, returning to the starting point of this age old cycle.

Since a population low of 75,000 caribou in 1976, the herd has steadily increased in numbers. Prior to the 1970s decline, the population was estimated at 240,000 caribou. Because the Western Arctic Caribou Herd is a vital subsistence resource, and caribou population numbers tend to fluctuate drastically, biologists use modern technology to obtain biological information about the herd across its vast range throughout the year.

Important population characteristics such as reproduction, mortality, and calf survival, combined with seasonal movements, reveal clues to the population's health. In order to collect this informa-



SUBSISTENCE WHAT IS IT?

by Lois Dalle-Molle
Park Resources Manager

Traveling through Alaska, a visitor quickly realizes what Alaskans have learned over the last two decades—that "subsistence" seems to mean many different things. The meaning of subsistence may be as varied as the people of this huge state.

For the National Park Service in Northwest Alaska, subsistence means that local residents—the majority of whom are Iñupiaq Eskimos—are guaranteed the right to continue their customary uses of lands which are now National Parks, Monuments, and Preserves. Local people can hunt, fish, and gather plants and berries on all park lands. This is unlike other United States national parks or monuments outside Alaska, where hunting is not allowed, and resources are protected from many consumptive uses.

To understand why Alaskan park lands are different, it is necessary to know that Alaska itself has only been a state for 38 years. Two important federal acts, which have been passed since the Statehood Act of 1959, have had major effects on subsistence in Alaska. The Alaska Native Claims Settlement Act of 1971 created Alaska's Native Corporations and gave ownership of selected lands to Alaska Natives. The Alaska National Interest Lands Conservation Act of 1980 added millions of acres of federal lands to the National Park system.

Under these Acts, Alaska Natives gave up their sovereign rights to land in Alaska—land which has been freely used by aboriginal people for thousands of years. In return, Alaska Natives and other rural residents were guaranteed the right to continue subsistence use of the newly created federal lands. They could hunt, fish, gather plant products and use resources of the land.

In Northwest Alaska, Native people have hunted, fished and lived along the Kobuk River for at least 9,000 years. Native people of every known cultural period in Arctic Alaska have lived in the Cape Krusenstern area.

Subsistence is a part of life for the Iñupiaq Eskimo people who currently live in the villages and camps of Northwest Alaska. Their values for the land and their use of its resources are an identity of their culture, past and present. When certain animals are caught, many hunters still follow the instructions taught by Elders out of respect to the spirit of the animals and to enhance their ability to catch them. Some rituals are still done to ensure the return of the animal.

The National Park Service is dedicated to the preservation of natural and cultural resources of the United States. In the Western Arctic National Parklands, the Park Service is working with Native organizations and other interested groups on protection of archeological, natural and cultural resources—which include subsistence rights—of Kobuk Valley National Park, Cape Krusenstern National Monument, Noatak National Preserve, and Bering Land Bridge National Preserve.

HUNTERS NOTE

THERE ARE TWO SETS OF REGULATIONS GOVERNING THE TAKING OF WILDLIFE.

IF YOU ARE NOT A RESIDENT OF UNIT 23 (NORTHWEST ALASKA)

You need to hunt under State of Alaska, Department of Fish and Game regulations. For further information on State regulations, call: Alaska Department of Fish and Game at (907) 442-3420.

IF YOU ARE A RESIDENT OF UNIT 23
YOU NEED TO IDENTIFY THE OWNERSHIP OF THE LANDS ON WHICH YOU PLAN TO HUNT.

1. IF YOU PLAN TO HUNT ON NON-FEDERAL PUBLIC LANDS:
(Non-Federal Public lands include all private and State lands, all selected lands, and lands belonging to NANA Regional Corporation.)

- You need to hunt under State of Alaska, Department of Fish and Game regulations. For further information on State regulations, call the number listed above.
- NANA Regional Corporation and other Private landowners may have additional restrictions for hunting on their lands.

2. IF YOU PLAN TO HUNT ON FEDERAL PUBLIC LANDS IN UNIT 23:

A. IN CAPE KRUSENSTERN NATIONAL MONUMENT OR KOBUK VALLEY NATIONAL PARK:
You may not hunt in these areas unless you are a Federally Qualified Subsistence hunter in Unit 23 and a resident of the appropriate resident zone for the park or monument. Hunting regulations are found in Subsistence Management Regulations for the Harvest of Fish and Wildlife on Public Lands in Alaska. For further information, call the National Park Service at (907) 442-3890 or (800) 478-7252.

B. ON OTHER FEDERAL PUBLIC LANDS IN UNIT 23:
Most remaining Federal Public Lands in Unit 23 are open to hunting under State regulations, State of Alaska Department of Fish and Game Hunting Regulations. HOWEVER, specific areas may be closed or restricted by Federal regulation; consult the Subsistence Management Regulation for the Harvest of Fish and Wildlife on Federal Public Lands in Alaska for details on who can hunt where and when. For further information, call the National Park Service at the number above, or the Fish and Wildlife Service at (907) 442-3799 or (800) 478-8848.

tion, biologists maintain a sample of caribou with neck collars that have attached radio transmitters. During any given year, approximately 100 such radio collars are on caribou to monitor not only an individual animal's fate, but more importantly to record movements of the herd and to locate caribou for periodic aerial surveys and a population census taken once every three years.

Radio collars are put on caribou by using personnel and boats to physically restrain caribou while they swim the Kobuk River within Kobuk Valley National Park. Although radio collars are an important wildlife management tool, biologists still must use fixed-wing aircraft to locate the individuals by following the radio signal. The triennial population census is presently the best method to determine population size. Following calving in June, caribou aggregations on the north slope of the Brooks range are found by locating the collared animals and by visually searching vast areas using fixed-winged aircraft. Caribou groups are photographed using a specially equipped aircraft, and each caribou in each photograph is later counted to produce a minimum population estimate.

How big will the Western Arctic Caribou Herd grow? No one can answer that question, but biologists will continue to collect information which will ensure that caribou continue to be an integral part of the arctic ecosystem and of the cultural tradition in Northwest Alaska.

REINDEER HERDING

by Richard Harris
Park Resources Specialist

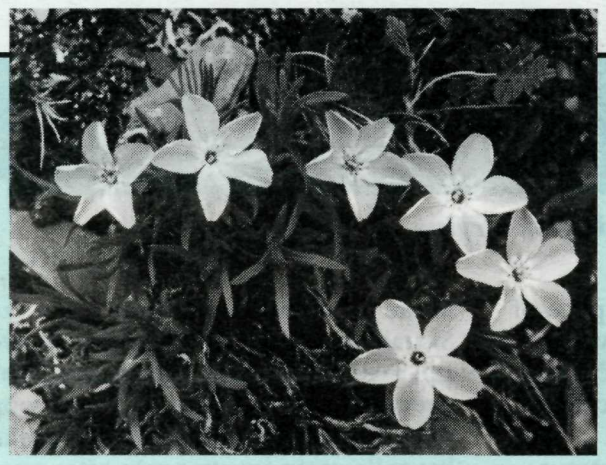
Reindeer were first brought to Alaska in 1891 by the Reverend Sheldon Jackson. While working as a missionary on the Seward Peninsula, Rev. Jackson learned that the caribou which had once been abundant there had disappeared. Local residents had no reliable source of red meat for much of the year. Rev. Jackson negotiated to bring reindeer from Eastern Asia to fill that need.

Individuals were able to start herds by purchasing reindeer, or by working and receiving reindeer as pay. Herds prospered and by the early 1930s, there were an estimated 600,000 reindeer on the Seward Peninsula. Reindeer herders attempted to negotiate markets in the lower 48 states in the late 1920s and early 1930s. The effort was unsuccessful because of direct competition from the cattle industry. The final demise of the reindeer herding effort was a result of the great depression.

In 1937, Congress mandated that all reindeer in Alaska would be native owned, as was the original intention of Rev. Jackson. Natives acquired the herds through a federal purchase program managed by the Bureau of Indian Affairs.

Reindeer herding today is centered on the Seward Peninsula. The total number of animals is about 30,000. Herders derive their income through sales of antler for medicinal use in Asia and sales of meat for the local markets. Reindeer meat is low in cholesterol. Because the meat is not federally inspected and slaughter is a seasonal activity, markets outside of Alaska are very limited. Reindeer meat can be purchased locally, in Nome or Kotzebue grocery stores.

Biologically, reindeer are old-world caribou. They are the same species as Alaska caribou, but reindeer are shorter and stockier. Only experienced observers are able readily to tell the difference. In fact, migrating caribou are one of the great concerns of reindeer herders today. If caribou migrate into a reindeer herd, the reindeer will follow the caribou. The large Western Arctic caribou herd—over half a million animals—migrates south in winter, near reindeer areas. Reindeer from several local herds have left their herds entirely, following the caribou on their northward migration in the spring.



BOTANICAL EXPLORATION IN NORTHWEST ALASKA

by Randy Meyers
Natural Resource Specialist, BLM

During the 20th Century, various portions of Northwest Alaska were explored by botanists seeking to document arctic, alpine and boreal vegetation unique to this region. Botanical expeditions floated the Noatak and Kobuk Rivers, hiked through the Great Kobuk Sand Dunes, and explored remote corners of the Seward Peninsula and the Cape Thompson area, sometimes using small "bush" aircraft or helicopters for access. In order to better understand matters such as limits on plant distribution, fire ecology, and plant species abundance and diversity, field botanists laid out temporary and permanent transects, cored trees to determine their age, studied aerial photographs and satellite images, and collected many plants for closer study and classification.

The Squirrel River, a major tributary to the Kobuk River, has remained largely unexamined during this period of botanical reconnaissance. Now under BLM management, botanical inventory of the Squirrel River basin during the 1992-1996 field seasons has revealed several rare plants (an aster, a sour dock, and an arctic locoweed), and extended the geographical ranges of many others. BLM is striving to balance current recreation and subsistence use of wildlife and vegetation resources in the Squirrel River valley with wise management and ongoing resource inventory.

AKUTUQ (ESKIMO ICE CREAM)

Akutaq is an Eskimo food made by warming fat then whipping air in by hand as it slowly cools into a foam. Many other foods can be added making it a dessert, a meal, or an excellent trail food that packs easily and can be eaten frozen.

Traditionally, this food was made for funerals, potlatches, when a boy got his first of any kind of animal and other special occasions, now including birthdays. Sometimes it was made as a special food, or for traveling.

It is best to learn to make this food from someone skilled in the art. There are many subtle tricks to making really good, fluffy *akutaq*, and not everyone seems to be able to do it.

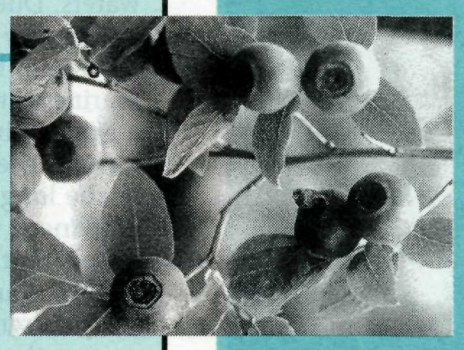
From Nauriat Niginaqtuat: Plants That We Eat, by Anore Jones and Manillaq Association, 1983.

AKUTUQ (Bethel Style)
Gretchen Booth

1/2 gallon salmonberries or blueberries
(you can add other berries to taste)
sugar to taste
1 handful Crisco
1 handful Crisco Oil
1 cup berry juice or water

Whip Crisco, oil, juice or water, and add sugar to taste. Then add berries to taste. If there is not enough salmonberries, you may want to add blackberries or raspberries. *Yum.*

AKUTUQ
Leora Kenick, Park Subsistence Ranger



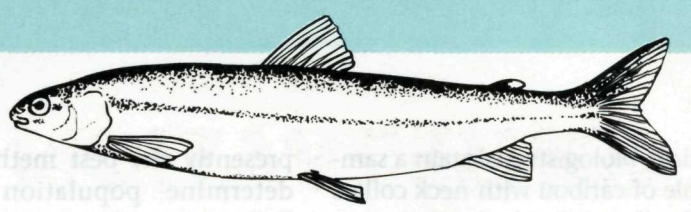
About a pound of *tunuq*
(tallow from moose, caribou or reindeer)
About 1/2 cup seal oil
About 1 cup sugar
About 1/4 cup of water
Salmonberries, blueberries, blackberries, cranberries, raspberries

Place the *tunuq* in an iron skillet over a low flame. Once it becomes a liquid, remove it from the heat and stir the liquid fat. To keep up the stirring for several hours, your arms must be strong and in good condition! From now on there are only brief pauses to your stirring to add various ingredients.

Veins and mesentery (the filmy membrane of the *tunuq*) are separated out while the *tunuq* is being whipped by hand. When the *tunuq* begins to turn white, add about a teaspoon of water at a time to help make the *qamamaq* softer (this is what the *tunuq* becomes after you work it). You will feel it fluff up a bit and stiffen. Then add the seal oil to help keep it soft. Keep adding the water and seal oil and mixing until the tallow whips into a smooth cream. Once it is light and fluffy, sweeten with sugar and/or any type of berries (drained). If you use berries, gently fold them into the mixture, one cup at a time.

Like most of our Native foods, its natural . . . *m-m-m!*

A WHITEFISH DAY



The following excerpt is from the journal of Bob Uhl. It is an account of one plentiful day of catching whitefish, using an ancient method of trapping fish that takes advantage of coastal beach movement. Bob and his wife Carrie reside on Native allotments within Cape Krusenstern National Monument. They live on the coast at Sisualik during the summer months and then move farther inland to the protection of trees during the Arctic winter. While the technological wizardry of the electronic age has reached as far as their winter cabin in the form of a <None> continuing the tradition of hunting and gathering which has occurred in those locations for thousands of years. For them, as for all Iñupiaq Eskimos of the northwest Arctic regions, subsistence is more than just hunting, fishing and gathering; it is a foundation for Native traditions and cultural identity. Bob and Carrie celebrate their 50th wedding anniversary this year and continue to keep a journal of their experiences. We are grateful they have agreed to share their observations and give us an insight into a traditional subsistence life.

September 23, 1997

Whitefish drying on racks

September is the month each year that Sisualik and Krusenstern people hope to put up large quantities of whitefish, both dried and frozen, from one or more of the lagoon outlets that are dammed by beach gravel- trapping greater or lessor numbers of whitefish inside. Usually netting goes on through the whole month and into the next, as well as tending a ditch trap called a "katigisak."

Two unusual things happened at the outlet of Anigaaq this September. One concerning us personally, the other more in the line of very ancient history. The first was really brought about by the second.

Air temperatures and the uses to be made of whitefish usually determine when in September that your net will be set. Fish for drying can be cut anytime; it seems that rain will slack off long enough for them to dry properly. Those to be eaten frozen, after being sewn in sacks and aged, turn out best when caught and prepared just as nights turn frosty.

On the 22nd, we went over to Anigaaq to set two nets. When we got to the outlet we marveled at the giant hand (wind and waves) that had shaped a giant katigisak. There was a long narrow ditch running from the edge of the slew inside towards the lapping ocean waves outside. Just before the ditch reached the ocean, a wide pond or ìstomachî had formed with an extensive dike of porous gravel between slew water and marine waters. Due to weeks of rain, the inside slew waters were at a higher level than the sea. The more the marine waters dropped, in response to a North wind system which we were having, the stronger the current was in the long narrow ditch. The set-up convinced whitefish trapped in inside waters that access to the sea was theirs if they would only enter the narrow swift current. On doing that, of course, they would only end up in the diked, holding pond. Now, this set-up on a small scale is an exact replica of what a human fisherman strives to achieve with shovel and muscle in making the ancient fish trap called "katigisak."

Well, when we went by to set our nets farther back in the slew there was no sign of fish but we marveled at this remarkable storm formed situation. There was a huge flock of gulls (1,000) waiting. We set our net and went home to Sisualik by ATV (all-terrain vehicle).

The next morning, the 23rd, anxious to check our nets, we went over early. The North wind had increased and continued and marine water level was considerably lower than the afternoon before. When we got to the outlet we could not believe our eyes, there were 1,000 stuffed Glaucous Gulls and large partially eaten whitefish all over the beach, out of the "stomach pond." On many of the fine large fish only the eyes and livers were eaten. The large katigisak, or "stomach pond" had much less water than yesterday due to marine water level drop, was alive with choice fat Anigaaq whitefish. Just scoop them out, pick them up, and stuff them in a sack, trailer or whatever. Carrie and I were alone for about a half hour when our Sisualik neighbor and his wife showed up. We four worked and stuffed fish in everything we had, for we knew what ever was left would be quickly worked by gulls- now empty again after a several hour wait. No one else (human) was lucky enough to come along and we still had our two nets to check!

We called September 23rd, Whitefish Day '97. It turned out to be a classic example of how one day in the cycle of subsistence activities can be so critical. As it turned out, this was going to be the only opportunity for all 197 fishers at Anigaaq to make a real haul. Netting went on into October at both Anigaaq and Akulaaq but only small sporadic catches were made. We got our whole winter supply of both dried whitefish and sacked whole whitefish that day—top quality at that. The fish were much fatter than usual for this location. We made several trips to get them home to Sisualik and it took a couple of days to work them up. We are very thankful for this strange pile up of circumstances, but it is an example of how well things can go for those that live off and on the land, sometimes! ■

SUBSISTENCE

The Western Arctic National Parklands differ from Yellowstone and other traditional parks in that local residents are guaranteed their right to continue their customary uses of the land. When Congress established these areas in 1980, it provided for the continued harvest of fish, wildlife and other wild renewable resources on these lands by local residents, the majority of whom are Inupiaq. Native people have hunted, fished, and lived on these lands for at least 9,000 years. The goal of the National Park Service is not only to preserve natural and cultural resources on these lands but is also to provide an opportunity for people to continue to live a subsistence way of life.

MIGRATORY SONGBIRDS

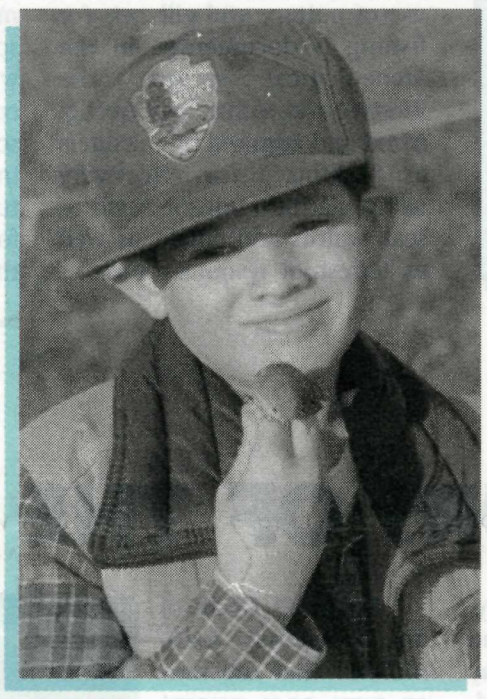
CONSERVATION IN NORTH AMERICA

by Brad Shults
Park Wildlife Biologist

Northwest Alaska boasts a wide and diverse collection of birds with over 150 bird species recorded in the Kotzebue basin. Of particular interest to many birders is the diversity of migratory songbirds. Many of the breeding songbirds in Northwest Alaska migrate from wintering habitats in South America and Eastern Asia. Some come from as far away as Africa. Geographically, we refer to southern species as Neotropical (New World) migrants and the Asian species as Palearctic (Old World) migrants.

In recent years, the U.S. Fish and Wildlife Service (USFWS), the federal agency charged with migratory bird management under the Migratory Bird Treaty Act, discovered that numbers of some species of migratory songbirds had declined by more than 60% as evidenced by their absence from the North American Breeding Bird Survey. What is happening to these long distance travelers? Habitat fragmentation and the deforestation of wintering areas are the most likely factors in these documented declines.

Recognizing this unprecedented decline in neotropical migratory songbirds, an international partnership was formed to search for reasons behind the decline and to prevent or mitigate further losses. In 1991, more than twelve government agencies and 20 non-governmental agencies came together to form Partners in Flight/Aves de las Americas. As part of an international comprehensive bird conservation program to stem the decline of migratory songbird species, Partners in Flight emphasizes habitat protection, management, professional training, and public education. To focus efforts in Alaska and Canada, the Boreal Partners in Flight Working Group was established in 1992. The group has met at least once per year to coordinate and prioritize statewide efforts, as well as to compile an annual summary of program activities. As part of this program, the National Park Service (NPS), in cooperation with the USFWS and local landowners, has conducted breeding bird surveys and has banded songbirds. Bird banding is conducted under the Monitoring Avian Productivity and Survivorship (MAPS) program protocol established by the Institute for Bird Populations at Point Reyes, California. Because there are no immediate threats to songbird habitats in the NPS units in Northwest Alaska (Cape Krusenstern National Monument, Noatak National Preserve, Kobuk Valley National Park and Bering Land Bridge National Preserve) these protected areas are ideal control sites for long-term songbird population monitoring.



NPS Volunteer helps with bird banding.

In 1994, the NPS began operation of bird banding stations at the Kelly River and the lower Kobuk River from June-August. In addition, a third banding station has been operated since 1995 by the staff of the Western Arctic National Parklands and Selawik National Wildlife Refuge on Native corporation land near Kotzebue. The proximity to Kotzebue allowed for public education and participation in banding activities. Each station represents different habitat types: upland tundra-spruce forest (Kelly River), riparian willow-spruce (Kobuk River), and a coastal tussock tundra-willow (Kotzebue). An array of ten nylon mist nets used to entangle birds in flight were set up at each site and operated once every ten days. We opened the nets for six hours during each banding session and removed captured birds hourly for processing. We began netting at 5:00 am as a standard start time because there is no "sunrise" during the arctic summer. From a trial field season in 1993, we "objectively" determined that bird activity between 3:00 am and 5:00 am was minimal and did not justify opening the nets this early. In other words, it was simply too early for biologists and volunteers to get out of bed! Captured birds are removed from the nets and banded with a uniquely numbered USFWS aluminum band carefully placed on one leg. Each banded bird is also sexed, aged, measured, and weighed so we can learn more about each specie's biology. Over several years, the recapture of banded birds will allow us to determine species survival rates as well as determine annual species productivity within a given habitat. The information collected in Northwest Alaska, when combined with regional and international efforts, will provide valuable insight into the ecological aspects of those species in decline so that effective conservation decisions can be made.

Since 1994, we have banded 1,253 birds of 34 species. Ten species banded have winter ranges in Mexico and as far south as Central and South America. We banded two Palearctic species at Kotzebue which are occasionally seen in coastal areas: the Bluethroat and Yellow Wagtail. Common Redpolls were the most frequently banded species at the three stations and accounted for roughly 50% of the birds banded at the Kotzebue station during 1995. Northern Waterthrushes were captured most often at the Kobuk River station while Common Redpolls and White-crowned Sparrows were most numerous at the Kelly River station. With only two years of data, it is obviously too early to make any conclusions; however, as we might expect, it appears that weather conditions and habitat differences between stations have made for noticeable distinctions in abundance and species composition between years and stations. For example, spring came almost three weeks early during 1995 with one of the earliest breakups in history. This gave migratory birds an early start on the breeding season. Because lakes and rivers were ice free, many migratory birds bypassed staging areas and flew directly to breeding areas. Specifically, the Kobuk River banding station was a "swamp" during 1994, but strikingly dry during 1995. Coincidentally, Northern Waterthrush captures at the Kobuk River station decreased by over 60% in 1995. In addition, the dry, warm conditions of 1995 translated into large numbers of juvenile redpolls captured at the Kelly and Kotzebue stations during the later banding sessions.

We intend to operate the stations through 1998. Surprisingly enough, given the remoteness of our banding stations (e.g. two of three are accessible only by aircraft), the banding program is the most inexpensive wildlife project we conduct in the parklands of Northwest Alaska. We have found that the Neotropical songbird banding stations are inexpensive resource management projects that provide valuable biological data along with opportunities for community education and local participation in banding activities. During the next few years, the NPS and USFWS will continue to contribute to the international effort to preserve this sometimes overlooked, but always heard, part of our everyday life. ■

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CULTURAL HERITAGE

by Bob Gal
Park Archeologist

Two key sites in Northwest Alaska—Onion Portage and Cape Krusenstern—provide an outline of the cultural history applicable to much of the state. At Onion Portage, layered soils containing human occupational debris and tools extend to a depth of almost twenty feet; the deeper the layer, the older it is. At Cape Krusenstern, successive occupations are horizontally rather than vertically stratified. The occupants of Cape Krusenstern were marine oriented and camped or built houses on the beach ridges closest to the shore of their time, thus one encounters increasingly older settlements as one walks inland from the active beach of today.

The earliest people arrived in the region over 10,000 years ago. They came from northern Asia and were nomadic hunters and gatherers who probably travelled in small groups.

Around 4,000 years ago, new people or ideas came into Alaska, possibly from Asia, and the distinctive tools that mark this influx can be traced eastward across the Canadian Arctic to Greenland. At least by this time, people were harvesting both marine and terrestrial mammals. Large whales were hunted by people living at Cape Krusenstern 3,000 years ago. Coastal settlements 2,500 years old attest to more permanent coastal living and increasing dependence on marine mammal resources. At this time the use of pottery and gill nets for fishing is documented in the archeological record. The lifestyle and technology (recognized and admired by outsiders as "Eskimo") for effectively using marine resources such as seal, walrus and whale, as well as terrestrial resources such as caribou and musk-ox was firmly established about 1,600 years ago. Since 1,200 years ago, but probably much earlier as well, extensive regional and intercontinental trade networks have been maintained.

European goods, including tobacco, reached Northwest Alaska in the 18th century via Russian traders and Chukchi (a people of the Russian Northeast) middlemen. After 1850, significant changes resulted from increasing Euro-American contacts. A gold rush on the Kobuk River in 1898 and the establishment of permanent missions and trading posts at about the same time established sustained contact with Euro-Americans. With this presence, the fur trade expanded in importance and the use of large dog teams, providing greater mobility, allowed persons to spread out over larger areas in winter. This tendency was countered by the enticement of schools, post offices and trading posts established after the turn of the century which formed the nucleus of most of the region's modern villages.

ALASKA NATIVE ARTS & CRAFTS

Many of the 1.6 million visitors to Alaska's national park areas spend a portion of their visit shopping for items to take home with them as momentos of their trip. A functional or decorative item crafted by an Alaska Native can provide a lasting remembrance of the unique culture and lifeways of Alaska Native people.

Traditional and contemporary Native arts and crafts include baleen and birch bark baskets, hide and whale bone masks, intricately woven rye grass baskets, detailed decorative beadwork, handcarved silver jewelry, and needlecraft using local furs. The continued creation of these items not only fosters cultural preservation, but also enhances economic opportunity. In the words of Secretary of the Interior Bruce Babbitt, "Support of both objectives, cultural preservation and economic well-being, is part of the trust responsibility and our overall mission (in the) Department of the Interior."

Visitors should be cautious when purchasing items called "Native arts and crafts." A "Silver Hand" emblem on an article guarantees that it was handcrafted by an Alaska Eskimo, Aleut, or Indian craftsperson or artist. Handcrafted items may be found in park concession facilities and commercial shops adjacent to park areas.

MUSKOXEN

SHAGGY SURVIVORS OF THE ICE AGE

by Ken Adkisson
Park Subsistence Specialist

The Seward Peninsula is currently home to one of the Arctic's more distinctive animal residents, the shaggy, prehistoric looking muskox.

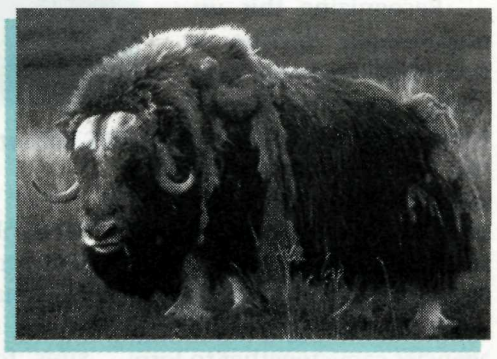
The muskox is truly an Ice-Age relic. It originated on the tundra of central Siberia and later entered North America over the Bering Land Bridge. Its bones have been found as far south as the states of Kansas and Illinois. However,when muskoxen lived there, the landscape was very different. Great sheets of ice up to a mile thick covered most of North America. The muskoxen lived on tundra that bordered the southern edge of the ice. As the ice melted, prairie grasslands and forests advanced northward, replacing the tundra. The muskoxen also moved northward or else died out. Meanwhile, muskoxen continued to live in smaller ice free parts of Alaska, the Yukon Territory of Canada, and in northern Asia. Finally, when the ice sheets had largely disappeared, the muskoxen were able to colonize the high arctic and even Greenland.

Unlike some animals that hibernate or else migrate southward in the winter, the muskoxen are year-round residents. They are well suited to survive in the rigorous and demanding environment of the arctic. Their bodies are compact and covered with layers of thick, insulating fur and longer guard hairs which may hang almost to the ground. Even their behavior is geared to conserving energy (which is their main survival strategy). While they are agile and can gallop in a short burst of speed, their most common pace is a slow, measured walk. When disturbed or threatened, groups of muskoxen often form a defensive circle, with animals bunched together and heads and horns facing out. This allows the group to stand its ground and fight off enemies rather than expend more energy by running away.

For an animal of its size, muskoxen seem to have a relatively small home range. In winter, groups of muskoxen appear to return to favorite wintering sites where snow is relatively shallow or swept free by wind. They do not do well in deep snow and the snow depth seems to be a factor limiting their distribution. On the Seward Peninsula, wintering sites are often located in the higher hill country. Once the animals have settled on a wintering site, they seem to prefer staying there throughout most of the winter unless they are disturbed and frightened into abandoning the site.

In spring, they begin to scatter out and move down to lower elevations to feed on lusher vegetation. Late fall will generally find them moving back to their favorite wintering area.

Scattered finds of an occasional fossil indicate that muskoxen were once present on the Seward Peninsula, at least a very long time ago. However, they were definitely gone by the late 1800s.



Having survived the major environmental changes at the end of the Ice-Age, muskoxen were to face an even more severe challenge. Evidence from the high Arctic suggests that muskoxen can survive at least limited hunting pressures from humans for a long time. However, ever increasing hunting pressure from a growing human population seems to be more than the animals can cope with. Even their defensive circle, which gives them such good protection from wolves, their major predator, serves only to make them more vulnerable to humans. As European exploration and settlement of the arctic increased, muskoxen were threatened with extinction from over hunting. Muskoxen were gone from Alaska by the end of the 1800s.

From where then do the muskoxen on the Seward Peninsula come? In 1930, thirty-four muskoxen were captured in east Greenland and taken to Fairbanks, Alaska. Five or six years later, all the surviving Fairbanks' muskoxen and their calves were taken to Nunivak Island in southwest Alaska where they thrived. It is from the Nunivak Island herd that 36 muskoxen were reintroduced onto the Seward Peninsula in 1970, with another 35 animals in1981. From those original 71 animals, the Seward Peninsula herd has grown to more than 900 animals.

This important conservation success story is not without its controversy. The expanding muskoxen population has brought complaints from some area residents that the animals trample berry picking areas, eat important greens like sourdock, and displace reindeer and moose. Answers to some of these questions are currently being sought through research. The growth of the herd led to the development of a cooperative muskoxen management plan in 1994. One of the plan's objectives recognized hunting as a legitimate use of the herd. Efforts for a State managed hunt were initiated in 1995, but were terminated when a Federal subsistence hunt was authorized that same year. Efforts at cooperative management continue, and hopefully solutions to some of the controversies will be found.

PARK NEIGHBORS

SELAWIK NATIONAL WILDLIFE REFUGE

by Leslie Kerr
Refuge Manager

REFUGES IN ALASKA

Alaska Wildlife Refuges are an important part of the National Wildlife Refuge System. The land is breathtaking. Vast tracts of untouched wilderness, landscaped with mountains, glaciers, rivers, lakes, forest, and tundra grace these lands. These refuges are inhabited by a wide variety of wildlife, birds, and indigenous peoples. There are 16 refuges in Alaska encompassing over 77 million acres of land. Alaska refuges account for 88 percent of all lands in the National Wildlife Refuge System.

SELAWIK NATIONAL WILDLIFE REFUGE

Located in Northwest Alaska and bisected by the Arctic Circle, the Selawik NWR is a showcase of estuaries, river deltas and tundra hills. The most prominent feature is the tundra wetlands nestled between the Waring Mountains and the Selawik Hills. These wetlands support an abundance of wildlife including songbirds, waterfowl and mammals. The northeastern part of the refuge includes 240,000 acres of designated wilderness. The upper portion of the Selawik River is designated as a National Wild and Scenic River.

Selawik NWR was established by the Alaska National Interest Lands Conservation Act (ANILCA) of 1980. The 2.86 million acre refuge was set aside to conserve wildlife and habitats, and to provide the opportunity for continued subsistence by local residents. The refuge is accessible by boat, aircraft, snowmachine, dog team, foot and cross-country skiing, depending on the season and weather. There are no roads or public facilities on the refuge. Year-round, the refuge offers numerous possibilities for exploration by the self-sufficient and adventurous.

For more information

about the refuge and its recreational opportunities, visitors in Kotzebue can stop at the **PUBLIC LANDS INFORMATION CENTER** (154A Second Avenue) or at the refuge office (160 Second Avenue). Visitors may also write to:

REFUGE MANAGER, SELAWIK NWR,
P.O. Box 270,
Kotzebue, AK
99752, or call (907)
442-3799.
The e-mail address is
R7SNWR@mail.fws.gov.

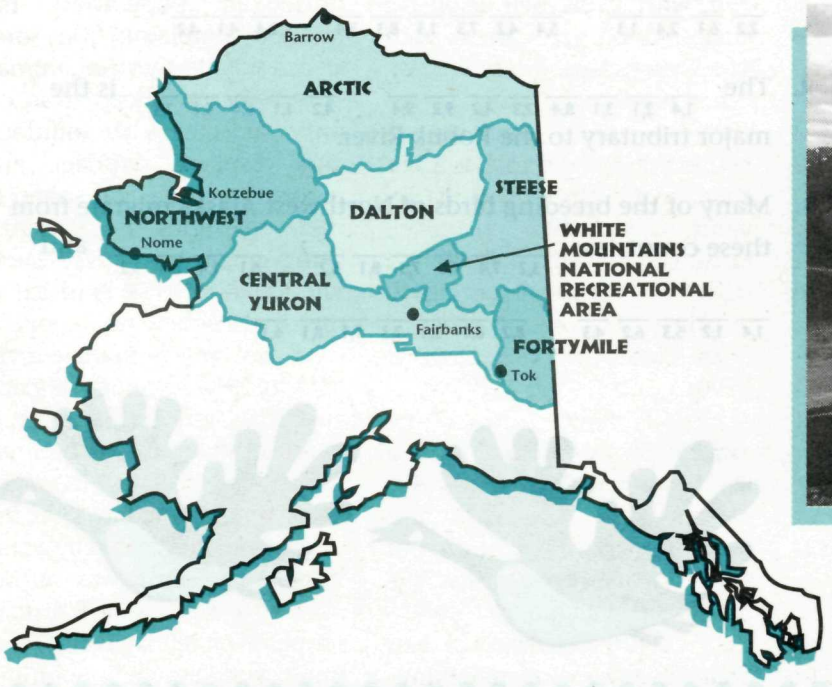
The Alaska Region of the **U.S. FISH AND WILDLIFE SERVICE** has a home page at http://www.r7.fws.gov.

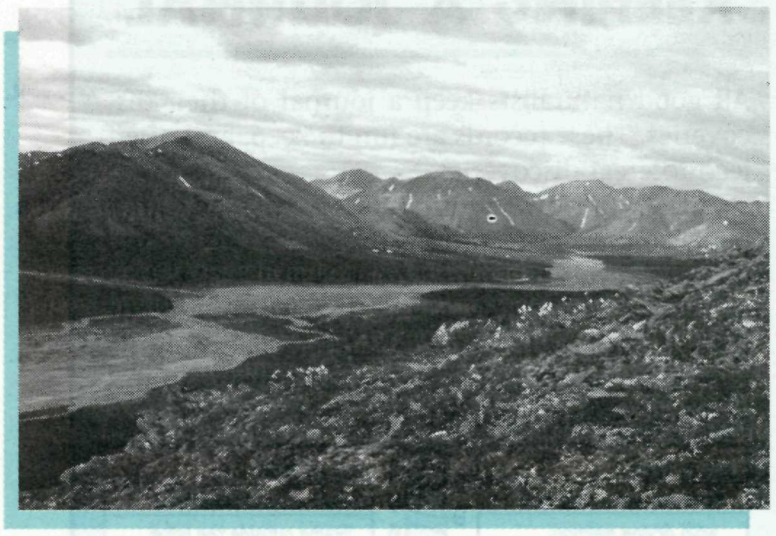
BUREAU OF LAND MANAGEMENT

Bureau of Land Management field stations in Kotzebue, Nome, and Tok belong to the BLM Northern District Office. From these areas, seasoned crews of wildlife and fisheries biologist, natural resource specialists, outdoor recreation planners, archaeologists, geologists, land law examiners, realty specialists, and rangers manage the 60 million acres of publics lands scattered throughout the Northern District.

BLM lands are available for many activities, some activities require a permit or lease, and some do not. In Northwest Alaska public lands host reindeer grazing, big game guided operations, placer and lode mines, sand and gravel sales, and harvest of timber. All of these activities require permits, and in some cases, fee payments. Other non-commercial uses include camping, boating, hiking, fishing, trapping and berry picking.

Tucked in the southwest flank of the Baird Mountains, the Squirrel River basin is the most easily accessible BLM land area from Kotzebue. The Squirrel River basin is a quiet pocket of clear, braided rivers and creeks, open white spruce forests and moist alpine meadows. Gently sloped tussock and rocky peaks are home to large groups of caribou that migrate through seasonally. Moose, grizzly bears, black bears, wolves, and Dall sheep are year round inhabitants. Important fish species are chum salmon, Dolly Varden, grayling, pike and whitefish. Although people have been traveling through this area in pursuit of subsistence and recreation for hundreds of years, the Squirrel River corridor has no trails or roads. The most direct approach to getting there is to fly 30 miles northeast across the Kotzebue Sound and over the Kiana Hills, then landing on one of the many river bars.





BLM–KOTZEBUE FIELD OFFICE
P.O. Box 1049
Kotzebue, AK
99752
(907) 442-3430
fax: (907) 442-2720

BLM–NOME FIELD OFFICE
P.O. Box 925
Nome, AK 99762
(907) 443-2177
fax: (907) 443-3611

ARCTIC EXPERTS

Let's find out how much you learned from the articles that you read in this newspaper. You will use your knowledge of the Arctic in the following activities. See how expert you are!

PROBLEM PUZZLERS:

JUST THE FACTS, MA'AM

1. 250,000 x 2 = _____ OR 1,000,000 - _____ = 500,000
   THE WESTERN ARCTIC CARIBOU HERD IS MADE UP OF _____ ANIMALS.

2. 79 + ___ = 83 OR 840 ÷ ___ = 210
   THE WESTERN ARCTIC NATIONAL PARKLANDS ARE MADE UP OF _____ PARK UNITS.

3. 62.5 x 4 = _____ OR 625 ÷ 2.5 = _____
   THE GREAT KOBUK SAND DUNES SWELL TO A HEIGHT OF _____ FT. OR MORE.

4. In 1930, **34** muskoxen were captured in east Greenland and taken to Fairbanks, Alaska. About five or six years later, all surviving Fairbanks muskoxen and their calves were taken to Nunivak Island in Southwest Alaska. From the Nunivak herd **36** muskoxen were reintroduced onto Seward Peninsula in 1970, with another **35** animals in 1981. The Seward Peninsula herd had grown to more than **900** animals. How many total muskoxen were there in the Seward Peninsula herd by 1981?

TAKE A NUMBER, PLEASE...

Solve the problems below. Then write the letter that is beside each answer every time you find it in the puzzle.

38 x 24 = A	26 x 18 = C	624÷12 = D	14 x 49 = E	645÷15 = F	385÷35 = G
25 x 34 = H	752÷8 = I	38 x 16 = K	380÷20 = L	700÷28 = N	27 x 35 = O
29 x 17 = P	37 x 11 = R	784÷16 = S	594÷22 = T	15 x 14 = U	962÷13 = W

1. Geographically, we refer to southern bird species as _____ (New World) migrants
   25 686 945 27 407 945 493 94 468 912 19
   and the asian species as _____ (Old World) migrants.
   493 912 19 686 912 407 468 27 94 468

2. Several rare plants discovered in the Squirrel River Basin area were _____, _____ and _____.
   912 49 27 686 407 / 49 945 210 407 / 52 945 418 608 / 912 407 468 27 94 468 / 19 945 468 945 74 686 686 52

WORD POWER

ASTONISH YOUR FRIENDS! AMAZE YOUR TEACHERS!
THESE FANCY WORDS SHOULD IMPRESS JUST ABOUT ANYONE!

BARCHAN: crescent-shaped; gentle slope on the convex side and steep slope on the concave side.

BOREAL FOREST: an area located in northern regions, characterized by the dominance of coniferous forests.

EOLIAN: deposited or moved by the wind.

RIPARIAN: located along the bank of a natural watercourse, like a river.

TRANSVERSE: lying across, set crosswise.

TUNDRA: a windy, treeless "desert" of the arctic region that occurs at high latitudes and elevations.

TUSSOCK: a small mound of tundra grasses that continually retain their dead leaves.

HOW "COORDINATED" ARE YOU?

Review some facts from the articles by plotting the answers. Find the coordinates on the grid. Then write the letter that is in that space on the proper lines below (the bottom coordinate goes first).

	1	2	3	4	5	6	7	8	9
4	S	N	E	K	B	V	F	I	L
3	D	R	O	H	U	M	I	G	Y
2	O	L	A	R	J	T	N	A	E
1	I	Q	U	P	E	A	K	C	S

1. The names of the National Park areas in Northwest Alaska are _____, _____, _____ and _____.
   8,1 3,2 4,1 9,2 / 7,1 2,3 5,3 1,4 3,4 7,2 9,1 6,2 5,1 4,2 2,4 / 7,2 6,3 / 7,2 1,2 8,2 6,2 3,2 7,1 / 7,2 4,1 2,3 / 4,4 3,3 5,4 3,1 7,1 / 6,4 3,2 2,2 9,4 5,1 9,3 / 2,4 4,1 / 5,4 9,2 2,3 1,1 2,4 8,3 / 2,2 6,1 2,4 1,3 / 5,4 4,2 7,3 1,3 8,3 3,4 / 2,4 4,1 4,2

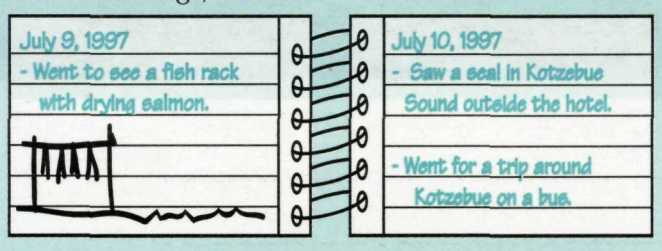
2. The _____ is the major tributary to the Kobuk River.
   1,4 2,1 3,1 8,4 2,3 4,2 9,2 9,4 / 4,2 1,1 6,4 5,1 2,3

3. Many of the breeding birds of Northwest Alaska migrate from these countries: _____; _____ and _____.
   3,2 7,4 4,2 7,3 8,1 8,2 / 6,1 1,4 8,4 3,2 / 1,4 1,2 5,3 6,2 4,3 / 8,2 6,3 3,4 2,3 1,1 8,1 6,1

KEEPING A JOURNAL

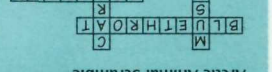
All good naturalists keep a journal of their discoveries. These records are fun to keep, and often lead to great discoveries.

Start your own journal. Get a notepad and a pencil and start recording things you see going on around you. It can be here in Northwest Alaska, or in your own backyard or city park. You might record what you do during summer vacation. Be sure to record the date of your observations and make drawings, as well.

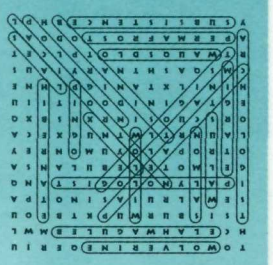


ANSWERS TO PUZZLES ON PAGE 17:

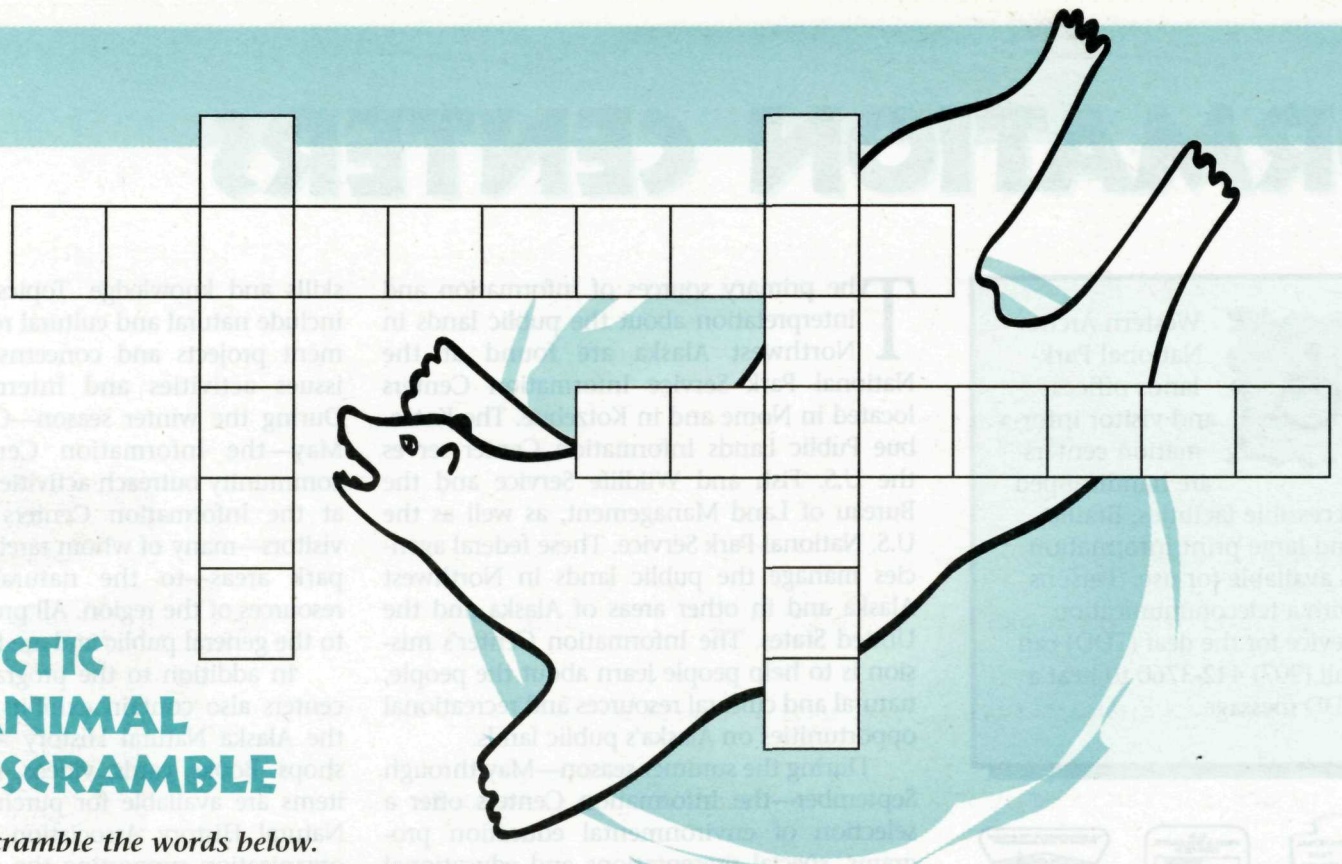
Arctic Animal Scramble



Did You Get the Drift?



Test Your Arctic I.Q.
1. c 2. d 3. d 4. b



ARCTIC ANIMAL SCRAMBLE

First unscramble the words below.
Then write the words in the fill-in puzzle.

1. o u s x k m _ _ _ _ _ _ This animal originated on the tundra of central Siberia and later entered North America over the Bering Land Bridge.

2. e e e r r i d n _ _ _ _ _ _ _ _ _ This animal was a reliable source of red meat for much of the year on the Seward Peninsula.

3. r o i u a c b _ _ _ _ _ _ _ This animal is part of the Western Arctic herd, one of the largest migratory herds of mammals left in North America.

4. l t t h b r o e a u _ _ _ _ _ _ _ _ _ _ _ This is one of two Asian species banded in Kotzebue.

WHAT IS A PARK RANGER?

Greg Dudgeon, Park Chief Ranger

For many, a park ranger is the person wearing the familiar gray and green uniform with a gold badge and the distinctive "flat" hat. In Alaska, you may encounter this person while hiking the Chilkoot Trail at Klondike Goldrush, on a cruise ship in Glacier Bay, at a campground in Denali, or on a snowmobile in Bering Land Bridge. Whether on foot, horseback, boat or plane, and whether at Cape Krusenstern or the Everglades, today's park rangers share the same primary role; that of resource education and protection specialist.

During the early years of the National Parks, their protection was the job of the U.S. Army. Each summer, troops of cavalry fought fires, guided visitors and built roads and trails. Since different units usually patrolled a park each year, civilian "scouts" were hired to orient and prepare the new troops.

With the establishment of the National Park Service in 1916, civilians replaced soldiers as guardians of the parks. The first park rangers carried on some of the cavalry traditions, such as a uniform (including that distinctive hat) and skill with horses and firearms. Nearly all park rangers were experienced mountaineers and woodsmen. A Denali superintendent interviewing a prospective park ranger years ago was a typical frontier administrator:

As the numbers of park visitors increased, the park ranger's job began to change. Protecting parks required more than just good outdoor skills, park rangers became proficient at aiding and protecting people in the parks. Search and rescue techniques were refined, certification as emergency medical technicians and paramedics was necessary. Park rangers trained and became skilled in structural and woodland fire fighting, SCUBA and other potential lifesaving skills.

Since the 1960s, law enforcement methods and training within the National Park Service have evolved as well. In many areas, park rangers must combat organized theft, drugs, investigate crimes and be proficient with firearms. Park rangers also became adept at conveying knowledge to visitors. Park rangers strive not only to share facts, but to impart a sense of appreciation for the natural and cultural resources within the parks, and to provoke the desire to preserve them.

When asked the question "What do park rangers do?" I am proud to answer:

"As a National Park Service ranger, I serve as a resource education and protection specialist. It is my responsibility to get to know as much about both the natural and cultural history of this area as I can, as well as the visitor use patterns and unlawful activities that impact those resources. On a daily basis I talk with visitors and try to educate them about the area and how to enjoy themselves without harm to the resources or themselves. As a commissioned law enforcement park ranger, my primary (but not exclusive) duty is to enforce and investigate the violation of park regulations and the criminal laws of the United States. I also serve as an EMT, perform search and rescue and fight fire, among many other duties."

In an age of increasing specialization, park rangers continue to perform an astonishing variety of jobs. The men and women who serve as park rangers are an important part of the larger team that carries out the National Park Service mission, of maintaining areas such as Western Arctic National Parklands unimpaired for the use and enjoyment of this and future generations.

WANT TO BE A JUNIOR RANGER?

Would you like a Western Arctic National Parklands Badge? Well, you have to become an arctic expert! You can become an arctic expert by completing the Junior Ranger section of this newspaper. Just fill and cutout the form below. Mail your name and address to us and soon you will get a certificate and a shiny new badge! Remember, if you need help it is always okay to ask a grown-up.

YES, I WANT TO BE A JUNIOR RANGER. PLEASE SEND MY BADGE TO:

NAME _____

ADDRESS _____

_____

NATIONAL PARK SERVICE
P.O. Box 220
Nome, Alaska 99762

INFORMATION CENTERS

Western Arctic National Parklands offices and visitor information centers are handicapped accessible facilities. Braille and large print information is available for use. Persons with a telecommunication device for the deaf (TDD) can call (907) 442-3760 to hear a TDD message.

The primary sources of information and interpretation about the public lands in Northwest Alaska are found at the National Park Service Information Centers located in Nome and in Kotzebue. The Kotzebue Public Lands Information Center serves the U.S. Fish and Wildlife Service and the Bureau of Land Management, as well as the U.S. National Park Service. These federal agencies manage the public lands in Northwest Alaska and in other areas of Alaska and the United States. The Information Center's mission is to help people learn about the people, natural and cultural resources and recreational opportunities on Alaska's public lands.

During the summer season—May through September—the Information Centers offer a selection of environmental education programs, special presentations and educational resources. The programs and presentations feature guest speakers or agency staff with special skills and knowledge. Topics discussed may include natural and cultural resource management projects and concerns; local, cultural issues activities and international issues. During the winter season—October through May—the Information Centers focus on community outreach activities. Videos shown at the Information Centers visually orient visitors—many of whom rarely travel into the park areas—to the natural and cultural resources of the region. All programs are open to the general public and are free of charge.

In addition to the programs offered, the centers also contain exhibits, brochures and the Alaska Natural History Association's gift shops. Books, cards, videos, maps and other items are available for purchase. The Alaska Natural History Association is a non-profit organization supporting the educational and scientific programs of land management agencies in Alaska. ■

VISITOR INFORMATION

WESTERN ARCTIC NATIONAL PARKLANDS

KOTZEBUE NATIONAL PARK SERVICE
P.O. Box 1029
Kotzebue, Alaska 99752
(907) 442-3890
Fax- (907) 442-8316
Internet Homepage: www.nps.gov\nwak

NOME NATIONAL PARK SERVICE
P.O. Box 220
Nome, Alaska 99762
(907) 443-2522
Fax- (907) 443-6139
Internet Homepage: www.nps.gov\bela

OTHER PUBLIC LANDS-RELATED INFORMATION

BUREAU OF LAND MANAGEMENT
KOTZEBUE FIELD OFFICE
P.O. Box 1049
Kotzebue, Alaska 99752
(907) 442-3430
Fax- (907) 442-2720
Internet Homepage: www.ndo.ak.blm.gov

U.S. FISH AND WILDLIFE
SELAWIK NATIONAL WILDLIFE REFUGE
P.O. Box 270
Kotzebue, Alaska 99752
(907) 442-3760
Fax- (907) 442-3124
Internet Homepage: www.r7.fws.gov

COMMUNITY INFORMATION & SERVICES

CITY OF KOTZEBUE
P.O. Box 46
Kotzebue, Alaska 99752
(907) 442-3401
Fax- (907) 442-3742

NORTHWEST ARCTIC BOROUGH
ECONOMIC DEVELOPMENT COMMISSION
P.O. Box 1110
Kotzebue, Alaska 99752
(907) 442-2500
Fax- (907) 442-2930

NOME VISITOR CENTER
P.O. Box 220
Nome, Alaska 99762
(907) 443-2522

CITY OF NOME
P.O. Box 281
Nome, Alaska 99762
(907) 443-6663

NOME CONVENTION AND VISITORS BUREAU
P.O. Box 240
Nome, Alaska 99762
(907) 443-5535
Fax- (907) 443-5832
Internet Homepage: www.alaska.net\~nome

EMERGENCY SERVICES

ALASKA STATE TROOPERS
(800) 789-3222
(907) 442-3222 non-emergency

KOTZEBUE SEARCH AND RESCUE
(907) 442-3351

MANIILAQ MEDICAL CENTER
P.O. Box 43
Kotzebue, Alaska 99752
(907) 442-3321/-3311
(800) 478-3321

KOTZEBUE POLICE
911 from Kotzebue
(907) 442-3351 (*non-emergency*)

NOME POLICE
(907) 442-5262

NORTON SOUND HEALTH CORPORATION CLINIC
P.O. Box 966
Nome,. Alaska 99762
(907) 443-3311

The Bering Land Bridge National Preserve Visitor Information Center's got the mammoth! Or rather, mammoth bones! On display are some of the ribs and hind leg bones of the 20,160-year-old Epigaruk mammoth. The mammoth was more than 11 feet tall and weighed 12,000 pounds. Also on display are a 7-foot-long mammoth tusk, leg bone and molar. While visiting this display, you can learn more about the Preserve while clicking through our interactive computer exhibit.

FOR ADDITIONAL INFORMATION

You may also contact National Park Service offices for community information.

For a list of National Park Service licensed air taxi and guide services, call:

THE NATIONAL PARK SERVICE
Kotzebue: (907) 442-3890
Nome: (907) 443-2522

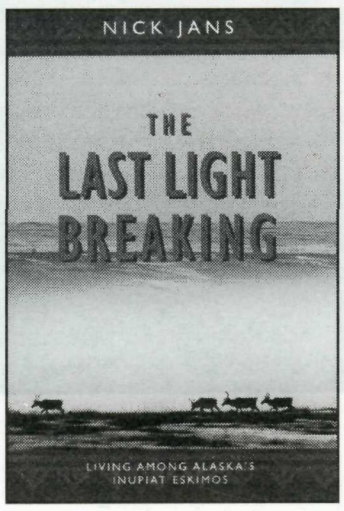
BOOKS OF INTEREST

ALASKA NATURAL HISTORY ASSOCIATION

A NON-PROFIT ORGANIZATION DEDICATED TO ENHANCING UNDERSTANDING AND CONSERVATION OF THE NATURAL, CULTURAL AND HISTORICAL RESOURCES OF ALASKA'S PUBLIC LANDS.

If you would like a complete catalog of publications available (including books, videos, maps, cd's, calendars and more), or would like to become a member of the Alaska Natural History Association, contact:

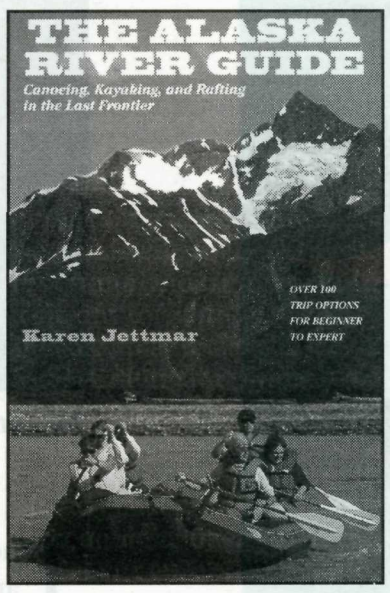
ALASKA NATURAL HISTORY ASSOC.
750 West Second Avenue
Suite 100
Anchorage, Alaska 99501
(907) 274-8440
fax: (907) 274-8343
www.Alaskanha.org



THE LAST LIGHT BREAKING

by Nick Jans

This first book by Nick Jans is a collection of essays about his life in Ambler, Alaska, an Iñupiat Eskimo village on the edge of the western Brooks Range. (224 pp.)
ALASKA NORTHWEST BOOKS
Softcover
ITEM 3351 . . . . . $14.95
Hardcover
ITEM 3350 . . . . . $21.95



THE ALASKA RIVER GUIDE

by Karen Jettmar

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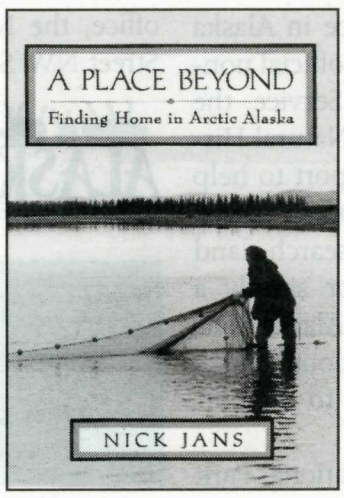

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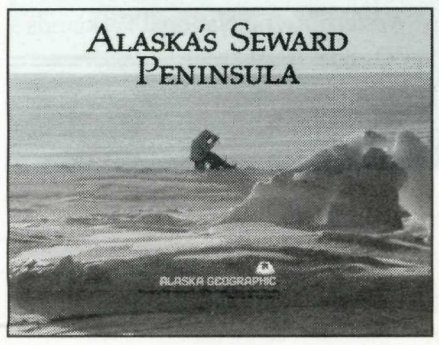

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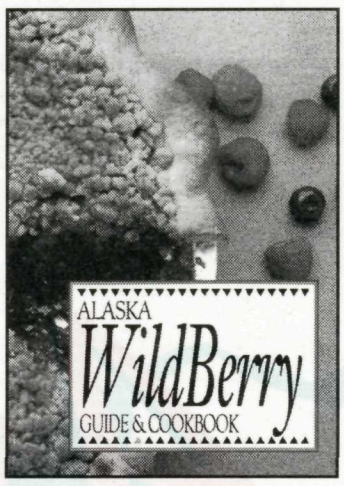

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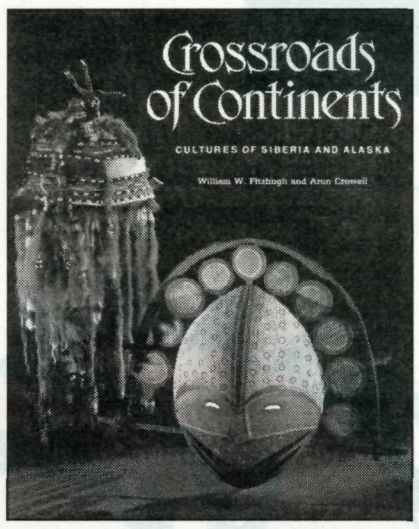

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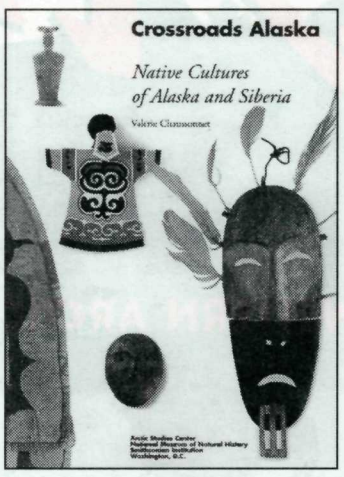

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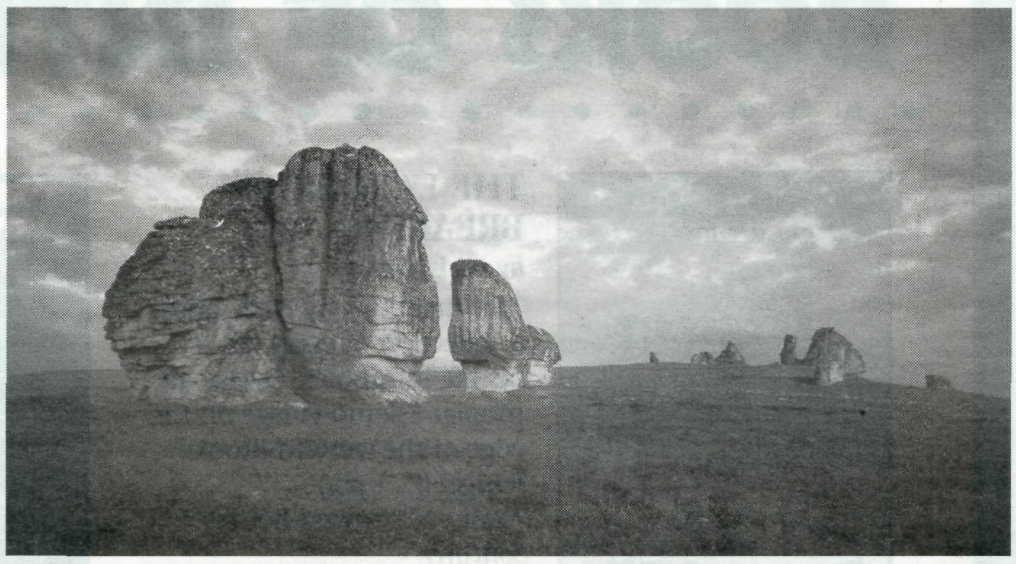

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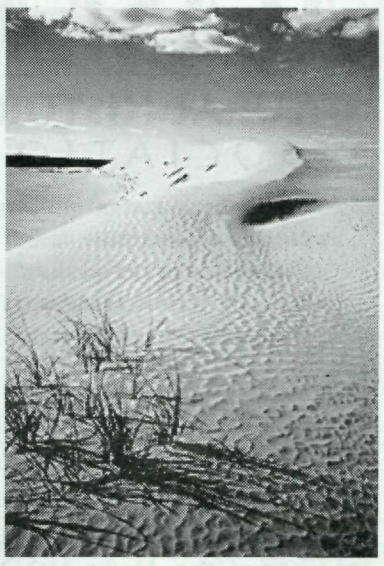

The Great Kobuk Sand Dunes

The challenges that park managers face in Alaska are as daunting as the landscape. Two official non-profit partners of the National Park Service, the National Park Foundation and the Alaska Natural History Association were created to raise support to help protect and enhance America's national parks. Whether your interest is in education, research, land protection, wildlife, cultural resources, or simply a special place with personal meaning, the Alaska Natural History Association and Alaska National Parks Endowment Fund provide opportunities to support efforts that you and your family value.

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Arctic VIEWS

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