TAGIUMSINAAQMIIT

Ocean Beach Dwellers of the Cape Krusenstern Area: Subsistence Patterns

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Introduction

The importance of the Krusenstern area as a present day gathering and harvesting area for resident people of Kotzebue, Sisualik, and to a lesser degree, Noatak and Kivalina, is perhaps best demonstrated by the very large number of ancient human dwellings, spread over a great time span, that are the very reason for establishing a Krusenstern National Monument. This area has obviously been able to support a greater density of people than the relatively unproductive areas that lie between it and other viable subsistence places. The reason for this high gathering and harvesting potential, current as well as historic, will be seen as details of plant, animal, fish and bird species, and activities are examined in detail. The salt water environment with its cape and bight patterns, is ideal, even necessary, for maximum sea mammal and shellfish harvesting. The network of fresh and brackish water sloughs, lakes, creeks—which flow directly into the sea during spring runoff, then often become closed before fall making huge natural fish traps--has been utilized probably as long as it has existed. That use continues to the present day.

One major present-day difference in use patterns exists. People formerly lived more or less permanently where they harvested; hence, the great number of archeological sites. Now, modern travel convenience, coupled with cultural change, has brought the population together in large villages and around schools, hospitals, stores, etc. People still gather and harvest, but no longer live permanently on the areas they use.

The Krusenstern area is the only harvesting place for some species at some seasons, and because of its proximity to Sisualik and Kotzebue,
many other species, though available in other areas, are better or more expediently harvested from the Monument area. The continued use of "Eskimo Foods" by virtually all residents of the area to some degree, regardless of which community they live in, makes harvesting time on the Monument a very real and important part of present-day life in this portion of Northwest Alaska.

With the importance of gathering and harvesting established, and a continuity from historic times to present active uses likewise indicated, we shall proceed to investigate various present day activities by local residents of species in season throughout the Arctic year. Subsistence living is a continual year-round harvesting.
Vicinity Map—Proposed Cape Kruesenstern National Monument
CHAPTER 1.
PLANTS AND THEIR USES

Because of the dominance of meat in the diet of an Arctic hunting culture, those plant foods that are available become especially appreciated—a few starchy roots, a few green leaves in a short season, and by far the most important edible plant life, the berries. Every "Eskimo Food" meal seems to the participants incomplete if there are no berries to top it off.

1. Berries

Akpik - (Salmonberries - Rubus chamaemorus). These berries are the most prized and sought after for several reasons: (1) their large size, (2) their citrus-like delicious flavor, and (3) their habit of growing close together in large patches on ground that has very little other vegetation except moss. Two of these characteristics make it possible for the gatherer to pick large quantities in a short time. Akpik are easily stored in seal pokes (bag-like sealskin containers) or wooden barrels, in "cool storage" houses made of sod on a wood frame. No additives or special preparations are necessary. Just pick, pack in containers, and store in a cool place—a delicious "fruit dessert" from August until June, if you can pick enough. There is much competition for harvesting best known akpik area, and they are the first berries to ripen in the last week of July and August in this area. The value placed on the akpik can be judged by the various sacrifices a family will make to obtain a few pounds:

(1) Men will babysit their whole families for ten days or so once a year to free women for camping to pick akpik
Several 55 gallon drums of high-priced gasoline will be expended looking for akpik.

Airplanes may be chartered by those women with money but no boat or crew to take them to distant berry grounds.

Some families may harvest as much as 400 lbs. of akpik in a good year, but ordinarily they harvest 100 lbs. or less. Akpik can be sold locally for $1.50 to $2.00 per pound, but few ever part with their akpik for any price.

One of the three traditional high productive akpik gathering areas lies in the heart of the monument proposal. It is the most extensive of the three, and usually in a year when berries set well it produces by far the greatest poundage of berries taken from any one locale. Sisualik and Kotzebue people get most of the yield, but in good berry years several Noatak families make the trip as well as some Kivalina based pickers.

Akpik gathering time on Krusenstern flats (Salluq) is always between August 10 and September 15, and some years the harvest is finished before September 1. This salmonberry ground is one of the major reasons for large concentrations of two species of geese (American whitefronted and lesser Canadian) after moulting time in July.

2. Other Berries

Krusenstern, because of its low, flat topography (and its) nearness to the open ocean with late summer ice packs, has a cool and wet berrygrowing season. Some years, all berries are stunted by the weather being a few degrees too cool at a critical time of development. Other years, all major species may develop to their full potential when more inland areas produce very poorly due to lack of moisture at critical times. Berries occurring in the Krusenstern area are listed in order of preference by resident gatherers:
Akpik (salmonberries - Rubus chamaemorus)
Assaivik (blueberries - Vaccinium uliginosum)
Paungaq (blackberries - Epetrum nigrum)
Kipmiñaq (cranberries - Vaccinium vitis-idea)
Tungaum assianga (nagoon berries - Rubus arcticus)

A few nagoon berries are sometimes put in with the akpis. The bog cranberry (Oxyccoccus microcarpus) is eaten where it is found, but not gathered in quantity. Kavlaq (bearberry - Arctostaphulus alpina), the black variety, is the only major species which is not utilized for food. They are often abundant and big, but are used only rarely for inflamed eye conditions. The red variety is named Angurtvak in the Kotzebue Eskimo dialect.

(3) Other edible plants - Leaves

Qaugaq (sourdock - Rumex arcticus). This is probably second in importance and quantity to berries as an edible plant. It is rhubarb-like except the leaves instead of the stems are cooked or stored raw (usually boiled with water and some marine mammal oil) and stored in pokes or barrels for later use. In storage, the Quagaq ferments in a week and makes a vinegar-like high acid mixture, in which a number of different fish products or meat can be pickled. One hundred pounds would be an approximate estimate for a common amount put aside for winter by a family, although some probably store as much as 400 lbs. in a season of good growth.

Krusenstern flats provide a good quantity of this prized leafy dessert. The numerous channels in the network of waterways make it possible to boat close to your gathering place. In other areas, qaugaq gatherers must backpack the fruits of their labor many miles to their
boat. Gathering time is the month of July.

**Tukaiuq** (sea lovage - Ligusticum hultenii) and **ikuusuk** (Angelica lucida). These two celery-like plants are pickled while young and tender, added to seal oil, and eaten as a green salad would be. The major difference between the two, besides taste, is that one (tukaiuq) remains fresh and good in oil for a year. It is stored in small quantities for the purpose of eating green leaves with seal oil at least once a day for most of the year. **Ikuusuk** stalks are eaten in oil raw, as celery would be, but they deteriorate in a week or ten days. Although they flavor the oil, they leave no real substance for winter greens.

**Paatitaq** (wild chives - Allium schoenoprasum). This species is sometimes eaten fresh or used in cooking if store onions are not available. No storage is made.

**Atchahluk** (beach greens - Arenaria peploides). A few families may put up a small barrel for winter use. It is boiled with a little water and eaten as a relish with fish. Not widely used.

**Ipiaq** (pink plumes - Polygonum bistortae). Leaves are eaten in oil in season. Roots were also eaten in times past.

**Sura** (willow leaves - Salix pulchra). Leaves are eaten in oil in season.

4. **Roots**

**Masu** (Hedysarum alpiuum) and **Pikniq** (cotton grass - Eriophorum angustifolium). **Masu** must share first place of importance as a root food with **pikniq** in the coastal area. Both are starchy, potato or parsnip-like, and in some years fairly large amounts (100 to 200 lbs) are cooked and stored in oil for winter use. The amount of these roots harvested depends on vole cycles, as they are only collected in quantity when they
can be taken from vole storehouses. Seeking out full vole storehouses is an art and is much fun, as well as being profitable. Only inland fresh water stream banks produce masu in the Monument area. Pikniq, cotton grass, is widespread and common.

Aigaq (vetch - Oxytropis nigrescens). Sometimes eaten with oil, but used very rarely now. Never stored. Early spring was former time of utilization.

5. Medicinal Plants

Sargigruaq (Alaska sage - Artemisia atilesii). This is the acme of medicinal plants from the Krusenstern area if not from all northwestern Alaska. It is good for everything in its different methods of use—tea, poultice, green, dry, boiled, powdered, raw or chewed.

Kavlaq (Arctostaphylos alpina). Eye salve for eye inflammation. Spruce waste from porcupine feces is a good remedy for acute diarrhea. Spruce needles are burned for deodorizing.

6. Shrubs and bushes

Nunangiaq (alder - Alnus crispa). Important as a red dye and preservative for skins of wolverine, caribou, and seal. The green bark is scraped from the wood, dried, and boiled for a very permanent, beautiful light orange to deep orange dye. This shrub is also important as fuel. Cut and burned green, it gives an extremely hot fire, comparable to coal, and is often used for makeshift forge work for sled brakes, hooks, or other necessary work that takes a hotter fire than spruce, cottonwood, or willow can provide.

Uqpik (willow - salix). Several varieties. Willow in sufficiently large patches to supply shelter from wind, drifting snow, and sufficient dry material for fire, is extremely important in the Monument area, as
it is a land of little shelter for the weary or storm-caught winter traveler. Only a small number (4-5) shelter places lie on the coastal route trail to Kivalina from Kotzebue. These are noted on Map 1.

In winter camping, it is also necessary to have some material as flooring for your sleeping bag and other floor space, so that things will not come in direct contact with snow and get wet. Willow branches and stems make an ideal flooring in this treeless western section of the Monument.

Feltleaf willows (Salix alaxensis) in special sheltered patches attain diameters of 4 to 6 inches and can meet needs that trees would ordinarily fulfill—tent poles, fish or meat racks, dog stakes or trap sticks.

7. Trees

A few extensive patches of white spruce trees (Picea glauca) occur close to the northeastern section of the Monument and are unique because they occur so far west, within 20 miles of the salt water peoples' land (Tagiuqmiit nunangat). They have supplied a source of wood to supplement usually scanty driftwood sources for such necessary things as skinboat and kayak frames, sled runners, spear handles, oars, paddles, cutting boards for sewing, and, of course, bows and arrows in former times. There is much sign of ancient (dateable) tree selecting in groves of better grade spruce in this area. Spruce, both dry and half-green, is of course, the most common source of fuel for those people with wood stoves. Fish and meat drying racks, dog and tent stakes, tent poles, sod, frame and log houses, and storehouse frames are all most commonly made with spruce.

Access to, and use of, these white spruce stands within and adjacent
to the Monument is of extreme current importance to a small number of people living more or less permanently on the Sisualik Peninsula.

*Ninnguq* (balsam poplar - *Populus balsamifera*). This is the second largest tree and the only other tree in this region. Paper birch and aspen do not occur this far west. There are some surprisingly large ninnguq (18 inch diameter) in sheltered creek draws mixed with spruce, close to the northeast corner of the Monument. Equally surprising are two groves of pure ninnguq in the Tuqruq creek drainage, which is the first drainage to the west that does not contain spruce. It is startling to be confronted with 12-16 inch diameter trees in a land of very short willow.

*Ninnguq* that grows in place is not generally utilized to any great extent except by the passing camper who might find a few dry limbs, or the whitefish fisherman who needs a few poles to dry his catch on. Ninnguq is a very poor fuel source. It produces much ash and little heat, and is unburnable in its green state. As driftwood, it is utilized but is second choice to spruce. Ninnguq is necessary for the wood handle of the argaun (seal caller)--two or three bearded seal claws fitted to a carved wood handle for a hand scratcher that decoys hair seals. The resonant quality of the wood is the important factor. Large ninnguq driftwood logs are ideal for splitting into slabs for sod house or cool storage cache construction.

8. **Driftwood**

*Tagiugmiit* (saltwater people) over the centuries have relied very heavily on the fruits of their beachcombing activities for building materials, sleds, hunting equipment and other things made of wood. This continues to the present by those families who live even for a month or two each year on Kotzebue Sound or the Chukchi Seacoast.
Firewood, scrap lumber for flooring, canoes, kayak and skinboat frames, fishnet floats, spear handles, bowls, spoons, ice fishing sticks, and all manner of wood needs can be met over a span of years by a diligent, high water line watcher, which all Tagiumiit are.

All native species of tree and shrub woods appear on the beaches, as well as more exotic "outside" types such as pine, fir, even hardwood (oak or hickory) in the form of timbers and planks. Sisaulik wood gatherers now utilize Krusenstern area drift. Those Tagiuqmiit who patrolled the beaches in the summer at the turn of the 19th to 20th century must have often found items that were a mystery to them.
Fishing is the most important subsistence activity for Eskimos who live on the river systems, the Kuuvangmiit (Kobuk River people) and Noatagmiit (Noatak River people). But the Tagiuqmiit (salt water person) spends nearly as much time seeking fish as his inland brothers. It is true that his harvest from marine mammal pursuits is greater in quantity and value to him, but his fishing activities are nevertheless very broad in scope, time consuming, and necessary to his subsistence oriented existence. The addition of commercial salmon fishing, since 1962, has made fish harvesting a primary pursuit for many Tagiuqmiit, rather than the secondary pursuit it formerly was.

In order to fully understand the high degree to which fishing patterns are related to the Monument, we will need in some detail to touch each species, its habits that relate to importance as a subsistence food source, and physical properties of the Monument's topography and geography.

There is need here to emphasize to the greatest possible degree the extent to which all living species utilized for subsistence purposes in the area of the Monument are nomadic, migratory, and cyclic. Whether it be fish, bird, land animal, marine mammal, or shellfish, none can be really classed as resident in the sense that applies in more temperate zones and milder environments. This seems to be one of the least understood dynamics of life among Arctic species as it relates to management in an area as small as the proposed 340,000 acres involved in the Krusenstern Monument. The degree to which this fact is accepted and dealt with realistically by those charged with the responsibility of management over the whole range of the species will determine whether this nomadic-
migratory trait will be the nemesis or the salvation of all Arctic wildlife. Man and his subsistence activities have been an integral part of this ecological whole for a very long time.

1. **Krusenstern Monument inland waterway fishery**

   Whitefish (*Iqalupiq*) species are listed below in order of quantity available and value to subsistence users:

   - **Qaaligiq** - Alaska whitefish (*Coregonus nelsoni*)
   - **Iqalusaaq** - least cisco (*Coregonus sardinella*)
   - **Tipuk** - Bering Cisco (*Coregonus lauettae*)
   - **Siguilaq** - Broad whitefish (*Coregonus nasus*)

   Within the Monument there are five small watersheds emptying first into the lagoons and then through an outlet in the lagoon to the ocean. These are unique, giant natural fish traps that resident subsistence people have exploited for as long as the people have eaten fish.

   This is the way the process works: Whitefish populations spend the ice-locked winter months in the deep river and slough mouths (Noatak, Kobuk, Selawik) and Hotham Inlet, which is brackish and for the most part uniformly deep (two fathoms). With the high crest of spring runoff in the month of June, much (though not all) of the whitefish population allows itself to be taken with the freshwater runoff far out into Kotzebue Sound and beyond, which has now become like a freshwater lake as so much fresh water has displaced the saltwater from the river estuaries.

   The whitefishes' principal path of movement is along beach lines. As they come to these outlets along the sea beach within the Monument, they instinctively go in and up every lake and stream they can reach, following the streams to the very end. A large supply of spring fresh feed and habitat awaits their visit. The month of July with its enormous insect
hatch keeps the fish occupied and well fed. As August progresses, 
the cooler temperatures and enlarging roe sacks of those female adults
that are laying eggs this year, cause a sporadic movement back towards
large river estuaries.

Now when these fish came out on the spring flush in June, Kotzebue
Sound and the Chukchi Sea had large amounts of thick floating ice that
kept the ocean beach free of large waves. But in the middle of July,
the ice barrier recedes to the north and allows the natural open sea
ground swells to work into the area. Because the beaches of the area
are coarse sand and gravel, there is much movement of beach material
parallel to the beach, depending on which way the wind pressures the waves.
The head of snow melt and rain water that was coming with a very strong
current out of the lagoons in June has by August, depending on the year's
rain density, dwindled to a mere trickle.

The outlet closes with porous gravel from beach wave action, allowing
some seepage of water, but no path for a whitefish to pass out on the
way to egg laying or wintering grounds. Many tons of choice whitefish
are impounded in the waters behind the natural gravel dam, while September
with its freshwater freezing temperatures and food preserving attributes,
relentlessly comes over the land.

The stage is set for possibly one of the world's most simple effective
fish exploitation procedures. A simple three foot wide "irrigation"
ditch is dug in the porous gravel 20 feet long with a 10 foot diameter,
circular "stomach" on the end away from the edge of the water. The level
of the gravel is graded downhill so that a good current flows out, but
as the water progresses down toward the ocean, it seeps through
the gravel and leaves a dry floor in half of the circular "stomach" when
the floor of the irrigation ditch is properly graded.
The whitefish feels the pull of the strong current at the head of the ditch and after finning head against the current for a time, it turns tail and rides the current toward the circular "stomach." It loses water depth all the way until back, sides, and finally all of the fish's body is exposed and it flops on its side, gasping until the maker of the gargissaq (trap) stuffs him in a grass sack (or burlap is common now), and puts the fish away to be eaten frozen sometime in the coming nine months of winter season.

Of the five outlets mentioned within the Monument, only the largest system at Anigaaq, the gateway to the Krusenstern flats waterway, is now used every year that conditions are right. However, this is the major source of frozen winter whitefish for the residents of Kotzebue and Sisualik.

Several camps may be maintained at the outlet for the months of September, October, and November, specifically for fishing. In the month of September, just before ice starts running between Kotzebue and Anigaaq, many boats may go to the outlet to seine or tend set nets for a few days to acquire a winter supply of qauq (frozen) fish.

The two outlets east of Krusenstern are better known for their quantity and quality of qaaligiq and igalusaaq. The three minor outlets to the northwest are known for their tipuq (Bering Cisco), an extremely fat fish, as well as some qaaligiq and igalusaaq.

Qaaligiq are the major fish species used for drying. They are taken in great numbers with 3½ inch mesh nets anywhere on the beach between Sisualik Point and Anigaaq during their two way migration pass. Those going west in June, called aniraq, are lean, not oily, making a better dried fish. Those going east in July and August, called kivangaktauq, are often too oily for dry stored fish as they get rancid. Put down in seal oil soon after they are dried, they are a Sisualik delicacy.
Setting Up Fish Camp at AnigaaQ, the Gateway to the Krusenstern Flats Waterway.
Several other species of fish occur with the whitefish in the Krusenstern Inland waterway. Generally, they are considered dog food material with a couple of exceptions. Rarely a few small sheefish come down with the spring flush and are taken in the fall; total number 10 or less. Siguilaq (broad whitefish) some years are fairly common but never plentiful. They are prized because of their good cooking qualities. A small, smooth skinned flounder is often in great numbers and prized as guaq. "Trash fish" would include tom cod, bullhead (sculpin), a nine spined stickleback, herring fry, and trout fry, bullhead fry, and rough skinned flounder.

Suluqpaugak (grayling - *Thymallus arcticus*) are common in the largest mountain creeks of the Krusenstern area (Tuqruq) and possibly other smaller creeks. Several large sacks of grayling have been taken after freezeup in a deep eddy on the lower canyon (Kungauyaaq). This fish is also considered an emergency food by summer hunters walking the mountains, because of the ease with which it can be taken with a small bait hook. A small number of large, usually breeding char, can be found in the mountain lengths of this same creek. Rabbit Creek (Ukalliksuk) in the far northern portion of the Monument is the largest mountain creek and has a large population of char of all sizes.

Both of these creeks have some potential as sport fishing sites, and even some of the small creek outlets on the ocean have concentrations of char that will take a lure while floating ice is still in the ocean and the creeks are ice free (late June, early July).

One final consideration for the Krusenstern Inland waterways (see Map No.3, entitled Krusenstern Inland Waterway System) is what might occur if human use of the resource of trapped fish was terminated for
any reason. Because of the potentially huge body of fish in a relatively small shallow sluggish water system, winter kill from freeze out and starvation of fish would seem not only to make a huge protein waste, but also a natural pollution problem.

All the ramifications of what would occur can only be speculation based on observations of somewhat similar occurrences at Akulaaq some years ago when a great number of storn-killed kajuaq (bluecod) literally filled the lake. This attracted huge numbers of jaegers during spring migration and held them over into egg laying time for the more desireable species (ducks, geese, terns, shorebirds) that use Krusenstern flats. As a result there was a great depredation by jaegers on eggs and downy young when rotten fish were no longer available.

In conclusion, the importance of the network of sloughs, lakes, and lagoons that acts as a giant natural fish trap for the Kotzebue Sound subsistence person cannot be overemphasized. Fishing activities, water access to the Krusenstern Flat area as well as small boat safety depends on and revolves around the outlet area called Anigaaq. For further information and description see Appendix 1.

2. Ocean Beach Subsistence Fishery

Igalukpiq (Arctic Char - Salvelinus alpinus). Second in importance to whitefish in the Monument area to the subsistence person, is the migration twice a year of large numbers of sea-run Arctic char, a large very fine food fish common in Arctic areas where freshwater streams enter the Chukchi Sea.

The beach water between the Kivalina rivers and Noatak river mouth have a very strong trout run for two weeks at breakup time (out of the Noatak River) and a general westward movement at least from Krusenstern
Point east to Sisualik. At the same time, much fatter char from the Kivalina and Wulik River systems move eastward toward Krusenstern. A second run occurs along the beaches and into the rivers during August and September at the end of salmon run. These are all heavy, fat fish that have spent the summer foraging in the ocean on abundant and high quality feed.

In June, large numbers of the lean char are taken at Sisualik, using 3½ inch whitefish nets. Those people who are living in the Krusenstern area for sealing at the time must use their nets as a beach sein because of clear water. They have the option of seining fat or lean fish depending on whether the fish are east or west bound and whether the fisherman needs a fat fish for cooking or a lean one for drying. Pan ice is still in the ocean at this time. In the August run of all fat fish, 4½ inch to 6 inch mesh is used by people in the villages of Kivalina and Kotzebue and at Sisualik Spit.

A new trend has taken place in the last few years as most village families have electric freezers. Trout are a preferred frozen fish food, but the run on the ocean has always been nearly a month too early for the fish to be preserved by fall outdoor temperatures. These char can't be dried as they are too oily and get rancid. When every family had a large dog team, much trout was buried in the ground and hung for dog feed. Now those people of the Kotzebue area with freezers have a new "Eskimo Food" (niqipiaq) staple that was before only available from Kivalina or Noatak, where trout are traditionally fished later in the season and in the rivers (October, late September).

Trout fishing with hook and line for food and pleasure is a new development in villages of Kivalina and Noatak. This activity demonstrates
change in subsistence methods and uses (diminished use for dogs) along with a continued dynamic species exploitation that meets the need for a well-filled larder of "Eskimo Foods."

Salmon (Iqalugraug)

King (Iqalusugruk - Onchorhynchus orientalis)
Silver (Iqalugraug - Onchorhynchus kisutch)
Chum (Iqalugraug - Onchorhynchus keta)
Sockeye (Iqalugraug - Onchorhynchus nerka)
Pink (Amaqtu - Onchorhynchus gorbuscha)

All five species of Pacific salmon occur in Kotzebue Sound, but only the chum finds the environment suitable for population development. The chum does develop large numbers and excellent qualities that have attracted Kotzebue Sound's only large scale commercial fishery (see commercial salmon fishery).

Salmon have not been exploited traditionally within the 340,000 acre Monument area, though they of course have passed by on their routes to Noatak and Kobuk spawning beds. Sisualik Spit residents, both permanent and seasonal, have taken the species for both dog and human food over the years.

Season, tradition, and ocean characteristics have combined to limit salmon subsistence use to Sisualik Spit, Kotzebue, Hotham Inlet, and river areas. Salmon run in July and August. People of the country traditionally gather for summer trading at this time. Weather is hot (80°F) and blow flies are plentiful, which makes fish curing difficult and wasteful. As the Chukchi Sea becomes free of ice in July, ground swell and surf conditions of the Krusenstern area make beach net tending impossible with traditional equipment, except on infrequent days when the ocean is calm.
Most families carry a short net of some kind for their daily eating of fresh fish or a few for cutting and hanging for half-dried boiled fish. In former times, little effort was made to take salmon in large numbers, except by those residents of Sisualik, Kotzebue, and a few scattered fish camps on Hotham Inlet (Kobuk Lake) who were involved in a limited commercial fishery between 1920 and 1965, providing dried salmon for local use as dog feed. A few salmon were processed for winter use by cutting them very thin, protecting them from a hot sun, and putting them down in seal oil when nearly dry.

The people of Noatak and Kobuk make a staple "Eskimo Food" (niqipiaq) of salmon after they return up river in late August and September when weather, fish, and season is better suited to the necessary process. The village of Noatak is almost certainly located where it is because of the springs that make a huge chum salmon spawning area. The trademark niqipiaq (Eskimo food) of Noatak is its good dried salmon, just as Kivalina is known for its trout quaq (frozen), Kobuk for its dried whitefish, and Pt. Hope for its black whale maktak.

3. Commercial Salmon Fishery

Commercial salmon fishing, after the pattern of commercial exploitation of salmon in the rest of the state of Alaska, did not get underway until the recent date of July 1962. Most of the more southern waters had experienced declines in their salmon stocks, and canned salmon market prices reflected this scarcity, prompting commercial processing companies to seek new areas in which to expand. The Kotzebue Sound chum run was large enough to attract attention, and a small floating cannery boat bought choice Kotzebue Sound chums for 32¢ apiece! As an example to provide perspective: one fish buyer was paying 50¢ per pound during the 1976 season, approximately $5.00 apiece for large males.
A number of factors have combined to make the Kotzebue Sound salmon fishery a unique part of changing lifestyles both for the fish and the fisherman. Salmon population dynamics have been influenced by such things as a great reduction in seining activity in upriver areas when motorized sleds replaced dog teams. The predatory Arctic char that are active all winter in the Noatak spawning area are taken in large numbers by salmon gear in salt water. Sheefish, another great eater of salmon smolts, were much reduced in numbers with the introduction of nylon net webbing to replace traditional cotton and other less durable materials that quickly rot when frozen in. Nylon continues to kill sheefish in nets that are left by the owner when stuck under the ice.

These factors led to a great increase in total salmon numbers that peaked in 1974 at a total catch of 634,527 by commercial fishermen, valued at $1,332,500 (estimated amount paid to fishermen at 30¢ per lb.). Quite naturally, this increase in fish numbers and value attracted more and more fishermen, foreign and fresh fish markets were made accessible by better transportation, and fish handling techniques were developed. The life pattern of the Kotzebue Sound subsistence person was much affected by this growth of a monetary base from which he could better reach out to his more distant subsistence (niqipiaq) food gathering activities.

Before this source of money was available, someone in each family had to take seasonal work somewhere else in the state to supply the money a family needed for such things as gasoline, ammunition, nets, guns, boats, snowmachines, etc., which were necessary for harvesting the food of the land. Now, for some family-head fishermen, quite a large yearly income can be had in a good two month fishing season. Thus, much new equipment that was formerly out of financial reach is available to pursue the food of the land.
The ultimate needs and aims of most resident families of the Kotzebue, Noatak and Kivalina area cannot be overemphasized. They want to live in communities. They want community benefits (schools, hospitals, stores, entertainment). They want living conditions comparable to what they see in larger communities (Anchorage, Fairbanks). But they have another need which is as imperative as those newer things are—the niqipiaq (food of the land). Very likely this longing for niqipiaq will be the longest lasting of personal traditional desires. This desire, which is a part of cultural heritage, should be considered a part of the complete life of a northwest Alaskan person.

Regulations and limitations of harvesting activities are inevitable and are possible with cooperation and understanding of local residents. It is especially important that these people are involved in the development of such restrictions.

Commercial fishing, with the implementation of limited entry and continued biological studies of salmon population dynamics, promises to be a continuing important source of cash income for many families.

4. Minor fish and marine invertebrates

Tomcod or Saffron Cod (Uugaq - Eluginus gracilis)

The uugaq is probably the only fish that the Eskimo has long appreciated and made good use of, but which (except for those whites that adopt Eskimo ways) has not been exploited by the rest of the world. This fish has an important place in the ecological scheme of things, being an abundant species in the food chain, supplying feed for such diverse species as bearded seal, beluga whale, sheefish, and Arctic char. In addition, it has served northern man very well as probably the most available source of fresh fish when all other species are not available.
The tomcod follows a westward-seaward migration in the spring, and in the fall an eastward-inland movement as far as the brackish demarcation line of salt and freshwater estuary. Tomcod are very lean during the spring (June), when they scavenge whatever is available, but have very full bodies and are plump with eggs in the late fall (October) after scavenging surf-killed shrimp, clams and young crabs all summer.

Uugaq are small (usually less than one pound) bottom feeders with a firm cod-like flesh, and they are a real treat eaten dried, boiled, half-dried boiled, or hard frozen (-20°C) with seal oil. They can be taken all winter with jigs in salt-brackish channel edges. In the vicinity of the Monument, only the fall run (late September-October) on the ocean beach is harvested, using whitefish gill nets (3" to 3½" mesh) or beach seines. The spring migration is not utilized unless most other species have failed to supply the day's needs.

Tomcod taken in the Monument area must be cut and hung, as they pass too early in the fall to be preserved by freezing in the open air. Some years, considerable numbers become trapped in the inland waters and can then be taken after freeze up. These are usually inferior in quality to those that are taken in waters open to the sea with its plentiful scavenging grounds.

Arctic cod (Kahlauq - Boreogadus saida) A relative of uugaq, smaller and larger mouthed, the Arctic cod has the rather unique habit of being washed up on the beach in sometimes very large numbers in late October and November while air temperatures are freezing. This is one of the smallest of fish utilized for food, but it is very rich, with a large liver and tasty roe. It can be eaten whole as picked up frozen from the beach, with only the head being discarded, as the bones are soft and chewable.
A few are taken while jigging for other species, but in some years, literally tons are deposited on the beach by ideal wave chop and wind conditions on either side of Krusenstern's point. Occasionally they are washed onto the surface of beach-fast ice and frozen into the over-flowing wave-wash, to be dug out by foxes or eaten by jaegers after the spring thaw releases them.

Rainbow smelt (ilquauniq - Osmerus mordax)

Flounders (rough and smooth skinned) (nataagnaq - Platichthys stellatus; ipgaqnailiaq - Liopsetta glacialis)

Bullheads (sculpins) Kanayuq - two species

These species are often eaten fresh-cooked when taken incidental to other fishing operations. Flounders and sculpins are especially prized in late fall when they are full-bodied and firm of flesh. Some spring spearing of large salt water sculpins was formerly done in beach ice cracks. Smelt are always appreciated but never taken in numbers in or near the Monument area.

Nine-spined Stickleback (Kakilisak - Pungitius pungitius) The nine-spined stickleback, along with fry of herring and sculpin, are often so thick in the gargisaaq (outlet fish trap), that they can be shoveled into a tub and cooked for a very rich dog feed. During times of fish or food scarcity, a chowder from these would be a very rich broth.

Herring (ugsrugtuuq - Clupea harengus pallasi) Though available in unknown but probably considerable quantity, herring are not much utilized by subsistence people on the north shore of Kotzebue Sound. In recent years some people salt a few down in barrels. Nylon herring gill nets have made this catch possible.

Herring stay somewhat offshore here. Thus, beach seining has never
produced much herring, although the Kotzebue village waterfront has produced huge catches in fall just before ice starts running. This subsistence practice has almost died out because of obstacles under water and because of the diminished need for dog food. Herring are often carried into places where they are trapped by extreme high waters, and these are gathered when located while they are fresh. Wave action at times deposits some on beach gravel where they are gathered. Pickled herring is a local treat and herring use may be on an upward trend as better methods of taking them become general knowledge.

Large white clams (iviliq - Spisula polynyma)

Mussels (avyyaq - Mytilus edulis)

These shellfish are highly prized by gatherers but can only be reached as storms whip up huge waves in the fall of the year. Tide differential is very slight in this area. Mussels are most common and distributed all along Kotzebue Sound’s north beach. Mussels, and at times, large amounts of white clams, are deposited at Sisualik Point.

Several other species of clams, whelks (nakunaq), and assorted worms, crabs, and shrimp are deposited on shore after high wave action. One of the most productive areas for these resources within the Monument is a large and building shoal ½ mile northwest of Krusenstern tower. All of these species are only utilized by people who are camping or travelling in the area for some other purpose (i.e. berry picking, goose hunting, fall fish trap work, or caribou hunting).

These sea foods are great treats and never seem plentiful enough, with methods of subsistence gathering now known. People would be quick to adopt any new means of gleaning these directly from the ocean without having to wait for a catastrophic storm to throw them out. Tomcod and
seal stomachs are often stuffed with finger-sized shrimp. No historic
harvesting or method of taking these is known.

Crabs (putyuvaq) Some crabbing has been done during spring open
water sealing, but with very limited results. After some large storms,
many crab - 2" to 5" diameter body size, carrying eggs--are washed on
shore. The largest of these are gathered and eaten cooked, but this
happens so rarely that it is not an important local food. It becomes
significant, however, when coupled with the occasional huge leg or body
shell that washes up with large waves. These indicate the presence of
a crab population of at least three species.

There is an interesting puzzle to close this consideration of
subsistence use of shellfish and related sea foods made available to
subsistence gatherers back through the years by fall (August, September,
October) storm action. It seems that no seashells are found in house
site excavations thus far in the Krusenstern area. From the viewpoint
of a modern subsistence person, this seems very strange, as all people
in this century consider shellfish a great treat and most fall camps
have large mounds of discarded shells.
1. The Importance of Hunting Activities

Hunting activities by residents of the areas adjacent to the 340,000 acres of the Monument are likely to be the most difficult to fully assess with an eye to management and need. Warm blooded animals, both land and marine, have, of course, made it possible for men to survive in the harsh environment of the Arctic. Red meat, fat and oil, skins for clothing from head to foot, practically all items necessary to sustain human life can and have come from the various species indigenous to Arctic land and ocean water-ice environment.

The pursuit, taking, and the preparation and preservation of these life sustaining products from these species has been the very nucleus about which the resident human population of the northwest Alaskan coast has orbited from its very beginning. The span of years that this has encompassed can again be glimpsed through the archeological sites that are the principal reason for the existence of the Krusenstern National Monument.

The expertise and techniques developed over the years to make do with what is available in these pursuits, whether it be with stone tools, metals of different kinds, spears, firearms, plastics, or modern electronic techniques, is the real cultural heritage of the Tagiugmi (saltwater person).

In this introduction to hunting, it seems again important to emphasize that although there are currently no permanent residents within the 340,000 acres of the Monument, the urban (village) residents of Kotzebue
and to some extent Noatak and Kivilina, as well as all village residents of northwest Alaska, depend on the types of niiqipiaq (Eskimo food) that are in their proper season harvested in the vicinity of Cape Krusenstern.

The degree to which these subsistence activities are a part of each individual of the region is difficult to determine. To some it is their whole reason for living. To others, it is simply a matter of satisfying the stomach and physical system with foods that they have always eaten. To a very few, usually short-term residents recently from different lifestyles, subsistence activities and niiqipiaq have no real personal meaning.

To the long term resident of the Kotzebue Sound area, whether he has come from another part of the world or been born here, subsistence activities are a very real part of his or her daily and yearly well-being, both physically and psychologically.

Because of the long traditional heritage of making practical use of the best materials and techniques available and the ever-existing challenge/tension between man and nature, the concept of having to limit one's self to insure a continued viable resource harvest may be the highest hurdle to overcome in working relationships between those who will administer the land and those who have traditionally made use of it. Ideally, of course, there will be users among the administrators.

2. Use of Marine Mammals

In the providential scheme of things, it seems wonderous that a group of animals, in order to sustain life functions in a hostile environment (saltwater with temperatures much of the year below 32°F), have been provided with a thick layer of tissue that can be used both to store energy and to provide insulation. This in a land where human and other
predators must spend much energy to stay active and warm through long
time periods of cold air temperatures and little life giving sunlight.
We speak of blubber, the marine mammal oil or fat that makes the warm
blooded marine mammal the desired and needed resource that it is. This
blubber (uqsrugaq) is the hallmark of the marine mammal, whether it be
seal, whale, or walrus; and it is one of the major reasons for its
extreme value as a resource.

It is also interesting to note that as other uses of marine mammal
products tend to diminish with acculturation (clothes, tools, boat
coverings, rope, shelters, even fresh meat) the edible oil remains a
diet staple, and demand remains much unchanged in the face of very
dramatic change in all other areas of local resource utilization.

Reasons for this can be readily outlined by pointing out that whether
or not you eat seal oil with your meal is often the criteria for deter-
mining whether you are considered more than a newcomer to the area.
Those Eskimos who have somehow lost their habit of eating seal oil with
meals are unbelievable to their peers. And a white person that does
eat oil is generally accepted as a brother quicker than by any other means
of relating, even language.

In short, marine mammal oil is a cultural staple for which there
is really no acceptable substitute and no promise of one. This is a fact
of northwest Alaska life that is by no means restricted to coastal residents.
There has always been, and promises to continue to be, a lively trade
between people with access to marine mammals and all those inland
people who have come in contact with its use, Eskimos as well as Indians
and whites.
3. Natchiq (Ringed seal - Phoca hispida)

The small (50 to 150 lb.) common Arctic seal shares, along with the tomcod, whitefish and the caribou, the distinction of being a mainstay, a staple, a basic resource at the bottom of the pyramid of human life-sustaining species in the Krusenstern area. This seal can be found in greater or lesser numbers wherever ice occurs on ocean water (in the vicinity of Krusenstern). August is the month least likely to produce natchiq sightings; June is the month they usually are most numerous; and May, October and November are the months when largest numbers are harvested.

A whole book could probably be written about the life patterns of this plump little animal, and about Arctic man's interactions with it. The ringed seal supplies meat (eaten fresh cooked or dried and stored in oil); it provides skin for boots, pants, parkas, food storage bags (poke), rope for lashing, qayaq coverings, and bleached hides for sewing; and it is the source of oil that can be eaten, or burned for light and warmth. Nearly the whole animal can be eaten, including kidneys, liver, stomach, heart, intestine, head, flippers and tail.

Cape Krusenstern is better known to older Eskimos by the English language name Sealing Point. This is because people from Sisualik, Kotzebue, Noatak, or elsewhere in the region, who desired to do their spring sealing (May-June) at the most productive place, would move their family and dogs to Cape Krusenstern. They would spend the next 2½ months hunting and processing seal, as the snow and finally the ice melted and moved north. They would then travel in boats back to wherever they came from, taking oil and by-products for trade or sale, as well as for their own winter use.
The camping sites for this activity are on the current beach ridges, closest to the ocean edge. They can be at any point from Anigaaq to Ukalliksuk, but the large camp at Itiptigvik (which is Sealing Point proper) is preferred and most used for reasons explained below.

At the seasons when ice covers most of the ocean, January through May, seals are necessarily concentrated in what little open water can be found. The jutting point which is a part of Cape Krusenstern has very strong currents on its southeast side, because this is where the bay of Kotzebue Sound meets the Chukchi Sea. Around the point, on its northwest side, a giant eddy is formed. These conditions cause two occurrences that are important to the seal harvester:

(1) Southeast of the point, strong currents cause ice movement that creates open water holes, where seals can be taken by shooting them in the water, then retrieving them with a qayaq.

(2) Northwest of the point, eddy current action causes no ice movement, and a large section of safe shore shelf ice lasts until very late in the season, often well into July. Here seals find quiet rotten ice to lay in the sun.

This makes Krusenstern-Itiptigvik an ideal place to harvest all species of seal (primarily ringed and bearded). It is important to note that this Sealing Point subsistence activity has steadily diminished in the past twenty years, from 15 families to between two and four families each season. However, there is a current trend (1977) toward greater interest in going back to the land, to the camps that people used to enjoy so much for a time each year. This has already occurred in the Sisualik peninsula area and it is likely the Sealing Point area will again see more seasonal camping activity by those who were there years before.
Three large families (35 to 40 individuals) camped there in the 1977 season.

As the "Two month camp out" method of gaining marine mammal products has faded, the need for oil and skins for personal use and trade has not. And so another method evolved. We will call it "the quick" method for harvesting marine mammals, and will begin by explaining how it came to be.

In the 1950's more jobs and more money became available to the subsistence person. These jobs were usually seasonal, but as time passed more and more steady jobs appeared as well. People took these jobs, and they continued subsistence patterns by incorporating wage earning into their traditional existence. We here continue to call them subsistence people, because little has really changed in what they eat and what they harvest from the land and sea. Money from wage earning made it possible for nearly every family to own a boat and an outboard to power it, whereas before few could swing it financially.

There is a short period each year, between the time the ocean ice breaks free of the shore and moves around with wind and current, and the time the ocean is completely free of ice as it melts or moves north. Usually 10 to 15 days comprises this interval. Ringed and bearded seals tend to concentrate along the southern edge of the ice. At the same time, there are fewer and fewer large floes with thaw holes, where they can find good soft, snowy ice on which to lay while they sun themselves.

At this time, hunters in outboard powered boats can shoot both ringed seals and bearded seals as they lie atop the ice or swim in the open water. This requires less expertise and involves less danger to the hunter than is possible at any other season. There are, however, some problems.

Both varieties of seals tend to sink quickly when shot while swimming, due to fresh water spring run off that has diluted the salinity
of the ocean. Also, seals have lost much fat from their bodies from having spent so much time laying in the sun and not feeding. To be sure of recovering the seal you shoot, it must be laying on the ice and hit with a bone-muscle paralyzing shot so it cannot roll into the water and be lost. All this adds up to considerable waste because of irretrievable kills.

The hunting boats don't return home until they have a good load, since home can be 20 to 60 miles away. When they do get home those who must butcher and process the catch have a huge quantity of meat and oil to process. At this time, the warmest weather of the year often occurs, with temperatures sometimes ranging to 60° and 70°. Consequently, there may be considerable loss due to spoilage and blowfly infestation.

These mentioned wasteful drawbacks to this kind of hunting constitute part of the negative side of evolved current practices. There is a positive side. Each family that has a power boat and hunters can now harvest their winter oil in one week or less instead of two months or more. The catch is transported the 50 or 60 miles to the village without need for an intermediate spring camp.

Within the last twenty years, subsistence people have not altered their consumption of hair seal products or the area from which they are harvested. They have altered methods and patterns of activity, but have retained the original need of fulfillment that causes them to be "subsistence life" oriented. At any given time there could be a trend back to the "two month camp" harvest method, as it is really much preferred by the families involved. But because of other pressures the "quick" method has been expedient.

The Krusenstern Monument figures very prominently in spring hair seal harvesting activities, because it is a shore base for whatever pattern
is followed. The mouth of the "inland waterway" (Anigaaq) provides a safe shelter for hunting boats at this season, as do several inlets north of the cape (See map). Actual seal hunting takes place offshore from a few hundred yards to as much as 50 miles. The distance is determined by season and ice condition, and no two years are ever identical.

Most natchiq (ringed seal) now are taken with rifles, from .22 caliber upward. The new high velocity "flat" shooting calibers are preferred, because of the critical aim required to hit a swimming seal's head or to make the preferred neck shot for seals laying on the ice.

During the winter and early spring (January-May), ringed seals rarely sink, and so they are shot when they surface in open leads. Retrieval of shot seals is by qayaq or hook and line. At any time in this season, after a strong easterly wind, there are open leads in the Krusenstern area. Hunters travel out to the leads by snow-go or dog team, hauling qayaqs, hoping to take as many as 12 to 14 seals. This load totals more than 1,000 lbs., and is about capacity for a 14 foot basket sled. A good average daily catch during the late winter or early spring (January-March) is 4 or 5 per sled. April and May usually bring higher average catches.

An occasionally seal is taken in the fall (October-December) from Krusenstern beaches by driftwood gatherers, fox trappers, or caribou hunters. Some natchiq give birth to pups in scattered isolated birth dens on shore fast ice off Krusenstern in late February or March.

4. Ugruk (bearded seal - Erignathus barbatus)

Mature ugruk usually appear in waters adjacent to the Monument only during the month of June, and into early July if the ocean ice remains. However, this short period of harvest historically was a critical
time for the subsistence hunter. Although it is no longer quite such a matter of life and death, this animal still plays a very important role as a form of niqipiaq (Eskimo food). Ugruk are much larger than natchiq, running from 200 to possibly 800 lbs., and have thicker skin, more oil per animal, and a finer quality of meat.

In the years before any outside manufactured type of foot gear (summer and winter) was available to people of the northwest coast, everyone literally walked on ugruk skin. This animal's skin is thick and durable, yet pliable enough to be worked into shape for winter and summer foot gear, in a land where proper foot gear is a strict necessity for mobility of any kind. No hunter can function as an unfailing food supplier without proper extremity protection, and ugruk skin is the best for foot protection.

Ugruk blubber is more flavorful and of a tougher tissue which is preferred over natchiq blubber. One ugruk's blubber may fill a 200 lb. sealskin poke (or puug) that would take the blubber of five natchiq. Dried or cooked ugruk meat is preferred over natchiq, because it has a less "fishy" and more beef-like flavor. This results no doubt from its preferred diet of shellfish rather than fin fish.

Ugruk rope was of extreme value before nylon or manila were available. It was used for snowshoes, harness, spear, and snare making, where a strong line was needed. It still retains some qualities not equaled by manufactured ropes, such as the ability to withstand much rubbing on itself without sawing through. Hides for skin boats (umiapiaq) in this area not frequented by walrus were necessarily made of ugruk.

Two to 18 or 20 bearded seals is considered a good catch during one hunting trip, depending on the size of the boat, ambition of the crew, weather, and availability of ugruk.
To the true Taġiuqmi of the Krusenstern area there is no animal more important to him and his well being as a subsistence person. Ugruk hunting from Itiptigvik, using sleds and qayaq without benefit of a boat, is an art that is no longer practiced. It could yet be revived, if there is a genuine movement back to camps by a few knowledgeable hunters.

5. Qasigiaq (Spotted or harbor seal - Phoca vitulina)

This hair seal comes to this area from southern waters, where it winters in the southern extremity of the ice pack (north of the Aleutian Islands). It is present from late June until December. Qasigiaq are summer river dwellers, following the salmon up large rivers to the first riffles. This makes them somewhat available when all other species are north with the perennial ice pack.

Qasigiaq is of minor importance in the major seal harvest of May and June, and comes into a more prominent position in fall harvest activities which will be considered below. Spotted seal are prized, and when the opportunity for harvest occurs with the last ice of the season, they are taken in conjunction with ugruk boat hunts.

The beautiful leopard-like spots of the qasigiaq hide are its primary asset. Many skin sewing projects are based on new haired, well patterned spotted seal skins, particularly those destined for the tourist trade. Qasigiaq has a tendency to shrink or allow water to pass through the pores of the skin, and so it is not well liked for personal hunting clothing. As a tough snowshoe webbing for the mid-section "foot piece" spotted seal rope has no equal. Also as a lashing rope for sled loads nothing is quite so strong and easy sliding.

The third use of qasigiaq has to do with the relative slowness of the blubber to oxidize before the tissue breaks down to release the
oil in the rendering process. When you are unable to harvest your winter's oil at the right time (May-June), you must spend time the following winter trying to make oil from fresh blubber. This is done by keeping fresh blubber tightly packed in artificial warmth for a week or so (not too hot, not too cold) until bacterial action and warmth breaks down tissue and releases the oil. The degree to which oxidation takes place in this week interval from blubber to oil determines how much distasteful rancidity occurs. Seal oil users develop a fine discerning taste for different qualities of oil.

6. Qaigutlik (Ribbon seal - Phoca fasciata)

   This hair seal is rare and beautiful, but sadly often has molting hair when taken off of Krusenstern. Some years none are taken; some years seven or eight are taken by all hunters active in the area of Kotzebue Sound. A jacket or large bag is usually sewed by the women for the lucky hunter, so he can show off the pattern of the "suspend seal." This seal is larger than natchiq and smaller than mature ugruk, resembling in body shape the 6 month old ugritchiaq discussed in the next section

7. Fall Seal Harvest

   We have so far covered the most important and productive time of hair seal harvest. But there is another harvest each year that involves different techniques, although it involves the same species. This secondary hunt is important subsistence-wise, because it takes place after summer has passed and air temperatures again act as a natural ice box to preserve whatever is taken for use anytime in the following nine months. Because this fall season activity is confined to large river estuary locations, the proposed Monument area is not directly involved. But Sisualik Spit
is, and the same people and animals that were on the Krusenstern scene two months earlier are now shifted 10 miles southeast to a new scene.

As September's closing bright days come upon the area, light frosts at night give way to heavy frost and light ice in fresh water on clear nights. A little slush begins to run out of fresh water channels, and as if by magic, the seals begin to appear. Spotted seals have spent all summer in large fresh water rivers, feeding on salmon and char which have now gone farther up out of their reach. Six month old ugruk, called ugruitchiaq come from an unknown source, and natchiq are again in evidence, increasing as more ice is formed.

In the Sisualik Point area, the nine mile area between Kotzebue and Sisualik, a number of channels from the mouth of Noatak river flow out onto a large mud flat bar where water levels vary from 6 inches to 9 feet. Kotzebue's wide main channel is much deeper, and the small channel at Sisualik Point is deeper. Mud bars run at different angles and lengths through this whole area, where seals go in to meet fresh water slush or feed. When a large seal is frightened in six feet of water, when the surface is calm or slushy, it leaves a discernable wake that can be followed with a small outboard powered boat. As long as the seal can be kept in shallow water, the wake can be followed. As it soon needs air it must surface momentarily and can be shot with a shotgun at close range, killing it instantly.

This procedure sounds simple, but like most hunting techniques, many details come up between the time the seal is located and the time it is killed and loaded into the boat, if it is. This type of hair seal harvest can only be done when the water is calm, and usually it is not calm many hours in the October, November ice-running months. During some
years, several of the fall hunting crews make total season catches of close to 100 seals of mixed species, but usually their takes are much less.

Late in October or early November, as larger and thicker pans of ice drift toward Krusenstern and the Monument area, seals climb out of the water and lay on them. On rare occasions when weather permits, two or three boats will go there to hunt; but in deep water the only chance is a single head shot from a moving boat and success is not common.

At this season, the ugruitchiaq (young ugruk) provide very good meat. They are less than half the size of adult ugruk, though 200 lbs. is not unusual. Qasigiaq (spotted seal) are usually extremely fat, and they are often hauled to Kobuk villages sometime during the winter for sale or trade. Natchiq, especially the extra large adults in November, have a very high oil yield and a liver that is a very special treat. Skins are prime at this time, and many hunting clothes for family use can be fashioned from them, as well as various items for tourist or novelty sale.

This style of hunting comes to an end quite early (late October) for those based in Kotzebue. But it can continue on into December for those based in Sisualik, after an easterly storm that drives loose ice out and warms the temperature. In recent years more families have depended on this fall take of a few seals to stretch out their meager winter oil supply, when their spring hunt has been limited or non existent.

8. Sisuaq (Beluga whale - *Delphinapterus leucas*)

The sisuaq is a small (12'-16') toothed whale that carries not only many pounds of blubber and meat, but also has a very delicious skin called maktak. Beluga maktak is a very important delicacy to most residents of northwest Alaska and a basic niqipiaq (Eskimo food) for
some villages (Buckland, Noatak). Maktak—as it is processed, stored and eaten—is composed of three layers. 1. White or grayish outer layer (epidermis), coconut or mushroom-like in flavor, $\frac{1}{4}$" to $\frac{3}{4}$" thick. 2. Inner layer, bacon rind-like gelatinous dermis that is neutral flavored. 3. Blubber or fatty layer, trimmed to $\frac{1}{2}$" thickness.

Though a few sisuaq are taken when there is opportunity within the proposed boundaries, the close proximity of Sisualik Spit and Point eclipses any marginal subsistence beluga activity. The place name Sisualik means in English "Place of White Whale" or "Place where beluga whale are found."

The base of Sisualik peninsula is only three miles from the southeastern corner of the proposal. Sisualik Point, summer site of Noatak village, is seven miles east. The whole village of Noatak historically came down their river behind spring break-up ice to pitch their tents at the tip of Sisualik's narrow fishhook point (in late June). Today a growing group of Noatak and other village people are continuing this pattern. At the same time, large pods of white whales, following narrow leads and cracks into Kotzebue Sound from the ice-bound Chukchi Sea, come into the fresh water outflow of break-up time at the river estuaries. Here they find an abundance of food and shallow (6 foot deep) warm (compared to ice filled salt ocean water) water, where they give birth and possibly mate.

The system of diagonal bars and channels that meet the open sound waters offer circumstances where sisuak can be driven, chased, speared and finally lanced to death by hunters in gayaqs working as a team. The people of Noatak developed this art to meet their winter's oil needs, with the added treat of the maktak staple. Today, some of their hunting
equipment has changed (i.e. firearms, motor driven boats), and some families through acculturation have dropped the pattern. But a goodly number continue these activities, along with other residents of the area that have come to appreciate the fruits of sisuaq hunting.

A few beluga are taken within the Monument from year to year when they appear in open leads during lead seal hunting time (May-June). After the shore ice has broken free, often large groups of sisuaq follow more or less the whole beachline of the Monument from Rabbit Creek to Sisualik. One can be taken at this time by a good shot from the beach, or an occasional one or two are taken by an engine-powered boat in deep water. But usually not more than four or five are taken from deep water, and some years none at all. In the Sisualik area, there has been a trend away from the cooperative hunt, in favor of every boat for itself. This results in a much diminished overall kill.

Beluga nets have become more common in the last 5 years (1977) with fair success. Simple 14 in. mesh set nets are placed in areas between Sisualik and Kotzebue, when ocean ice conditions permit, during spring beluga hunting time (late June-July).

Numbers of Belugas taken appear to have diminished in the last ten years, but this seems more due to hunting methods and trends of emphasis or priority for the two week "ice out" time than to diminish numbers of belugas.

9. Aiviq (walrus - Odabenus rosmarus)

Only stray aiviq are taken in the vicinity of Krusenstern, presumably due to relatively shallow water and to migration paths that for one reason or another miss (and have historically missed) this area. Some years, two or three may be taken by all Kotzebue and Sisualik hunters in
the spring ice hunt. Four or five is a normal total for all hunters during the fall period (usually October). There is no "walrus hunt" for this area. Those taken are always more or less accidently encountered.

A good deal of subsistence use is made of walrus carcasses that drift into these shores each year with the last ice of the spring season. Some of these have heads and flippers, most do not. Those walrus that have heads and flippers are especially fortunate finds for the beach comber. The ivory and skull bones have many craft uses, and walrus flippers are the most prized part of the animal, second only to caribou tongue as a longed-for treat. Though the meat from these drifted-in carcasses is only fit for dog feed, the outer skin and blubber is salvageable for human use. The oil is much valued in this area, and the outer skin with blubber is cut in small squares and boiled long to make qauq that can be stored in oil for winter use (much like sisuaq maktak). It has some resemblance to head cheese or pigs fat.

Every year there are some drifted dead walrus on the Monument beach area that act as food sources for white and red fox populations, dog feed for those who have teams, and bait for winter fox trapping. Brown bears and grizzly bears often feed on them during the summer.

10. Nanuq (polar bear - Thalarctos maritimus)

Kotzebue was once termed the "polar bear capital of the world" by some enterprising guide service advertisements, during the heyday of commercial aircraft polar bear hunts. This was misleading, however, because it implied a situation that does not exist as far as polar bear populations and the Krusenstern area subsistence hunters are concerned. Only two stray cubs have been taken by this area's hunters since 1949, and no record is known by this writer of any adults taken in this century by surface traveling hunters, although some are taken every
year in Kivalina and Pt. Hope to the north, and Wales to the south.

Tracks are sometimes seen by seal hunters when the open winter leads are 30 to 50 miles offshore from Krusenstern Point. If a bear was sighted it would be taken. But such occurrences are rare, and open leads are generally closer to the beach during January to March when bears might be in the outer (100 mi. or more) ocean area. One former polar bear guide-pilot indicates that some 100 miles west of Kotzebue one can expect to begin seeing bear tracks in February to April.

The notion of Kotzebue as the "polar bear capital" of the world was based on its central location, air field, hotels, and restaurant accommodations for pilots and hunters. There is no potential for subsistence use of this species here, though should a large dead whale drift in and attract bears that are offshore (although a great distance offshore) there could be conceivably a number of bears in the Krusenstern area for a short time.

11. _Agvik_ (baleen whales)

Sightings of two or three species of baleen whale are not uncommon in the Krusenstern area, but at least two have been taken in this generation (40 years) with regular seal hunting rifles. Other attempts have not been successful, and their occurrence is too rare for any regular subsistence effort.

12. Marine Mammal Summary

Two species, natchiq (ringed seal) and ugruk (bearded seal), are by far, almost to the exclusion of other marine mammals, the most important in the Monument area proper. The Monument beach area and up to 50 miles or more offshore, though not the only area where these two species are sought, comprises more than half of total area used for hunting these species by residents of northern Kotzebue Sound (Kotzebue-Sisualik).
The products derived from these two species are second to none in the continued need by residents of the whole NANA region (including inland residents of the Kobuk and Noatak watersheds) for a niqipiaq (Eskimo food) that has become a part of what being Eskimo means. The sisuaq (beluga whale) and the qasigiaq (spotted or harbor seal) are the next most important mammals in the "Near Monument" area (i.e. Sisualik).

All Eskimos and many Caucasians of the entire northwestern Alaska area benefit from the harvest of this renewable resource, though the number of harvesters is relatively small.
1. **Introduction**

In considering the terrestrial species within the monument area, what first becomes apparent is that there are few or no really "resident" species. Over a period of years, populations of species rise and diminish over wide areas of the Arctic - subarctic transition zone, of which the Krusenstern Monument is the extreme western continental termination point. As various indigenous species approach highs of population cycles, movement patterns develop; sometimes because of food availability and sometimes for other reasons. All food sources for grazing, browsing, or predator-scavenger species are erratic, depending on cycles of weather, degrees of usage, and patterns of their own biological nature. As a result, most terrestrial mammals occur in the Monument area as migrants or as semi-permanent residents whose population densities vary widely between years and between seasons.

For these reasons and others, the land animals are never truly resident but always transient. This includes all species from caribou, the extreme traveler, to the tiny shrew that uses the caribou's trail as a path. These land animals, which are of such importance to the subsistence hunter as a source of fresh meat, dried meat, and skins for clothing, supply also the psychological challenge of the pursuit of the hunt which is a part of "mental subsistence" for a hunting society.

2. **Tuttu (caribou - Rangifer arcticus)**

The extreme importance of caribou as a food and clothing source, from past to present, for the northwest Alaska subsistence person can
never be questioned. However, a point that often seems overlooked is that this "extreme importance" only exists when the animal is available. Certain groups (Nunamiut of Alaska and Canadian Interior Arctic Caribou followers) did make caribou their nearly sole subsistence resource. But the Tagiuqmiit (salt water person) that the Monument area historically supported, and the present niqipiaq (Eskimo food) oriented culture that persists today, undoubtedly did very well without this "primary" resource when it was not available.

This is to say that when caribou were within reasonable reach of Tagiuqmiit camps they immediately became of primary importance as a preferred meat and cold weather clothing source. But if the tuttu did not come for one year, ten years, or 40 years, the Tagiuqmiit still had marine mammals and other bird and land animal species to continue existence, although to be sure it was a less comfortable or less satisfying existence than the years when caribou were present.

The Krusenstern Monument area was affected by the general pattern of caribou population decline or almost non-existence from mid-1800 through the reindeer era 1909 to 1942. And it was affected by the increasing occurrence and density that reached a peak in the area of the Monument in 1975, the year the alarm was sounded by Alaska Department of Fish and Game. The population cycle was already into sharp decline from an estimated 240,000 in 1970 to a bare 50,000 in 1976. The year 1949 was the first year in this century that caribou appeared in fall (October) migration groups within the area of the monument. Time lag in Monument area peak population occurrences (1968 to 1970 peak for overall northwest Alaska herd, as opposed to 1975 peak within the Monument area) is accounted for by altered migration patterns.
State game department biologists have been severely limited through this era of transition by lack of funds, personnel and equipment. Such dramatic innovations as guns, large dog teams, snow machines, small aircraft, and outboard engines have combined in the last 100 years to make a confusing snarl of circumstances for any agency seeking to deal with management of such a wide ranging animal species. Lack of biological knowledge, disease, parasites, and tallying techniques both of harvest and annual herd numbers have made the job of management nearly impossible. Attempts to manage with insufficient knowledge have led to rather poor relationships between subsistence-dependent people and a sport hunting-oriented state department of game.

These problems have come to a focus in the years of 1976 and 1977, the time of this study, and are not yet resolved. The most emotional and publicized questions have revolved around the question of wanton waste in a cross cultural situation. What is waste when populations of a cyclic species is high, has peaked and is on its way down? Non-use of leg skins or a head or sinew or bone and marrow may seem to be waste to the subsistence oriented person, whereas the more easily or quickly spoiled portions of roast and steak meat may to him be less important if caribou are plentiful. Non-use of roast, steak, and hamburger cuts may seem a waste when value systems are oriented to meat rather than bones, sinew and clothing materials. Since Alaska became a state (1959), caribou in Unit 23 (The Monument's Game Management Unit) have had a continual year-round open season with no limit for residents, with sale and barter permitted within units and dog feed use permitted. Restrictions were first introduced in 1976.

It is interesting to note that caribou came to a peak of considerable magnitude under many years of this non-restrictive policy. It is also
interesting that unless subsistence patterns are well known, a year round open season and no limit to harvest seems (in this day of worldwide protein shortage) too permissive. Yet the old subsistence pattern disciplines have a whole set of built in protection for caribou as a species if they are adhered to and if true wanton waste is dealt with as it occurs. Animals like caribou, snowshoe hares, and lemmings that have more extreme cyclic population fluctuations do for a time provide excesses of protein for animal and human predators. Human technology is not yet to the stage that it can distribute this surplus protein to where the need exists before it deteriorates by spoilage. Thus a certain amount of "wanton waste" seems to be an integral part of the providential scheme of things, although a striving to make use instead of waste is surely a proper and good policy.

Recent historical caribou movement through the Monument Area (since October, 1949), has been one of widely varying patterns, dependent on each year's peculiarities. But there have been some dependable similarities. Between late April and early October only stray cripples or occasional healthy old bulls could be expected to be found anywhere within the 340,000 acres of the Monument, and probably no more than 10 of these at any given time. Sometime between the first and 14th of October, depending on the relative warmth of that particular year, the fall rut and southward seasonal migration begins, from wherever the main body of the herd has summered (usually north of Noatak River drainage somewhere on the North Slope).

Caribou that are close to the coast, or that travel west and intercept the coast, turn south, and if uninterrupted will usually pass through the monument sometime in October or November. These animals travel on to the
Selawik-Purcell mountain area. This passage can be swift (3 to 4 days) and as simple as it is here described, but it has only happened that way once or twice in 28 years of personal observations. Usually it is complicated and extended and the passage takes a month or more.

Some years the caribou turn or are turned inland toward Noatak as they approach the vicinity of Kivalina. Some years it is said that small plane or boat hunting activity, or large wolf concentrations, turn the leaders in other directions. It has been observed that such a small incident as the sudden appearance of a fox or a startled ptarmigan can cause the leading caribou to spook in a different direction, and all the animals behind (some years many thousands) will turn east instead of continuing south at that point as they come along following the leaders.

With these indications in mind, it can be seen although the total northwest Arctic herd might be large or small, the number that pass through the Monument might be large or small in any given year, but not necessarily in the same ratio to the main herd fluctuations.

Some years, herds have entered the Monument from the northeast instead of the northwest or north as they come south from Squirrel River or Igiasisaq River (Aggie River). Some few years they have entered from the East as they come out of North Kobuk slopes to Hotham Inlet to follow the beach west before circling again through Noatak flats to finally cross to Kobuk wintering areas. Often it seems the Krusenstern flats proper have been a "staging" area where bulls fight and breed, others rest, lick salt ice or feed before heading off onto a long march in some direction. Some years the herds never leave the mountains during the march, and although many thousands pass on the high ground no tracks are made on Krusenstern flats.
To further confuse or inform those who would predict what pattern the caribou migration will follow, we must add that many or most years some percentage of those which "pass through" stop over in favored places. This occurs where an abundance of food and escape avenues are available, and as the impetus of the rut fades some animals are content to winter locally instead of continuing farther south. Some years these "local residents" number several thousand, and numerous favored places lie within the Monument.

These animals become for that year (October to April) the "fresh meat" source for caribou subsistence hunters from Kotzebue and perhaps from Noatak or Kivalina, depending on what other sources these villages might have nearby. Usually, Noatak and Kivalina are situated closer to wintering caribou herds.

The term "fresh meat source" requires some further explanation. Most families take as near a whole winter's supply as they can estimate or have opportunity to take from the huge October-November migration. But when caribou are known to be wintering within reach, a fresh one is killed from time to time during the winter. This provides the treat and the vitamins that fresh-killed meat provide for the subsistence hunter in a land short of fresh vegetables for winter use.

There is another fact of importance to this study. The nearly universal changeover from dog team to snow machine as the necessary mode of getting about for subsistence activities, and the related need for a cash economy that this precipitates, has brought about a risky situation which is now unfolding. This situation derives from the almost total dependence of a population on one species as a winter meat supply. The availability and relatively close proximity of caribou for the past ten
years has made it possible for the household hunter or hunters to work at a steady job. By hunting for only one or two days, they can supply the family with caribou meat for another month. Or more recently, a man could hold a North Slope job for three weeks, then go home and hunt for a few days to gain meat for his family while he goes back for another stint on the job.

All of this has been fine to this point, but now the subsistence hunter is told that caribou have dwindled to 50,000 or less (from 240,000 in 1970), and a quota system has been implemented. In most cases this will limit a family that has been using 50 or more caribou a year to 1 or 2 caribou. The eventual outcome of this situation can hardly be predicted, but it can be noted that the subsistence person's real forte is being able to adapt to change. The only real difference in this modern crisis is that man-made law has preceded natural restrictions by an unknown but probably short length of time. The hope is that as the subsistence hunger again adapts to circumstances beyond his control, personal, and particularly cross-cultural relationships won't be hindered so that a cooperative game use-management situation can be developed for the future. In a way this may be setting the foundations for attitudes toward Park Service management policies on subsistence use areas under their control.

As might be expected, caribou hunting methods have undergone some changes in recent years, mainly in those late winter and early spring months when heavy snow cover makes snow machine operation good and makes running difficult for the caribou. Since the major harvest is made either during boating time or shortly after freeze up, the snow machine has been a great help to the subsistence person, without the
potential for misuse that is possible at later seasons of the year. Usually there is little or no snow cover at this time. Old methods remain standard procedure, such as stalking feeding groups or attempting to get hidden beside a trail that a traveling line of caribou is using. The snow machine is used for hauling meat to camp and transportation along lake or stream edges, or on flat lands with a little ice or frosty surface.

Late in the season, as a foot or two of snow covers the uneven ground, chasing, especially with more than one machine, is effective though not as easy as it might seem to those who haven't tried it. Caribou have developed some evasive tactics that are effective against snow machines, as they are against wolves. Conceivably, if the herd nucleus could be sustained and true wanton waste dealt with, this manner of hunting is not really basically different from herding large numbers into lakes or river systems and spearing them from boats or qayaqqs, which was an historical method.

To the subsistence hunter, the method that is effective and expedient is the one to be utilized. The sport hunter ethic that is often reflected in game management policies sometimes becomes a cultural bias that obscures real objectivity. The expert foot hunter usually has more time and opportunity to make a greater kill from the group he stalks than the machine chaser who must drive, stop, shoot once, drive again, etc. Some prefer meat from animals that have not been chased, and the majority of winter hunters kill one or two as they first come up to a group, for they are then relatively tame, and they do not chase further. There are, of course, those individuals that misuse the improved technology they have under their control, and this seems so in any society. By and large,
most subsistence family hunters are as law abiding as they can be and still meet their real subsistence needs.

There was a small fall migration through the Monument area the fall of this study (1976-77) and small groups wintered over as they have in some previous years. Legal harvest was limited to 600 permits for 1976. Only 30% of quota was legally taken. Subsistence people seem to have limited themselves effectively, as caribou were available.

3. Tiniikaq (Moose - Alces alces)

It is only within the past ten years that moose achieved number two rank as a land animal resource for subsistence hunters in the Monument related areas. Now it seems likely that within the next five years this largest of the deer family may for a time replace the gap in the protein chain left by the diminishing caribou herd.

To some degree this year (1976-77) has already brought about that situation, as stringent caribou restrictions have come into play and moose populations are high in the subsistence use areas of Kotzebue, Noatak and Kobuk. There are some problems of moose replacing or substituting for caribou, even for a time, here in an area where moose seem strangers in a strange land.

The first moose seen and taken in the area of the Monument in recent times was a young bull that appeared in October at the fall fishing outlet of Anigaaq in 1947. The people camped there did not at first recognize the tracks, assuming them to be a very large fat bull caribou. Most of the older people there had never seen a moose in their lifetime but knew of them from Kobuk contacts. At least one elder camped there that fall had firsthand knowledge of moose from experience that he had gained on an extended trapping trip in the 1930's. This trip took him through
the Noatak watershed into the Colville River tributaries, areas that evidently had moose years before any were known in the Noatak valley. Several were taken to sustain men and dogs during wolf, wolverine, and fox trapping activities in the face of caribou scarcity.

In the late 1950's, moose became more and more common in timbered areas of the Noatak valley and coastal timbered areas of Kobuk and Noatak deltas. By the late 1960's, moose were common throughout the area, and could be expected in even non-timbered areas such as the Monument proposal. The gradual increase in population has continued into the years of this study (1976-77), and there seems to be no overpopulation in most areas (though a current high in snowshoe hare numbers is putting additional pressure on winter willow sources). Moose are found at any season wherever there is a large willow patch. During July, when the cool predominant westerlies blow off the ice, they are attracted to the coast from the sweltering inland areas, with their hot sunlight and abundant mosquitoes and flies.

Subsistence people of the area have accepted the availability of moose with mixed reactions. Probably the most typical is "It is good to have another kind of meat, especially when it is fat (August-September), but for soup or favorite land animal meat treats, we prefer caribou." No clothing use is generally attempted with moose, although tanned moose hide from other sources is much prized. Antler art work is gaining popularity. There seems to be no historic tradition of how to utilize various parts of moose, indicating a very long absence of moose from the Krusenstern area. However, archaeological digs indicate a presence of moose 200 or 300 years ago.
Hunting procedures for moose are similar to general methods of land big game hunts. These consist primarily of seeking a high place to overlook the surrounding area, glassing it thoroughly, and moving on to another high place until game is sighted. This procedure is used during boat hunts, and it involves the restrictive necessity to judge how far the game will have to be packed to the boat, and whether the effort is practical.

Most people with freezers prefer to fill their one moose a year limit in August or September, because all bulls are fat and good then. Those few without home freezers must hunt after October 1. Since the rut is then on in earnest and the flavor of moose meat (bulls) in rut is detested, a female unaccompanied by a calf is eagerly sought. Such animals are fine flavored and fat through the months of October and November, when other moose are at best second grade.

Moose population on the Monument proper can probably never be more than 50 at one time and probably always much less. The preferred winter environment of mixed spruce and willow timber patches is scarce within the boundaries, although there are extensive willow patches and good summer feeding areas.

One somewhat unique aspect of moose behavior in the Monument follows the pattern of animals generally in this area. Though moose are usually considered to be more of a "residential animal," there is obviously a new influx each year during the summer season into the Monument, and an outflow in midwinter or early spring. This can partly be explained by a western movement in the hot weather months (July-August). Extensive areas of glare ice on the lower Noatak river tend to hold moose in the west end of the Igichuk hills from October 1 until snow covers the ice in December or later. After this they can again move east if they choose.
It seems that moose may be easier to monitor and manage than caribou, and since they are now here it may be that they can be kept here with proper management. But it is to be noted that our moose habitat is such that usually winter icing conditions and high wolf populations, coupled with low available caribou numbers for wolf sustenance, could at any time bring a catastrophic crash in moose density.

4. AkJaq (brown bear - Ursus arctos)

The tundra bear or grizzly bear (akJaq) is a common visitor, and sometimes a winter resident of the Monument area as it is to most all other mountainous areas of northwest Alaska. It is never plentiful, but tracks are always in evidence along stream courses with patches of masu (Eskimo potato - Hedysarum alpinum), areas with many siksrik (Arctic ground squirrel) or places where dead marine mammals wash up on ocean beaches adjacent to mountainous terrain.

As a subsistence species, the akJaq is of very minor importance, because of its relative scarcity and its general unsuitability for making clothes or items that are of modern utilitarian value. The meat and fat in September or October is very well liked, and the skin is prized for a mattress. In late April and May the fat meat and thick hair is highly valued. Fresh meat (big game) of any kind at this time is scarce in most subsistence camps.

Usually any bear sighted in these two seasons is pursued, but few are sighted and the harvest from the Monument area varies from none in two years to possibly three or four taken in one year by berry pickers, moose hunters or caribou hunters. Several old den sites are known in the monument, but probably more than ten bears on the Monument at any one time would be unusual.
Black bears (*Ursus americana*) are very rare, if they occur at all. A black colored bear was killed in the Monument area 35-40 years ago during the reindeer era, but unverified as to species.

5. *Ipniaq* (Dall sheep - *Ovis dalli*)

Strangely enough, the mountain sheep seem to have come back to the Monument area after an absence of many years. Previous to 1971, only one occurrence is known during this century. But in 1971, four were reported, and each year since there have been reported sightings, though never more than seven animals.

An explanation for this might be in part based on an altered subsistence pattern in this century in the Monument proper. It can be seen from the map that the southern half of the Monument contains the western butt of the Igichuk hills, which rise into more normal Dall sheep habitat at the head of Squirrel, Eli, and Igisisauq Rivers. Likewise, in the northern half, the Agiagrauq range is the coastal butt of higher sheep ranges to the northeast that eventually lead to known sheep range in the Kelly (Kugruraq) River tributary to the upper Noatak River.

Formerly summer walking trips were made by men from Sisualik in search of caribou, sheep, or bear. These animals were hunted for their hides, as the July-August caribou and sheep skins are the only kind suitable for making parkas or inner clothing. Also, in the reindeer era (1910-1945) people were often in the mountains in the summer or fall, tending to the herds.

*Ipniaq* skins have a characteristic that makes them of high priority for parkas. The hair breaks off rather than loosens at the roots like caribou, and so the sheep skin lasts much longer and remains much warmer. Thus, sheep were much desired in the past. Furthermore, the ease of sighting their white coats from a distance, the ease with which they are
approached from above, and their propensity for using mineral licks made them relatively easy prey for expert Eskimo open land hunters.

Since 1960, skin parkas have given way to commercial down or other easily purchased materials, and no expert hunters walk the hills in summer seasons. And so, those Ipiñiaq that wander into the area during the summer are left mostly to themselves. Some are taken by small plane activity, and some incidental to snow machine caribou hunting. But their high rocky habitat is not the best snow machine traveling area. Ipiñiaq are not presently an important subsistence species. But it must be noted that because of the subsistence hunter's ability to adapt to what is available, sheep and bear (in the absence of caribou and moose) become the meat to feed the family until the next trip.

6. Siksrik (Arctic ground squirrel - Citellus parryi)

As we consider small game on the Monument proper, probably the siksrik's most unique characteristic is that he may be the most resident of all species. He shares this to some degree with the red fox and vole. This is not to say that he does not migrate or have cyclic highs and lows of population. But it seems you can always find an occupied squirrel hole without too much searching on any of the well drained beach or mountainous sections of the Monument. There is an unusually high percentage of well drained rocky soil within the Monument compared to the general run of northwest Alaska terrain. Ground squirrels are plentiful.

This is somewhat surprising, as every predator in the country including the subsistence person thoroughly appreciates the usually fat, tasty, bear-like meat of the little rodent. Not only is his flesh tasty, but his short but thick haired, sometimes beautifully grey spotted, tough little hide makes one of the North's preferred parka skins.
He is not difficult to catch, as he is easily rattled, forgets where the entrance to his burrow is, runs under a rock that a small boy or bear can lift, or any of a number of other not-so-wise things. Bears spend much of their time at certain seasons digging out these little fellows, sometimes moving tons of earth and rocks for a pound or two of fat squirrel meat. Snowy owls, golden eagles, peregrines, gyrfalcons and goshawks find sustenance in open country from siksrik, as do red and white foxes, weasels, wolverines, wolves, and of course, bears.

It seems fitting that he gets to dream away most of the winter in a snug chamber underground, though I don't know what protection he has from weasel at that season. From early October until late April siksrik is silent and inactive in a dark burrow, so it can be imagined what a shock the brilliant April sun glaring off a snow bank is when he first awakens, digs through the snow cover and sits on his haunches by his burrow. Often he can be approached almost close enough to grab with a bare hand before becoming aware of something near him. It is assumed that for a short time they suffer from a kind of snow blindness at this season, or at least a shock of contrast between terribly dark and terribly bright.

This time, late April-May and late September, is the season when they are trapped with small number 1 or 1½ traps, or rarely, snared. But they are never shot, as they are too readily lost in their burrows. They are one of the first fresh meats available to seal hunters moving to Sealing Point in early May, appearing a week or so before the first waterfowl.

Between 80 and 100 skins are needed for an adult's parka, but once acquired many years of good service can be expected. Siksrik and muskrat
are two parka skins still highly valued for everyday and social use. Most skinned siksrik that are fat are eaten. The whole animal is often buried in a snowbank for a few hours or a day before skinning, as most animals are more or less flea infested and the cold of snow makes the fleas inactive while the squirrel is being skinned.

This animal, because of his burrowing activities, has contributed to both discoveries and confusion in important archaeological digs, as he has a liking for mounds and depressions to construct his elaborate burrows. And in this soft ground the bears, his major predator, will go to any lengths to dig him out.

There are only two hints of the presence of the larger siksrikpak (Hoary Marmot - Marmota caligata) in the vicinity of the Monument. One was dropped by a disturbed golden eagle twenty years ago and one whistle supposedly from a siksrikpak was heard ten years ago.

7. Ukallaichiak (snowshoe hare - Lepus americanus)

The Monument area occupies the west terminus of the Ugichuk hills, and the eastern portion of these hills is timbered and provides a continuous habitat line both from the timbered Noatak valley and the Kobuk valley. For this reason, the Monument provides a setting for some interesting studies in migration and cyclic population highs and lows of this famous rabbit resident of the North.

When exceptional highs occur either to the east in the Kobuk valley or the north in the Noatak valley, all through the winter tracks can be observed on fresh snow in large lakes or river open places. These tracks all point in one direction (west from Kobuk or south from Noatak) to the last tree patches west of the lower Noatak River. Close to the eastern and northern boundaries of the Monument, spruce patches, the usual
habitat of this hare, terminate. Only large patches of red and water willows remain in the Monument toward the coast, and as these are a major source of feed for the "overflow" rabbits that stop over, sometimes for a season or two, reproduce, and reach very high concentrations. If a season of heavy snow occurs around this time of high population, most willows are drifted over and wherever there is some shelter left two rabbit hunters can load their sled in no time with up to 200 rabbits in a day.

Eventually many rabbits starve, wander out onto the ocean ice or otherwise meet untimely ends. There is always a large area of glare ice on the lagoon directly under the Palisades and rocky face of Ingngit-kalik bluff. Rabbits straying out from the large sheltering willows at Taliqut during windy periods cannot get traction on the ice, and often ten or fifteen can be found frozen on the ice feet upright.

Highs in this rabbit's cycle seem to vary considerably, and extreme highs seem only to occur every 12-15 years. In 1977, rabbits seem to be approaching a high, and if they follow the cycle of the 1960's pattern, they will drop rapidly, and many years will pass with no varying hare tracks on the Monument anywhere.

During the years of highs, rabbits have fed dog teams, sustained some subsistence hunters' cash needs (as they have a dressed value in Kotzebue of $.75 to $2.00 apiece), and of course they have supplied many other natural bird and animal predators with food. Still, many will simply die and rot in place until the blow flies of summer lay eggs and fulfill their own cycle.

Rabbit meat is well liked, if not too often eaten. It is better in early fall than late spring. Some years, when there was no nigipiaq
(Eskimo food) of other varieties available, some families used to cook only heads and feed the dogs the bodies. This is because when you get tired of eating ukallaichiak only the head remains palatable.

Snaring with braided, soft picture-hanging wire is the most common fall and winter method of taking rabbits. As the sun rises higher in the sky in late January, rabbit driving or uungaraq time is at hand. This activity is very exciting and often serves as a family or group outing between January and May as spring days grow longer. It consists primarily of driving rabbits out of the thicker places of willow shelter (where they spend the day) into more open, ever-narrowing willow cover, where they can be shot with .22 rifles or shotguns. It is not as easy as it sounds, because rabbits don't like to leave shelter and double back or "paqsaq" at any opportunity. It ends up something like a chess game, where many rabbits escape, the young hunter learns a little more of the outdoor world, and the old folks get tired.

Pot roasted hare is later enjoyed by all. The outing is re-enacted loudly around the table: what should have been done to trap more rabbits, who fell on his snowshoes and couldn't get untangled while rabbits ran by within touching distance, and the non-conformist rabbit of note that took off across open country forsaking all shelter for escape, for the moment forgetting his natural instinct to stick to cover for fear of hawk or lynx; one rabbit in a thousand.

Rabbit population highs can be very destructive to young spruce or any other browse that sticks out of the snow in early spring. And of course in this area, rabbit and moose both depend primarily on willow shoots for winter browse. Sometimes they compete with each other, as snow depth determines what height they can reach. The floor of our scattered willow and tree patches is altered much by heavy snowfall and much drifting.
No regular use is presently made of rabbit skins, as the hide is paper thin and easily torn. Socks, knitted blankets, and children's clothing are some historic uses of skins. In times of need even now the tender hide can be backed with cloth and used for clothes when better furs are not available.

8. Ukallisugruk (Arctic hare - Lepus othus)

On seeing one's first Arctic "Jack rabbit," particularly if it is "loping" away from you in the bright early spring (March) sunlight, you are likely to feel that you have either lost your senses or are seeing an apparition. Everything seems exaggerated. Legs, ears and leaps give an impression of a slow motion, magnified moving picture film.

Unlike his smaller brush-dwelling relative, the snowshoe hare, this very large hare of the open tundra has such creamy white winter fur that he is often spotted by man and probably other predators because he is too white against dirty snow.

In recent years this very fine flavored subsistence food animal has become rather rare, though certain preferred areas can be depended on to show some tracks and other signs. In the era of 1900-1940, when caribou were absent and reindeer had their ups and downs, ukallisugruk and ptarmigan were the preferred "soup meat" when the larger animals were not available. "Jack rabbit" and ptarmigan meat does not seem to get monotonous the way snowshoe hare or a straight diet of fish can. This can possibly be attributed to the diet of the species, as lichens form a large part of the winter fare of jack rabbits and a very small or no part of the snowshoe hare winter diet. Willow, spruce and alder are the mainstay of the smaller rabbit. Ukallisugruk has creamy white back and a jet black upper ear border, weighs as much as three or four varying hares and has double length ears when compared to the small ukallaichaik.
Unlike their smaller relatives, Arctic hares seem to live rather isolated lives, at least in recent history in the Krusenstern area. Usually two are found together, and sometimes three or four, with many miles of open country between small groups. Bluffs, cliffs, or high banked lake areas, where the wind is so strong that it continually leaves lichens and dwarf willow and birch buds exposed throughout the winter, are the favored habitat for this unique Arctic species.

Ingngitkalik mountain and the Palisades are well known areas to expect to see ukallisugruk, as are a number of other locations within the Monument. The large freshwater creek in the northern section of the Monument, called Rabbit Creek or more correctly Ukalliksuk, is named in Eskimo for the presence of this large rabbit at some time in history.

The hunting method used for this rabbit is a kind of basic "walk up" stalk that can be employed by the winter snowshoe hunter on any species of land animal he might encounter. It could be said that this rabbit is the perfect training species for the inexperienced open or barren lands hunter, to gain knowledge and expertise to prepare him for more difficult game.

It is not that ukallisugruk is easy to hunt, it is just that he is so predictable. Usually he will allow the hunter to approach within 50 yards or less if dozing by his snow-hole hawk shelter. He then starts off on his kangaroo like hop, only to stop after 8 or 10 hops to sit upright for a few seconds to see, evidently, if whatever disturbed him is going to chase him. The hunter who is ready has just exactly time to shoulder his rifle, throw off the safety and fire one accurate shot. No second shot and no hesitation in getting the first one off is permitted. If you miss this first encounter you follow the tracks always
trying to figure where he is likely to stop again. He usually does this in a small willow patch or hillside with a few willow clumps, where he makes a new snow-hole for bird protection, then watches his back trails. The hunter makes a wide circle, watching the wind, and attempts to come up behind or at least from a different direction than the rabbit expects. If there is a good breeze and the hunter is sharp eyed, he may see the animal before the rabbit sees him. If not, it is a replay of the first act. The rabbit takes off, at 40 or 50 yards stops for the shot, and again goes over the hill. This goes on until the hunter finally hits the rabbit or it gets dark.

This method, with little adjustments for special peculiarities, might be termed the barren ground showshoe hunter's modus operandi. It is effective on all species, the jack rabbit being the least rangey and therefore the simplest to practice on. Snares of a larger gauge wire can be used, as with small rabbits, but regularly used trails are much harder to find.

Ukallisugruk skins make fine hunting parkas or baby clothes. The hide is thicker and more readily tanned than snowshoe hares, being much like domestic rabbit hides in this respect, though of thicker and silkier hair. Some enterprising hunters are said to have sewed on longer tails and trimmed the ears off jack rabbit skins to pass for white fox on a non-alert or uninformed fur buyer.

In times past, jack rabbits have had population highs that have caused migrations of the animals in "herds" on the Baldwin Peninsula and south in the Deering area. Golden eagles, gyrfalcons and snowy owls are probably ukallisugruk's greatest predators. Although the rabbits much outweigh the owl, they do fall prey though it is not known how often. Lynx, when they are on a migration high that takes them through the
treeless regions, could decimate any ukallisugruk population.

9. Ilugutaq (porcupine - Erithizon dorsatum)

Last in our list, though I'm sure not last in the preferred list of many subsistence people, is this ancient, unique animal that can transform such unlikely things as spruce and willow bark into very tasty, deliciously fat meat.

There is a very high density of this animal within or close to the boundaries of the Monument, which is surprising since porcupine are timber dwellers. As before stated, there is a western terminus of the boreal forest within or bordering the Monument, and there is a kind of natural pile up of those timber oriented species that move west and find only ocean or barren ground instead of another patch of spruce.

Some years there is an almost daily occurrence of beach-wandering ilugutaq in the month of July, wherever you might camp between Kivalina and Sisualik. July and August seem to be the months when even this slow moving fellow develops a wanderlust. Young males and some older males seem the predominant travelers. By the time snow flies in late September all porcupines are back in timber patches, making the few patches we have north of Sisualik quite thickly populated and prime areas for anyone who would like a fine pot roasted porky.

In those years when the subsistence hunter is limited to fish, ptarmigan, and snowshoe rabbits (caribou and moose absent) a pot roasted porcupine twice a week is a special treat, as the porky carries more fat than any of the other winter land game species.

Hunting methods are simple. The animal often prefers the higher line of timber on a hillside tree patch, often in a sheltered ravine or draw. Once freshly chewed trees are located, tracks are sought and followed.
If they do not end in a hole in the ground, the slow-moving animal is killed with a club blow, or if it is in a tree a single .22 rifle shot in the head brings the animal tumbling down to be skinned and gutted immediately.

Formerly, when time was of a different value, the porcupine was plucked like a duck, as the skin is very delicious and much like very tender pig skin. Viscera must be immediately removed from a porcupine, as the usually full condition of stomach and intestines with very bitter tree inner bark quickly spoils the meat if not removed. Thorough cooking (pot roast) until almost burned is the most delicious method of preparation; and it is just that, one of the best and most delicious game foods.
CHAPTER 5.
BIRD HUNTING

1. Introduction

From the Subsistence person's viewpoint, the hunting of birds must immediately bring to mind (not withstanding this century's sport-hunting cultural taboo against it) the spring migration of waterfowl to summer breeding grounds, after seven months of a nearly birdless sky, as well as a nearly birdless pot. (This is not to slight the few year round resident species: raven, ptarmigan and snowy owl, but the contrast between summer and winter bird populations is overwhelming to one who lives off and on the land north of the Arctic Circle.)

The one aspect of the situation that has not been emphasized, it seems, for general public official acceptance of a spring hunting season, is the fact that this spectacular spring occurrence is a migration flight the same as is the fall flight. There is an open fall hunting season. Serious breeding and nesting activities take place later than this spring migration flight, and the birds are then not generally fit for the pot and are traditionally not sought.

The fact that international treaties are involved and are immutable has been the usual official response to concerned citizens seeking a legal spring open season. Practical subsistence living has therefore brought about a traditional disregard for the law that has over the years penetrated very deeply in the philosophy by which contemporary people live. This has affected both those who are subsistence people and those who are charged with managing different species. It is hoped that someone with Solomon-like wisdom might present a plant to resolve this unhealthy situation with equanimity.
2. Kurugaq (American pintail - Anas acuta)

This large, long-necked puddle duck is probably the most important species to the subsistence person of the Krusenstern-Sisualik area. Large concentrations make good use of the plentiful aquatic grasses in the brackish mud flats that abound in both locations. The kurugaq arrives in early May, nests, molts, and fattens himself to prodigious proportions before he leaves for the south in September. During this cycle there are special times when he is much sought after for his tasty flesh.

He is one of the first ducks to make an appearance on land in May, and often flocks are seen before any real water puddles have formed. At this time, he usually arrives with a thin layer of fat left from the long flight, and makes a delicious pot of soup that you can almost feel course strength through your winter-tired body. Very old Eskimo people seem to visibly take a new lease on life after the first pot of duck soup, and the pintail more often than not fills the pot.

A week or ten days after arrival, mating activities sap all the fat, and kurugaq becomes not much but skin and bones. This physical low continues throughout the early weeks of June. From the very last week of June until the 18th or 20th of July, the pintail undergoes another drastic change. Flight wing feathers loosen and drop off the males and non-nesting females. With the abundant new green growth of water grasses, large rafts of all male kurugaq grow very fat and try to make themselves inconspicuous on large inland lakes of the Monument area, while they are flightless.

This time coincides with the end of the marine mammal hunting at Itiπtigungik (Sealing Point), and in years past every man with a gayaq
would join the party that would seek out these fat, flightless ducks on the inland waterways of the Monument. Some years large numbers were taken in a two or three day trip. All of the qayaqs would come home loaded, and the catch would be cached in the last snow or ice chunks. If more than could be used fresh were taken, they were half dried, boiled, and stored in seal oil for use late in the summer.

In late July all pintails with new flight feathers come back to favorite feeding areas. Again they are skin and bones, but with bright, fluffy, uniformly grayish brown new feathers. Few are taken until late August, when they begin to fatten for the September flight south. Most birds one year or older have left this area by September 10th, and some years they leave earlier. Some young birds of the year stay as late into October as there is open fresh water, getting extremely fat on the starchy roots and aquatic grass. Birds taken after the 16th of September can be hung in the cool storehouse for winter use.

Today's bird hunting is all done with shotguns. A few bird spears were used as late as 1948-1950 on the Monument for qayaq hunting of "isaa" (molting flightless waterfowl).

3. Ugiihiq (American Widgeon - Mareca americana)

This short-necked, plump "surface feeder" is second in abundance and importance as a waterfowl food source in the Krusenstern-Sisualik area. Large flocks often mix with pintail on feeding lakes, the widgeon eating off the surface what the longer-necked pintail have dredged up from the pond bottom.

Large beds of green algae form during the summer on various shallow brackish water inlets and lakes in the Monument and the Sisualik mud flats. This seems to be the preferred and primary food source for this duck, and they have been known to get so fat in late fall that they are
unable to fly. This happens especially on a cold morning, when they can be killed with a club. This has only occurred rarely and always in places where they haven't been disturbed for long periods of time.

These birds are much harder to catch when moulting than pintails, and they do not moult in numbers in the Monument area, preferring the Kobuk delta area where there are more willows and grass for cover. They do return to the Krusenstern-Sisualik area in large flocks after moulting.

4. Other Surface Feeding Ducks

Mallard (kurugasugruk), green-winged teal (gaingiq), and shoveler (aluttaq) occur regularly and are taken occasionally. Numbers are never great, the teal being the most numerous.

5. Ahaaliq (Oldsquaw - Clangula hyemalis)

Of the diving ducks this handsome, noisy, gregarious fowl is probably more in evidence than any other waterfowl at Cape Krusenstern proper. It lays eggs close to the water's edge on the small ponds that dot the area between the beach ridges. The males and non-breeding individuals gather in huge flocks on the largest lagoon (Ingngitkalik or Itiptigvik lagoon) to spend the summer.

When this duck first arrives in the spring while in large flocks, it is well liked as a food source, though it is different flavored than the ducks that feed on vegetable matter. This different flavor is termed "fishy" or "gamey" by those accustomed to milder flavored poultry. All eiders, scoters, mergansers, loons, and grebes share this "stronger" flavor which makes them different but not necessarily less preferred by the subsistence person, especially when they are fat.

The ahaaliq in the Krusenstern environment provides a study in how a bird's food determines its palatability. When the flocks first arrive from wintering grounds they have a thick layer of usually reddish
colored fat. This is very tasty, but has a noticeable "fishy" difference from the fat of pintail or widgeon. The large flocks of males that gather on the lagoon after breeding fatten again by late July from the algae of the lagoon, but this fat is white and the "fishy" flavor is not prominent. At this time these birds taste much like a surface feeding duck.

No special hunting methods are used for these waterfowl. The general system for all waterfowl is either to sit hidden in a known flyway, or to hike over the country spotting flocks at a distance and crawling up unseen to collect as many as possible from one or two shots with a 12 gauge shotgun. The small sand island in the Itiptiγvik lagoon's southwest corner is a well known place to seek ahaaliq in late July. May hunting is at offshore open water leads or land flyway points that are used more or less by all migrating waterfowl. Ahaaliq are extremely fast fliers, and during spring inspired acrobatics, this species attracts so much attention to itself that it has become an integral part of spring seal hunting camp life.

6. Other diving ducks
Qaahlutuuq (greater scaup - Aythya marila)
Mitig (common eider - Somateria mollissima)
Tuungaaγrûq (black scoter - Oidemia nigra)
Paisugruk (red-breasted merganser - Mergus serrator)

Although other divers pass through the Krusenstern inland or offshore flyways, these four both nest and are occasionally taken for food, though never in large quantities. Each, however, fits its own niche of special value for the subsistence person, although currently on a diminished level.

Qaahlutuuq (greater scaup), like all the diving ducks, provides much qivvi (down) in spring, as well as a late-in-migration fatness, and a large clutch of 9-12 medium sized eggs which are eaten, if found.
Mitiq (common eider), the only eider that regularly nests in the Monument, is the largest most prized diver for food in May, being very fat with a clam-flavored yellow layer coating its dark meat. No large concentrations occur, and those which are taken are shot from the few (but sometimes large) passing flocks. Some small flocks become residents for the months of May and June, when they find food sources in the open water of ocean leads.

All other eider species are observable nearly every spring, but they are rare enough to be of little consequence to the subsistence person. This is somewhat strange, because just 40 miles north, the Kivalina people have a large flight of King eiders (*Somateria spectabilis*) in early May, along open ocean leads and often right through the village. Spectacles and Steller's eider are observable but never plentiful.

Tuungaagrug (black scoter) have the distinction of being the last migrant to arrive, and therefore the fattest and latest sought at the very end of the spring migration. This is a time when all other species have split up into nesting pairs and no longer have preferred meat. Also, this jet black duck lays its eggs last and has a clutch of 8-12 buff colored large eggs. They are fresh laid and quite edible when most other species have partially developed birds in the eggs.

Paisugruk (red-breasted merganser) are also late, fat migrants and egg layers with as many as 14 eggs in one nest. This true fish duck is the least preferred of all the large divers. It is only occasionally taken, usually when nothing else is available and a bird is needed for the soup pot.

A few general characteristics of sea ducks that are interesting from
a subsistence person's viewpoint should be mentioned: all are fat and have abundant clear down (qivii) in May-June. Most are lean with pin-feathery thin down in all other months that they are in this area. Flights are concentrated in May and June, when ice covers most of salt water, and so birds follow the leads. In the fall no concentrated flyways for sea ducks exist and so they are not available to the hunter.

Some years, large numbers of young common eiders freeze and perish on Krusenstern flats, when they attempt to winter offshore and all available water closes or freezes. The darker beach ridges appear to them to be dark open water and they are attracted when all else in their world is white. They alight expecting water, find none, and perish. This happens during any winter month from December through March, when conditions are such that no fresh ice movements create open water for these unfortunate birds that didn't seem to have sense enough to go south with others of their kind.

7. Geese and Brant

From the subsistence person's standpoint, two species of geese, iqsrąqutilik (Canada goose - Branta canadensis) and kigiyuk (white-fronted goose - Anser albifrons) can be considered together, because their occurrence, habits, and importance as a food source are similar. Usually hailed as the real sign that spring is imminent, these hardy birds are the first waterfowl (along with swans and cranes) to make their presence known over land areas of the Monument by their raucous call of "nigilik, nigilik". From this they get their general Eskimo name of "nigilik" when not identifiable by their specific species name.

These are berry and green grass eaters, and they are found in quite large concentrations on the Cape Krusenstern flats area, in competition with
human berry pickers in August and September. Some nest in isolated inland lakes of the area and often non-breeders moult in higher inaccessible lakes in quite large flocks. During the spring migration flight period these are plentiful at promintory points, where hunters sit and wait for waterfowl. These two species are preferred table birds, but they are fairly wise to the ways of men. Their population seems to change very little from year to year.

The fall concentrations in good years for cloudberry (rubus chamaemorus) or crowberry (Empertrum nigrum) are the most spectacular. These often attract the more "well to do" subsistence people, who can afford to fly to the area during the fall waterfowl season, as well as boat hunters or berry pickers who would have a very delicious fowl soup.

Hunting methods generally follow the unsophisticated method of trying to hide and wait along paths of flight from feeding areas to resting areas, a routine which these geese follow regularly though changeably when interrupted. The more general use of electricity powered freezers by town dwelling subsistence people has made long term storage of these favored fowl possible. This added potential for use of the resource does not seem to cause much abuse, as these species are wary and prolific.

The black brant and snow goose generally occur at the same time and are of equal high value as a food source, so they can be considered together. In the Monument area only the spring migration flight offers opportunity to use this resource. Late May and early June flights can be quite extensive, and these fowl are of top priority as a preferred fowl.

Kanguq (snow goose - Chen hyperborea) are not known to nest in the area, but in some years a few flocks of niglignauraq (black brant - Branta nigricans) have been known to nest in the Krusenstern flats.
Although snow geese are avid berry eaters, only a stray flock or two can be expected after the first of July. Obviously, they use other flyways for the fall migration.

When the brant arrive in the spring they are very fat and fine flavored. They are never known to eat berries, and the small family groups occasionally encountered in August or September are always skin and bones. For this reason, they are not preferred. This species seems very specialized, and seems to eat only easily available floating fresh water plants pulled up by some other species, and kelp, which is only available here in minute quantities. The spring harvest of this species is the only one of importance, and methods are similar to other migratory flyway hideout hunts. These birds come late, toward the end of the spring waterfowl migration. A person wearing a white drill seal hunting parka can often crawl in plain sight up to shotgun range of a flock of feeding or resting snow geese.

8. Swan and Crane

Qugruk (whistling swan - Olor columbianus) and tatirgaq (lesser sandhill crane - Grus canadensis) are the two largest fowl. Although the crane is the more common and plentiful, the swan is always in evidence somewhere within the Monument area, with isolated nesting sites and preferred feeding or sheltering places. Neither is taken in numbers by subsistence hunters. However, because cranes come so early (late April) they sometimes give opportunity for large numbers to be taken early in May during extreme weather conditions.

Large numbers of cranes migrate south very early, usually in the first few days of September, flying very high in the air so that there is little opportunity for the subsistence person to harvest even the legal fall
bag limit. The beach ridges of the Monument are a favorite nesting area for tattirgaq. No special hunting methods are used and the flyway hide out or the accidental fly over are the only harvesting means.

Swans are often very late fall migrants as well as very early comers. Large flocks (20-40) are commonly seen in October. They and the Canada goose are late migrators, and some are in evidence until the very last fresh water has frozen in October.

9. **Loons - Grebes**

Although horned grebes (suglichaurq - Podiceps auritus) and red-necked grebes (sugliq - Podiceps grisegena) play no part in the Monument area's subsistence life, except for an occasionally floating nest of rather good eggs, the several species of loon do have a special niche.

Tuutlik (Common loon - Gavia immer and yellowbilled loon - Gavia adamsii)

Qaqsrauq (Arctic loon - Gavia arctica)

Qaqsrastauchauraq (red throated loon - Gavia stellata)

During the period of time between the last migrant species (brant, scoter, and merganser) and the first moulting pintails (July 1st), if the subsistence camper-seal hunter wants to eat fowl his choice would most often have to be a loon of one kind or another. Most other fowl are nesting inland, and at any rate of poor eating condition. Loons, on the other hand, as often as not are flying directly over the camp or the travelling boat, and are still carrying a good layer of fat. The meat has a mild seal-like flavor, but is very good with onions and flour-thickened broth.

The largest loon (tuutlik, both common and yellowbilled loon occur and have the same Eskimo name) is rare in this area, but can be found in larger lakes or lagoons on the Monument each season. The other two species are common, and nest in the many small shallow lakes, the parents
carrying fish from distant ocean or slough fishing grounds to the usual two offspring.

Commercial salmon fishing activity has in recent years taken a great toll of loons in the waters where it is practiced, because of the extreme number and length of nets in water where loons habitually seek their food and become entangled. It is probably not a reason for concern, as commercial fishing is confined to a relatively small area, while the loon is widely distributed here.

No special hunting methods are employed, and loons are only taken for immediate use. Usually, they are in the pot an hour or two after being shot while flying over the camp or over the boat.

10. Seabirds
Isungngaq (long-tailed jaeger - Stercorarius longicaudus) and two other species. Akpa (common murre - Uria aalge) and (thickbilled murre - Uria lomvia) Nauyaq (Glaucus gull - Larus hyberboreus) Mitqutaillag (Arctic tern - Sterna paradisaea)

As there are no ocean cliffs within the Monument area, those seabirds which characteristically use such sites for nesting are often seen but are of no material importance to the subsistence person of this area. However, the above species contribute in one way or another to the table fare from time to time.

Akpa (common and thickbilled murre) fly back and forth following open leads from late April until the beach ice moves out. They are undoubtedly the bird that inspired the first Eskimo bolas or qilamitaut. They fly very low and in long ragged lines, with a straight headlong flight that nearly nips the peaks off the pressure ridges.

When large flocks are on small ponds of water when the air is calm they can be frightened into trying to take off on too short a taxiway
and be clubbed as they struggle over the ice with their ill adapted shore legs. In former years the skins of these birds may have been of value as clothing, because of their abundance and relative ease of capture. There is not now much of a harvest. A few are taken with a shotgun near ice edge seal hunting camps, to be eaten immediately after being skinned and plunged for a short time in boiling water. The flesh is very seal-like, and most subsistence people of the Krusenstern area prefer seal meat.

Few are killed these days, and as they lay their eggs on cliffs no nesting areas are located between Cape Thompson on the north and Chamisso Island on the south. Their main value as a subsistence species lies in their large numbers and ease of capture when every other of the ice hunter's sources of food are absent.

The isungngaq (long-tailed jaeger) is unique in that it is probably the most hated of all birds by the people of this part of the north. Its predatory habits and the great public display of them very nearly leaves the isungngaq no friends. It persistently chases the smaller seabirds (gulls, terns) to steal their food and/or offspring, often using deadly teamwork. Very seldom, if ever, does it catch its own fish, and this makes the bird seem evil clean through. It also chases shorebirds and songbirds. No other bird seeks out and eats more duck and other preferred species' eggs than does this fellow. Strangely enough, it is seldom killed nowadays, except when it is shot in anger and left to rot.

Formerly, when the jaegers first arrived, their fat meat, though a trifle small, was eagerly sought. This was done by using a sharp bone splinter or sharpened double-ended piece of wood (tivititaq), tied in the center with sinew. It was then imbeded in a chunk of blood or meat and fastened by the sinew length to an anchor. The isungngaq gulped the
morsel, attempted to fly, and as the double pointed splinter toggled on the line the unfortunate bird toppled as it took to the air.

Formerly, the skins of this bird were probably used for a poor grade of clothing when better material was not available. No use is now made, and the species stays at as high a population level as its food supply can maintain (and it is not real particular what it eats). A few long-tailed Jaeger eggs are found and eaten each year, but since they don't nest in colonies only few are thus destroyed. At times the jaeger out-populates every other bird species on the beach ridge portion of the Krusenstern area of the Monument.

Glaucous gulls produce the largest volume of fresh eggs for the subsistence person of this area. Several locations on the Monument support quite sizeable colonies of these big birds which lay large, well-flavored eggs. Each egg contains as much material as two extra-large chicken eggs. A two egg cake recipe turns out just right with one fresh gull egg. They also are the first coastal large bird to lay eggs, usually the last week in May. Often their eggs are laid in grass nests made on ice when spring run-off water is yet flooding the land, so the usual nest mounds are still under water. The eggs are later transferred to mounds on small islands.

As many as 200 or 300 gull eggs can be gathered from an area at one time when most nests contain two or three eggs. After a wait of four or five days almost as many can again be found. This can be continued into August on a declining scale. Many move to other locations where they are undisturbed, but some are persistent.

One other use is made of the larger gulls. Often during salmonberry (akpik) harvesting time (late August), meat is scarce to feed the berry pickers.
Young ducks may be scarce or unavailable, old ducks somewhere else, or there may simply be no ammunition for the shotgun. Some young gulls have already flown, but many are just trying or in the "squab" stage. These can be easily captured by hand with a qaqaq, their necks wrung, and a very delicious flour soup made to give akpiq harvesters strength to carry on.

Mi tquai1 lag (Arctic tern) are very beautiful and dextrous in their pursuit of stickleback and other small fish of the Monument waterways. They also have the most delicious, delicately flavored egg of all northern wild eggs. Chicken eggs are coarse and over-flavored by comparison. They lay in quite large colonies at several known locations within the coastal Monument area. A daily take of 200 to 300 eggs can sometimes be accomplished from nests containing one to three eggs. Only a few areas are this thickly populated and they can only be "picked" about once a week. No other use besides simply observing is made of this celebrated long distant migrant.

11. Shorebirds

Except for a couple of species (whimbrel and godwit), no subsistence use besides occasional egg finds are made of shorebirds in normal circumstances. In time of a summer food shortage, because of their availability, they would be an emergency source of energy.

The whimbrel (*Numenius phaeopus*) which is called turaturaq, is a large blueberry eating shorebird that is much enjoyed for its delicious flavor and availability close to camps in the early fall after blueberries ripen. Old women, with the help of young folks, formerly used snares or old whitefish nets to entangle these scimitar-billed berry eaters. Now a few are taken with a shotgun, usually for the older people who miss their flavor, or to help fill out the regular evening soup pot.
12. Land birds

One outstanding species dominates the strictly land bird category from the standpoint of the subsistence person's use potential. **Aqargiq** (willow ptarmigan - *Lagopus*), whatever you choose to call him, is by far the one year round resident bird that every predator is surely thankful for. This is the bird that turns willow buds, berries and a few insects into a very delicious energy-giving meat. Probably ptarmigan is the most universally liked resident bird meat in all the North.

The Monument area has a large, more or less resident, but movable population of both **aqargiq** (willow ptarmigan) and **niqsaatungiq** (rock ptarmigan - *Lagopus mutus*). The norther portion of the Monument is well known for its large population of the small rock ptarmigan. Rabbit Creek and the Agiagrauq Mountains often have huge flocks of these hairy little birds. They prefer dwarf birch buds and various alpine herbs to the larger red and water willows that sustain the willow ptarmigan.

All ptarmigan now are taken with shotgun or .22 rifle in the Monument area. However, spring snaring is not a forgotten art and could be again utilized if the need developed. Ptarmigan numbers vary from year to year, but never to the extremes that rabbits do. Often they are the only source of fresh meat available in years of inclement weather and scarcity of other species. This typically happens in the months of March and early April, which have been historically the most difficult for subsistence people.

When not harrassed by **kirqavik** (goshawk or gyrfalcon) or **ukpik** (snowy owl), **aqargiq** are fairly tame throughout the winter, allowing a shot or two into their midst before they take wing. In late April, with the mating season beginning, the roosters become very brave and aggressive, often as if daring man or sled dog to come and fight. At this season
flocks scatter and a .22 rifle is often used to shoot singles for the ever demanding subsistence person's family pot.

**Ukpik** (snowy owl - *Nyctea scandiaca*) is a large, efficient predator, which for a short season each year provides many good meals for those subsistence people located for the month of October on the ocean beach. This white owl with dark spots migrates south during this month, after raising young in the far reaches of the North Slope.

Though voles and ground squirrels probably make up the bulk of this silent hunter's prey, it has been observed in the area of the Monument that ducks, ptarmigan, and even the large Arctic hares, as well as the smaller snowshoe hare, can be a part of the diet that makes this bird fat and tasty as it moves southward. It is somewhat concentrated as it follows the line that black, ice-free open water makes where it meets the snow-covered ground.

Driftwood posts of varying heights (3' to 7' and diameter 4" to 8") are stood upright, with a steel trap of size 1\(\frac{1}{4}\) or larger set on the upright end. The trap chain is tied in a groove in the log. When the bird lands on the pole to survey the countryside for prey, as is its habit, it finds its foot caught and tumbles off the pole to await the coming of the trap owner. A real effort is made to check the traps every day, as this bird is much prized and red foxes often run the lines to steal trapped owls.

Where many people live together there is much competition for available migrating ukpik. This is worked out in practice by each individual setting large numbers of *iññutaq* (the pole trap rigs) and traveling far from the village. Ukpik is a very good flavored soup bird, but it cannot be described by comparing it to something else. It simply tastes like ukpik, which is a pleasant satisfying flavor when
you are hungry, and a real treat in the months of October and November.

Some ukpik do not go south and winter, remaining instead in the inland portions of the Monument when they run across a food source such as abundant ptarmigan, a rabbit high, or plentiful voles or lemming. These resident owls are sometimes shot at long ranges from dog sleds or snowmachines, using large caribou hunting rifles, and they are eaten in camp that night as a welcome treat.

Kirgavik (gyrfalcon and peregrine falcon) are also often taken in pole sets for ukpik. Both birds are seen chasing ducks or most especially ptarmigan, and are very much disliked as they disturb the game the subsistence person hopes to feed his family for supper. These birds, the jaeger, and the northern shrike are the only birds that seem hated with a passion by traditional subsistence people. Some families or clans prefer the meat of these hawks and readily eat those caught in traps set for ukpik. Others don't care for the odd flavor and either discard them or give them to friends who like them.

No other bird is regularly used by subsistence persons of the Monument vicinity. However, it must be kept in mind that even in these days on extended trips or during times of prolonged storms, isolated subsistence people would make use of whatever animal, bird, or fish was available to fill the ever-busy soup pot. Extreme hunger has few prejudices, and quality often falls away to make room for expediency. Such is the life of the subsistence person, rich or poor, historical or contemporary, as this is still a large, sparsely populated land where the unusual often happens.
CHAPTER 6.
TRAPPING

1. Introduction

Trapping within the Monument area as done by the subsistence resident of the locale has two purposes. One is to provide a raw material for certain traditional/historical clothing that is still used by the trapper, his family, his friend or his neighbor. This friend or neighbor may not have the particular kind of fur he needs at this time, or he may not be trapping but working for wages somewhere, and for this year will buy from the trapper what he or his family needs. Also related to this function is the current good handicraft market for such Eskimo made items as slippers, mukluks, parkas, hats, etc. Most of these items require a combination of marine mammal skins, caribou skins, and various bearer hides indigenous to the area. The second function is a more direct raw fur sale to large outside dealers at standard world market prices.

Both of these uses of furbearers are legitimate and needful to the full cycle of the subsistence person's economy. It has been stated that a subsistence lifestyle is never a static thing and that it must always change and adapt to whatever conditions effect it. Thus, the Kotzebue Sound subsistence person has adopted those modern improvements in transportation and work saving devices as his cash income has allowed. This, of course, has been an ever expanding situation. Gasoline, ammunition, steel traps, outboard engines and snowmobiles all take considerable sums of cash, and mere day to day existence now necessitates some yearly cash income.

As trapping areas go, the Krusenstern Monument area is very poor, because only a few species of fur animals occur in numbers large enough
to make the pursuit worthwhile. No full time trapping activity as a profession exists here. However, the subsistence person who makes a dollar here and a dollar there and incorporates this into his lifestyle does benefit to a greater or lesser degree from what fur animals are available that particular year.

The low world market price on long haired furs for many years brought trapping in this coastal area almost to a standstill. Now for several years, long haired furs, particularly red and white fox, have soared from $5 to $6 a pelt to more than $100 for red fox and $50 for white fox. These two species are the ones of primary importance on the Monument, because of the ideal habitat. There is currently a revival of active trapping interest with an eye to outright sale to fur buyers. No one knows how long until the price again drops to a few dollars, and the home arts and crafts function again becomes the most profitable way for the subsistence person-trapper to deal with his catch.

An interesting current consideration on this subject (1977) is the nearly yearly rabies scare on Alaska's northwest coast. Whenever red or white fox populations get high, invariably some individual animals are tested and found to be rabid. The Krusenstern Monument area has usually high red fox and sometimes white fox populations, because of good den sites, waterfowl nesting areas, and drifted in sea mammal carcasses. A continued utilization of this renewable resource would seem good, faced with the option of providing a breeding place for so dangerous a disease as rabies.

2. Kayuqtuq (red fox - Vulpes fulva)

The wide open spaces, waterfowl flats, rolling coastal hills with high ground squirrel density, and grassy areas with excellent vole
habitat make the Monument an ideal home for the red fox and his various color phases. The species comes as close as any to being truly residents in a land of migrants. Populations of red fox within the Monument rise and fall on a monthly basis, because of a variable food supply. Caribou hunting activities, as well as marine mammal hunting activities of the year, provide sometimes large carrion sources that cause foxes to congregate until the food source is eaten up.

There is a continued use every year of certain favored den sites that at least give the impression of permanency, though it cannot be said with accuracy that the same fox uses the same den, or even that members of the same family use the same den, from year to year. There is, however, an attachment to the den site by litters of the year at least until the great upheaval of breeding time in March.

The fox played a very large part in the evolution and development of subsistence hunting from the time of first contact until now. For many families of Eskimos in the first third of the 20th Century, the fox was the key trade item for the white man's riches. From the opening of the season on November 15th, until late February, some small children in large subsistence families would not see their father. He would come home late in the evening, after they had gone to bed, and would be up and gone again before they awoke in the morning, snowshoeing after fox.

The fifty dollars or so paid for each red fox at that time could buy a large sled load of such wonderful items as coffee, tea, sugar, ammunition, cloth, needles, etc. No other item of trade in that era could bring such riches. By the time long haired fur prices dropped (1935-1940), some subsistence people had members of their family who could
hire out as carpenters, mechanics, and related construction jobs as World War II developed. There is no doubt that for a number of years many subsistence families in the Kotzebue area could thank the red fox for providing a means to acquire new guns, ammunition, telescopes or binoculars, as well as more short term conveniences as children's clothes, dog harnesses, or sled materials. Some even caught enough to afford to build a tarpaper-lumber shack in town so the kids could go to school for a few months.

The red fox is not an easy animal to trap as a rule, having a dog-like intelligence and a sharp sense of smell and awareness. Even the young of the year seem usually to be cautious around hidden traps. There are sophisticated methods that are very effective, but to the Eskimo subsistence person the best and quickest way to catch a fox is to walk after it on snowshoes. Thus, most red foxes were hunted rather than trapped. In the 1970's, red fox pelts were again almost worth their weight in gold, but now trapping methods are more widely known. Also, because of the flat open terrain, chasing with snow machines can be very effective for the adventurous.

The red fox population has seemed to increase in the Monument area through 1977, even in the face of a high harvest. The high population of voles and abundant carrion from the large caribou harvest of 1975 probably help to explain this present abundance. The existence of rabies among foxes in this area has resulted in public announcements that all loose dogs in villages are being destroyed, and rabies vaccination clinics are being held for tied dogs.

3. **Qusrhaaq (Arctic fox - Alopex lagopus)**

This white shadow of the ice pack is the species of fur animal that is second in importance as a Monument subsistence cash resource, though
Some years may pass without even one qusrhaaq touching the soil of any of the 340,000 acres! White fox are really animals of the ocean ice. They are as marine-oriented as the polar bear, and in fact spend much of their life cycle following in the tracks of bears to clean up the leftovers. They do have their young in burrows on land, and this is one way the Monument can have a population for a while. Another way is to have a dead whale drift ashore, or large number of small fish stranded, providing a large food attraction to draw them from their far offshore habitat.

Those born in dens on the Monument usually move out onto the new ocean ice which forms during the first long, cold, calm spell of December. These same calm cold spells of December, or west winds through the rest of the winter make a solid bridge of ice that can allow great numbers of white fox to come inland within reach of the trapper. This happens if there is something to attract them on shore or if there are too many for whatever food is available for them offshore. Their occurrence then on the Monument proper is very erratic to say the least.

Qusrhaaq have other odd characteristics. Because some spend much of their life at sea following nanuq (polar bear), they have no fear of man except to stay out of reach as if he were a bear. The only other fur animal as easy to trap as the Arctic fox is the weasel. This fox has no awareness or cautiousness toward steel traps. His gregarious habits and non-awareness of man's methods of trapping him combine to make him either of first or of second importance as a coastal fur animal. His pelt, when not stained is generally of more stable value than his red relative, although this is not currently true ($128 for red versus $60 for white in 1977). Both whites and reds have had a high value as arts and crafts material for slipper trimmings, parka ruffs and edging.
When subsistence people of the Monument area are in spring seal hunting camps, they do not like to have many white fox coming to land to have their young. This is because they are avid egg eaters, and during those years when there are many white foxes on the Monument there are very few eggs of any kind to be found.

4. Qapvik (wolverine - Gulo luscus)

This legendary relative of the weasel and mink occupies a very high place of value for the subsistence person, although it is very limited in numbers. Even in good years, there are probably never more than ten individuals at the same time on the 340,000 acre Monument area.

The animal was evidently very rare here from 1850 until the recent (1945) return of caribou in numbers to this area. Wolverine seem dependent on the presence of a big game species to be prolific, although individuals do well as small game hunters. They seem to prefer areas that have populations of moose, caribou, or sheep, and for the most part scavenge after wolves, man, or natural disasters that leave marrow bones to be crushed by their powerful jaws.

Qapvik often leave an isolated area when winter caribou hunters intrude by setting up a temporary camp, and then the wolverines return as the men leave, to pick whatever interesting scraps have been left. This characteristic, combined with the tendency to rather quickly chew off a foot caught in a steel trap (two or three days), makes this animal a real lucky catch for the trapper. Wolverines are especially valuable since it is almost an absolute necessity for every mature female subsistence person to have a new qapvik siagvik (parka or jacket ruff) every few years. This is not only because of the unique way wolverine hair does not mat when wet, but particularly in recent years because of the beauty of the fur. It has become somewhat a status symbol, comparable to a mink coat in another culture.
The qapvik may be the first animal species to be in trouble as a result of motorized sleds, small planes, and desirability as a status fur. Another point against his survival is his destructive activities when subsistence foods are cached in the field for any length of time. He has few friends that would rather have him alive than dead, although everyone will miss him when he is gone.

Coastal wolverine are especially prized for their light color compared to those from inland areas, especially inland timbered areas, where their color is usually very dark. The best pelts have a nearly white back pattern, with jet black legs and underparts, and underfur colored to match the long guard hair. Furs from heavy timber tend to have less contrast, and often the back pelt is only a little lighter brown than the rest of the animal. A reddish-rusty underfur or very thin guard hair is less desired.

Many subsistence people eat the fat of the qapvik well cooked, but many others do not. Probably no more than ten have ever been taken in any one winter on the Monument. Locking steel snares or large conibear traps are probably the best means of taking qapvik, although leg hold traps are often the only possible means in open barren country. Elaborate rock or rock and timber deadfalls were historically used to catch this animal.

5. Ama'guq (wolf - Canis lupus)

Wolves get on the Monument area two ways: First, a pregnant female may find herself in the area in April, usually after at least some caribou have wintered there, providing a good food supply and den site. Thus she may have her pups and raise them there. This happens infrequently, as the location of the Monument is such that there is more snowmachine and
light airplane traffic in the month of April than pregnant wolves can tolerate. Still, summer wolf signs on the Monument have increased in the last two years (1975, 1976), probably because caribou have for these two years broken their pattern and have summered on or closer to the Monument.

The second way wolves come onto the Monument is with or behind the fall caribou migration when it passes through the Monument. At this time, quite large numbers can pass through, though few linger. In years when most of the caribou that summered on the northwest slope areas of the Brooks range pass through the Monument on their way south, many wolves that were also living in that area will sometime during the fall drift along in search of the missing caribou. Usually they follow the good trails the caribou have provided.

It is very seldom that a wolf is taken in a trap on the Monument, though each year a few sets are made specifically for them by fox trappers or caribou hunters. The wolf is a wide ranging animal, and in this area nearly always transient, so they do not pass the same location often enough to give the trapper an opportunity to work his art. Some wolves are shot, however, when they are encountered in the course of other hunting activities (caribou or moose hunting).

Since the snow machine has come into universal usage, it has become possible for any experienced operator-hunter who finds fresh wolf tracks to give chase and often kill one or more. Previous to this era of the snow machine, aircraft hunting seemed the only practical way to reduce wolf populations, where for one reason or another they became a threat to domestic reindeer or game herds that were in a diminished state.

In some circumstances this may still be so, but so many wolves are now taken in areas within reasonable range of villages by snow machine
hunters, it seems that except for extreme isolated sections wolf populations could be kept within necessary limits without the use of aircraft. The reasoning here is that aircraft owners are still an "elite" group, whereas snow machine operations are more within reach of the "common citizen". In this country the wolf is or should be considered a renewable resource, as other fur bearers are. The pelt is of great value as a personal clothing item. Wolf and wolverine are the only culturally acceptable furs for adult men or women's jacket or parka ruffs. Any other fur makes the wearer stand out as peculiar, and this is not much tolerated.

Wolves share with jaegers, shrike, and falcons the hate seldom shown any living species by traditional subsistence persons. It seems strange that only as man becomes "civilized" does he identify with or edify the killer-predator over the "dumb" herd animal. This "built-in" intolerance of these species will present possible problems of management in areas such as the Monument in the future.

Another point of interest is the observation that in some years in the past thirty years there have been no tracks of caribou, reindeer, or moose seen during the full 12 month cycle in the Monument. Each and every year, however, there has been observed at some season the large outsized pads and long stride of amağuq the wolf.

6. Tiğiaq (weasel - Mustela erminea)

Probably the weasel would be considered the most numerous as well as the smallest of the utilized fur bearers on the Monument proper, if all years are taken together. Some years they can be very scarce, but most years it is far easier to find a weasel track after a fresh snow than any other fur animal. Some years there is a very dense invasion in the early fall of these bloodthirsty little creatures. When this happens,
the subsistence person who is trying to store fish or meat of any kind for winter has a real problem, especially before the food item is hard frozen.

In historic years some children or women's parkas were made of this short haired but tough hided little animal. Now they are often used for trim on doll clothing, or for numerous sewn handicraft items for sale. The real niche that the weasel has filled in this area is in the training of young would-be trappers. Probably every person that now sets a trap anywhere in the area learned to do so in his boyhood by first catching a weasel.

Because they are a nuisance where food storing is taking place, and they always have a $1.00 to $3.00 value at the store, parents living in camp encourage children to take them. In years past, when there were more families in fall camps, all the youngsters waited eagerly for opening day of the trapping season and often set several traps at 12:01 a.m. on the opening day.

7. Tigiapkap (mink - Mustela vison)

A few of these beautiful, dark-coated fish and muskrat eaters are taken each year from the Monument proper. But the take is probably less than 10 in any one year. This is marginal mink habitat, being for the most part too open and having too much blowing snow. However, every year certain spring-fed stream and muskrat lake areas within the Monument have a few mink that are sometimes sought if a subsistence trapper is in the area for some other reason.

8. Pamiatuuq (river otter - Lutra canadensis)

At least three of the larger creeks on the Monument have year-round springs at higher elevations with deep enough eddies to provide a winter
feeding place for these long-tailed water animals. Otters are able
to travel long distance overland in extreme cold weather conditions to
reach open water holes, where they feed on fish and other aquatic life.
At least one den site area is known, and otter signs can be found every
winter at suitable feeding areas on the Monument. These animals are
wide-ranging travelers, and some reach the Monument on travel sorties
from the Noatak River.

A few are taken by subsistence hunters, but probably less than ten
in any year. These are usually encountered accidentally by people who
are traveling overland, and they can be caught by chasing with a dog team
or snow machine. Some individuals set traps when otters are noticed to
be in an area where they can be trapped, but this is always done incidentally to some other activity.

The land otter is highly prized for its short, dark, rich fur,
which is used for making maklak tops and parka sleeve trim. In this
area, where beaver are only to be had by trade with inland people, no
otter gets sold to an outside market. Otter, beaver and unborn ringed
seal are the only furs culturally acceptable for adult women's fancy
maklak tops. Otter, then, like wolverine and wolf, can usually be sold
for a higher price locally than can be obtained on the world market.

Subsistence people who fish with hooks under river ice for trout or
grayling do not like to have otter in the area, as they keep the fish
scared and scattered.

9. **Niituuyiq (lynx - Lynx canadensis)**

Probably the most unusual thing about this "Arctic cat" is that he
is found on the Monument at all, since he is ordinarily considered a
deep forest animal. The key to understanding his presence is, of course,
the same pattern already outlined concerning the numbers of snowshoe hare, the primary prey of the lynx. **Niituuyiq** are not completely restricted to the hare as prey. They have been observed to take voles, weasels, squirrels, mink, red fox, Arctic hare, caribou and sheep fawns, as well as ptarmigan and other birds. Still it seems that the dedicated life purpose of every lynx is to seek out the hare, through thick and thin, highs and lows of cycle, or whatever comes.

The years following a snowshoe hare population high causes erratic lynx behavior, as their numbers have increased through the years of rabbit population growth. When the hare is gone from the lynx's usual territory, he turns to other prey; but he must kill for nearly every meal as he cannot gnaw or chew frozen meat easily, and he is not an eater of carrion. No other species besides the hare occurs in sufficient numbers to sustain **niituuyiq** for very long, and he is forced to travel much to seek better hunting areas. His habit is to follow any tracks or disturbances in the snow, presumably out of curiosity and with an eye to a possible meal.

There seems to be evidence of a large passing of lynx through the Monument every 20-40 years. The last, which this writer experienced, was in the mid-1960's, when numbers of lynx came from the northwest through barren coastal ground on trails made in November by migrating caribou. Eskimo explanation of this phenomena some years ago was that **niituuyiq** seem to travel all the way around the world. They are completely absent for many years and then very plentiful for a time before disappearing again. This writer took 18 lynx one winter close to the northeast corner of the Monument, in a twenty square mile segment of land. This is a dense population for any fur bearer in this area.
Lynx meat is prized at least as much as the skin. Because they usually eat only fresh killed hares, and often all they care to eat, the lynx become very fat and have white "turkey breast" textured, mild flavored meat. They are very delicious pot roasted, and probably only second to caribou as a favorite animal meat for subsistence hunting families. Numbers are never great enough to supply many meals, but when one is taken it is a very welcome change of diet for the day at least.

There is no warmer or longer lasting fur than lynx for parka material. The hide portion is thick and durable compared to fox or rabbit, and the hair never sheds as caribou or reindeer will, nor is it brittle-haired like Dall sheep. Six to eight lynx, depending on size, make a "hair inside" parka, which is extremely warm and light. Such a parka will often last for 10-15 years of hard "subsistence life" use, being worn every day for nine months of the year.

The usual snaring and leg-hold trapping methods are locally used for taking lynx. They are also taken now (as well as historically) by tracking, as they are short-winded and are more easily caught than red fox by the same methods. This is because of the large open areas with relatively small brush or timber patches. The lynx is a very curious animal and has no fear of hidden traps. He is therefore easily trapped when present. He has come to be one of the highest priced of furs on the world market in 1975-77, bringing as much as $350 for a large perfect pelt.

10. Kigvaluk (muskrat - Ondatra zibethicus)

Last of the Monument's utilized fur bearers is this common little rodent of the sloughs and deep lakes. The deeper sloughs and high banked
lakes of the Krusenstern flats always have some muskrats, but as with other species their population density varies much from year to year. Two of the major factors that effect muskrat populations in this area are winter ice thickness and presence of numbers of reindeer or caribou in the fall or winter. In shallower lakes, many muskrats perish in a winter when there is little snow cover and much cold weather. Water freezes to the bottom and the muskrat either freezes or starves. Caribou or reindeer in numbers destroy houses and pushups on lakes, which also causes the rodents to freeze out.

As many as 100 have been taken by individual hunters at breakup time in the Anigaaq-Salluq waterway, which is the area of most concentrated kigvaluq population within the Monument. No trapping of this animal is done. Those taken are shot with .22 rifles at breakup time, in late May-early June.

Most of those taken are kept to make a jacket or parka for someone of the family. Sixty to eighty skins are required, depending on the kind and size of garment needed. Often muskrat skins are traded or sold between subsistence families in order to acquire the number of skins needed for the new garment. Muskrat meat is well liked, and most of those taken end up either cooked and eaten fresh, or half-dried and boiled, as a welcome change from seal meat or birds.

11. Conclusion

Beaver and marten are not known to have ever been present in the Monument. The nearest known occurrence of marten in the past 50 years was on the north branch of Squirrel River known as Siksriktuuq. Beaver are not known north of the Kobuk and Selawik River watersheds.
Trapping operations on the Monument have never been extensive. Because of the limited number of subsistence people involved and the limited transient nature of the furbearers, it would seem that continued use of this renewable resource by subsistence people, whether they sell their catch for cash or use it for clothing, would be consistent with NPS subsistence use policy as outlined for new additions in Alaska.
1. Introduction

The importance of travel and transport has intensified for the modern day subsistence person. This has resulted from the need for more and longer distance travelling to harvest areas, now that the base has become a small city or a village, which brings increased competition for game, fish, and plant resources. The subsistence person must be able to travel both summer and winter, and must have a vehicle with sufficient power and capacity to return home with the catch, whether it be a few pounds or several tons.

An important characteristic of Northwest Alaska, one that does not seem well understood by those who have never been there, and even by some who have, is that there is no real wilderness, though the land is sparsely populated. In summer (ice-free months), every lake, slough, river and creek, as well as the ocean, is a known and used roadway to something or to somewhere. In the winter, an even more universal roadway potential exists. With normal snow cover from January until late April a roadway over which individual loads of 1,000 to 1,500 pounds can be hauled is quickly made by packing down the snow in any direction for any distance. Timbered areas and steep gullies need extra work, but can usually be skirted or in some manner fairly quickly dealt with. Once these trailways are packed, frozen, and cleared of obstacles, they are good for the rest of the frozen portion of the year, as they have the needed solid bottom even when additional storms and snowfalls occur.

This is of course a description of snow machine and dog team roads or trailways that are constructed to wherever there is a need for them
in that particular year. This is done for such activities as caribou hunting, seal hunting, wood gathering, inter-village travel, camp-village trails and main arteries from villages to scattered subsistence activities. Although these "roadways" are limited in the weight load they can bear (usually for easy rapid travel less than 1000 lbs.), and weight of freight can be moved with enough trips if it can be broken down into small packages.

There is no wilderness because individual travelers pass through all sections nearly every year. And whenever there is game or fish to be harvested of sufficient density to make it worthwhile for a group, word is passed around and several people or families may go for a short term trip or an extended stay (several months). This was so during the small dog team era (before 1900), during the large team era (1900-1965), and is so during the snow machine era (1965-77). Each of these eras have their unique ways of covering the wide areas of land to locate and utilize distant subsistence resources, but the end result is the same. Subsistence people monitor their land remarkably well, considering the extent of it.

2. Summer Travel (June-October)

A. Outboard powered boat.

Nearly every family in the Krusenstern subsistence use complex has at least one boat and one outboard engine for it. These vary from 12-14 foot dories powered with 5-25 hp engines, to 30-35 foot commercial salmon fishing boats with outboard engines of up to 200 hp. Many families have more than one boat and engine, but most make do with one for all purposes. The current emphasis on commercial salmon fishing has caused a trend toward long, wide boats to handle gear and catch in the bays and
ocean during all kinds of weather. This type of boat doubles superbly for family moving or long distance spring marine mammal hunts. For river travel (fall moose and caribou hunts), a long and narrow boat is more economical in breasting the strong river current. Most families have tried some compromise between these two boat types to suit their particular circumstances.

Those families that habitually make summer or fall use of the Monument area have some additional boat style considerations. It will be noticed the only water route access to areas utilized by subsistence gatherers in the Monument proper is by open ocean travel. From halfway down Sisualik Spit to the northern beach boundary of the Monument, there are no sheltering bars to break up waves and ground swells from the Chukchi Sea. From the time the ocean is free of ice (early July) until there is enough freezing to impede wave action (late November) the subsistence person must either have a craft large enough to ride out any weather without shelter or have a craft he can run up on the gravelly beach out of the surf and move it above the high water line as the water and waves rise. If he would enter the Krusenstern inland waterway system after the outlet has closed, he must drag his boat and engine 20 to 50 yards, part of it upgrade, to get from ocean to slough. Most users of the area's resources opt to have a craft that the crew can manhandle in beaching through the surf or dragging overland. Of course, the ugrug or walrus hide skin boat was perfect for this use, but the only continued use of these historical craft is by coastal whalers of Pt. Hope or Kivalina.

There is an interesting consideration here that extends into other areas of historic, contemporary, and future subsistence life. We
generally tend to assume that as modern technology and better equipment comes into general use, there will be no regression back to those ways and things that have become historical. In light of the energy and fuel shortages in the late 1970's, it seems that these actualities hang by a very slim thread. In the Krusenstern area, it has only been 30 years since people began to use and then come to depend on imported fuels for transportation and mobility. If for any reason gasoline and other fuels become unavailable, there would remain among Krusenstern subsistence people a knowledge of how to continue life sustaining patterns with such methods as skin boat travel and dog traction.

B. Qayaq and foot travel

Until about twenty years ago, every family head had his personal qayaq and often others in the family had their own. In a land with such a high percentage of waterways and such difficult walking conditions during the summer, it is not surprising that much individual "getting around" was done with this unique one person boat.

Nearly all phases of harvesting or gathering can be facilitated at some time or another by use of the 12' to 15' sealskin or canvas-covered qayaq. Retrieval of game or birds killed on the water, placement of nets, transit to game spotted from afar, and easy transport of otherwise heavy backpack loads are some of the chores a qayaq is handy for. Often most summer hunting trips, whether an afternoon duck hunt for the evening pot or an extended 30-day outing for summer caribou skins, are or have been done in part by qayaq and in part by backpack walking.

Coastal qayaqs varied as much in size and shape as did the individuals who used them. Certain use criteria is taken into consideration, available materials are totaled up, past observations are considered, time available before need, and then the individual begins the task of
making his personalized craft. A list of choices might include the following: Long (15') and narrow (12") for speed and ease of paddling. Short (10'-12') and wide (18" to 20") for use in wave tossed water after transport on sled. Light, with few ribs and minimum woodwork, for shoulder packing-portaging. Heavy, with many ribs, very tough woodwork, and heavy duty canvas, for long distance transport with sleds over rough ice to be used for short distance retrieval of seals killed in open water. Very long (18'), wide (20"), and strong built, for ocean ugruq hunting when ice is well off the beach.

All have a covered deck fore and aft, with only a small round hole amidship for entrance. This is necessary for rough water use, and a rain coat on the operator can be tied down over this entrance so that waves can roll completely over the craft without its taking on water. Some compromise of these and other characteristics of intended use patterns are used to determine what kind of qayaq the individual will have.

Traditional qayaq construction has come to a standstill in this area for the following reasons: First, small speed boats (12' to 14') used in shallow water noisily and quickly accomplish many camp chore duties formerly done in the qayaq. Seal retrieving qayaqs have been re-designed for rough snow machine transport to and from open water leads on ocean ice. These are made of plywood, shaped like oblong boxes with slanted sides, bow, and stern, for use with oars as a small punt-like boat. No real intense need remains to stimulate continued qayaq construction, as long as gasoline and oil, and the money to purchase them, are generally within reach of subsistence families.

Summer backpacking trips with a pack dog or two have also ceased, because the main reason they were made was to acquire summer caribou or
Seal Retrieving QayaQ for Snow Machine Transport on Ocean Ice.
sheep skins for clothing, fat, and sinew. Summer has become the wage employment time for most subsistence people. Most heads of families are no longer blessed with the free summer time to take extended backpacking trips, although they and the fruits of them are not forgotten.

Fall hunting trips for moose and caribou are of course a combination boat and backpack trip, although few make kills very far from the boat. Much backpacking of meat to the boat is necessary when game is available. Most subsistence families take part in this August-September activity, but mostly on the larger river systems. Backpacking of each day's berries or leaf greens to the boat or to camp can entail a three to five mile hike.

C. Airplane - All Terrain Vehicle

In the last twenty years, money has become more and more within reach of subsistence families, due to the Alaska Pipeline and other construction projects, land claims settlement related activities, and a general gravitation toward a cash economy. Dependence upon "Eskimo food" has continued, and so it is only natural that the airplane has become an important vehicle in the "subsistence family's" life, despite the high cost of its use.

Those who hold more or less steady jobs are often able to take a few days or 2 weeks off and fly to an area for berry picking activity, fishing, bird hunting or whatever is currently ready for harvesting. This is not inconsistent with what we are calling a subsistence oriented lifestyle. The need for niqipiaq (Eskimo food) remains. The airplane provides quick, though expensive, means of getting on the harvesting scene. Those who use it can often dispense with expensive summer boat upkeep, extended periods of camping, and the equipment it takes to do it, and still have on their table the foods that are familiar and required for their general well being.
This is a growing trend, as more and more people are holding steady jobs and as urban type services are increased in village sites. Potential renewable resources probably should be used but not abused. The subsistence person of the Krusenstern area is used to adapting new methods to meet his continued needs. The hired air taxi has become part of the travel scene.

Another sign of affluence in the last five years is the appearance of all terrain vehicles (ATV's). A few are being used in the vicinity of Sisualik and Krusenstern, and the area is ideal for this kind of vehicle traffic. It promises to be a major problem however, as necessary restrictions are implemented. Abusive use of summer wheeled vehicles (motor bikes, three wheelers, ATV's) seems impossible to handle without complete restriction.

2. Summer Camping

Summer camps for harvesting activities are simple affairs requiring little time to set up, take down, or move. The same outfit can be used for one night or two months, and it is comfortably dry and warm or insect proof depending on need. Most items are carried in the boat, and this is the quickest and most convenient way, although under certain conditions tent poles, stakes or floor can be found in the area of intended camping and need not be carried along.

Following is a list of the items used for a summer camp:

- 1 canvas wall tent (7'X 9', 8'X 10', 10'X 12')
- 1 ridge pole
- 2 uprights
- 10 3"X 5' spruce pole stakes, one for each corner and each wall
- rope
4 stove pipes
wood stove
gasoline pressure stove
\{ one or the other, or preferably both \}
gas lantern
axe
shovel
driftwood logs or coarse gravel to hold tent wall bottom to ground
insect repellent and insecticide (Buhach powder, etc.)
grub box, with utensils, pots, cups, plates, matches, first aid materials, etc.

These are the bare necessities for a comfortable shelter summer camp that provides protection from rain, wind, cold, heat or insects. Many luxury items can be added, and any number of people can be accommodated by larger or more units. Cooking, sleeping, and small child care is best done within shelter, except on rare days of ideal weather and few insects.

3. Winter travel

The Krusenstern area is north of the Arctic Circle, and so the season of winter travel or frozen surface travel is quite long. It lasts roughly from October 15 to June 15, with local variations due to salt water or strong fresh water currents. Throughout this period, subsistence people can be out and travelling, even in the months of 3-4 hours daylight. Bad storms or extreme cold during extended calm spells (-30°F to -60°F) are the only times of limited travel, and even these conditions are not prohibitive if a great enough need arises. As mentioned before, at this time all surface is potential roadway. Some surfaces are more easily used than others, however; rivers, lakes, lowlands, highlands, barren ground, and timbered areas can all become surface transit byways, using the combined old and new technology of Krusenstern area
subsistence people. Snow machines, snowshoes, dog teams, and airplanes are the four major methods of resource harvest or inter-village, inter-camp transit.

A. Snow machine

The introduction of the motorized sled into subsistence activities in northwest Alaska can be compared with the introduction of firearms in the 19th century, as far as initiation of change, universal acceptance and adoptive use are concerned. Much could be written and has been written as to whether the change is for better or worse. Probably the better approach is the usual pragmatic Eskimo stance of "now we have them, how best can we live with them?"

The historic subsistence person had never been able to run or travel consistently fast enough to keep up with such winter prey as caribou, wolf, or fox, even with the best of dogs and trail. A few shots from ambush, or a short chase and a few shots with a dog team, and the fleeing animals disappeared in the distance. Then all in the space of five years, increased money earning potential hit the area at approximately the same time that the perfected snow machine went on sale in the larger village stores.

Change and innovations occurred in all areas of winter subsistence activities. There was a wonderful relief from slave-like drudgery of maintaining many dogs, laboriously hauling wood for the ever-hungry stove, or hauling heavy ice for water. Long, tedious, many-night camping trips were cut to one day hunting sorties. Heavy loads that took many days of round trips to move could now be dealt with in short order, as the machine never tires. Caribou could be caught even in clear, cold, noisy weather, where previously an extreme long cold spell could mean hardship for people and dogs, even with game plentiful.
Many uses on the positive side can be demonstrated. Some negative areas of misuse or abuse were inevitable. The problem now for everyone who has an interest in the area is to deal with the negative aspects in a reasonable and equitable way. It needs to be pointed out here that the subsistence family must have one or the other (machine or dogs). Their existence still depends on being mobile. The option of not having either snow machine or dogs is only open to those who are in special circumstances or are no longer subsistence "niqipiaq" (Eskimo food) or lifestyle oriented.

B. Snowshoes

If the snow machine or dog team traveler would leave his sled and walk any distance off the hard frozen trail, even 100 yards, he would do well to have his webs, even in the coastal areas of the Monument. It is true that sometimes after certain weather and snow conditions the surface in coastal areas is hard enough to support a man without snowshoes. It is well to note however, that this is the exceptional situation. Normally, each step without snowshoes will mean breaking through some snow crust, making a second step very difficult. The prudent traveler, especially if he is alone, always ties his snowshoes onto the sled, whether he uses dogs or machine.

Most snowshoes used nowadays are commercially made, with heavy, long lasting materials that are adequate for short range use. During the heyday of "walk up" fox hunting, lightweight Kobuk-made birch snowshoes, "custom made" (that is made to fit the individual) were much prized, as the hunter practically lived most of the winter on his shoes. Now, those subsistence people that burn wood, drive rabbits, hunt caribou or moose, or trap make considerable use of their snowshoes. There are
usually no overnight pack trips made with showshoes in this coastal area. Those who establish camps or intend to camp overnight travel with a sled drawn by snowmachine or dogs.

C. Dog team

Before 1965, every functioning subsistence family had at least one dog team of 8 or more dogs. Now (1977) there are five families who might sometime during the year make subsistence use of some part of the Monument using a dog team. Dog traction has been very important in the exploitation of the marine mammal environment. Those subsistence families involved generally agree that even a small dog team would be desirable if one was again going to camp for the two month spring seal harvest. As before mentioned, it is not known whether this kind of planning will come to fruition, although there seems to be a trend of "back to camp" for a while, at least in the Monument area.

D. Sleds

Sleds, being the means by which you carry your camping gear and bring home the product of your hunt, are a very important part of present day subsistence equipment. Twelve to fourteen foot long hardwood basket sleds, sturdily built, are needed to stand up under heavy loads and fast snowmachine travel. Twelve seals or eight caribou, which probably weigh over 1,000 lbs., are not unusual loads when the trail is known to be in good shape.

Coastal sleds were historically made wider and with a lower bed, to prevent tipping over with heavy loads on ocean ice. Inland area sleds were made long, high of bed, and narrow to cope with deep snows of timbered country. Both areas now tend to make sleds wide enough so the runners follow in the groove made by snow machine skis. This is a wide sled, and it can be as long and as high of bed as the owner wishes, usually
dependent on uses he generally makes of it. Sleds are often long for the large family subsistence hunter, shorter for one who travels much with light loads (i.e. inter-village travel, trapping, waterfowl or other bird hunting).

The gamun, or plank runner sled with no side railing, continues in use for hauling broken snow machines and heavy awkward loads (ice blocks, full gas or oil drums, logs, or boats). Often a family will keep one of these "rough use" sleds to save the more valuable basket sled from work that is likely to damage it.

The older uniapiaq (Eskimo sled) has gone out of style. This was pulled by a small team or a man, had a straight railing, was made of soft wood, could float, and was generally used to carry the qayaq. Its main function as a marine mammal hunting sled for use with historical type double pointed qayaq had made it obsolete. This sled, with whale bone runners and qayaq, made the Krusenstern marine mammal hunter master of the ice pack environment during spring harvest months. The 4 or 5 hundred pound ugruq could be brought home to the beach across open leads, cracks, and miles of ice, drawn by the hunter or three or four old dogs. The whale bone runners slide along very easily on spring ice. It seems ironic that some of the most unique inventions of a culture are often some of the first to be forgotten as acculturation takes place. The toggle spearhead, the skin qayaq, and the uniapiaq must have been the very heart of life for many years on the beach front of the Krusenstern Monument.

It seems facetious to compare inventions, but has it benefited man more to learn to exist in personal comfort in an American urban society than to learn to exist in a hostile environment like the Arctic Krusenstern area?
4. Winter Camping

The subject of winter camping in the Krusenstern area may be peculiar to the 20th century. Perhaps those subsistence people who historically used the natural resources of the area made more permanent dwellings of driftwood and sod, and did not have this century's problem of making a temporary camp for a timely hunt in the winter.

This particular section of Arctic coast has the dangerous winter weather extremes that exposed promontories are susceptible to in these latitudes. The combination of cape, flat level floor and abrupt beachside mountains (hills), the spines of which run generally east and west (the directions of strongest prevailing winds) make the whole area of the Monument dangerous for winter travel. More than \(-100^\circ\) chill factors have been recorded, and during times of fresh or loose snow and wind, the dog team driver is often unable to see his leader let alone landmarks.

Because of these weather extremes, the traveler who would hunt on the Monument or pass through it on the main coastal inter-village trail does well to be familiar with sheltered spots and winter camping techniques. In mid-winter, travelers between Kivalina or Pt. Hope and Kotzebue often take the longer route through Noatak instead of braving the coastal Krusenstern route. Snow machine travel has greatly lessened the possibility of being trapped by long, powerful storms, as it is usually possible to reach home base after the storm begins and before it develops impossible traveling conditions.

During dog traction days, there were three shelter cabins between Kotzebue and Kivalina, 20 to 25 miles apart erected by the Alaska Road commission. These are all within the Monument boundary and are still standing, but they have not been kept up and haven't provided
safe winter shelter since the 1940's. The 20 to 25 mile interval between
cabins was considered a day's travel by dog team in mid-winter. Often,
when weather and trails were bad and the load heavy, 25 miles seemed
enough for one day.

Now, with the snow machine, barring breakdown, 5 or 6 hours with
large loads is sufficient time to make the entire trip. It can be
easily seen that for winter travel you stand much less chance of being
pinned down by a storm for three or more days when you can make the
trip in 6 hours instead of three days.

The wind, with its drifting snow and chill factor potential at
low temperature, is the winter traveler's nemesis. During times of
bad drift, wherever air can enter clothes (seams, button holes, tears,
or opening between garments), it carries minute snow grains with it.
Where these come in contact with body heat they melt, causing wetness
that destroys any insulating factor the garments have. One must have
good air resistant clothes, kept dry. Inner wetness from sweating,
caused by over-exertion or melting wind-drifted snow, means bad trouble
for the traveler. He must make camp and have shelter and heat to dry
and help his body maintain its necessary life-continuing temperature.

It follows, then, that if the traveler can find an area that breaks
the force of the wind he can go about the chore of making a comfortable
camp. The Krusenstern coastal area has a few such places close enough
to the main trail to be used by those who know where to find them. They
are, for the most part, not immediately visible from the main trail
by the casual traveler. Shelter for the dogs and the driver as he tends
their needs is an important consideration. Shelter is also necessary for
the snowmachine traveler's camp. Woe to the snowmachine traveler if his
machine breaks down before he reaches that shelter. The dog man did not have that problem, and several snow machine travelers have died of exposure after finding themselves without transportation. So we are considering a meaningful subject.

Large and extensive willow patches, and large and extensive rough ocean ice, are the traveler's only safe camping spots where he gets relief from the full force of storm wind and snow drift. Emergency survival action can be taken without these sheltering factors, but they are a last resort rather than a planned action. Large willow camping areas are noted on Map No.3. There is every year a build up of a line of huge grounded ice piles a mile or so offshore from Cape Krusenstern's point. These are caused by strong current action on large ice floes, and once formed they act as large nails to hold the beach shelf ice fast and safe from drifting away. There are certain safe areas amongst this fence line of rough ice that runs several miles northwestward from the point. Often several hundred yards back from the active edge between floe ice and ground or beach fast ice there is a large area of 'forest-like' rough ice that is extensive enough on its eastern edge to absorb all ground drift. This leaves the camper on its western edge relatively free of wind, with only upper air drift that has a minimum pile up potential. Care, of course, must be taken not to camp too close to the western edge, where change in wind direction could causing piling ice.

One can camp out in the full force of any storm with a small (7'X 9', 8'X 10') wall tent with new canvas and new tie down ropes, if he can find or have means of tying it down to stakes or other already-in-place anchor lines. Old camp sites with poles frozen in place offer this potential. For emergency shelter an already formed snowbank that will not build higher
where you dig your shelter hole is best. A shovel or trenching tool of some sort should probably be a part of coastal traveler's equipment during deep winter months. A canvas sled cover can be so fastened around a basket or other sled to make a drift proof air space big enough around the head and shoulders of the traveler so he can lie in his sleeping bag and be dry and warm while he waits out the worst of the storm. There are many ways to improvise in an emergency situation, and a cool head and dry clothing are the best life savers. Any action that tends to take these assets from you is probably a wrong one.

Hunting camps in the winter should be as comfortable as it is possible to make them, within reason, by carrying items and planning ahead for known needs. There are several sound reasons for this: the daily hunting activities are dangerous, tiring, moisture-forming and energy sapping. A warm, dry, safe place to prepare food, dry clothing, and get a full night's sleep is essential to be ready for the next day's cold weather action.

A few items for comfortable winter camping are indispensible:

1. A warm enough sleeping bag
2. A strong canvas tent
3. A small wood burning stove
4. A gasoline burning stove one or both
5. A good canvas tarp sled cover doubles for tent door
6. Some material for tent flooring to keep all things from touching snow or ground when wood stove heat is used.

Floor material can be gathered at the camping site, if it is in willows or timber. Driftwood lumber can often be used on Monument ocean beach areas. Something must be carried in the sled for an ocean ice camp (cardboard, scrap lumber, or willow or tree branches from wherever they are available). Utensils, pots, grub box, axe, shovel, caribou skin mats, hunting equipment and food, light (and gasoline for it), and stove are all ordinary camping equipment winter or summer. Frost forming on the
inside of winter camping tents at night or in extreme cold at anytime is dealt with by throwing a canvas fly over the back or wherever frost is forming. This double layer with dead air space prevents frost forming and increases camp dryness and comfort.

5. Winter clothing

This is not an exhaustive study of Arctic winter clothing but a few hints for the contemporary winter Monument traveler. Proper clothing for the walking person, the dog team driver, and the snowmachine traveler can be the same, but seldom should they be worn all at the same time. If this is a confusing point it serves the purpose of attracting attention of those who would travel in the dangerous months on the Monument.

Warm clothes would seem the simple answer to a cold environment. This is true for the snow machine traveler. Because of high speeds and different angles of forced cold air draft, chill factors of a very extreme magnitude are developed. Before the advent of the snowmachine, it was very unusual in this area to see an Eskimo with a frost bitten face. As more people came to own machines it became possible to tell which people they were by the healing signs of frostbitten cheeks, foreheads and noses.

Face masks (commercial), fox tails, special mittens, one piece insulated sno-go suits, layered boots of different styles, down and nylon insulated underwear all make rapid transit by snowmachine warmly comfortable in a space suit-like sense. All this is good and different brands or dealers will gladly state how warm and satisfactory their products are. Their problem comes when the person does or is forced to do anything in his "space suit."

It takes very little activity, and especially exciting activity, to work up a sweat when you are over-dressed, especially with non-absorbing
materials (like nylon) that inhibit evaporation. Internal moisture, as before stated, is the real danger to the severe weather traveler. The open-bottomed skin parka, seal skin pants, and light warm maklaks allow for excess heat and moisture to dissipate, but they can't supply the warmth needed to sit still for hours while traveling by snow machine. Thus comes to light the dilemma of the modern day Monument area traveler. Old style hunting clothing is better and safer for mid-winter walking or dog team travel. New style manufactured garments are necessary for speed travel attained by machines. When on a hunting or traveling trip in severe cold weather it is always wise to shed, but carry, clothing before you start sweating.

6. Trail conditions

There is a set of unique characteristics that have to do with trail conditions and dispositions within the Monument area. In more temperate climates, or in areas of timber or other tree-shrub growth, a trail or a roadway can be accurately placed on a map, and except for small additions or detours the trail remains in place where it is indicated on the map.

This is not so in the area of this study, for reasons we will briefly outline: Winter surface travel is on or over snow, ice, and frozen ground. The character of the upper surface, where the traveling is done, is very changeable. The wind moves snow piles; water from unusually high tides well up from underneath to flood ice that is fast to the bottom; stream beds freeze down to the bottom, causing spring water to surface and create cold weather traveling hazards; extreme funneled winds take all snow and frost off of large areas, so a loaded sled can't be drawn across it; lake ice under bluff areas can be swept free of snow and polished by wind and snow particles, so it becomes so slippery that anything venturing onto it loses all control of its movements.
For these reasons and others, even main haul trails between villages can only be approximated on maps, as they are forever changing with local conditions. A few areas have been permanently staked overland, and are staked each year over long distance ice crossings like the 9 mile crossing from Kotzebue to Sisualik. Even this does not guarantee that on any given day there is a passable trail for the traveler through that line of stakes. Great detours might be necessary for one reason or another, including temporary conditions such as overflow or semi-permanent conditions like ice piles or machine breaking "washboard" snow drifts.

General lines of usual trail position can be indicated on the map, but the prudent traveler seeks all current information that he can get by word of mouth, weather trends, and previous experience.

7. Frequency of travel in Monument area

A consideration of just how much surface travel currently occurs on the Monument proper seems relevant to this study, as infrequent observations could be misleading in both directions. When no one is camping on the Monument, and at certain times during the winter when subsistence people have an interest in a different area (sheefish hooking on Kobuk Lake or caribou hunting in the Selawik area) travel on the Monument may be very infrequent indeed. In the short days of December, even travel to or from Kivalina is infrequent by way of the coast.

At these times there can, of course, be a complete sudden change of pattern. Once a dead baleen whale was discovered at Ugsruraq (Battle Rock) in mid-December. It was reported that the maktak was gone, but the blubber was edible. In two days most of the people who could travel from Kotzebue were at the scene, camped and ready for the near-impossible job of carving up this huge animal frozen in young ocean ice.
Three days later the whale was cut up, divided, and most teams headed home with the best of their share. Similar large volume travel times can occur at any season if sufficient subsistence food reward is likely (e.g., caribou in numbers, white fox in numbers, many seals, dead walrus, or even a beach salvage operation such as lumber or drums).

At the present time several (4-5) families living the winter through at Sisualik regularly haul wood and tend traps from the Cape proper, often traveling as far as Battle Rock, once or twice a week. At least one hunting camp of a semi-permanent nature is active this winter (76-77) in the Killigmaiq area. The hunters travel back and forth each week to Kotzebue.

Generally, mid-winter traffic is very light in years when no fall fishing is done at Anigaaq it is lighter still when no caribou or white fox are present. In March and April, travel increases and it reaches a peak the first two weeks of May when squirrels, seals, and bears are out, and waterfowl are returning. This ends abruptly as rotten ice and deep water on the ice stops surface travel from Kotzebue. There is still nearly a month of ocean surface travel time for those camped from Sisualik westward, as the surface water sinks and spring seal harvest from open leads (usually off Krusenstern) continues. Early May is by far the month of most frozen surface travel on the Monument proper. December and January are usually the months of least travel.
CHAPTER 8.

ANNUAL CYCLE OF SUBSISTENCE ACTIVITIES

1. Introduction

The study of the cycles of nature, which in turn determine the annual cycles of subsistence activities, is a fascinating and complicated never-ending occupation for man. The best we can probably do here is to take a peek at some of the recurring cycles, some of the most important reasons for them from the subsistence person's viewpoint, and the degree to which they may continue into the future. The basic change that has occurred in this century, as mentioned before, is that the subsistence person lives in a village relatively far from his gathering or harvesting area. He has additional new foodstuffs, some of which he has become very fond now available through stores and mail ordering opportunities. He retains the hunger for his traditional niqipiaq (Eskimo food) to varying degrees. Most families are dependent both physically and mentally on continued subsistence activities for a balanced, whole and complete existence.

It is a bit difficult to divide subsistence activities in the framework of traditional calendar seasons. North of the Arctic Circle, the presence and absence of sunlight, and the warmth and growth energy it gives to animal and plant life, is critical and intensely obvious to those who live under its disciplines. Thus, it seems that the beginning of spring is more basically tied to the time the sun begins its reappearance which is, of course, the first day of winter by calendar terminology.

For the purposes of this study the seasons are determined as follows:

Early spring - March and April
Mid-spring - May
Late spring - June and July, until the ocean is ice free
Summer - July, when the icean is ice free, to mid-August when darkness returns and insects are diminishing
Early fall - mid-August until fresh water freeze up (early October)
Late fall - Early October to mid-December
Deep winter - mid-December through January
Late winter - February and March

2. February-March (late winter)

For the subsistence person, the most dormant portion of the year is deep winter, mid-December through January. That being so, late winter (February-March) is really the beginning of things for the coming season. By February first, daylight has increased to 7-8 hours from 3-4. Surface snow cover has increased, blown this way and that, and become more firm. The ocean has become choked with ice and a non-moving beach shelf 1 to 20 miles wide has become ground fast. If an easterly storm has just blown itself out, the low clouds may indicate a long black open water reflection some six miles off Cape Krusenstern's point, running toward Cape Espenberg.

When this happens, all experienced subsistence hunters of Kotzebue-Sisualik know that the time is right to hunt natchiq (ringed seal). Noatak and Kivalina people also are knowledgeable of conditions by sky reflection signs in their areas on the north tip of the Monument. There is demonstrated here the imperative that the subsistence person always lives under. If you want fresh seal liver, meat, blubber you hunt now. You cannot wait till tomorrow or next week. Weather conditions, season, and game presence more often than not determine what the subsistence hunter will do and when,
not his own well made plans or his needs. This is sometimes difficult to communicate across cultures.

If you do not hunt seal now, you may not have an opportunity for a month. How sad not to go now, and then sometime before conditions are right again to have your family or dogs suffer hunger for seal meat. In the area of the Monument proper, seal hunting when open water is available is the most important activity of late winter. It should be noted that this is an offshore activity (1-20 miles), but camping and shelter in case of storms, as well as gathering driftwood for stoves, is done on Monument ground.

Days are longer, surface traveling conditions are usually good and often February is relatively mild. It's a great time to travel when weather permits. If caribou are wintering on the Monument they are hunted if their meat is reasonably fat. White fox are prime and if available are sought. Red fox are past prime in February but with today's high prices they are sought. Wolf and wolverine, if encountered, are still prime and sought.

In conjunction with either inter-village travel or hunts for other species, ptarmigan are taken. And if rabbit cycles are high some camps are made to hunt these white little fellows that are now easy to see in the extra bright sunlight. February and March are especially good rabbit hunting months.

No fishing occurs on the Monument at this time, now. Historically March and April were sometimes starvation months. Two possible fish sources are open to the subsistence person in need. The tipuq (Bering cisco) which winters in the big deep water lagoon can sometimes be taken with small ivory or spoon hooks along pressure cracks. Spring holes in
the cottonwood (Iggavaun) area of Tuqruq sometimes contain large schools of whitefish, in years when many fish are trapped in the inland waterway of the Monument. They can be "brailed" out with dip nets, as the water is fairly shallow and has no ice cover in mild weather because of underwater spring action. Neither of these sources are dependable, but they are chances when the subsistence person's need is severe.

Subsistence people are likely to be found in ice camping groups on Hotham inlet (Kobuk Lake), especially when there are no open leads in the ocean at this time. Sheefish have formed into large schools, and for Kotzebue subsistence people this subsistence activity outshines all others in March. Once a school is located they can be followed and taken with ivory or spoon hooks for more than a week, and then another school can be sought. These are large, fat, favorite fish, and although considerable distances are involved, the subsistence people that sometimes use the Krusenstern area are the same subsistence people for a time (February - March) active on Hotham Inlet.

Back again to the Monument area, February and March are the months when the large Arctic hare is most likely to be hunted successfully. Snowy owl can be seen occasionally, and early emerging tundra grizzly have been taken in late March.

It should be noted that for the pre-store subsistence hunter this season would be a difficult one. Some years, whatever has been stored from the past harvest season is nearly finished. Long periods of calm weather which can occur at this time mean no ice movement, and seal take depends on occasional ice movement. Fish, even in Kobuk Lake, often cannot be located. So the hunter must wander and make use of whatever species is available to him.
This, of course, is the beginning of the high angle sun brightness problem that causes dry cracked skin and the crippling condition for the hunter, snow blindness.

Oh wonderful light and warmth from a sun long hid with sweet promises of real spring with its welcome abundance and easy living but for now, alas, sun, you have blinded me!

3. March-April (early spring)

We have twice included March in our seasonal rundown of subsistence activities, but it is fitting. March is often the month of very chilling strong, long-lasting west winds. These may occur in the first part or the last part or not at all. Whether they blow or not can be of much importance to the subsistence person. It is impossible to hunt anything during strong cold west winds within the Monument area. Here we will consider the more spring-like things that occur in April and on those March days when no strong west wind blows.

Once a lead in the ocean opens in April, parallel to the beach and 1 to 20 miles off Cape Krusenstern, regular tidal currents cause pack shifting to and fro against the ground-fast shelf. This makes an area of open water and young ice in which a marine mammal hunter can operate successfully. In recent historic times (late 1800's) the subsistence families moved down onto rough ocean ice close to the water's edge. Here they camped and lived, catching whatever natchiq or other marine mammals they could, and stock-piling them until they later moved back to the beach as surface water on the ice became uncomfortable (late May).

Now, April is the most opportune time for the Tagiuqmi (salt water person) to harvest fat natchiq for his winter oil and excess for trade with inland people. Seals have much blubber per animal at this time, and so none sink. For the snowmachine user this is the best chance of the year to obtain seal
blubber for oil, and for those who do not plan to hunt by boat it is the only chance of the year. Much of the oil that eventually reaches inland areas is taken at this time.

The first migrant waterfowl, including eiders, old squaw, murres, and glaucous gulls, begin to show in offshore leads during late April. Meanwhile back on land subtle changes are also occurring. Snow surface is warmed each mid-day and steel sled runners become easy sliding, so hardwood runner shoes are removed. Male ptarmigan heads begin, feather by feather to turn reddish-brown, and cocks can be coaxed into a willow snare fence with a stuffed skin decoy, a replica of another male. The first ground squirrels are out, fat and snowblind. One might hear the first cry of goose or crane before the last day of April. Tundra grizzlies can be found in mountainous areas, beginning their summer foraging. White fox are still prime, but all other furs have become pale and brittle except of course the ground squirrel and muskrat.

This is load moving time for whoever would freight big loads, because the ice is still at full winter strength and the surface is very easy sliding. Those who would move out into spring or summer camp do well to move now, before a day comes when it is too warm and the frozen snow surface gives way to slush that won't hold anything up. It is firewood hauling time, either from timber patches or from driftwood collecting areas. Since huge loads can be moved with little pulling power, it is a time to stockpile wood for summer use. Sap is up in the willows, and the inner bark can be scraped and mixed with oil and sugar for the season's first plant food.

No sure source of fish is yet available on the Monument proper. Sheefish hooking continues in Hotham Inlet. In the large rivers, (Noatak and
Kobuk) there are special known areas where large concentrations of burbot can be caught with ivory or spoon hooks.

4. May (mid-spring)

This is the most vibrant month of the year on the Monument. With the melting of the thin snow cover on the beach ridges and western slopes of coastal mountains, large ponds form on the surface of icebound lakes and lagoons, flooding ground areas and making last year's plant growth available to incoming waterfowl. Small birds of all varieties seek last year's berries and berry seeds. Winter's near-barren sky becomes a screen on which spring's promise of replenishing is played. The birds are back!

Many of the land animal species have given birth or are about to. Those sea mammals that can are climbing out on the ice for longer and longer periods of sunbathing, and an increased tempo of traveling takes place as more paths to feeding and traveling areas open up. The first fresh eggs of the year are laid by glaucous gulls, ptarmigan, cranes and pintail ducks, and are harvested in the last week of May.

May is the month that changes the face of things for the subsistence person. Through the cold, short, stormy days of winter his one aim has been to keep his family and animals fed, comfortable and alive until May. Now there is such a diversified variety of good niqiqiq available that he begins to look ahead for the coming year. Now is ocean harvest time for next year's staples. These are not only for his own family, but the extra he and his family can put up is for those distant people who will again expect to eat marine mammal oil for every meal in the coming year.

This is ringed seal, natchiq, harvest month for those who camp on the ocean beach. As many as 100 can be handled by one family, but 50
makes the spring a success. May is the last month when enough will regularly float when shot in the water to make recovery possible. Large numbers usually move through Krusenstern waters sometime during this month.

Waterfowl hunting is the second most active pursuit, and currently has taken over first place insofar as numbers of participants is concerned. Formerly this was an activity that simply fed the camp. No long range storage was customary with Monument area subsistence people. Family freezers have changed this somewhat, and although their capacity is small most villagers can keep a few birds.

The latter part of May is the time of surface travel termination on trails that cross large fresh water channels. Only those people camped at or north of Sisualik can continue to travel on salt water ice through the month of June. Noatak people that harvest a few seals by travel to the ocean through the Monument in the vicinity of Ukalliksuq (Rabbit Creek) must haul their catch back to the village before mid-May, when highland or inland snow gets too soft to support loaded sleds.

Ground squirrels for parka and other sewing uses are harvested in early May. The first melting of beach ridge snow exposes large juicy cranberries, a special favorite treat of the Krusenstern flats area. A pudding of cranberries, flour, sugar and fresh seal oil is the Itiptigvik spring favorite. No quantity is stored; just the needs for the day are picked. Cranberries are also present and are often picked and eaten by the handful, as they are first exposed or made into a dishpan full of akutuq (caribou fat, seal oil, water and sugar). These berries dry out very quickly, lose their juice, and are not usable for a few days after the snow melts.
Willow leaves and bumble bees sometimes are in evidence the last week of May. The surta (willow leaves) are gathered for eating in oil. The bumble bees are an indication that the first bearded seals are in, and the first week of June usually confirms it. One kind of root is sometimes dug and eaten with oil. This is a vetch (probably Oxytropis nigresceus, called aiqaq), but no one uses it much now. Masu (Hedysarum alpinum) is available and good in this month, but it is found inland where there is little travel at this time of spring runoff.

No big land game is usually available, though if a bear is seen from camp it will probably be taken. No fur bearers are taken. Also, no fish are usually available yet in the Monument area. It is possible to find ptarmigan, crane, pintail and especially the large glaucous gull eggs that are much prized, on the Monument proper in small numbers this last week of May.

5. June-July (late spring)

June is the most moderate and ideal month of the year, insofar as subsistence living and enjoyable life is concerned. It has warm sun, little wind, fresh eggs, fresh meat, fresh greens, fresh fish, and the only warm time of the year without mosquitos.

For the Tagiuqmi, as May was the month of natchiq (ringed seal), June is the month of the ugruq (bearded seal). Sometimes in early June the water on the surface of the ocean ice, caused by melting snow, sinks through seal holes, cracks, and rotten ice spots. The ice then floats high and dry and develops a granular snowy surface, much unlike thick fresh water ice but very characteristic of thick salt water floes. This surface makes an ideal mattress for the large bearded seal, and the heat of the sun makes a muffled floor on which the subsistence hunter can
quietly sneak into shooting range. These large (300-600 lbs.) animals seek relatively quiet, often shorefast ice at this time, because the outer ice pack is often grinding and noisy as spring runoff from the land affects the current strength.

Strangely, the appearance of migrating large bumble bees over the ice pack generally occurs at the same time that some lucky hunter brings in the first spring ugruq. These seals are occasionally taken at any time during the winter, but are usually small (200 lbs) and not plentiful. Spring ugruq are large adults, and they usually do not show in the Krusenstern areas until June, although Kivalina hunters begin to see them regularly in March.

Camped seal hunters in the Krusenstern area go all out to catch all the ugruq they can in the month of June. The huge animals have to be hauled in to camp from 1 to 20 miles out sometimes on rough ice. Early in the season this is done with dogs, or with snowmachines. As the ice gets unsafe for machine or dog team, the hunter himself will pull sled, qayaq and catch. It is hard work, and usually one ugruq per day is considered a full day's work. Some days the hunter cannot get one, and occasionally he finds two laying in one spot and takes two home at once. This is a trying day for the hunter, and for his wife, who must butcher both in the same day.

All this is done because ugruq not only have fine skin and much oil, but the meat makes the most preferred niqipiaq of the Krusenstern subsistence area. The meat is stored in oil when a little more than half dried, and makes a soft tasty "black meat", very highly prized throughout Eskimo land. Ten is a good month's catch and 23 is a longstanding record, although 40 may have been taken by one man. This is all without and before a boat can be used. Few people continue this type of hunt, but each year
there are some.

In middle to late June, boats are able to reach the Krusenstern ugruq hunting area from Kotzebue, Noatak, and a few Kobuk villages, and harvest what ugruq they can get to haul back to camps at Sisualik or Kotzebue. These boats also take natchiq laying on the ice, as they have need for the skins and oil and they haven't had earlier opportunities. Their hunting time is short, however. Usually, the ice moves north out of reach after a week or 10 days, and spring gives way to full summer, usually before July 10th.

Sisuaq (beluga whale) are sometimes seen, and one or two are taken by ice hunters of Krusenstern in this month. Of course, the big catch of these animals is made back at Sisualik Point this month, as that area becomes free of ice and boat hunting becomes possible.

Fish once again become available as the ground fast ice breaks away and moves with the current. This ice moves back and forth, in and out, with wind and current for one or two weeks, depending where your camp is. The closer to a fresh water estuary, the sooner the ice is completely gone.

The subsistence person does not wait until the ice is completely gone, for he knows the spring flush of fresh water has brought winter bound fish of many varieties. He only needs enough of a water hole between ice floes to get even a few fathoms of his net stretched out with a long, slender spruce pole, and he will immediately have enough for a fresh fish feed that he may not have enjoyed for a long time. A 3\(\frac{1}{2}\) inch mesh net, 32 or more meshes deep, is the most productive camp net at this time, though a 4\(\frac{1}{2}\) inch net will catch better table fish.

Fish caught include trout, both lean for dried fish and fat for table use, depending on whether they have come from the Noatak watershed.
(skinny) or the Kivalina watershed (fat). All four species of whitefish are taken, as are tomcod herring, and smelt, and the so called scrap fish (sculpin and two species of flounder). The air, usually being dry, cool, and relatively free of flies because of cool breezes off the ice, makes this the best month of the year to dry fish for the coming season.

Whitefish of two species (qaalgiq and siguilaq) are taken in as large a quantity as can be scaled, cut, and dried for the coming year. Lean trout (iqalukpiq) are also preferred for drying. Other species generally have no use except for cooking while fresh, either for dogs or people. People camped north of Krusenstern's point usually only fish for table use, as nearly all of their time is put into marine mammal products. People camped on the southeast beach, back toward Sisualik Point, have more time and opportunity to work larger quantities of dried fish, as their sealing ends when the flush of fresh water runoff reaches them. Often the people camped north of Krusenstern's point travel with snowmachine or dogs to creek outlets entering the ocean at Aitiligauraq or Tasiqqagaruuq. Here they catch fresh table fish with fishnets and poles, away from the eddy area of Itiptiqvik which is often very late breaking up. This solid ice is good for marine mammal hunting, but not for fishing.

In the later part of June, as the beach ice does break up, there is again a small harvest of natchiq, a few young ugruk, and sometimes a few beluga. Beach hunters shoot these animals as they swim in close enough to the beach among the broken ice floes. Even small seals that sink at this time can be recovered from the bottom close to the beach, by using a weighted hook and line. Spotted seals arrive from southern waters at this time, and a few are taken from the beach as well as from boats.
This was formerly the time of ugruk hunting by qayaq from camps north of Krusenstern's Point. As soon as there is a trail for a qayaq out to large ice floes where ugruk might be (3 to 10 miles), the subsistence hunter takes his gun, lunch, wooden plugs, skin rope and few other odds and ends, and paddles due west, out into the Chukchi Sea. When he finds a large flat ice floe he climbs up on it, being careful not to be separated from his qayaq, and then he looks around with binoculars for a sleeping ugruk. If he spots one (or sometimes two laying close to each other), he gets back into his qayaq and paddles to within a few hundred yards. Then he again leaves his qayaq at a safe hidden place, sneaks to within 50 yards and kills the animal, or two if he is an expert.

He then plugs the bullet holes, puts a "halter" made of ugruk skin rope on the animal to keep its head and neck from swinging from side to side, and blows the animal full of air through a chest incision just deep enough for the air to enter the layers of tissue between blubber and meat. A large wooden plug closes this hole, and the 500 lb inflated "cigar" is dragged to the water's edge. It is put into the water with the qayaq and wrapped around and around with skin rope, making a raft of ugruk and qayaq. Two or even three of the large animals can then be slowly paddled the miles back to camp, a job that may require many hours of steady paddling.

Because this method is relatively dangerous and hard work compared to engine boat hunting, it is no longer much practiced, although this writer and relatives used the method occasionally as late as the mid-1960's. Some years no ugruk were taken by sled, and all maklak bottoms depended on the subsistence person taking at least a few by this method. Some years this method can be used for a week while the sea ice is still too
tightly packed for successful boat hunting. In pre-outboard motor
times, the qayaq hunt continued until the ice was out of sight of land.
The one or two skin boats in camp were then pressed into service.
Ugruk are such a valuable animal that all methods were used and much
risk was taken to harvest all possible. There is still much time, effort,
and risk put forth to secure this favorite of Krusenstern marine mammals.

June is an egg month as well as an ugruk and beluga month. Although
egg hunting and gathering in this area adds nothing to the harvest that
is stored for coming seasons, it is a kind of free, burdenless type of
relaxation from other more intense and tedious chores. It is, I'm sure,
stored "psychologically". It is a fun time, and the fruits of the hunt
are especially appreciated as it is difficult to have a really good
egg even if you live close to a store in northwest Alaska.

Two species only are taken in numbers in excess of 100 in a single
day's gathering. These are glaucous gulls and Arctic terns. Both have
very delicately flavored eggs, the gull's very large (two extra-large
chicken-size), the tern's small (bantam chicken size) but a very rich,
delicious, soft textured egg. Both birds nest in colonies on exposed
sandy or grassy islands at many different locations in the Monument.

Old squaw (ahaaliq) eggs are most numerous of the duck eggs that
are found. Many duck eggs of all species go undiscovered, because of
the skill with which they are hidden. Common eider, black scoter,
pintail, merganser, and grebe eggs are sometimes located. Loon, long-tailed
jaeger, and an occasional crane or goose egg are about all of the larger
eggs that can be expected. Small children spend much time looking for
"birdie" and "snipe" eggs around camp. The snipe (phalarope or sandpiper)
eggs they may take home and boil. The "birdie" (longspur and sparrow)
nests they mark with a short willow so they will not be stepped on, and these are simply observed from time to time until they hatch and fly.

June is green leaf gathering time for those subsistence families that would store some for the coming winter. Two varieties of wild celery can be stored in seal oil, enriching that universal product to some degree with vitamin C and giving it a fresh green flavor that many like. If the oil and greens are kept in cool storage during July and August, the species (takaiuk, sea lovage) is very little changed from its fresh condition, even after nine months of storage.

Only willow leaves and wild celery are currently utilized for storage, although a few other greens are put in oil for current seasonal use. Tukaiuk is the most used in the Sisualik area, and this plant is extending its range so that people are using it more today than historically. Willow leaves and pink plume leaves are too scarce to be used as a storage food, though immediate camp use of small quantities is made at most spring camp sites on the Monument proper. Chives and labrador tea are used sparingly.

The first gathering of the "dessert" or sweet plant, sourdock (qaguaq) can take place in the last week of June, although July is usually the month of gathering. Some sections of the Monument provide large quantities of this leafy, well regarded rhubarb-like plant. One of the major reasons for its importance is that it is the first berry or fruit-like product of the season, and it is available in quantity a full month before any berries ripen.

A few species of late migrating ducks are utilized for the soup pot, although fresh marine mammal products have taken much pressure off the birds. Brant, scoters, and old squaw from large flocks are fat and
preferred. Male pintails that have gathered in large flocks after mating activity begin to fatten again, but they are quite wild and hard to stalk as they approach moulting time.

During the month of June, subsistence families do most of the actual work of processing the marine mammal catch so that it can be preserved and transported. This takes considerable time and is tedious, exacting work. Work days in the month of June are seldom less than 12 hours long; and combined work and hunting operations can keep an active person from any sleep at all for a day or two during the peaks of good weather and abundant game.

Very little seal oil poke (puuq) making is done in any other month but June and the first week of July. All ringed seals taken in May are buried in piles under snowbanks to await the mild working conditions of June. Historically, skin boats and qayaqs were re-covered each year at this time by cooperative effort between camp families. Such sealskin products as rope, red skin, and white skin, which require a time of being buried while moist to allow the epidermis and hair to slip, are also done in this month. No other month provides suitable outdoor conditions.

Driftwood gathering for the year is done anywhere along the ocean beach from Sisualik Point to the northwest boundary of the Monument. This takes place as the icepack recedes northward, and flotsam and jetsam from estuary high water spring runoff is distributed along the beach by the wind and current. There is much competition for wood at this time, because wherever people have camps close together the driftwood supply is quite rapidly depleted. Then, fire-sustaining wood must be hauled from long distances by expending gas for the boat or snowmachine.
Large, dry spruce trees are most prized and most sought, although usually any and all wood is piled above high water line to dry throughout the summer in areas with many camps like the Sisualik spit area. Large, valuable driftwood is towed to camp with either qayaq or outboard skiff. Many logs are pushed up onto the gravel beach by onshore wind and resultant waves. Some years no new wood appears, because floods do not occur or because of wind that deposits the wood in delta areas. These conditions make firewood an everpresent concern of families camped near or on the Monument.

The very last activity of June may in some years be the move from spring camp to summer residence. If this move can be made before the ocean is totally ice free, calmer ocean conditions can be expected for the heavily loaded boats. Usually this is not possible because of unfinished work load, and the move is not made until July.

6. July-middle August (summer)

Moving, as indicated above, is one of the first activities of this warmest month of the year. Historically the period of hot weather after the spring harvest "super active" time was one of rest, gathering together, and trade. Weather and insect (mosquito, blowfly) activity make food preservation difficult. At the present time, commercial salmon fishing activity and seasonal wage work has replaced the more leisurely times of a few years back.

Three activities remain quite important to the subsistence families that stay in camp while wage earners or commercial fishing activities are underway. These are: pursuit of moulting pintails, processing of headless walrus that may drift up onto the beach, and gathering of sourdock (qauqaq).
Because of the multitude of insects at this time, special days are chosen for the two inland activities. A cold west wind keeps mosquitos relatively inactive, and any night or day that is cool and not too wet is an opportune time to make a trek of 1 to 5 miles inland to gather sacks of sourdock and/or catch a few moulting pintails which are very fat and delicious. No attempt is made for preservation of the birds as usually not many are taken. The soup pot for family, friends and neighbors quickly makes use of these summer caught birds.

The sourdock is a different matter. Large amounts, once they are gathered and packed home can be cooked and stored in wooden barrels or sealskin pokes. In early September, various species of fat fish can be placed in this mixture, as it becomes vinegar like and "pickles" trout bellies or tipuk. This remains good throughout the coming year.

That portion of a drifted-in dead walrus that has been underwater and protected from the sun is edible and prized when it is found in early July. The outer skin and blubber is cooked long, much like beluga maktak, and then put down in barrels and covered with oil to be eaten anytime. The meat is generally too spoiled to be used as human food, although it remains good dog food for the whole summer and following winter, being very impervious to worms or summer heat action.

Chum salmon and a very small run of pink (or humpbacked) salmon begins in the first or second week of July. During cool dry spells, some can be cut thin and dried for storage in oil for human use. But by and large, only fresh cooking or artificial refrigeration are practical for the warm month of July.

Whitefish (qaalgiq) travel east, back to the river estuaries, and often run in large numbers at different times this month. They are a
very fat, superb, fresh cooked fish, and can be partially dried and put in oil for winter use during spells of dry, cool weather. They are always much too fat to make a good dried fish at this time.

Large quantities of either takaiuk or ikuusuk (the celeries) can be gathered, as leaves are now larger but still juicy and tender. They must be put in oil to be preserved.

The latter part of July is of course, the beginning of berry time. This is a very important event in this area as a whole, and a complete Eskimo food meal must have as its last course some kind of berry. Berries ripen at varied times in the Monument area, depending on distance, inland elevations, variety, and the peculiarities of the particular season. Blueberries are first to color, and the salmonberries (cloudberrries) quickly follow. Both can be picked half-ripe and cooked as a stewed fruit for those who can't wait. The last week of July, all of August, and until the first heavy frost of September are berry gathering times. Generally, all subsistence families participate in short or long trips to the country.

Ducks are back from moulting by August, and are on their fall feeding grounds. Only the scaup ducks can still be found flightless in this month. The soup pot tends to be used more on a daily basis now than it was in July, as the birds are back, available, and beginning their fall fat production.

Late July and early August is the ideal time to take caribou for parka or other special use purposes. Formerly, early August was time for some small group (two or three persons) back country camping trips to take caribou for this purpose. Usually only the skin, fat, and sinew were carried home, although in a dry season some dried meat would be
made. This is no longer done, but if commercially manufactured
cold weather gear became unavailable the practice would quickly revive,
if caribou were in the area. Man's active existence in this north
country depends on a suitable outer garment.

7. Middle August - Middle October (early fall)

This was historically the time for another move to a fall harvest
place, and sometimes to a wintering place. It remains a time of peak
resource harvest of fall species that come into harvesting quality during
the pre-freeze up months.

Berry picking maintains a high priority among subsistence people
throughout August and until the first hard freeze in September. Activity
intensifies with the approach of September. The berries continue to
grow larger and sweeter as long as moisture and above freezing temperatures
continue. One night of hard freeze or several nights of light frost in
a row cause all types of berries to become soft and very difficult to
pick. Later, when they remain solidly frozen (in late September or
early October) they are again easily picked from clean stems.

Those ducks and geese which feed on plant materials are in the
process of putting on layers of fat for migration, and they begin that
migration in early September. Goose hunting is very good in September
near the large lagoons and beach ridge areas that support much berry
growth. Cranes and adult pintails are the first to start the flight
south. This year's young are the last to leave, often remaining in
isolated open water puddles into October. Many birds are taken from
September first on, the largest numbers being this year's young. Some
are stored in home freezers, and for those who live in camp any bird
taken after September 15th-20th can be kept for the winter by hanging
in cool storage places.
Fish of all species can again be cut for drying, but although heat is no longer a problem, flies and extended rain spells are. Often much tedious work ends in spoiled fish that can be used only for dogs. An eye to the weather and a bit of luck is needed to bring dry fish into freezeup for human use. This situation gets better as August gives way to cooler, usually drier September, and better yet as September 15th passes. There is no more rain, only snow and freezing nights, which quickly dries a good fish. Even the tomcod, which makes its fall run at this time, makes a special winter treat when cut and dried.

At Anıgaaq (outlet of the Krusenstern inland waterway), fishing for the trapped whitefish species begins in earnest after the 15th of September. Before that, only enough are taken to cut and dry, but by mid-September all whitefish can be put in sacks. These make the best of winter qauq (frozen fish), as they age just enough before freezing solid. Most effort is put in at this outlet between September 15 and October 15, and in some years many tons are put up for winter use by Sisualik or Kotzebue subsistence people.

For one who seeks to follow a wholly subsistence pattern of life it is expedient to move by September first, camp and all, to the area where you intend to do your fall harvesting. Even two weeks earlier would be profitable, as much preparing for the harvest is necessary if one would make use of all opportunities presented in the relatively short harvest time.

A family that does choose this pattern takes on a certain responsibility to other subsistence families around the country to put up all he is given a chance to put up, so he can share this much liked niqipiaq throughout the winter. This is not done without compensation, but it is important that someone is one the scene at the proper time, so that
everyone who likes that food will know where he can buy or trade for some.

The big game land animals come into their best physical condition of the year in August and September. Caribou, moose, and bear carry much fat and have good skins. In the last five years, moose hunting in August and September by boat has become the most time consuming pursuit in the Kotzebue area. Caribou hunting trips by boat are limited to the river systems, except when some are known to have summered on or close to the Monument. This is rare, but did occur in 1955 and 1975. Single bull or stray caribou are taken from time to time when they are seen by people pursuing other activities. This also happens with bears and very rarely sheep.

Any large storm that occurs in the area in this early fall period brings the yearly harvest of shellfish of various species. These storms seem to produce more seafood the later they occur in the season. October storms are the highest producers just before new slush ice quiets the rollers. Even August storms can produce blue mussels, white clams, or small razors, and small but edible crabs. Large quantities can be washed up with certain wave/wind action combinations, but no method of storing is attempted. Large quantities of mussels are roasted on stove tops, and white clams at Sisualik Point are cooked in 5 gallon cans. The Monument area is better known for its small razor clams and blue mussels. Many other species of shellfish are thrown up on the beach, but these are not much utilized locally.

In some years, huge flocks of ptarmigan come down to the flats in late September and October, and large numbers are taken. In the best year for this (out of the last 30 years) an old gentleman took 150 in one day, and he said he could have done better if he wasn't so old and tired so easily. When these "ptarmigan rich" falls occur, old fish
nets, slings, sling shots, and clubs are used when ammunition for firearms is exhausted or scarce.

Stray walrus, usually two year old males, are sometimes taken at this season. They are usually "hauled out" on the beach after a light snow. Ordinarily, four or less are taken on Monument beach area each year. Fall seal hunting begins with the hard frosts of late September, but is minimal within the Monument proper.

Most of the fall subsistence activity on the Monument occurs around the inland waterway outlet (Aniγaaq) and the camps established there for fishing, or along the course of the waterway at traditional berry picking spots. Most of the mountainous areas of the Monument, and inland areas not adjacent to boating trails, are not visited during the whole of summer and fall months except by small airplane sorties.

Early fall subsistence activities most important on the Monument proper are berry picking and whitefish harvesting. These activities bring more participants to the area than any other, and have in recent years become more important to more people than spring use of the Monument as a sealing base.

8. Middle October - November (late fall)

All freshwater systems, except where strong current, underground springs or heavy insulating snow prevents rapid ice formation, become frozen enough in mid-October to provide safe traveling surfaces for dog teams or snow machines. The exact date varies, of course, with the particular lateness or earliness of the season. Dog teams have crossed the nine miles of ice separating Kotzebue and Sisualik Point as early as October 12th once, October 14th once, and in most years before November 1st. Most small inland lakes with fresher water are frozen by October 10th.
This ice-forming time for Sisualik or Krusenstern subsistence people means fall seal harvest and fall caribou migration. These are two of the most critical harvest activities of the year, as a good run of seals or many caribou determines whether niqipiaq (Eskimo food) will be plentiful or scarce for the coming winter.

The whitefish harvest continues in the traps or nets of the Monument inland waterway. The ocean beach is only likely to produce one species of fish after October 1st, and that is the small, big-mouthed, Arctic cod (kaJuaq). All other species have passed to their wintering grounds, and will not travel the ocean until break-up time. Farther inland from the Monument, in brackish river estuaries and Kotzebue channel, ice fishing for egg-laden tomcod is in progress. Some can be taken in the lagoon side of Sisualik Point.

The seal harvest with outboard powered skiffs is in progress in the deeper water area of a 5 mile-wide belt of slush and chunks between Kotzebue and Sisualik.

Formation of ocean ice begins in this period and is of considerable importance to the area's subsistence people. Its pattern and stages of development involve the southeastern Monument beach.

Fresh water freezes easily, and moving fresh water ice jams and piles in shallow areas, making a visible trail in a circular route along shallow water and mud flats between Kotzebue channel and the Sisualik lagoon area. As nights get longer and colder, sheet ice areas get larger and thicker. These jam against ground-fast ice as the tide comes, and pull away leaving open water as the tide ebbs. The pieces that jammed part at their weakest point, leaving shore-fast ice in shallow water and moving slush and pans to seaward. Wind, tide, and water level change constantly, and the ocean ground swell makes a continuous up and down
motion of ice that retards ground fast ice development. Long calm spells speed up heave ice growth.

Changeable winds, east and west, cause much piling and make bottom fast ice piles "nails" that speed deep water ocean ice development. Steady, long term easterly winds blow all new-formed ice away, far out to sea. Steady and not too strong onshore winds promote ice growth if they do not create huge fall waves that pile the ice up along the beach. From this, it can be seen (see map) that although it might be possible to travel on the ice from Sisualik to Kotzebue as early as October 14th, it takes more than a month to form deep water ocean ice thick enough for travel along the seaward side of Sisualik Spit. This area is utilized by Sisualik hunters for fall power boat seal hunting, and boating is possible on special occasions even between Thanksgiving and Christmas.

Because the ¼ mile wide channel at Kotzebue discharges most of the fresh water from the Kobuk and Noatak rivers, it freezes rather abruptly in front of town. This halts boat travel by town-based boats, unless they choose to haul or leave their boats toward Cape Blossom. Thus boat travel to Sisualik and the Monument area nearly ceases by mid-October, although Sisualik based boats are still very active.

October 15th is rutting time for the caribou, and this is when they can be expected to pass through the Monument and Sisualik area. Often they begin passing through this area just when thin ice makes it most difficult for Kotzebue people to travel either by boat or by snowmachine. Caribou may be in this area for as little as three days or as much as a month. Previous to 1976, most Kotzebue and Sisualik subsistence families took most of their winter caribou meat supply at this time. Stringent laws and quota system were initiated in 1976, and relatively few caribou were taken.
October is ukpi̍k (snowy owl) month, and upright pole traps are placed at favored spots to take as many of the fat birds as possible while they move south along the ocean beaches. Ptarmigan hunting with a shotgun is continued through October and November whenever a change for the soup pot is desired.

Large numbers of eiders (several species) are present during these months, and when they have a plentiful food supply (i.e. kahyauq, Arctic cod) they become fat enough to be good soup stock. They are mostly birds of the year, in very poor physical condition, and therefore not much sought after. Freshwater ducks are gone by October 10th unless exceptionally mild late fall temperatures leave a few open water feed holes.

Some young glaucous gulls become fat by eating small live fish around the fish traps, and these are sometimes taken for a good flour soup when other birds are not available. Old birds are never eaten. Young birds are never taken when they are known to be feeding heavily on rotten flesh, as their meat takes on the flavor of whatever they have been eating.

Trapping is the most important new activity to begin in November, as most species are prime and seasons open on the first, tenth, or fifteenth of the month. There is currently much renewed activity in fox trapping, and of course the Monument area is good country for red and white fox.

November again offers the qayaq seal hunter an opportunity to travel the snowy shoreline, especially in the early morning hours. He shoots any kind of seal from water's edge and uses his qayaq to retrieve his catch. This is the best time for a chance at large "ranger" spotted seals (qasigiaq), for a beach bound hunter on Monument beaches. Beluga whales occasionally pass and one or two are sometimes taken, but this does not happen every fall.
Days become quite short, and the camp subsistence hunter spends his day hauling firewood and checking traps. The town subsistence person currently has a multitude of social activities, and many also run trap lines. Burning stove oil, they are free of wood gathering chores, but of course they need a high cash income to keep up with ever-growing town services.

Another moving time can occur in early November. The best part of the fall harvest of fish, seal or caribou has passed, and winds causing drifting snow can make tent living tedious. Those who have camped at a fishing or sealing place may now wish to move back to their home in town or to sheltering timber patches, where access to firewood and shelter from drifting snow make winter living easier. This leaves the trappers of the family more free to spend all of their time in pursuit of fur for the months when it is most prized.

A very important and intense November subsistence living activity is the home sewing and preparation of skin clothing. The work is done mostly by women, but scraping or tanning of caribou leg skins and some other manual work is often done by men.

November is also the month that tests cold weather clothes. One can get around in this Arctic area quite comfortably through the spring and summer months with most any regular store bought or temperate climate clothing. As November storms and cold weather develop, these clothes can no longer protect a person in active outdoor pursuits.

Light, roomy, and warm caribou skin maklaks (boots), socks, mittens and a down or skin hooded parka, with fur ruff to protect the face, are necessary. Sealskin or insulated pants are also required, although currently the insulated coverall snowmachine suit has somewhat replaced
traditional gear. These have their limitations, however and one who plans to walk or do anything but ride should choose clothing that strikes a medium between being too hot or too cold with whatever activity he is involved in.

For those who have dog teams, this is very busy training time, from the first snowfall until late November. Then, longer distance traveling becomes possible, as thicker ice and increased snow cover makes better, safer trails. The sooner the team and driver know what to expect of each other after the long summer's rest, the better for both, so that the subsistence person can concentrate on his hunting or trapping.

Five teams were more or less active in the Kotzebue-Sisualik-Krusenstern area during the winter of this study (1976-77). It is presently difficult to predict whether dog traction is still decreasing or may be on a limited upswing. Increasing costs for gas, oil and parts, combined with tightening game restrictions, leave the subsistence family in an increasingly difficult mobility problem.

Beachcombing or patrolling is no less a subsistence activity in October and November than it is at other seasons in the Monument area. Late fall storms, before slush quiets the ocean swells, bring the biggest harvest of shellfish. Wood and lumber of any kind, and the occasional walrus that hauls out are all important incentives. When conditions are just right, one can pick up a sled load of quick frozen, wave washed, stranded Arctic cod.

There is one plant gathering activity besides the everlasting search of firewood. The dried, frost-killed leaves of sargiğruaq (Artemisia tilessi elatior) are stripped from dry stalks and stored in a clean cloth sugar sack for medicinal purposes. During the winter the plants may become covered by hard snow banks and therefore are not easily available
when needed. October and November are a good time to do this around camps where they grow profusely.

As December begins, daylight (actually twilight) has diminished to 3½ or 4 hours, and except for camp or home chores subsistence activities have dwindled to trap checking and hauling of already stockpiled resources.

Now the excessive activity of June and September pay off, as those special foods put down in oil or frozen in sacks become especially dear. Cold weather increases the body's need for oil, and those things stored in it retain the energy from days of continual sunshine. Without this stockpile, existence through the next three months would be difficult indeed, and even with modern access to village stores and welfare agencies, one would feel ill-equipped to face the formidable months of deep winter north of the Arctic Circle.

9. Middle December-January (deep winter)

Cold, dark, and stormy would seem good words to describe the deep winter period. But the Eskimo sod house, sunk several feet in the ground, traditionally provided safe refuge from weather than can develop chill factor temperatures of more than minus 100 degrees Fahrenheit. Oddly enough, some December and January days in the Krusenstern National Monument can be described as warm, bright and calm. At other times large storms from out of the warm Japanese current can make even rain fall in these months. And there are nights when the moon comes into a brightness never realized in more temperate latitudes. When the moon is full and the whole outside world is white and glistening with new snow on the flats of Cape Krusenstern, darkness can hardly be conceived, night or day.

Certain subsistence activities continue: Traplines are checked, nets are knitted, firewood is sought, freshwater ice is hauled for drinking water, and small or large game that is accidentally encountered makes daily
life exciting. Elders give warning not to venture out on ocean ice until January, when there is less chance of drifting away. And people discuss methods of survival on land, in case someone is caught out in a bad storm while fox or caribou hunting, and cannot make it to shelter. This is often a time of story telling and education of the young by the elders.

If a family has a good supply of nigipiaq, subsistence activities drop off dramatically in December, except for basic daily chores. Most subsistence families participate in a social whirl created by Christmas holidays, games, visiting, and nowadays television, civic activities, and projects of many different kinds. This lasts until the longer days of February and March again bring a beckoning back to the outdoor world of the subsistence person.
1. Introduction

It has been pointed out earlier in this study that the subsistence person of the Krusenstern Monument area continues to be a subsistence person because traditional food types and the mental-physical equilibrium maintained by harvesting activities are an integral part of being a complete or whole Eskimo person. This is no less so with those residents of the area who are not Eskimo but who have adopted the living style or married into it.

Acculturation to date has progressed so that few people any longer live outside of villages except for seasonal forays generally related to gathering or harvesting of traditional Eskimo food. There are presently no year round residents on the Monument proper, although several families are now maintaining year round living residence in the Sisualik area.

The people of Sisualik and Kotzebue are the prominent users of the Krusenstern area. The inland waterway of Cape Krusenstern, also called the Sealing Point Flats, is the area of the monument that is most used by subsistence people. Minor use is made of the northern portions of the Monument by both Noatak and Kivalina subsistence people, mostly for winter caribou hunting or fur animal hunting. Historically, Noatak people used two areas of the northern portion for spring marine mammal hunting camps. Several families lived in each camp, and after the ice went out they would move to Sisualik Point. Some late winter seal hunting is done from the Rabbit Creek area by present day Noatak people.

Our consideration in this section has to do with just what nigipiaq
or Eskimo food is, how it is used, and hopefully a coherent explanation of why it is different from what you can buy in a supermarket.

2. *Niqipa*iq

It is not difficult for anyone to understand that a person likes to eat what he is used to eating. If the roots of this go back for centuries, as they do in most cultures, it is not surprising that such things as olive oil, bread, lamb, wine, cheese, beans, etc. become a part of staple eating habits that often characterize the culture. It seems possible, historically speaking, that some of the foods and ways of preparing and preserving them in the Eskimo culture may extend farther into the past than many more modern cultural eating habits of world renown.

The Eskimo word *niqipa*iq means "real meat", or better, "original meat", or "the basic meat we started with." In recent usage (from first contact until now), it has come to mean the alternative to *naluq*mitak, which means "white man's food." From the subsistence person's viewpoint, there are only two kinds of food: *niqipa*iq and *naluq*mitak.

Basically, what makes a food *niqipa*iq is that it comes from a species that is indigenous to this local land. Secondly, it should be prepared after traditional methods. Most methods of preservation or preparation have been tried down through the years. Those that work best are retained. Recipes that do not work and are not pleasing to the palate are discarded. Generally speaking, Eskimo people have a very discerning and delicate sense of taste. Highly seasoned or spiced foods are not usually well liked. Rancid foods are not liked, if rancid is taken to mean oxidized as rancid ham, bacon or fat. Fermented, aged, or cured foods on the other hand are the mainstay of the culture.

"Raw" meat, in the sense of fresh-killed, unfrozen and uncooked meat is abhorred (except for blood or kidneys of certain animals). For
the people of this region, meat is no longer considered "raw" when it is frozen, dried, fermented, aged, or cooked. The term "meat", as used here, means the flesh of land and sea mammals, birds, and fish.

3. Use and Preparation of the Bearded Seal

For the sake of illustration, we can take the favorite Krusenstern subsistence animal, the ugruk, and see how thoroughly the animal can be utilized with methods and recipes developed over the centuries.

Head - boiled whole for 3 or 4 hours, usually several together in \( \frac{1}{4} \) of a 55 gallon drum pot, to be shared with nearest working neighbor. All meat and edible material is eaten from the bones. Eyes, tongue, brain, lips, nose are good. The cartilaginous oil portions of sea mammals are a special treat that has no parallel unless it be pigs feet or head-cheese.

Neck - Usually blood shot and shattered, as this is the spot aimed for and usually twice bullet struck to prevent loss of animal. Used for dog feed if shattered, boiled fresh meat if not.

Windpipe (trachea) - Sections cleaned, dried, dyed and used for ornamental sealskin maklak design work.

Blubber - This is the oil filled tissue, \( \frac{3}{4} \)" to 4" thick, between the skin and muscle of all sea mammals. Possibly 150 or 200 lbs. of blubber can be obtained from one extra large, extra fat ugruk. This is material from which seal oil, the cultural staple in this region, is made. It is cut in small strips, 3" by 8", put in sealskin pokes or barrels, where by warmth and bacterial action (fermenting) the tissue releases the oil. Seal oil is a part of nearly every meal in every subsistence household of this locale. Some small chunks of fresh blubber are also boiled with each pot of fresh meat. Blubber has several medicinal uses, provides waterproofing, and its oil has the property
of preserving other foods.

**Shoulder meat** - Cooked fresh boiled, pot roast, hung to dry for several days and then cooked to be eaten immediately; or the meat of the shoulder can be cut in small strips, dried one day then cooked, dried one more day and stored in oil for later use.

**Foreflippers, hind flippers and tail** - Buried with scrap oil in a shallow, grass-lined hole for ten days or until the hair slips, and then eaten as the best treat of the season, called uutniq. Claws from the foreflipper are dried to make a wood-handled seal call (argaun).

Two slabs of boneless meat are cut from the front of the animal outside the ribs, including the abdomen covering. These are hung to dry for several days and then cut in 1" strips to dry more thoroughly to make "black meat" (soft dried meat stored in oil for winter). They can also be boiled half dried as igamaahluq to eat immediately, or dried a day after cooking and put in oil.

Two slabs of boneless meat from the back (tenderloin) are hung for several days and split, as with the front portions, except that these are the choice textured meat that can be cut in a single huge flat sheet rather than strips. This makes a fine flavored, thin, crunchy "jerky" to be eaten as it dries. Or it is broken in small pieces and mixed with strips to put in oil for winter use as "black meat."

**The ribs with inside meat intact** - Hung to dry hard, making a good dried meat to be eaten later in the season. Ribs are also good fresh boiled.

**Heart** - Cooked fresh boiled

**Lungs** - Hung for one week, boiled, dried a day, and then put down in oil. This is a treat, as they acquire a cheese-like flavor after being in oil for several weeks.
The Outer Layer of Seal Intestine Being Scraped Off for a Special Treat at Butchering Time.
Stomach - Opened, cleaned, hung to dry, then boiled long, dried one day, and put in oil for later use.

Small intestine - Cooked fresh; or hung for one week, boiled, dried a day and put in oil for later use. A special treat is made from the outer layer of fresh intestine, scraped off with the thumb at butchering time. This outer layer is then chopped with an ulu against the fresh blubber. The fresh oil from the blubber mixes with the reddish minced intestine layer. The result is a unique Eskimo recipe that is really good but indescribably, as there is nothing in this writer's experience to compare it with. This is qaiq, the ugruk hunter's favorite. The inside of the intestine, after qaiq is made, is kept moist and warm for several days, until the inside layer can be scraped off with a spoon. It is then washed, blown full of air, and dried. This plastic-like material is used for raincoats, window material, and material for small food bags.

Liver - Except for young ugruk, the liver is used for dog feed or discarded. If used it can be fried.

Short piece of large intestine - discarded. This is the only portion of the whole animal, except the bone material and the gall bladder, that has no use.

Bladder - turned inside out, inflated, dried and used for buoy or back packing oil container.

Hind limb bones are separated from the pelvis at the joint, and the "hams" are cooked fresh or hung, as are the forelimbs. These are dried whole for a few days, and then the meat is sliced from the bone to make thinner pieces, and dried a few more days. It is then boiled, dried another day, and put down in oil for future use.
Backbone and pelvis, with most of the meat already removed with other body parts, is all that remain. These are boiled for camp use, as the bits of meat clinging to such bones are especially prized.

The first parts cooked for camp use after or during butchering are the heart, kidneys, intestine sections, sternum and rib tip bones with a few chunks of thin sliced blubber.

The blood is saved for making broth, or for coating newly made sealskin pokes as a protective outer layer. In the latter case, the poke is rubbed with a paste of wood ashes and blood as a preservative.

Sinews can be pulled from hind legs in years of caribou sinew shortage.

The skin can be used for a strong rope, snowshoe foot webbing and harness, hinges, boat covering, dog harnesses, drag sled, and a multitude of heavy leather strap and harness functions. The entire skin (except rear flippers, tail, and nose) has blubber shaved off and is pegged down, flesh side up, to dry for maklak soles. This is an extremely valuable hide, as no other animal provides such a durable, workable material for all weather footgear.

This is not a complete usage recipe account of ugruk utilization, but it gives an indication of the thoroughness of the subsistence person's repertoire of resource utilization and experience and skills.

A word of caution lest an untrue supposition arise from this discussion. This is what can potentially be done with every ugruk that is harvested and brought to butchering. In actual practice, a need-use-time situation is always in effect and certain priorities are necessarily followed. For example, it takes only two or three dried claws to make a seal call (argaun) which may last for several years if not lost. If one family takes 15 ugruk in one season, very few claws are used. Some skins are better for boot bottoms than others, and some are better for rope than others.
When skins are plentiful, some waste is not unusual. When skins are scarce, special time and care are given to properly preserve those that are available.

Certain body parts always retain a high priority, though they may vary in relation to each other at any given time. These are the skin, blubber, meat, and hind flippers with tail. Flippers with connecting tail are in this high priority list because of the universal favorite fermented uutniq.

4. Use and Preparation of the Ringed Seal

Head - All parts are boiled and eaten fresh, but not during the ugruk season as all boiled meat parts of ugruk are preferred over seal, except for the liver.

Neck, backbone, rib complex - fresh cooked.

Skin - Historically most important as a "bag-container", puuq, for oil and oil products. This is an airtight bag made of a whole medium sized seal, and will weigh close to 200 lbs. when filled with blubber. Wooden handles are tied on the head, hind legs, and front leg extremities, so it can be easily moved from place to place by boat or sled. Thus, the entire spring harvest is movable to wherever it might be needed for winter. These puuqs are a major trade item with inland sections.

It can be seen that during springs when common seals are scarce, the Tagiuqmi (salt water person) is hard put to find something to store his harvest in. Wooden barrels have, of course, been adopted, but these are difficult to transport, make an inferior oil because of oxidation, and are difficult to clean each year. Seal poke making is a very tedious task, however, and it is becoming a lost art, though it is still practiced on a small scale.
Skinning a Seal--The Skin Will Be Used as a PuuQ for Storing Seal Oil and Oil Products.
Seal skin has many other uses, some of which are rope (babiche and rawhide) for sled-snowshoe constructions, winter and summer footwear material, windproof and waterproof pants, bags, various handicrafted articles for sale in the tourist trade, qayaq covering, red and white dyed sewing material, and manufacture of jackets, parkas and hats.

**Blubber** - Ringed seal blubber is prized for its clear white, long-lasting, easy-rendering oil. Probably 75% of the "seal oil" originating from the Cape Krusenstern area is from this species.

**Liver** - Ringed seal liver is the most preferred liver of all land and sea animals in northwest Alaska. It is eaten raw/frozen, partially cooked, fried, and raw from inside a killed seal that has been buried in snow for a week or more.

When a fresh killed seal is butchered, the cooking procedure for human use is as follows: the heart, kidneys, and parts of the forelimbs and hind limbs are boiled long, until tender. The gall is removed from the liver, which is dropped into the boiling pot, together with long pieces of intestine (from which the contents have been removed). Almost immediately, everything is taken from the pot, put on a wooden platter, and eaten while hot. The liver and intestine are more "scalded" than cooked.

Front and hind limbs (meat and bone) are often removed from the carcass still connected with the boneless meat from outside the ribs, and then hung for a week or ten days in cool weather. Then the trimmed limb bones with meat are put down in oil for a cured raw seal meat that is a special treat later in the summer or fall. Natchahluuq, the juice from the bones, is choice!!

Seal stomachs are boiled for a long time, making a treat that adds variety to the daily fare.
The quality of dried natchiq meat is very poor compared with ugruk, and except for the above natchahluug, very little use is ordinarily made of dried meat from this species, except for dog feed. Fresh cooked seal meat is much prized on a seasonal basis. It is often preferred during the fall and winter, but during the spring and summer it is seldom prepared if any other seasonal niqipiaq is available.

5. Patterns of Resource Utilization

From these examples of two hair seal species, it can be seen that subsistence people have a long established and thorough utilization pattern for animals species available to them. Some animals are often of more use than others. A list similar to ugruk could be drawn up for caribou. Moose and bear slip down a bit in variety and importance of use. Others drop still further in degrees of importance, and some have only a single use value, as in the case of some fur bearers.

Again, for purposes of this study, it should be kept in mind that the subsistence person has always felt free to make use of potential raw material (animals) as weather conditions, species density, and general opportunity to take the resource involved has been presented to him. Or he may not make use of it, as his current need dictates.

This feeling of being free to "waste" in times of plenty comes naturally to the subsistence person in this region, as he sees natural patterns all around him following this system. This does not mean he wantonly kills after he has taken enough for what he sees as his need, but if he has taken more than he can preserve he is not guilt ridden because of the "waste" that occurs. Problems arise when cross-cultural confrontations occur, when what seems to be waste by one culture really seems to be nothing to worry about by the other. The whole pattern of
subsistence living has been to make use of whatever species is plentiful at any given time, and to expect species density to be fluctuating between more than enough and less than enough. These will be critical areas for a meeting of minds when the people who live off of the land seek to understand those who have been given authority to manage the land and those living things on it.

A very detailed inland species use report is contained in the Kobuk subsistence study (Anderson et al., 1977, p. 409-437) and as subsistence people travel and exchange ideas much, it would only be repetitious to give such details here.

It might be said that the subsistence person is very personally involved with the species he utilizes. For variety and palatability, he does not have the cultural hang-ups about what body parts look tasty, but is used to what his culture has deemed tasty and nutritious. For many hundreds of years, these species have been all he has had to work with to make life possible and pleasant in a harsh environment. In some ways, acculturation has increased the "harshness of the environment", though, of course, in most situations of life, it has alleviated the pain and harshness.

Subsistence use of the land and utilization of indigenous species, seems something the subsistence person should be allowed to take into the future with him much as it has seen him through the past. If his needs continue the trend away from the land, and even away from the dependence on niqiiqiaq, so be it. But let us remember that the potential for some limited group of people to live this lifestyle remains, and that to make no use of the resource potential or of the long tradition of knowledge that goes with it seems to be a "waste" in the true sense of the word.
6. Levels of Resource Availability

At least a part of what it means to be a subsistence person is to be able to adapt to whichever resource species is currently abundant. This often means modifying one's basic needs, to sustain life until density levels of more preferred species rise in the immediate region, or until the person moves to a different location where more preferred species may be present.

It has been indicated elsewhere in this study, that in the Krusenstern area most mammal, bird and fish species are not only seasonally nomadic and migratory, but fluctuate considerably in population level. It can also be truthfully stated that there is really no such thing as a "normal" year of harvest for any given species. This is due to the year to year population variations, weather, water level, beach gravel movement, and a multitude of other environmental variables that determine how much of each indigenous species will be available for the subsistence person to exploit. No two years are ever the same.

Several basic needs must be met each season and each year by the subsistence person. Once these are satisfied, the person can be more free to devote time and effort to harvesting the more tasty or preferred species or to undertake any other activities he chooses. Primary needs include shelter (house/tent), fuel for warmth and cooking (wood, oil, coal), water, and of course proximity to other people for social interaction. The annual supply of edible oil (from marine mammals, fish, and sometimes fat from caribou or bear) is almost as important. And of course there are some relatively large caches of staple subsistence foods which are used almost daily, especially during inclement weather or when unsuccessful hunting days occur. Thes "bank account" for the Krusenstern-Sisualik-Kotzebue
subsistence person, can be any one or a combination of several major species. But one never knows beforehand, from year to year, which species it will be possible to harvest in quantities great enough to meet the "yearly staple" requirement.

7. List of Utilized Species

The following is a complete list of all species currently utilized in the Sisualik-Krusenstern Monument area. Those underlined are often harvested; those starred most often taken in quantities enough to act as yearly "staple" nigipiag. Of course, the particular species may vary from year to year, or from person to person, depending on the harvest opportunity presented.

<table>
<thead>
<tr>
<th>English Name</th>
<th>Latin Name</th>
<th>Eskimo Name</th>
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<td>caribou*</td>
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MAMMALS
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<tr>
<td>Ribbon seal</td>
<td>Phoca fasciata</td>
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**BIRDS**

<p>| Common loon                  | Gavia immer               | tuutlik             |
| Yellow-billed loon           | Gavi adamsii              | tuutlik             |
| Arctic loon                  | Gavia arctica             | tunusulik-qaqsrauq  |
| Red-throated loon            | Gavia stellata            | qaqsrauchauraq      |
| Horned grebe                 | Podiceps auritus          | suqilitchauraq      |
| Red-necked grebe             | Podiceps grisegena        | suqil                |
| White-fronted goose          | Anser albifrons           | kigiyuk             |
| Canada goose                 | Branta canadensis         | iqsrqututilik       |
| Snow goose                   | Chen hyperborea           | kanguq               |
| Brant                        | Branta nigricans          | nigliqnaq           |
| Old squaw                    | Clangula hyemalis         | ahaaliq             |
| Shoveler                     | Spatula clypeata          | alluutaq            |</p>
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<td>Black scoter</td>
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<td>Surf scoter</td>
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<td>Sandhill crane</td>
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<td>White spruce</td>
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<td>Razor clam and several unidentified varieties of shellfish</td>
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<td>Crabs</td>
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<tr>
<td>Whelk</td>
<td>Buccinum Sp.</td>
<td>nakunak</td>
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8. **Summary of Resource Uses**

   The following section is a resumé of the common uses of resource species. Although it is reasonably complete, it is not detailed and exhaustive. It is based on current contemporary use patterns, and not merely historic uses unless so noted.

   **Caribou.** Most edible parts are used for human and (formerly) dog food, including flesh, fat, bone marrow, head, most intestines, and the partially digested stomach contents, as well as the blood. Body and leg skin, and sinew, used in various sewing and clothing needs in season. Antlers were used for tool handles, net sinkers and broken sled repairs. Skins also used for bedding and qayaq covering. (See Anderson et al. 1977 for more complete data).

   **Moose.** Human meat and fat source. Currently very common in suitable habitat. Historically not resident at all here.

   **Dall Sheep.** Human meat and fat source in season. Skins formerly prized for parka use because hair breaks off rather than pulls out, as caribou hair does. Not often taken by subsistence people now.
Wolf. Skin prized for ruff on parka.

Arctic fox. Used for skin clothing, trim and local or commercial sale.

Red fox. All color phases used for skin clothing, trim, and local or commercial sale.

Short-tailed weasel. Used for skin sewing, handicraft, and sale.

Mink. Used for skin sewing, handicrafts, and sale. Sometimes flesh eaten by humans.

Wolverine. Skin used for parka ruffs, parka trim, and meat often eaten by humans when fat.

River otter. Skin used for mukluk and parka trim, sale, and meat often eaten by humans.

Lynx. Skin is prized for parka making, trim, and sale. When fat, the meat is much preferred for human use.

Muskrat. Skin is used for parka making, trim, and handicrafts or sold. The meat is a favorite of humans and dogs, in season when fat.

Porcupine. Meat is a human favorite when fat. A length of intestine containing elongated fecal pellets is dried for use as remedy for diarrhea. It seems effective.

Arctic ground squirrel The skin is a favorite for parka construction and handicrafts. Meat is a favorite of humans and dogs, when fat.

Arctic hare. The skin is good for baby clothes or adult parka. Meat is a favorite of humans and dogs.

Snowshoe hare. Skin is fragile, but sometimes used for clothing. Meat is well-liked by humans and dogs.

Spotted seal. Skin used for jacket, pants, mukluks and handicrafts. Blubber preferred for human use when rendered indoor with artificial heat in winter season. Meat and blubber for dogs, and meat is least preferred of the seals for human use.
Ringed seal. Skin used for clothing, rope, boots, pants, container, float, gayaq over, and handicrafts. Blubber preferred for oil making for both human and dog use. Meat, nearly all parts, preferred by both humans and dogs. More complete use list in Chapter 9 - Part 4

Bearded seal. Skin used for mukluk bottoms, rope, skin boat cover, harnesses, hinges, and handicrafts. Blubber used to make oil for use as human and dog food. Meat is a top priority favorite for human use and dogs also like it. Also see Chapter 9 - Part 3 for many uses of body parts.

Beluga. Skin is a food favorite (maktak), and historically was also used for maklak bottoms. Some human use of the meat when possible, but the weather is often too warm to properly dry it, and dogs get much. Blubber makes a good oil, but easily spoiled by hot weather, so not a favorite; but often saved and sometimes used by humans. (That thin layer of blubber on maktak, cooked and cured with it, is a favorite source of oil).

Ribbon seal. Skins of this rare seal are much prized as jacket material. The meat and oil are eaten by both humans and dogs.

BIRDS

Common loon. Rare—meat eaten by humans—skins occasionally made into bags.

Yellow-billed loon. Rare—meat eaten by humans—skin occasionally made into bags.

Arctic loon. Common—skins occasionally made into bags—meat a favorite after spring goose and duck migration has ceased. Eggs a favorite, but very few taken.


Horned grebe. Only the eggs are utilized in this area. Solitary floating nest.


Brant. Favorite late spring migrant. One of the best flavored in spring. Down utilized, often plentiful. Occasional eggs found in colony (not every year). In fall, not common nor very palatable.


Mallard. Not common, but more some years than others. Meat prized when taken. Down utilized in spring. Eggs sometimes found—well hidden and solitary.

Greater scaup. Common, good meat and down. Eggs sometimes found but well hidden and solitary.

Green-winged teal. Common, sometimes taken though small. Eggs sometimes found but nests are solitary. Down is utilized.

American widgeon. Common, preferred major food source spring and fall. Down utilized in spring. Eggs rarely found, as they are exceptionally well hidden and usually far inland.

Harlequin duck. Rare but regular. Seldom taken. Eggs rarely found, as inland creeks are generally not travelled by egg gatherers.
White-winged scoter. Rare. Used when seen and taken. Meat and down same as black scoter.

Black scoter. Common, preferred late migrant and egg layer. Meat, down, eggs utilized, numbers of eggs not great and nests solitary.

Surf scoter. Rare. Used when seen and taken. Meat and down similar to black scoter.


King eider. Rare, but preferred meat when taken in spring while sealing. Down utilized. No nesting in this area. Head skinned for handicrafts.


Spectacled eider. Rare—occasionally taken open ocean when sealing. Head skinned for handicraft work. Does not nest here.

Steller's eider. Rare—head skinned for handicraft work. Does not nest here.

Parasitic jaeger. Historically, an early spring food source. No longer utilized, but sometimes shot because hated. Does not nest here.


Pomarine jaeger. No longer utilized. Does not nest here.

Glaucous gull. Largest source of fresh eggs. Quite large numbers nest in colonies at a number of different localities on Monument. A take of 200 to 300 eggs from one area is not uncommon. The birds re-lay after a few days, some in the same place and some elsewhere. Young in preflight "squab" stage are sometimes eaten by summer campers and/or berry pickers.

Arctic tern. The very best flavored of wild eggs (small-two tern eggs = one large chicken egg). Nests in colony in special places, 200 to 300 eggs from one colony possible. Some move and re-ly; some re-ly on same site several times (though not on same "nest").

Aleutian tern. A known colony site in Sisualik seems the result of a recent movement. There were other sites on the Monument summer of 1977. Eggs utilized. Everybody loves to watch terns. Most also love their eggs.

Thick-billed and common murre. A bird which only occurs in ocean ice environment in this area. They are concentrated in open water areas in May and June, then move north or south to nesting bluffs. Non-nesters continue north with southern ice edge. A few are now utilized in conjunction with spring seal hunts. Quite easily caught as an emergency food supply. Flesh is seal-like.

Willow ptarmigan. A very important and much used bird; a preferred flesh. Found wherever willows are present, but in variable population density from year to year and season to season.

Rock ptarmigan. Less common and smaller than willow ptarmigan, but found at higher elevations and dependent on dwarf birch rather than willow. A good meat.

Spruce grouse. Rare, found in white spruce timber patches on northeast extremities of Monument proposal.

Sandhill crane. Common and preferred meat in spring and fall. Numbers taken are small, because it is a very wary bird. Eggs sometimes found on Monument. Solitary nests.
Snowy owl. A preferred species when fat in fall migration. Most taken with traps on short poles; some shot. Eggs not found regularly on Monument.

Gyrfalcon. Often taken in traps set for snowy owls. Some people like the flesh, some do not. A bird locally hated, as is the jaeger.

Short-eared owl. Eggs sometimes found. Late migrators taken in traps for snowy owl. Rarely eaten.

March hawk. Eggs sometimes found. No effort to take or eat meat.

Whistling swan. Rarely taken, spring or fall. A good meat, down plentiful. Eggs rarely found.

Semipalmated and western sandpiper. Eggs very large for small bird. Children learn how to search for eggs from this species around camps. They are allowed to take eggs home and cook them.

Whimbrel. A favorite tasty meat after blueberries ripen, especially preferred by elders. Formerly netted or snared over berry patches. Now, a few shot by rural people.

FISH

Alaska whitefish. Most important whitefish species in this area. Outlet of Krusenstern inland waterway is a focal point of harvest activity for this species. A preferred fish for drying, freezing, and cooking for human and dog use.

Least cisco. Though small, this tasty little fish is the second most important whitefish for this area, for both man and dog.

Arctic char. Abundant in spring and fall runs, in salt water. A preferred table fish and during the fall run it is probably the best quality fish in the area. Most small streams with outlets to the sea have summer populations. This area is famous for its char.
Chum salmon. Abundant in season. Area offshore from Monument is thought to be a staging area where migrant salmon circulate until the time is right to ascend river systems. The chum salmon develops a high degree of quality here and has become the major cash producing species. Some local utilization by humans and dogs continues, but commercial salmon fishing activities have grown into nearly a million dollar local industry. See Chapter 2 - Part 3. Monument Proposal lies just outside the legal commercial salmon fishing grounds.

Tomcod (saffron cod). A plentiful and important species for man and animals in active tideline areas where fresh water estuary systems meet ocean waters. Historically, a basic staple species because of its ease of taking and constant availability. Oddly, population density is very low the past three years and one wonders if this scavenger is not one of the first in our area to be affected by pollutants. No study has been initiated and other causes may be responsible, but the species seem to have been pretty consistently abundant in the memory of all living persons until now. Quite large quantities would still be used especially in Kotzebue proper if they were available.

Humpback salmon. Quite plentiful in some years, but not much sought. A good dried fish, but usually only taken in nets set for other fish (chum salmon and whitefish). The major spawning stream for this species is Fish Creek, iqaluligagaruq, on the northwest corner of Hotham Inlet.

Grayling. Most mountain streams have populations of this fish. Though they are a well-liked frozen fish, their habitat preference limits their availability to the subsistence person. A few, from specific known eddies, are used by humans. Summer trips into the mountains often depend on this food source until big game is taken.
Broad whitefish. Common and choice, but seem mostly of young immature stock in this area. Kobuk River and related slough areas are the best habitat for this fish. When taken they are used by man and dogs, as with Alaska whitefish.

Bering cisco. Known as the most oily fish of the area; an extremely rich fish, good fresh cooked, frozen or canned. A fish of salt water lagoons. Population density only moderate at any time, but always present. Cannot be dried for human food because too oily. Krusenstern inland waterway and Killiqmaiq Lagoon known for relatively high density of this fish. Good dog food, and good human food when fresh caught. Possible sport fish possibility, as they readily take small fry or insects.

Nine-spined stickleback. An abundant forage fish for larger fish in the brackish water areas. Because of great numbers and oily flesh, sometimes cooked for dog feed when taken in fish trap activities for other fish. No human use because of small size, but extremely important as a food fish to all major species of larger fish.

Arctic cod. A small dark or purplish ocean cod that during some years (October-November) is extremely plentiful on beach edge of entire Monument Proposal. They are a rich food for both man and dog, and under certain weather and wave conditions they need only to be picked up frozen off the tide line. Sometimes found in washtub quantities, and more rarely several 55 gallon oil drums can be filled from a mile or two of beachline. They can also be seined with a small-meshed, short beach seine when none are deposited on the beach by wave action.

Arctic cod are half the size of tomcod, with a large head, large delicious liver, and two small but delicious skeins of roe. Although there are some every year, they are very erratic in density and cannot be
depended upon. But they are appreciated by man, seal, eider, gull, fox, and all animals during those years when they appear on the Monument beach in numbers in October or November.

Sculpin. A fish often taken in small numbers when fishing for other fish with nets, traps, or hooks. There is both a salt water and a fresh or brackish water species. They are a favorite food fish for boiling in October and November, when they have large egg sacks and a delicious liver. They are only eaten fresh boiled by humans, and are otherwise utilized only in cooked dog feed. Only small (one meal) quantities are used.

Arctic flounder. These are a small but delicious flatfish, generally eaten frozen in October or November, when they are taken in fall fishing activities from beach lagoon outlets. They are plentiful in the spring flush-out, but not utilized at that time. Not available in winter, except for those trapped in mentioned lagoons. It is a mystery where they winter. They are used for human and dog feed.

Starry flounder. Larger and more common than the Arctic flounder. Large numbers winter in Hotham Inlet, and then move seaward in July when commercial salmon fishing begins. Sandpaper-like skin and ventral needle is hard on gear and fishermen's hands.

Make a good cooked dog feed anytime and a very favorite eating and dried fish in September, when they fatten up. Not utilized during the summer, when they are lean and mushy.

Smelt. Commonly taken when jigging for tomcod, and prized for frying. Not taken in large enough numbers in this area for any use but frying and occasional dog pot use.

Herring. Occur in quite large quantities in lagoons at ice-out time, and even greater numbers in many areas in late fall, just before slush ice runs.
Formerly seined in large numbers in Kotzebue channel. A renewed interest is growing among subsistence people, as set nylon herring nets have become available and pickled herring recipes known. Commercialization is not here yet, but may occur as the magnitude of stock becomes known.

PLANTS

White spruce. Being the only real "tree" wood available, spruce timber gets a wide range of usage. More intensively used when "store bought lumber" was not available, but even now a wide range of camp needs are met by this tree. Spruce is used to make fish poles, tent frames, tent stakes and poles, firewood, house logs, rough lumber, qayaq and boat frames, meat drying racks, caches, cool cellars and sod house construction, dog stakes, net poles and other wood uses as needs arise. Branches and needles are used medicinally and for dog bedding and winter camp tent flooring.

The sheltered environment that spruce patches provide is appreciated by campers and travelers. And of course much use is made of the animals that are associated with spruce-willow-poplar communities.

Willow. Leaves and inner bark are edible in early spring, and it is the only firewood available in many areas. It provides storm shelter and supplies sustenance for ptarmigan, rabbits and moose. Willow is also used for dog collar frames, snowshoe frames, qayaq construction material, and flooring for winter tent camps.

American green alder. Extremely hot burning firewood (green), also good for forge work. A red dye preservative for certain skins (wolverine, caribou, seal). Long-lasting handle for tools (skin scrapers, wood carving blades).
Balsam poplar. Easily split, though soft wood. Used for flooring in sod house or cache construction, cold weather sled runners (green) a poor but usable firewood when dry; best handle for seal scratcher call (argaun) because of resonance.

Crowberry or blackberry. This berry reaches its height of perfection for the species in the Sisualik-Krusenstern flats area. Often larger than blueberries, very juicy, and mildly sweet. After freezing in the fall this berry often develops a syrupy coating that is an indication of its high dextrose(?) content. Must have been a real sweet treat in pre-contact times among subsistence persons. A preferred favorite berry by humans, geese, pintails, foxes, porcupines and ptarmigans.

In a good year one family may put up as much as 300 lbs. It is stored uncooked in seal pokes, or mixed with other berries or sourdock and stored uncooked in seal pokes, or mixed with other berries or sourdock and stored in barrels. Second most important berry in this area.

Purported to be an antidote for crossed eyes caused by nakunak (whelk poisoning).

Bearberry. This berry is not eaten. Its only use is for relief of eye irritation or infection, specifically a clouding of the eye--glaucoma-like.

Lowbush cranberry. This berry is common, plentiful, and well liked as meat sauce or special fish egg recipes. Picked in late summer or in spring as snow first melts. Fourth most important berry. Some families use 50 to 100 lbs. a year.

Nagoonberry. Plants are common, but berries are rare. Sometimes a handful or two is put into a barrel of salmon berries (cloudberry) to flavor them with its strong raspberry-like fragrance.
Bog blueberry. A favorite fresh berry, also cooked and mixed with crowberry or sourdock, or frozen. Does not store well without freezing when uncooked. Common berry - ranking number three in importance for this area.

Cloudberry or salmonberry. The number one berry for the area. Much competition for best harvesting places. In bountiful years many families gather more than 100 pounds.

Labrador tea. Very common, used sparingly, usually as a flavoring with commercial tea.

Eskimo potato. Common on larger creek and river banks, strictly fresh-water habitat. Usually enough taken to store for winter only in those years when voles are plentiful, as robbing their storehouses is the only efficient way to gather large quantities. This is not an important activity on the Monument, although the plant occurs in many places.

Vetch. This plant served as a substitute for Eskimo potato in Krusenstern flats area, as it is common. Close to saltwater sealing camps. It is a favorite of ground squirrels. Always eaten with oil. Very rarely used now.

Pink plume. Both the leaves and roots were used historically, but rarely now. Leaves put in oil when first grown in late spring.

Wild celery. This plant is extending its range west and perhaps north. Use is on the upswing as more people come to know and appreciate it. It is picked before flowers form on clumps. Leaves with stems are put immediately in oil. Nine months later they can be taken from the oil, looking and tasting much like they did the day they went in.

Wild celery. The celery-like stalks of this plant are cut in lengths, strings are pulled off, and then they are put in oil for eating within the week. They are good, and widely used, but not stored.
Sourdock. Most important harvested green for this area. Often several hundred pounds of finished, cooked product are stored by families for winter. Used with sugar and oil as a sweet dish.

Fireweed. Young spring shoots are eaten in oil, not often stored.

Wild chives. Stems sometimes used when store onions are not available. Bulbs are quite strong when gathered in the fall. Greens are sometimes eaten as green onions, in salad or alone.

Alaska sage. A very widely used medicinal plant used as a poultice, tea, and deodorant. Seems very effective as a poultice for infections with no outlet to drain. A tea sometimes to help sore throats, mouth sores, or skin infections. Purported to be helpful for almost any ailment. Obviously, it is beneficial to some. Mosquito or fly smudges are made of this common plant.

Cottongrass. A "hairy", starchy-sweet root, date-sized, taken only from vole storehouses in late September and October. Very plentiful in the Krusenstern area. Replaces Eskimo potato as a root starch source there. Considerable use continues by "camp families." Eaten raw, but often boiled, drained, and stored in oil for winter use. Sometimes as much as 50 to 100 pounds per family is stored.

Grass or sedge. Several difference species are used for mukluk insoles, sod house construction, dog bedding (whelping bitches with small pups). An ideal insole, used often for this purpose.

House moss. Used for chinking log cabins and sod house roofs. When dry, it provides a good insulation for plumbing, ice cellars, building, etc.

Reindeer lichen. Provides sustenance for caribou, Arctic hare and reindeer. Historically, it was taken half digested from caribou or reindeer stomachs, mixed with oil and sugar, and eaten by humans. Dogs also eat this partially digested product. Not a human food as it grows,
unless leached. Still used to some degree by older people and can be used to pickle small strips of caribou liver or meat when taken from caribou stomachs and kept from freezing. A very good product when properly prepared, and it satisfies a craving for vegetable material when living on a meat diet.

**Bog cranberry.** Rare. Never gathered, but eaten in place when found.

**Rye grass.** Historically, burlap-like bags and containers were made from this tough, common, ocean beach grass. These were used for handling whitefish at fish trapping locations. Now used only for insoles, matting or dog bedding. Sustenance of snow bunting year-round, and many other small coastal birds seasonally.

**Coltsfoot.** Used only as a barrel cover for cloudberries. Mold, dirt, etc. collects on leaves, which are thrown away, leaving the upper layer of berries clean and fresh.

**Beach greens.** Common on all ocean beach areas. Gathered, cooked, and stored in barrels before the blossoms come out. Has never been widely used, but a few people continue to use it. A small barrel is filled by some families. Has an unusual flavor which is not universally liked. Goes well with boiled fish.

**SHELLFISH**

**Mussel.** Large quantities are washed up by big storm waves. Everyone likes them when alive and fresh. Generally largest ones are gathered and placed on top of wood stove until their shells open wide, and then they are eaten.

**White clam.** Large quantities can be gathered after large storms of a certain pattern, west of the very end of Sisualik point (Qaisitaq). Everyone likes them. Usually lightly boiled, or cooked like mussels.
Some years they occur four or five times, other years not at all. Fifty-five gallon drum cans can sometimes be filled, but more often 5 gallon cans are used. No recovery of clams in place is attempted, because there are negligible tides in this area. There is no storage. 

**Razor clams.** Small razor clams, and several other species of clam are found after large waves in late fall along Krusenstern beaches. Most are eaten if they look good. They usually occur in small quantities.

**Crabs.** Occasional small (4-5 inch diameter) crabs are washed up by waves and are eaten boiled.
CHAPTER 10.
THE NATURE OF SUBSISTENCE AND SUBSISTENCE RESOURCES

1. The Annual Subsistence Harvest

If it were possible to accurately monitor the actual take of each species by each subsistence person or family each year for a period of ten years, 20 years, 30 years, and 40 years, some very meaningful conclusions could be drawn by those charged with the responsibility of managing resource species and resource users.

But it is only necessary in the Krusenstern area to look at the current status of two important species to realize their dynamic, transient nature, and the long range changes that constantly occur. To make use of quickly gathered, or, worse yet, estimated statistics to determine norms of either human use or animal species populations for the purpose of establishing static rules and regulations, with the idea of keeping the ecological whole intact and a functioning, balancing system operating, is a very serious undertaking.

Caribou and moose provide an example of 100-year changes that are dramatic. Those subsistence people who were and are on the scene have just as dramatically adapted their use, methods, and means of taking and preserving methods as those animals have risen in importance or faded to insignificance.

There is, of course, a proper place for statistics. Indeed, management depends on accurate, unbiased data. This is the beginning of a "management era" for northwest Alaska. People of this area have not yet known or seen that management of natural resources really is possible, though most are beginning to see that it will be necessary. Accurate and unbiased statistical data will be what preserves both the subsistence person and the species he utilizes.
One of the greatest dangers to proper relationships between managers and managed is the use of pseudo-statistics, estimated statistics, and biased or incomplete statistics, used as if they were unadulterated truth. In a study of this type, there is always a temptation for the researcher to give incomplete statistics to establish points or opinions. This is done without realizing that someone farther down the line may extract those incomplete statistics from their intended context and use them to build a case for some proposition or another that is of current importance. There is further pressure on the researcher to do this when those who must know and understand the issues want a quick, usable resume of the material.

I feel that for the Krusenstern Monument Proposal there is presently no feasible means to gather statistical data of sufficient accuracy to become a matter of permanent record. Further, because of species dynamics and the need for continual updating of use patterns, those figures which are given in this report must always be considered flexible and changing, rather than static and constant.

2. Subsistence Dynamics: A Case Example

To demonstrate some important truths, let us tell the story of John Hunter, a Kotzebue Sound subsistence person, here given a fictitious name. John is Eskimo, and has a typical large family--eight children, some in school and many local family connections. He works five to six months a year as a journeyman carpenter, at different construction sites around the state.

During some of the time he is not on the job, and so John receives an unemployment compensation check. Thus he has a cash income base sufficient to permit his use of modern technology. For his subsistence
pursuits, John has a snow machine and also an eight dog team that acts as insurance if his snow machine becomes inoperable. He sometimes races his dogs in local or state events.

Many people depend on John Hunter and his wife for their year's supply of seal oil and marine mammal products. Remember, nearly every Eskimo household in the entire Kotzebue Sound, Noatak, Kobuk, Selawik area, eats a small amount of oil with each major meal. John's is one of a few families that continues to have equipment, know-how, and inclination to hunt the ocean ice when season and conditions are right. In late February and March there were three easterly storms of sufficient intensity to open leads, 30 miles offshore from Kotzebue. John went out to the ice edge after each storm calmed enough, for possible taking of ringed seals.

The first time, John shot and retrieved two in the first hour he was at the water's edge. Then the wind picked up and made large waves, ending the hunt. He would like to have taken ten or twelve seals, but was glad to have two. He returned home, and his wife and a neighbor butchered the seals inside the house while they were still thawed. Besides the meat, three five gallon cans of blubber were realized. The meat was all cooked and eaten by midnight of the same day by John's immediate family, local in-laws, and one or two close neighbors. Two cans of blubber went to different households in eight pound lard can lots, to be left close to the heater for a week until the oil rendered. John packed one 35 pound can well and took it to the airport to be delivered to his partner in Shungnak, who had been pestering John all winter for some seal oil. This cost his partner in Shungnak $26.50 (freight cost $6.50). John got $20.00, his only income from the hunt, unless his wife later worked the skins into something to sell.
Three weeks later, another storm, another hunt. John followed the open water edge for 30 miles (mostly offshore of the Monument). The weather remained calm all day. John saw one seal which came up so close that he excitedly pulled his rifle off target and missed. The seal did not show again. John went home empty.

Two weeks later, another storm and John went out again. The wind picked up after he arrived at water's edge, making it too rough to retrieve seals. There were many, many seals in sight, but except for one he shot that came up in a narrow crack, John had to again turn homeward with a nearly empty sled. His own family finished this seal in record time.

John now had a problem. Because of his work as a union carpenter he usually depended on this early spring seal harvest to supply his coming year's supply of oil. In his case, this meant three or four pokes of 200 pounds each. Thirty ringed seals would have been about right to supply that amount of oil.

John did not get to hunt again until boat hunting time, in the last week of June. This would be the last opportunity for spring oil this year, and John and his crew (which was made up of his own family, except one neighbor who would receive a share) would be willing to take any marine mammal to make up for the poor early spring hunt. They traveled west about four miles off the beach and began to find many ugruk as they passed Krusenstern's Point. Their boat could only hold six, so they headed for home from where they caught the last ugruk, ten miles west of the tower at Krusenstern's Point.

Ordinarily this one successful hunt for ugruk would have satisfied John for meat and skin. But because ugruk were plentiful, the weather was perfect, and ringed seals had not provided the needed amount of oil,
he and his crew made two more trips. They took eight more ugruks, which made up the four pokes of oil for John's yearly need, as well as a goodly share for his crew and the bonus of much dried "black meat:"

Many other things could have happened to John in his quest for oil in this partial year we have reconstructed. He could have caught 30 ringed seals in any one or all three of the early trips. He could have been fortunate enough to catch a stray walrus. He could have caught a number of beluga, either in regular boating time or on the rare instance when beluga are trapped in early spring leads.

We could also trace John's land hunting year, where the fresh meat staples such as moose or caribou came from. If neither was available, perhaps he or his older boys in his absence had to depend on rabbits, ptarmigan, or porcupine. If it was a very good year, perhaps they had some of all of these. If it was a poor year, maybe they ate more beans and bacon from the store, with an occasional chicken or expensive reindeer meat ($.90 a pound - 1976).

If this little story seems tedious, bear with me yet awhile, because this is contemporary subsistence living, and the pattern must be understood as we look to resource population dynamics.

3. Resource Population Factors

In a subsistence economy situation, if one resource species is down in numbers, a convenient substitute is quickly turned to. In the particular instance of our story above, ringed seal numbers may or may not have been down. They were simply not available due to some of the usual environmental factors that prevail in this area. It is likely that there is very little variation in overall ringed seal and ugruk populations, as they seldom concentrate in any given spot. Even their breeding and whelping
processes are accomplished in the wide reaches of the relatively unpopulated Arctic ocean. However, as our story demonstrates, for that particular subsistence person at that particular time, ringed seals could not be exploited. The need had to be filled by another species.

This situation, with limited resource users, illustrates how subsistence use over the years successfully regulates itself to a degree. Because of the great spaces involved and the limited time available (because of weather, seasons, etc.), the subsistence person must drop pursuit of the species that is at low ebb and pursue what is expedient, even though it may be less preferred. This automatically takes pressure off the species which is least plentiful and allows it to make a comeback. This process continues to function well with marine species in this area.

Land species, especially big game, have functioned in the past the same way. But now, those whose scope is broad enough can see a multitude of potential problems. Nevertheless, the basic soundness of the subsistence person's activities can be recognized. Snow machines and airplanes present special problems. Perhaps they can be dealt with. Most subsistence people in the area do not yet have a world view that lets them see the hope, goals, and necessity of resource management. They are beginning to gain this, however.

Another aspect of resource population dynamics, that may be difficult for a non-subsistence person to visualize, is the large amount of meat and fat that is consumed by people who subsist in this area. A few ounces of steak, chops, hamburger or fish together with a multitude of side dishes, suffice to keep body and soul together for most Americans. But the subsistence person's diet has long consisted of nearly all meat, fish and oil. Meat, fish and oil with a bowl of berries and a biscuit or two,
comprise the usual two-meal day. With cold weather and active living, one must eat quite a large piece of meat and plenty of oil to satisfy his bodily needs.

One ringed seal (30-40 pounds of meat), one ugruk (300 pounds of meat), one caribou (100 pounds), one rabbit (2 pounds), one ptarmigan or duck (1½-3 pounds), or even one moose (600-700 pounds), does not last long when eight or ten of one's own family, and an untold number of friends, neighbors, and relatives are eating from it two meals a day, every day.

Nowadays, of course, there are a lot more storebought goods to supplement the meat diet that subsistence people are used to. The food stamp program has made this universally so among people of northwest Alaska. These things are welcomed with thanksgiving and go well with the meat diet, but they don't replace the meat diet. A subsistence culture takes into it all good things that are expedient. It does not automatically follow that, as a cash income and economy becomes available and adopted the culture drops all former things and takes on a new and completely conformed lifestyle. The idea that this does happen has, it seems, been taken as axiomatic by government and related social programs, as they strive to deal with cross-cultural problems. This may lead to gross misunderstandings.

Population of harvesters is somewhat of a variable within the limitations of a resident population. There is a difference in harvest when, say, ten families camp in sealing camps on Krusenstern beaches, compared to when only two families do. But to actually lay out true figures would require on-the-scene monitoring. The eight additional families would probably come from Kotzebue or Sisualik, and would have probably participated in some form of marine mammal hunt from there. But by camping for the two sealing months (May-June), they would have more time
for choice (waiting out weather conditions), could do more of tedious work involved, and would thereby process more animals.

During years when there are plenty of salmon berries, good weather, and people with a lot of time, there would be many more berry picking "residents" on the Monument in August and September than in a year when the berry crop was small. If inclement weather persisted, few or none would likely camp for an extended period. The same situation of course would occur at the fishing outlet of Aniğaaq for September, October and November.

The effect of these people, although the groups are small, would be felt by all local game, fish and bird species. These subsistence people have the daily pot to fill, and this would for the most part come from the land. Two years of good berry seasons mean people on the scene. A year or two of poor berry crops means no people, no take of resources, a degree of build up, and healing of use areas.

On the basis of this writer's 29 year familiarity with the Krusenstern area, resource populations have constantly fluctuated in their availability for exploitation. As explained before, these fluctuations may or may not have a direct relationship to the overall species population. There were more caribou in the Krusenstern Monument area in the fall of 1975 than during any year in any living person's memory. Yet, this is the year the Alaska Department of Fish and Game, rather belatedly, announced that total numbers were down to a mere fraction of what they had been a few years back.

Ringed seals have been so scarce in some years that dog starvation seemed imminent. Once, with 20 active hunters watching the water all night every night for a month and a half, no hunter took more than three
seals in one night. Eskimos explained this as the result of ice conditions, food supply, lead direction and general yearly positioning of multi-year ice. Yet the following year some hunters took as many as 30 seals in one night of hunting.

Another year, old and experienced Eskimo qayaq hunters took their lives in their hands as a last resort. They headed west from Krusenstern in their frail craft, when no ice was even visible on the horizon, in hopes of finding ice and paddling home one or two ugruks. None had been taken in the whole month of June, and it seemed that no mukluk bottom material would be available for the coming year. Tears of joy flowed freely as they returned, when the sun was very low, each with the characteristic upthrust inflated ugruk hand showing above the prow of their qayaqs. These were the only ugruk taken that year. Yet the following spring, this writer counted 208 on one piece of flat ice, within five miles of the beach. At Itiptigik the meat racks were so heavy, and there was so much preserving work to do, the men quit hunting ugruks and made a trip inland for moulting pintails.

All species seem bound in this dynamic pattern, and some years small game and/or fish have made the difference between existing and not existing for the subsistence person. Strangely, one must focus only on three species if he seeks concrete evidence of over-exploitation by subsistence people that has brought about extermination of the species in this area. These animals are the reindeer, musk ox, and hairy mammoth.

4. Effect of Resource Dynamics on Subsistence Activities

There is, in the inherent makeup of a subsistence person, a set of values or favorites in food from the land. These values seem written so indelibly in his "inner person", that the desire for them can lead
him to almost any sacrifice to obtain them. A small, three pound lard can of not-so-good seal oil has sold for $20.00. At a time when lard was 20¢ a pound, butter $1.25 a pound, and a can of peaches or pears 35¢, one could get $1.50 a pound for salmonberries from Krusenstern flats, and be able to sell all he could spare. Five dollars was the going price for one Arctic hare when flour sold for $2.50 for 50 pounds. And three small dried whitefish for $5.00 was considered a good deal by the person who had been away working and had yearned for a little "oil and dried fish."

It is common knowledge that several different people have died of botulism in the last generation, from eating fermented ugruk and beluga flippers. Everyone still eats them and feeds them to his children, often knowing with what care they were prepared. They are such a delicious treat!

And consider the effort that goes into obtaining qaiq, the outer layer of ugruk intestine. First, all the sweat and blood and tears of moving the entire household including kids and dogs, the 35 miles to sealing camp. Then traveling 15 miles over rotten ice beyond yawning cracks and leads to find an ugruk, to kill it and drag it back, all 600 pounds of it over the same cracks and rotten ice. All of this fades into insignificance when one gathers around the women butchers, eagerly awaiting the large communal platter of fresh qaiq while commenting how good the fat flippers will be in a week or two when the hair has slipped on them!

What has all this to do with "effects of resource dynamics on subsistence activities?" Just this--when word gets around (and it does quickly and universally) that some favorite species is especially numerous or plentiful at some given spot, any means is used to get there by those who have the
equipment and know what to do when they arrive. No monetary expense is spared and no physical sacrifice is too much. Subsistence people tend to revert to old values when favorite food from the land is involved.

To those who are given the responsibility of managing land and resources, this characteristic of subsistence people is going to be a thorn in the side. It will not be easy to deal with. Any favorite sea mammal, land animal, bird or plant resource that appears locally and obviously in abundance, will just naturally seem to be ready for harvest. And to be told that it is not, in the face of such visible evidence, by persons tenuously given authority, will not be easily understood.

But there is hope! Subsistence people do want to be law abiding. They do tend to want to conform to reasonable (to them) regulations. In practice, even those restrictions that seem burdensome are in time accepted. The length of this time interval generally depends on depth of understanding and participation in drafting restrictions. Again, the balance must be maintained between users and their resources, with a striving toward knowing true species population, and bringing awareness of those facts to the very highest percentage of people involved. Flexible management is needed with fluctuating species dynamics and variable use patterns.

The other side of this resource dynamics question--the low population phases--is a greater mystery when considering future trends, especially with regard to the preferred species. Historically, this problem took care of itself, because of limited technology, low human population, and availability of large open spaces. Preferred species, when low in total population, were just not available for exploitation and had remote areas where a nucleus could again build up to numbers overflowing.
This, of course, is no longer true for some species and will soon be true for no species. Management of species and users is the only recourse. But this is not yet fully understood and accepted by the average subsistence person of northwest Alaska.

5. Nature of Dependence on Subsistence

To the reader who has diligently followed this report to this point, it must be very obvious that there was, historically, a dependency by resident subsistence people on food and other resources from the land of the Krusenstern area. Hopefully, it is just as clearly certain that there remains now, today, a dependency on the general area by resident people of the locale. We have continued to call these residents subsistence people, although they are no longer, for the moment at least, entirely dependent on the land's natural local resources for physical and mental sustenance. It should be remembered, at this point, that there is a difference between existing and living, that the preamble to the United States Constitution speaks to in the realm of human rights. Life, liberty and the pursuit of happiness if granted to today's "subsistence person" may allow him to become the "renewable resource person" of the future from whom many cultures could benefit.

It is a difficult tie to accurately estimate the number of people who participate in subsistence activities in this area. Even if you could monitor all activities for one year, and trace all those who benefited from the resources harvested, you would still only come up with figures good for that one specific year. One must first acquire a solid grasp of what subsistence life is, its fluctuating dynamics and ever adjusting flexible nature. Otherwise, figures and general statistics can only give indications that can easily be misinterpreted as norms or standards by those unaware of the dynamic, rather than static thing that
it is. No two "subsistence years" are ever the same.

To share the harvest of the land or sea to the degree that residents of the Krusenstern use area do, may be nearly incomprehensible to those not acquainted with subsistence living. Simply said, this means many necessarily share in the harvest of a few. Individual bag limits, understandable in recreational hunting systems, at times become nonsensical in a subsistence-sharing context.

With the points of the two preceding paragraphs in mind, we would need to give a figure for subsistence users that reflects the total Eskimo population of Kotzebue, Noatak, Noorvik, Kiana, Ambler, Shungnak, Kobuk, Selawik, occasionally some Koyukuk villages, and a number of Eskimos living in Anchorage and Fairbanks, not to mention a few white residents who habitually use marine mammal oil as a food staple. A large percentage of this oil, which may be used in a greater or lesser degree by 4,000 persons, comes each year from offshore waters of the Krusenstern area. These are the users of one resource.

Even these figures, broad estimates, can only be used to get a general view of the relationship between harvester and user. Season-to-season variables such as ice conditions, weather conditions, species availability, and local activities that may compete for time in harvest season all influence the whole scene each year.

All other subsistence uses of the Monument area are of a lesser magnitude. Two hundred individuals likely took part in combined berry picking, waterfowl hunting, and fishing activities in 1976. Again the "users" of those resources taken home by "harvesters," would likely number 2,000 or more.
Late fall and winter harvesters were relatively few in 1976, because of extreme restrictions on caribou take, and the Monument's caribou hunting grounds were not much utilized. The high price of long-haired furs (red fox - $100, Arctic fox - $60) caused a bit more trapper activity. Probably one hundred different individuals were involved in all parts of the Monument during late fall and winter activities of all kinds.

Most of the users and harvesters that we have been considering are Eskimo residents of Kotzebue Sound and related traditional "trading" communities (Noatak, Kobuk, Selawik river people). There are a number of Eskimo-white intermarried families among harvester-user residents, and a few white families of long standing residency, who are occasional harvester-user participants. Some mixed families, of course, go back to contact times. The only reasonable, equitable lines for determining eligible subsistence users for the Monument area would therefore be residency. White and Eskimo social-community interaction has been functioning for 100 years now, in all aspects and levels. The Marine Mammals Protection Act, with its dividing of subsistence residents on racial lines, came as a shock to many neighbors of both races in the Kotzebue Sound area. Even the state has considered all residents on an equal level, and for the federal government to be responsible for driving wedges of separation on racial lines seems sad, though probably a by-product of what were thought to be problems of a greater priority (world-wide sea mammal considerations).

Few whites have participated on a full-time basis in a subsistence lifestyle in the Krusenstern area--less than five in the past 30 years. There is, however, a part-time involvement in different aspects of gathering and harvesting. This has somewhat increased in recent years, as all subsistence
people have, in a sense, become part-time partakers. Still the number is less than ten, even for berry pickers, because of Krusenstern's remoteness and difficulty of access during open water months.

In conclusion, especially for those that may be disappointed in not finding well documented, clean-cut, black and white figures to use as norms, standards or even base lines, let me again emphasize the fact of the dynamic nature of subsistence patterns. Also, the fact that a culture can take on or incorporate into itself a monetary economy, does not necessarily mean losing the need for what we have been calling subsistence. In a way, we are past the time of dealing with clear-cut cultural boundaries. We are dealing more with geographic residents seeking to achieve the best patterns of living in the environment they find themselves inhabiting. Historical and traditional backgrounds tend, to a very great extent in this northern area, to limit the individuals who are able to partake of what we are calling subsistence living. Few, very very few, outsiders have to this time successfully adapted or even wanted to try to adapt to Eskimo subsistence living. There seems no local indication that this century-old pattern is about to undergo any change, except that doors may be closed where no one else wants to go in anyway.

6. Degree of Dependence on Subsistence

Why do people of Kotzebue Sound areas want to carry on a subsistence use of Sisualik-Krusenstern harvest area? Perhaps the best way to answer this question would be to pose a few more:

Would you ask a duck why he flies?
A seal or whale why they swim?
A doctor why he is a doctor?
A lawyer why he is a lawyer?

This may seem a childish illustration, but there is a large measure
of truth involved. The subsistence person wants to continue subsistence use because he is a subsistence person.

Yes, he may have other alternatives. Yes, alternative welfare food sources could be provided and maybe even alternative psychological diversions like basketball and T.V. could be further implemented so that there will no longer be subsistence persons. Would it not seem better to allow subsistence living patterns to continue so they might contribute to completeness and maturity of those people of northwestern Alaska involved?

Now, the question of food quantity, the percentage derived from subsistence harvests, can be addressed in a proper perspective. Thirty percent of the total meat consumption for some subsistence people this year, may have depended on local resources for 90% of their meat, some as little as 1%. Last year (1975), with a multitude of caribou and no restrictions, 80% to 90% of most subsistence families' meat supply was from local game resources. But even in that year, some may have used only 5% because of extenuating circumstances in their particular situation. Next year? It is possible that the individual who used only 5% "wild meat" in 1975 might in 1977 depend on wild species for 80-90% of his sustenance!

This kind of fluctuation is a part of the pattern of subsistence living. Because it is, some aspects of management will be easier. People are used to change and adaptation, when they understand. Some aspects will be harder. Game species population monitoring will be especially important. Subsistence people easily accept a natural low or scarcity. They do not easily accept restrictive pressures, limiting of resource harvest by edict from strangers from other places, unless they understand the need.

It is difficult, at this point in time, to give a balanced, unbiased
picture of dependency on subsistence in northwest Alaska. Perhaps by breaking subsistence into some of its particular fruits to the individual, the picture can be made clearer.

We have touched earlier upon the importance of marine mammal oil and its universal use. Main course meal products—fish, meat, fowl, we have lingered over. Greens, berries, roots we have discussed. Arts and crafts for personal clothing and necessary cash sales, derived from furs and handicrafts, we have lightly considered, as well as wood, a renewable resource for fuel and utilitarian uses.

All of these are used in varying degrees by individuals in different circumstances in different years. An important point to note is that the freedom to do this is an inherent part of being a subsistence person, and it has deep psychological roots. It is probably very reassuring, at least for the middle-aged family people, to know that if the shaky, young cash economy or welfare structure collapsed, they would still be able to exist from the fruits of the land.

Of course, other psychological needs are met through subsistence activities. The person who works as a janitor, garbage collector, or dishwasher, can have pride in being good at whatever menial task he must perform to earn wages and meet his family's cash needs in an urban-village situation. But the cultural tradition that he is still very much a part of has long standing ties to the challenges of the hunt and harvest of local species. Status, appreciation, acceptance, and probably most important of all, self-worth, is often established through subsistence harvesting activities, for both males and females.

In a study of population trends for Alaska (Alonso and Rush 1976), it was found that most larger established villages are remaining fairly
constant in size or growing slightly, even with a steady drain of population increase to large urban centers (Fairbanks - Anchorage). Also, there is a back and forth movement between village and large city that tends to bring the "urban life back to the village." This could be seen as a "phasing out" of subsistence living, and a fairly rapid extinction of whatever a "subsistence person" is.

It seems more likely that the "subsistence person" if allowed to, for stability, wholeness, identity, and general equilibrium, will incorporate into himself this "village urbanization" trend. He will evolve and maintain the same uniqueness he has shown in the past, with much to offer to those other cultures that are willing to learn and to add to their own fullness and completeness.

This is simply saying in a different way, that without overt outside coercion the subsistence person (in this case every Eskimo by birthright and a few of other races by adoption) will take into his being those urban things that seem desirable. But he will do this without dropping all of those things that set him apart as a unique individual in his own right, as a part of a very old culture that has assets to offer to the universal scope of things.

Now, how much does each resident individual in the Kotzebue Sound-Krusenstern subsistence area depend on subsistence activities? Remember, we are speaking of a few thousand people, always under 5,000, the size of a small American town! The answer—some on this day, Tuesday, May 3, 1977—may be somehow totally independent of subsistence use ties. Some on this same day may depend for their day's sustenance 100% on resources taken during the course of the day's harvest activities (seal hunters out on the ice, sheefish hookers on Kobuk Lake, wood cutters eating rabbits, or whatever this day). Most of the few thousand people are
in-between somewhere in degree of dependence. Tomorrow, Wednesday, of course, the scene changes at least on the level of the individual.

7. Relationships Between Economic Changes and Subsistence Needs

Our previous discussions, if their intended points were communicated, have in a general sense answered many of the questions that might be dealt with under this topic. Emphasis should again be placed on the short time that the Kotzebue Sound area could even be considered as a place where a resident had the option of choosing to exist on a cash economy, exclusive of subsistence activities. In actual practice, it is not clear at this time that it would be physically possible to maintain adequate diets and health for more than a few families if the fruits of subsistence activities were excluded.

All "imports" are dependent on long distance shipping, the stability of which depends on world political whims, at least in the case of such basic things as oil and gasoline. Individual acquisition of these is also dependent on his ability to pay cash for them. A commercial fishery based on one species, government welfare and social services, Native corporation activity, and sporadic construction activity around the state, are the yet tenuous threads by which a cash base can be derived.

How will these things go in the future? What new avenues of wage earning or cash acquisition will develop? How well will the "subsistence person" be able to adapt to the corporation world of high finance and land management in the long run? The tenuous nature of all this is obvious to the resident of this area, on his level of involvement.

Again referring the interested reader to Alonso and Rust's study The Evolving Pattern of Village Alaska, as the subsistence resident experiences urban conveniences, he will increasingly want and expect them.
And he will get them, in the village situation, as money-earning opportunity continues or increases. His desire for (and who will separate desire from need on the subsistence scene?) many subsistence resources will remain. They will not automatically drop away. A lifetime, and a long tradition of eating habits, thinking patterns, world views, are not tossed aside like a candy wrapper for a dozen years of something new.

Let us go back for a minute to the question in parentheses in the above paragraph. Who will separate desire from need on the subsistence scene? This may be the heart of the problem for future relationships between economic and subsistence needs. Because of modern technology (improved means of taking wild species), human population trends, and a dividing up of land under the Alaska Native Claims Settlement Act, a distinction will have to be made between subsistence people's "wants" and "needs."

If one takes the view that the various natural resources (animal, bird, fish, plant species) are to be used and harvested, with man as steward as well as user, the future course of action of the agency given responsibility for administering various areas, such as the Krusenstern Monument Proposal, will be fairly straightforward. There will surely be a multitude of problems, but the chore is basically to keep resource species at a healthy density and the environment intact, and to allow subsistence and visitor use to the degree that the land can tolerate it. This will eventually lead, with some species, to separating subsistence need from subsistence desire. This will be such a complex problem, from an outsider's perspective, that he might not be inclined to take the responsibility of decision.
With sound biological monitoring of the relatively few species concerned, resident "inside people" would not find decision making difficult at all. In other words, subsistence people know the difference between needs and wants in their lives. And if they are furnished truthful scientific knowledge, they will understand curtailing "wants" for a time, to sustain "need" potential for the future. This of course, is only valid if it is accepted that there is truly such a thing as a subsistence person.

All this is to indicate that a small group of knowledgeable people, comprised of "outsiders" concerned with national interests and providing scientific capability, and of subsistence people of high awareness and low bias, could fulfill the stewardship that the future demands in the Kotzebue Sound-Krusenstern-Kobuk areas.

8. Effects of Current and Proposed Developments on Subsistence Activities

As local people have heard rumors of the Aniная-Sealing Point-Rabbit Creek areas becoming National Park Areas, there has been much consternation, fostered by some knowledge of very strict regulation, of wild species use in established National Parks elsewhere. This has been further aggravated by state agency (Alaska Department of Fish and Game) assurance that if the area comes under National Park Service administration, there will be no allowance made for continued subsistence use. The restricted preserve, pristine garden picture is pushed pretty strongly. People, of course, react to this very strongly for reasons discussed in this study.

There has been enough local contact to communicate the idea that there might be a new subsistence policy within the National Park Service's new areas of responsibility. People sense that there is some disagreement
of opinion between state and federal agencies as to what the subsistence use policy would be if and when the National Park Service takes on management responsibilities.

Also the idea of tourist-visitor use at times of subsistence-camp involvement, is viewed with mixed feelings. Subsistence people are generally friendly, out-going people, but they are easily offended and often shy before strangers, particularly those who continually ask rather odd questions. Visitors, for their part, may suffer some shock at butchering activities, cultural differences in food preparation, attitudes and so on. Surely some who come as visitors will have never fully viewed the origin of their steak, hamburger or hot dog. These problems have avenues along which they can be dealt with in time and circumstance, but they depend much on attitudes of local residents and administrators toward each other.

At this time, subsistence activities are not well known by the general public outside the circles of those who partake of them. Certain particular, usually spectacular parts, are often observed by local, state and federal agencies, and individual people involved in those special orbits of activity in bush Alaska. But for the most part, very few are aware of the full season cycles and extent of activities.

This will create some real problems for the time when not only the spotlight, but also the magnifying glass, will be focused on the subsistence complex of the Kotzebue Sound-Sisualik-Krusenstern areas. This "time," now seems very close, with large areas of northwest Alaska becoming the responsibility of specific agencies.

Game management in Alaska has derived from a sport or recreational hunting philosophy, coming from outside Alaska, where subsistence hunting
is no longer a way of life. Because Alaska's population is so unevenly distributed, and where people are few the "barren lands" seem inexhaustably spacious, nearly all game management has until now centered on sport-recreational hunting in high population sections. This is a natural result of cultural background (White-American) and limited money, methods, and personnel available throughout the years for state game management.

There is a world of difference between sport-recreational hunting and true subsistence hunting. The two have different goals, different basic philosophies, different methods, different time deadlines determined by particular species characteristics, and different ethical standards. Northwest Alaska has retained its subsistence hunting needs to this present time. Sport hunting philosophies have naturally come into the area through school teachers, government workers, cross-cultural marriage, and other influences over the years, but basic needs have extended the life of subsistence oriented practices.

There have been confrontations between sports hunting oriented game management people and the subsistence people. Some managers have been ridiculed, either because they did not understand the perspective of the subsistence person or because they committed errors of fact. Management people simply stepped, for a moment, into a situation that they basically knew nothing about. The unfortunate thing about these confrontations and the reason they are being mentioned here, is the relationships that have evolved. There is little mutual trust.

For the sake of the subsistence people, the indigenous species, and the general environment, we must have management, which means both regulation and scientific knowledge. Mutual trust and cooperation between management people and resident people is necessary for success. The burden
of taking the initiative in seeking trust and confidence currently lies with those who would manage. That game can be managed, or even accurately monitored, here in northwest Alaska, remains a question in the mind of most residents. Yet most are coming to see that it must be managed for man to fit his proper role as steward as well as predator.

In all of this there remains hope. The year 1976-77, with its catastrophic caribou situation, if it has done nothing else has brought attention to people's needs, animals' needs, and most of all the need for all to look ahead a bit. It would seem, even at this late date, that some of the remote areas of the state could be managed under subsistence use disciplines rather than sport-recreation criteria. This is true even if the actual use in set-aside areas did have indistinct lines of definition. In other words, perhaps the proper way for management to go in northwest Alaska would be to manage resident people and resource species from a historic subsistence use base, instead of a sport-recreational society base.

It is hoped, of course, that useable living resources would be dealt with in a uniform manner in the land areas adjacent to parklands. Because of the geographic positioning of these lands, it seems possible that sound use policies and good public relationships, begun on areas like Krusenstern and Kobuk Valley, would act as a standard from which land holders in adjacent areas could build.
APPENDIX 1

Krusenstern Inland Waterways

There is a unique system of lakes, creeks, sloughs and connected waterway trails within the Krusenstern Monument, especially in the Krusenstern-Point Flats area of the beach ridge complex. Much of the water area is navigable, with shallow draft boats powered by outboard engines of up to 100 horsepower. This water is ice free during the months of July, August and September. Qayaqs and skin boats, as well as canoes or light rubber rafts, are especially useful for traveling these areas. Generally speaking, water travel is easier and more comfortable than land travel during the months that it is possible.

The Sealing Camp at Cape Krusenstern, called Itiptigvik in the Eskimo language, means "place where boats can be portaged." Here, it is only a short distance from the ocean beach to the inland passage, where protection is offered from the ground swells that often prevail on the point of the cape after the ice is gone. Berry pickers and waterfowl hunters make most use of the water trails, though people moving from Sealing Camp or traveling the coast frequently find the "inside passage" expedient.

On the Place Name Map, the most often used boat trails are indicated. It should be kept in mind that when the outlet at Aniğaaq is "open" the whole system becomes "tidewater" and water runs in or out dependent on ocean level and recent rain water runoff. This, of course, influences water depth levels in all areas, and some places may be traveled at high water stages, but are not so easily traversed at low water levels.
The major sloughs, however, remain navigable even at lowest water levels. This itself is a unique characteristic, as it requires a delicate balance of water table and elevations so that the whole system does not "flush out" or drain off and leave those aquatic species high and dry. Beach gravel movement is of course an important part of this formula and it would seem the Krusenstern Monument area could provide a fertile study area for Arctic coast gravel movement and makeup.

The other two major lagoons, Killiqmaiq and Akulaaq, only offer boat travel within their lagoon area proper. One can travel less than two miles into the creek mouths of tributary streams. One large lake, Tiritchiliq, is connected to the slough system and is named for two large alligator or dinosaur-like monsters seen from time to time by different observers. The descriptions vary from observation to observation, but certain characteristics remain constant. There was a sighting in the 1940's, described to this writer by a very credible source, and there seems little doubt that the witness saw some creature or phenomena that he had never seen before in a lifetime spent on the Krusenstern area flats. The place name and its derivation and history are intriguing, as no other use is made in this general vicinity of the term or concept.

Twin mountain streams that join as sloughs two miles out in the flats present another interesting occurrence. After spring runoff, and for the remainder of the summer (except after extremely heavy rains) Tuqruq creek-slough remains brilliant crystal clear in deep mud-bottomed slough pools. Milukrauluq is another stream which heads in the same mountains, on the western slopes with only a dividing ridge between. It is milk-colored in its slough portion, in the flat area where the two sloughs eventually meet. Its Eskimo name is derived from this milky color. The slough portion of these creeks, where the contrasts are obvious, are
readily accessible by boat.

The large creek on the north shore of the northwestern portion of Itiptigvik lagoon is named for large clams found there, Iviluqpalik. Whether this name refers to live fresh water clams or to fossil shells imbedded in ancient rock or more recent sediment deposits, is at present unknown. But it is very interesting, as is the origin of the name "Tagiugnichuk" which indicates salt water ponds at mountain top in the extreme northwest corner of the Monument.

Many hours of leisurely boat travel are possible in the slough system, with a widely diversified choice of landing spots for further exploring of sea level to mountain top Arctic coast flora and fauna. It should also be noted that stream courses offer the best footing for summer tundra hiking trails. The permafrost lowlands of Arctic Alaska are notoriously soft, boggy, and lumpy and present a very difficult walking surface. The well drained area of creek banks provides access to mountain ridge spines where walking conditions are free and easy. The hiker who ignores these conveniences pays dearly in time and suffering from sore muscles and bites of lowland mosquitos.

Stream courses in this treeless country also provide fuel and shelter for camping and are thus especially important in times of inclement weather. Various willow species are found in larger and sturdier patches along stream courses, and of course fish of various species are available even at higher elevations during summer months.

For the person interested in what may lie under the moss-lichen-grass-shrub carpet that covers all but high elevation mountain spines in this coastal section, water courses offer rock and fossil exposures that may be of considerable interest. There are limestone, flint, calcedony, and fossil ivory occurrences within different sections of the Monument.
Inland waterways have, of course, historically played an important part in the life of subsistence people. And they will continue to be the highways and byways of summer travel, whether by boat, qayaq, canoe or, at higher levels, foot travel.

There is another aspect of interest unique to stream courses in this southern Arctic region. Visualize, if you will, walking for miles over "barren" tundra land, with never a tree or a shrub much more than knee high, where the wind seemingly never stops but only changes direction. Lichens, mosses, cotton grass and various berry plants hugging tightly to the ground make a three or four inch carpet. And there are barren plains animals and birds one expects to see in such an environment--longspurs, ptarmigan, ground squirrels, caribou, snowy owl and so on.

Suddenly, on a hidden bend in a sheltered watercourse ravine or canyon, you come onto a complete change of environment. There are twenty-to thirty-foot tall willows, or even taller balsam poplar, no wind, warm sun, sparkling water, a nesting robin, or blackbird, perhaps even a moose or a porcupine, and a multitude of bright colored "ground covering" wild flowers. There are a few of these "isolated climates" or "environments within environments" in the Monument area, and the thrill of coming onto one unexpectedly is surely one of the more valuable experiences of aesthetic life.

In many ways, the inland water courses or waterways are the living arteries of the Arctic coastal land mass and are extremely important to all life--man, animal, bird, fish, insect and plant that exist in the geographical area.
APPENDIX 2

The Geographic Dimensions of Subsistence

In order to put the map work accompanying this section in proper perspective, it is necessary to understand something of the dynamics of subsistence living and not consider the maps a simple graphic illustration of facts that are immutable and can be fully understood at a glance. They should be considered a help to further understanding, and an indication of which areas at certain seasons attract harvesters and gatherers because of species availability and quality. It is very difficult, in the scope of this study, to differentiate between what can be done and what is being done, insofar as land use and species exploitation are concerned.

It is also difficult to give a balanced picture of numbers of either users or the prey they are using. One hundred different people may hunt ptarmigan in the course of a year. They may hunt in one hundred different willow patches. Some may take two or three birds. Some may take two or three hundred. The maps and the species they indicate are given as a help to understanding the species and place of concentrated activity at certain seasons. No year can be taken as a "normal" year, and a base line made of it to which other years would be expected to conform.

Subsistence living and all it entails does not function that way. Each year is in this sense unique. The only true picture that can be drawn by anyone is a composite of many past years that will indicate what might be expected to occur in the coming seasons of harvesting.
To monitor numbers of people and exact harvest from exact location is likewise currently not possible.

The maps, then, are a conscientious effort to give an indication of what currently (1976-1977) goes on in specific areas. They are current in the sense that at least a few people each year participate. Twenty years ago, many more would have been participating. Twenty years from now, more or less may be participating. Those activities which really seem to have become part of the past, with absolutely no current continuum, are not reflected in the geographic work. They are few.
APPENDIX 3

Geographic Areas Utilized for Obtaining Specific Resources

More effort has been made to indicate utilized areas in the Kotzebue - Sisualik - Cape Krusenstern proper area and the 350,000 acre Monument Proposal than in the surrounding area such as the Noatak River - Hotham Inlet - Noatak-Kivalina Village areas. Therefore, any comparison of the relative use of areas could be misleading.

Where groups of people live permanently, more exploitable resources are discovered and become general knowledge. Those places inhabited seasonally often have only the more obvious resources commonly known. Much potential remains hidden. It is so with this study. A thorough resource study of the Noatak - Kivalina village areas would reveal much detail not contained in this study about immediate village site resources, but not much relevant to the Krusenstern National Monument.

The ocean beach line, and the open water lead area between shorefast ice and moving pack, are utilized by passing migratory species (fish, mammal or bird). This assures that all points along this zone are used at some time. Thus, the maps indicate the species that can be expected in these migratory zones all along the line. Other species may travel the "migratory zones" but are only sufficiently concentrated for harvesting at certain points along the zones.

Whitefish are an example of this last condition. Although they can be taken all along the beach at times in "tub full" quantity, the natural dam blocking their pathway at Aniğaaq causes concentrations where tons can be taken at a convenient time (freeze-up). Certain specific
places, then, have a high use value even though the species occurs more or less all over the area. The use area maps reflect this.

The larger land animals in the Monument (caribou, bear and moose) area tend to occur almost anywhere as their food quality changes from year to year. And when they are found, they are predictably in areas where their food is ready for them. Thus, any extensive willow patch can be expected to have a moose, especially if lakes and other water are nearby. Bears frequent stream courses, patches of Eskimo potato, berry patches, and occupied ground squirrel areas. Caribou are partial to good moss and late greens.

Food supply areas for those animals on the Monument are always much more abundant than the animals themselves. Thus an "M" on the map on a large willow patch indicates moose have been seen there, taken there, can be expected there any time; but they are not always there. Bear and caribou follow a similar pattern, and when in the country will likely occur where indicated on the map. Exactly when they will be there is anyone's guess, and this is a major problem faced by the subsistence person.

Certain ocean resources only become available at the whim of current, waves, and winds (clams, mussels, driftwood, usable dead marine animals, Arctic cod). Consequently, some full years can pass without any appreciable harvest of these resources. And in some years there is an over-abundance and so frequent an occurrence that use cannot be made in time to preserve the raw materials before they deteriorate. Waste?

These conditions of subsistence involvement are noted to indicate that statistics and cataloging of various activities only give a very limited picture of actual place-time dynamics. Certain areas are very
much used, by many people, much of the time that the resources are right for harvesting. These could be termed Community Use Areas and those in the vicinity of Sisualik and the Krusenstern Monument are listed here.
### 1976-77 Current Community Use Areas

<table>
<thead>
<tr>
<th>PLACE</th>
<th>TIME</th>
<th>SPECIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuvuraq (Sisualik Point)</td>
<td>June-July</td>
<td>Fish, white whale, ugruq</td>
</tr>
<tr>
<td></td>
<td>July-August</td>
<td>commercial salmon fishing</td>
</tr>
<tr>
<td>Aniγaaq-Salluq (Monument entrance to inland waterway)</td>
<td>August-September</td>
<td>Salmon berries, fish-whitefish</td>
</tr>
<tr>
<td>Qauγlaqtq (Noatak River Estuary)</td>
<td>late July-August</td>
<td>Salmon berries</td>
</tr>
</tbody>
</table>

### 1950-60 Community Use Areas (in addition to above)

<table>
<thead>
<tr>
<th>PLACE</th>
<th>TIME</th>
<th>SPECIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Itiπiγvik</td>
<td>May-June</td>
<td>Marine Mammals</td>
</tr>
<tr>
<td>Kiligmaiq</td>
<td>May-June</td>
<td>Marine Mammals</td>
</tr>
</tbody>
</table>
TAGIUQMIIT - 1975-77

USE

Early Summer to Fall, June-September

Fishing

Early Summer gill net
Late Summer gill net
Fall gill netting
Early summer seining (char
Fall seining

Commercial Salmon Fishing
Grayling hooking
Young sheefish hooking
Pike hooking
Char hooking

Camps

Spring - Summer camp
Fall camp

Winter camp
Permanent camp

Egg Gathering

Gull eggs
Tern eggs

Hunting

Moose
Caribou
Spotted seal
Bear
Sheep
Bearded seal
Waterfowl
Ringed seal
Beluga (White whale)

Edible Vegetation

Blueberries
Sourdock
Cranberries
Onions
Blackberries (Crowberries)
Masu
Salmonberries (Cloudberries)
Celery
Non-edible Vegetation

Firewood growing in place
Driftwood
Growing spruce for fishing poles, sleds, spears, skinboat frames, qayaq frame, etc...
Storm Shelter Area (boat - summer)
Storm Shelter Area (Winter) Natural windbreaker.

Fall, Winter and Spring, October-May

Fishing

Under ice gill net
Beach gravel fish trap
Pike hooking
Whitefish hooking
Tom cod hooking

Marine Mammal Hunting

Spotted seal
Common ringed seal

Hunting, Snaring and Trapping

Caribou
Moose
Rabbit (varying hare)
Arctic hare
Ptarmigan (willow)
Ptarmigan (mountain)
Trapping area (mink, otter)

Herring, tom cod ocean net
Clams
Mussels
Arctic cod
Burbot

Bearded seal
Beluga whale

Wolverine
Wolf
Fox (white, red)
Lynx
Muskrat
Ground squirrel
Snowy owl
<table>
<thead>
<tr>
<th>No.</th>
<th>Place Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sisualik Peninsula</td>
<td>Place of white whales.</td>
</tr>
<tr>
<td>2.</td>
<td>Nuvurauraq</td>
<td>Small point, very end Sisualik Point.</td>
</tr>
<tr>
<td>4.</td>
<td>Qaisitaq</td>
<td>Offshore bar where waves break.</td>
</tr>
<tr>
<td>5.</td>
<td>Sisualigrauq</td>
<td>High ground of Sisualik Peninsula.</td>
</tr>
<tr>
<td>7.</td>
<td>Itiptigvitaq</td>
<td>Narrow strip of Sisualik Peninsula.</td>
</tr>
<tr>
<td>8.</td>
<td>Singigrauq</td>
<td>Narrow sand spits in lagoon (Maklak strings).</td>
</tr>
<tr>
<td>9.</td>
<td>Qaqaaluq</td>
<td>Place where Polygonum bistorta found.</td>
</tr>
<tr>
<td>10.</td>
<td>Qangainauraq</td>
<td>Root or base of waterway (lagoon).</td>
</tr>
<tr>
<td>11.</td>
<td>Ahaaliksuq</td>
<td>Place having young ahaalik (old squaw duck).</td>
</tr>
<tr>
<td>12.</td>
<td>Qulitgiin</td>
<td>New outlet (outlet of Sisualik inland waterway).</td>
</tr>
<tr>
<td>13.</td>
<td>Killichaiq</td>
<td>Edge of high ground North Sisualik.</td>
</tr>
<tr>
<td>14.</td>
<td>Qilitmumaniq</td>
<td>Creek that goes behind.</td>
</tr>
<tr>
<td>15.</td>
<td>Iqpigagaruq</td>
<td>High bank bordering ocean.</td>
</tr>
<tr>
<td>16.</td>
<td>Akulaaq</td>
<td>Large lagoon.</td>
</tr>
<tr>
<td>17.</td>
<td>Amiliguq</td>
<td>Very narrow area of water between wider areas.</td>
</tr>
<tr>
<td>18.</td>
<td>Qilangak</td>
<td>Abrupt highbank on ocean beach, nose like puffin.</td>
</tr>
<tr>
<td>19.</td>
<td>Anigaaq</td>
<td>Place of going out (Entrance to inland waterway).</td>
</tr>
<tr>
<td>20.</td>
<td>Aanguagshaktugvik</td>
<td>Place of getting Aanguaq (charm, familiar spirit).</td>
</tr>
<tr>
<td>22.</td>
<td>Salluq</td>
<td>End one toward ocean (channel)</td>
</tr>
<tr>
<td>23.</td>
<td>Saunigrauq</td>
<td>Whale bone upright, not grave</td>
</tr>
<tr>
<td>24.</td>
<td>Uyulait</td>
<td>Double grave site.</td>
</tr>
<tr>
<td>25.</td>
<td>Atiginyak</td>
<td>Grave site.</td>
</tr>
</tbody>
</table>
26. Alagaat
27. Nuvaut Cape Krusenstern Point.
28. Naapaksak Wooden tower at Point
29. Iti iqshaq Ground depressions (Campsite).
30. Itiptigvik Place to portage (Main campsite).
31. Qangaigiaq Old corral (reindeer)
32. Ayaigutauraq High ground to beach gravel.
33. Aitiligauraq Low ground in midst of highlands.
34. Tasiqgagaruq Small lagoon.
35. Uqs ruraq Rocky ocean bluff that looks like a cut sea
    mammal skin with blubber exposed.
36. Killiqmaiq Person name (Former Noatak Spring campsite).
37. Qulhliq Place drifted out Siberians killed.
38. Ukallik suk Place of Arctic hare - Rabbit Creek.
39. Agaigrauq File-like mountain range and creek.
40. Tagiuqnichuq "That one over there has salty water."
41. Uuman Heart Peak - and Creek
42. Imik Water lagoon - fresh - drinkable
43. Napaktuqu tuuq Spruce tree covered hill.
44. Tulaagait Place to beach boat.
45. Siituquiuq Ear like crooked creek campsite.
46. Aqulauqutaq Spruce tree patch (campsite).
47. Napaktuuru rak Hillside tree patch
48. Unigun Most westerly tree patch behind Sisualik on
    south slope of first high ridge.
49. Tutilik Large lake named for yellow billed loon.
50. Naliqaqshauq Pantaloon-shaped connected lake system.
51. Nuviaqhuq - Chain of lakes with willows.
52. Napparauq - Large rock outcrop land mark.
53. Kimiaqpaq - Large round foot hill at base of mountain range.
54. Iggisigruq - Highest peak of Monument - wrongly called Mt. Noak on map.
55. Tuqruq - Upper canyon of inland waterway's main creek - means narrow hallway-like Eskimo house entrance.
56. Sanningaruq - Sharp angled creek-ridge junction
57. Kungaayaaq - Lower Tuqruq canyon
58. Kungaugpaq - Upper Tuqruq canyon.
59. Qangainauraq - "Root" of Akulaaq lagoon.
60. Tikiqigiaiauchainaulik - Lake with rising high bank "finger".
61. Qaisugrauq - Flat topped mountain.
62. Aqargichaat - Mountain with willows attracting ptarmigan.
63. Igğavaun - Mountain ridge source of cooking stones for boiling water
64. Puktautaq - "Floating ridge."
65. Milukrauluq - Creek that is milky
66. Kimigruq - Rounded foot hill.
67. Taliqut - Arm (palisades).
68. Nuiľaat - Outlet area of Krusenstern Lagoon.
69. Ingngitkalik - Cliff face on Krusenstern Lagoon.
70. Tiritchiliq - Large lake purported to have Alligator like monster
71. Iqpiigralik - High-cut bank on lakes.
72. Narvaq - Large distinctive lake, campsite.
73. Sigluaruraliq - Recent origin. Name for the place of a cool storage house made for one good berry picking year.
74. Iviľuqpalik - Creek of large clams.
75. Kiasik - Shoulder blade shaped late spring snowbank
76. Qayangauq - Qayaq shaped late snowbank
77. Igalauraq - Window (slab rock that looks like window).
78. Tigiaqtaqlik - Snowbanks cause weasel like appearance.
79. Umagaichaiq - Heart shaped landmark
80. Aglinaqaq - Rock (young girl turned to stone)
81. Kirgaviq - Inland rock cliff where falcon nests.
82. Qaqagaruq - Mountain group.
83. Isingngaq - Jade Creek.
84. Nunnaqshaq - Land with lakes.
85. Nauyauraq - Shelter cabin (Gull)
86. Qaiqsgugrauyaq - "young" flat top mountain.
87. Iglauyaq - Place of going through (Pass).
88. Aquulisaq - End mountain.
89. Iggaichaiq - Small or new timbered mountain.
90. Nasiqsaugvik - Mountain to scan from.
91. Miluraq - Breast shaped rocky knolls.
92. Sanningaruq - Creek-ridge sharp angle (campsite).
93. Mamailaq - Strong smell-mountain-creek.
94. Iggiqpaq - Big mountain.
95. Napaktuqtuchauraq - Small Napaktuqtuq.
96. Kipisunaq - Very crooked slough (Paul's slough).
97. Qauglaqtaqpaq - Draining-dripping area (big).
98. Qauglaqtaauraq - Draining-dripping area (little).
99. Qitiqliqaugaq - Middle slough.
100. Saliqaugaq - Toward ocean, slough.
101. Sanningyiq - Sharp river bend (Noatak canyon)
102. Amaktut - Rock River bluff "like baby on back."
### APPENDIX 4

Commercial and Subsistence Salmon Catches, Kotzebue District, 1914-1976

<table>
<thead>
<tr>
<th>Year (1)</th>
<th>Chum (2)</th>
<th>Other (3)</th>
<th>Total</th>
<th>Chum</th>
<th>Combined Catches</th>
</tr>
</thead>
<tbody>
<tr>
<td>1914</td>
<td>8,550</td>
<td></td>
<td>8,550</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1915</td>
<td>4,750</td>
<td></td>
<td>4,750</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1916</td>
<td>19,000</td>
<td></td>
<td>19,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1917</td>
<td>44,612</td>
<td></td>
<td>44,612</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1918</td>
<td>27,407</td>
<td></td>
<td>27,407</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1957 (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>298.430</td>
</tr>
<tr>
<td>1962</td>
<td>129,948</td>
<td>127</td>
<td>130,075</td>
<td>70,283</td>
<td>200,358</td>
</tr>
<tr>
<td>1963</td>
<td>54,445</td>
<td>143</td>
<td>54,588</td>
<td>31,069</td>
<td>85,657</td>
</tr>
<tr>
<td>1964</td>
<td>76,499</td>
<td>5</td>
<td>76,504</td>
<td>29,762</td>
<td>106,266</td>
</tr>
<tr>
<td>1965</td>
<td>40,034</td>
<td></td>
<td>40,034</td>
<td>30,500</td>
<td>70,534</td>
</tr>
<tr>
<td>1966</td>
<td>30,764</td>
<td>1</td>
<td>30,765</td>
<td>35,588</td>
<td>66,353</td>
</tr>
<tr>
<td>1967</td>
<td>29,400</td>
<td></td>
<td>29,400</td>
<td>40,108</td>
<td>69,508</td>
</tr>
<tr>
<td>1968</td>
<td>30,384 (5)</td>
<td></td>
<td>30,384</td>
<td>20,814</td>
<td>51,198</td>
</tr>
<tr>
<td>1969</td>
<td>59,335</td>
<td>48</td>
<td>59,383</td>
<td>29,812</td>
<td>89,195</td>
</tr>
<tr>
<td>1970</td>
<td>159,664</td>
<td></td>
<td>159,664</td>
<td>28,486</td>
<td>188,150</td>
</tr>
<tr>
<td>1971</td>
<td>154,956</td>
<td>1</td>
<td>154,957</td>
<td>23,959</td>
<td>178,916</td>
</tr>
<tr>
<td>1972</td>
<td>169,664</td>
<td>3</td>
<td>169,667</td>
<td>11,085</td>
<td>180,752</td>
</tr>
<tr>
<td>1973</td>
<td>375,432</td>
<td>5</td>
<td>375,437</td>
<td>18,942</td>
<td>394,379</td>
</tr>
<tr>
<td>1974</td>
<td>634,479 (6)</td>
<td>48</td>
<td>634,527</td>
<td>26,729</td>
<td>661,256</td>
</tr>
</tbody>
</table>

(1) There was no commercial fishing during 1919-1961
(2) Catches for 1914-1918 from pack data only; numbers of chums estimated at 9.5 per case (#48) and 34 per barrel.
(3) Mostly pinks, but includes king salmon and red salmon
(4) Estimated mean annual catches prior to 1957 (study by Raleigh)
(5) Corrected from 1968 annual report due to addition of late catches.
(6) Includes 6,567 chum salmon harvested from Deering experimental fishery.
<table>
<thead>
<tr>
<th>Year</th>
<th>Commercial Catch</th>
<th>Subsistence Catch</th>
<th>Combined Catches</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chum</td>
<td>Other</td>
<td>Total</td>
</tr>
<tr>
<td>1975</td>
<td>563,345</td>
<td></td>
<td>563,345</td>
</tr>
<tr>
<td>1976</td>
<td>159,796(7)</td>
<td>2</td>
<td>159,798</td>
</tr>
</tbody>
</table>

(7) Includes 10,704 chum salmon harvested from Deering experimental fishery.
### Appendix 5


<table>
<thead>
<tr>
<th>Year</th>
<th>Commercial</th>
<th>Vessel</th>
<th>Set Gill Nets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1962&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>128</td>
<td>88&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>102 (11,350 F)</td>
</tr>
<tr>
<td>1963</td>
<td>110</td>
<td>59</td>
<td>60 (8,550 F)</td>
</tr>
<tr>
<td>1964</td>
<td>81</td>
<td>48</td>
<td>52 (5,500 F)</td>
</tr>
<tr>
<td>1965</td>
<td>61</td>
<td>43</td>
<td>45 (5,450 F)</td>
</tr>
<tr>
<td>1966</td>
<td>64</td>
<td>44</td>
<td>44 (4,650 F)</td>
</tr>
<tr>
<td>1967</td>
<td>54</td>
<td>32&lt;sup&gt;(4)&lt;/sup&gt;</td>
<td>30 (3,600 F)</td>
</tr>
<tr>
<td>1968</td>
<td>90</td>
<td>59</td>
<td>59 (6,750 F)</td>
</tr>
<tr>
<td>1969</td>
<td>77</td>
<td>52</td>
<td>52 (5,400 F)</td>
</tr>
<tr>
<td>1970</td>
<td>160</td>
<td>82</td>
<td>82 (9,800 F)</td>
</tr>
<tr>
<td>1971</td>
<td>198</td>
<td>87</td>
<td>91 (11,100 F)</td>
</tr>
<tr>
<td>1972</td>
<td>202</td>
<td>87</td>
<td>101 (13,100 F)</td>
</tr>
<tr>
<td>1973</td>
<td>390</td>
<td>136</td>
<td>156 (19,250 F)</td>
</tr>
<tr>
<td>1974&lt;sup&gt;(5)&lt;/sup&gt;</td>
<td>401</td>
<td>174</td>
<td>191 (26,500 F)</td>
</tr>
<tr>
<td>1975&lt;sup&gt;(6)&lt;/sup&gt;</td>
<td>551</td>
<td>258</td>
<td>275 (37,050 F)</td>
</tr>
<tr>
<td>1976</td>
<td>512</td>
<td>219</td>
<td>225</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>3,079</strong></td>
<td><strong>1,468</strong></td>
<td><strong>1,565</strong></td>
</tr>
</tbody>
</table>

<sup>(1)</sup> Includes Norton Sound district fishermen and their gear who also fished in Kotzebue

<sup>(2)</sup> Includes 4 tenders.

<sup>(3)</sup> Includes 2 tenders.

<sup>(4)</sup> Includes 2 tenders.

<sup>(5)</sup> Includes 7 commercial, 4 vessel and 6 (300 fathoms) set gill net for the Deering experimental commercial fishery

<sup>(6)</sup> Includes 21 commercial, 8 vessel and 8 (400 fathoms) set gill net for the Deering experimental commercial fishery.
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PLACE NAMES - NUMBERS 1 TO 110
SUMMER OUTBOARD BOATING TRAILS

SCALE: 1 MILE = 1 INCH

ARCTIC OCEAN