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THE ESKIMO HUNTER AT POINT HOPE, ALASKA:

SEPTEMBER, 1959, to MAY, 1960

9/59 - 5/60

by

Don Charles Foote

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Submitted to the
United States Atomic Energy Commission
in compliance with
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June, 1960

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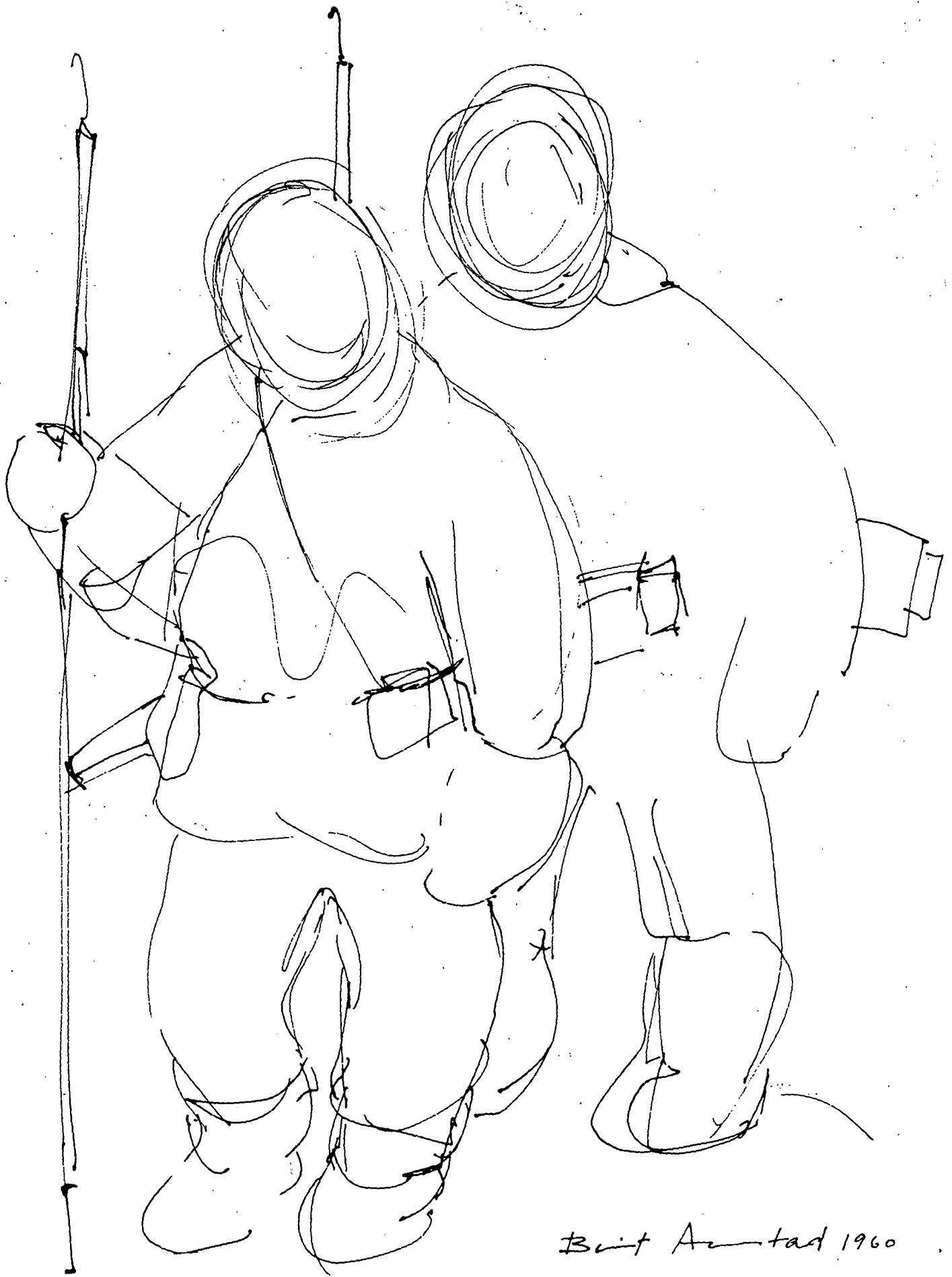
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INTRODUCTION

During the past twelve months of research and field work, no evidence has been found which would alter the basic facts and findings presented in my preliminary report of November, 1959, entitled: "The Economic Base and Seasonal Activities of Some Northwest Alaskan Villages."

In the present report, I have attempted to synthesize a significant portion of nine months of continual field work into a paper which will prove valuable to the Committee on Environmental Studies for Project Chariot, as well as to the numerous members of the Project Chariot biological program who have requested information pertaining to the Point Hope area.

D.C.F.

Point Hope, Alaska

July 15, 1960

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Research Methods and Remarks

Residence was maintained at Point Hope, Alaska, from September 3rd, 1959, to date, and field data were compiled for every day during that period.

All statistics and accounts used in this report are based upon observations of the author, or upon those of at least two other observers. In respect to the statistics on game, the hunter's name, the date and location of kill and often the sex of the animal have been recorded. All data pertaining to travel include the sled driver's or boat captain's name, and the names of his passengers. Because they are based upon known facts only, the statistics used in this paper necessarily represent the minimum for the seasons' activities. In the author's estimation, however, the report records 100% of the large game animals killed, about 80% of the seals and fish taken, about 80% of the travel data and perhaps 60% of the kill of birds and small land animals.

Since data and/or specimens have already been supplied the following interested agencies, the author has omitted or abridged his treatment of the work: terrestrial mammals, caribou, botony, human ecology and avian studies, University of Alaska; marine mammals, Arctic Health Research Center; coastal geomorphology, USGS; daily weather reports, USWB; river fishing and small marine organisms, University of Washington; background radiation studies, Hanford Laboratory; wildlife harvest reports, Alaska Department of Fish and Game.

The inclosed place-name map of northwest Alaska was compiled for the area of most interest to other Project Chariot research workers. Phonetic spellings are the author's, and they are intended to approximate the dialect of those Eskimos most intimately connected with each region. Hence, Noatak names are used near Noatak, but not near Point Hope. All place names used in this report conform to the usage noted on the map.

The author wishes to express his gratitude to Mr. Joseph Towksjhea of Point Hope, Alaska, for his unfailing assistance throughout the year.

PART I

AUTUMN

Autumn began, in 1959, with the departure from Point Hope of the annual supply ship MS Northstar on September 9th. Autumn lasted until all fishing parties and caribou hunters had returned to the village, on November 15th and 18th, respectively.

During the autumn season, activities at Point Hope fall into three general categories. In the village proper, the inhabitants make repairs on their houses and engage in the normal preparations for winter. Along the lagoons and beaches of Tigaraq Peninsula,¹ hunters range for ducks, walrus, seal and caribou, as well as for driftwood. Caribou hunters enter the Kukpuk River area, where fall fishing camps are also established and manned.

Kukpuk River

Occupation of the river fishing camps, at Eetiblaeruk, Kukpuk and Ogsaghaek, is an unique activity for Point Hope people, since it is the only season of the year when large numbers of men, women and children take up residence inland from the sea coast. Apparently this is a traditional migration, based upon older hunting patterns which brought numerous Tigaraqmiut² families to the Kukpuk and Eepeevik Rivers for fall and winter caribou hunting.

In current years, fishing and hunting on the Kukpuk River fulfill a variety of important needs in Point Hope life. The catch of fish, caribou, ptarmigen and land animals, and the harvest of berries and plants, assure a supplement to the diet of marine mammal meat which is sure to prevail from mid-November until early or mid-January. At the same time, this inland activity guarantees a constant and plentiful source of food, during a season when seals and walrus appear along the coast only sporadically, and seldom in large numbers.

Three types of persons can be identified on the Kukpuk River in the fall, and they may be categorized according to their motivation for travel, First, there are older people, who assume semi-permanent residence in the

1. The term Tigaraq Peninsula will be used in this Report to denote the entire land area of the Kukpuk Delta and Point Hope.

2. The term Tigaraqmiut refers to residents of Point Hope prior to 1850.

area for periods ranging from three to six weeks. They are joined by a second group of young married couples, who may visit for a few days or a few weeks. Thirdly, the caribou hunters may be counted: they travel alone or in parties up to four or five men in size. These hunters usually over-night at a fish camp, but seldom stay for more than three days. Frequently, men already in residence on the river will accompany the hunters further inland to the caribou herds.

Travel

Until fresh and salt water lagoons and streams and rivers freeze, skin boats powered by outboard motors are the primary means of transportation. On the Kukpuk River the first boats arrived on September 17th, 1959, and the last departed on October 6th. Ice prevented one boat from returning down river, and it was left at Eetiblaeruk until the following April. In all, there were 17 boat trips to and from the river camps, for a total of 2028 passenger miles.

Dog teams, although in use year around near Point Hope, were not used inland until October 9th. They continued to ply between the fishing camps and the village until November 15th. During this six-week period, 116 dog team trips were made along the Kukpuk River, for a total of 4700 passenger miles. The greatest single day's sledding was done on October 20th, when 18 teams traveled 1195 passenger miles or 820 geographic miles.

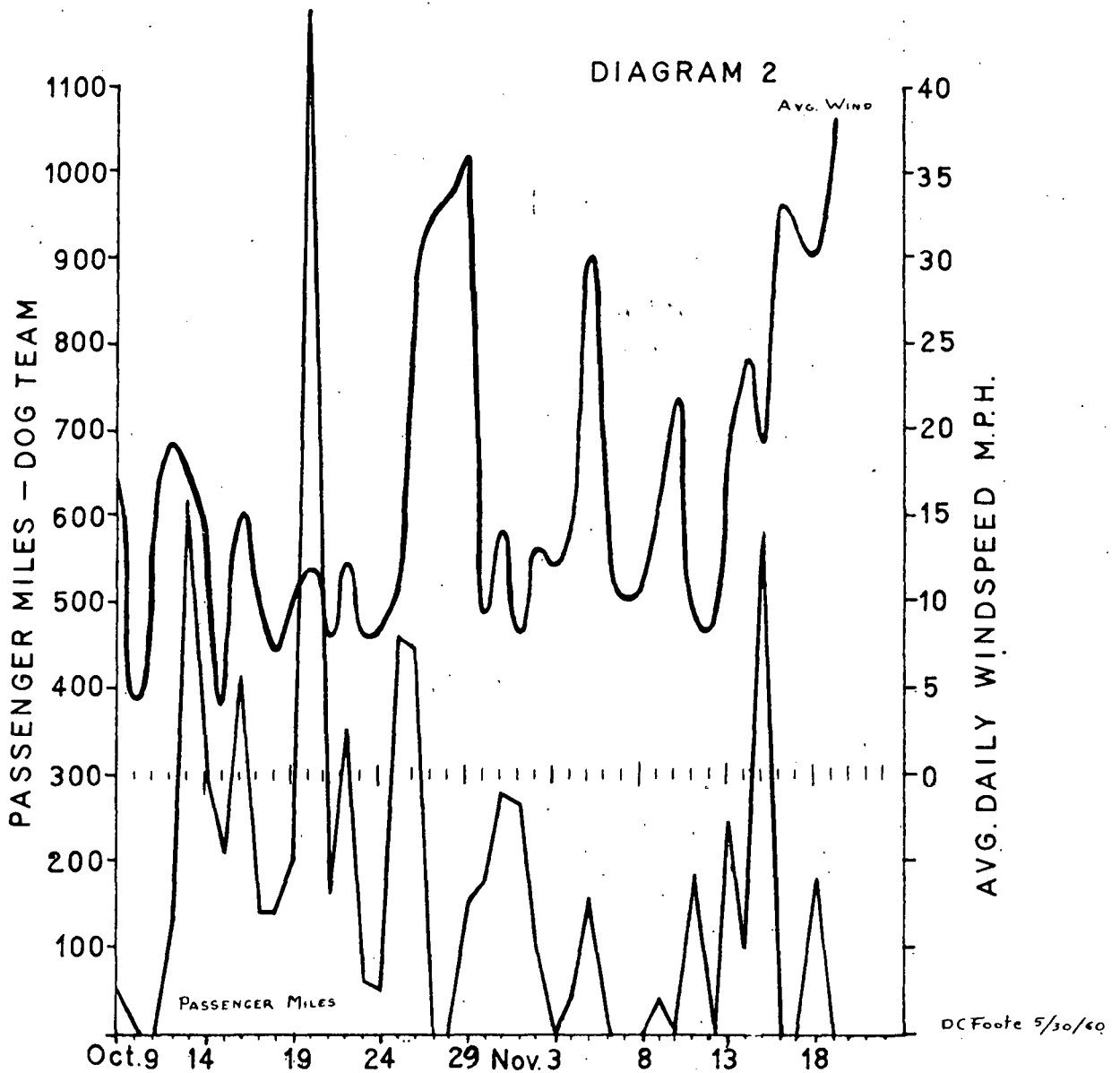
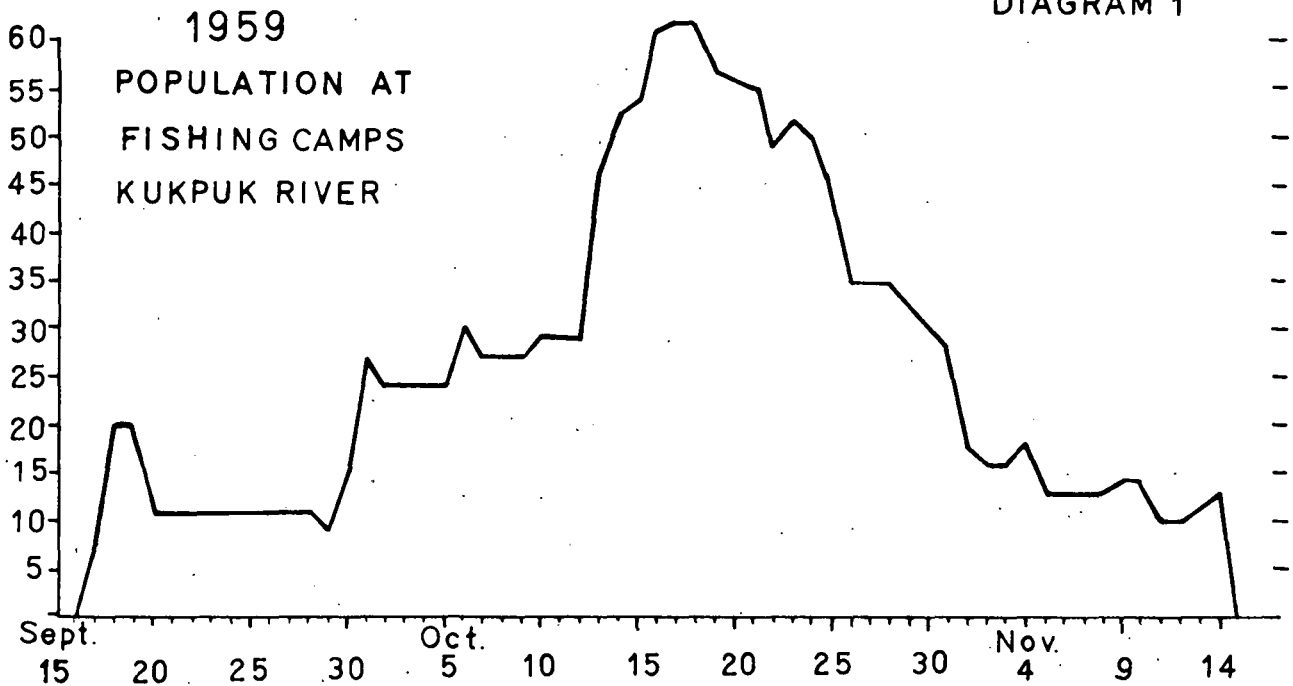
Unlike other seasons of the year, autumn dog team trips to the Kukpuk River are often a family affair. A little more than 50 per cent of all sleds traveling inland during October and early November, 1959, had one or more passengers; usually a woman, child or older family member.

Most Point Hope inhabitants prefer to limit their inland activities to the period between freeze-up and the first severe winter storms. In 1959, from October 9th, the onset of dog team use, to October 26th, when the first winter storm struck, 69 per cent of all inland sledding took place. This fact is graphically portrayed in Diagrams One and Two.

Some dog team trips are probably motivated by a shortage of dog food. Because Point Hope sled dogs are raised on marine mammal meat, it is often difficult or impossible quickly to introduce a new food like fish. Besides, fresh water fish is a preferred human food at Point Hope. Caribou is accepted by the dogs, but, again, the hunters choose to save this meat for household use. Thus, it is common practice to return to the village for dog food when the 3-5 day supply taken inland is exhausted.

Fresh Water Fishing

From September 17th to November 15th, 1959, an estimated 1173 fishing-days were spent on the Kukpuk River by Point Hope adults. Although children take part in fishing, they are usually of pre-school age, and their contribution to the over-all season's catch is not significant. The only



real limiting factors to daily fishing are the periodic absence of fish or their reluctance to strike a lure. Abundant water from the river and fuel from dry willows keep the camps well supplied, and fishing continues in any type of weather, even when high winds force the fishermen to crawl from one spot to another.

Fishing techniques are of two types: jigging with home-made, unbaited and unbarbed "Eskimo" hooks, cleverly constructed from ivory, bone and metal; and netting with light-weight gill nets with an average mesh of ca. $1\frac{1}{2}$ inches.

Before river ice forms, hooking is done from the bank with short, wooden poles about 4 or 5 feet long. Nets are set across narrow channels or calm backwater eddies. Once there is a thickness of ice sufficient to support a man (October 10, 1959), fishing takes place through chopped holes or in open, swift-moving water. Nets are strung under the ice by lowering and retrieving through a system of holes.

About 90 per cent of those people fishing on the Kukpuk River use hooks. Gill nets are less popular although certain individuals seem to prefer them. At Kukpuk the first net was set on September 18th and during late October at least four nets were in use at that camp. One net was possibly employed at Ogsaghaek in mid-October, and one at Eetiblaeruk.

Salmon do not comprise a large percentage of the yearly take because fishing presumably begins after the major salmon runs are over, salmon are not readily attracted or secured on the eskimo hooks, and the net mesh is gauged to fish types smaller than salmon. In late October, the ratio of trout-grayling to salmon, netted at Kukpuk, was 15:1.

Success in fishing varies from place to place and day to day. At Eetiblaeruk, from October 1st to October 20th, the rate of catch was about 12.5 lbs/day/adult. At Kukpuk, from September 17th to October 17th, the average was 5 lbs/day/adult, but from October 18th to October 21st, it increased sharply to 14.3 lb/day/adult. Fishing at Ogsaghaek, from September 17th to September 20th, was 18 lbs/day/adult.

The importance of individual skill is also evident. Two persons at Ogsaghaek averaged, from October 3rd to October 19th, 15.6 lb/day, while another Ogsaghaek fisherman hooked 29.4 lb/day during the same period.

For the entire season, September 17th to November 15th, the average catch was 12.8 lb/day/adult, for a total of about 15,000 lbs. of fish. 1959 was considered a poor fishing season, however, since the river water was uncommonly low.¹

1. Fish caught on the Kukpuk River in 1959 did not meet the immediate village demand, and at least 800 or more pounds of Kivalina fish were imported by air freight.

Plants and Land Animals

Plant gathering, which normally occurs in early autumn, was at a minimum in 1959, because traditional berry-picking sites were devoid of fruit. About 5 gallons of blue berries were harvested in the vicinity of Ogsaghaek during mid-September, and some wild onions were picked at Kukpuk.

Among the willow thickets of the Kukpuk River, large numbers of ptarmigen are found. These birds, already in their white winter plumage before the first snows, were seen in flocks of 200 or 300. Since caribou hunters traveling by dog team seldom, if ever, carry a shotgun, ptarmigen hunting can be considered an activity of boat parties and resident fishermen. More than 200 birds were killed during the fall season; a number less than 10 per cent of the ptarmigen population as estimated at Eetiblaeruk-Kukpuk on September 18th-21st, and Kukpuk-Ogsaghaek on October 19th-20th.

During middle and late September, fresh brown bear tracks were seen near Eetiblaeruk, Kukpuk and Ogsaghaek, but only one animal was killed. Wolverines and foxes were numerous, but none was killed.

Squirrels are common near the Kukpuk camp, but only 40 to 50 were trapped and shot. Mice are very plentiful at all the fishing cabins, where their presence provides a constant source of conversation and anxiety.

Fall Caribou Hunting

Autumn caribou hunting on the Kukpuk River began on September 18th when men from two boat parties walked inland from Ogsaghaek. Although no animals were taken, a successful kill was made on September 21st by Kotzebue residents flying a light plane near the confluence of the Eepeevik and Kukpuk Rivers.

Concentrated, overland caribou hunting by dog team began on October 14th and ended on November 18th. During this 36 day period, 26 hunters killed 98 caribou, for an average sled load of 3.76 animals.

It is common practice for several men, usually of the same age group or family, to form a hunting party. Ten such groups did all the hunting in October-November, 1959. The average round trip was 160 to 180 miles long, and the hunters camped at least one night near the caribou herds.

Summary of Caribou Hunting: October 14th-November 18th, 1959

<u>No. of hunters</u>	<u>Date of kill</u>	<u>Location of kill</u>	<u>No. of animals</u>
6	10/18-19	Suklowlik-Kukpayak	31
2	10/21	Eepeevik-Kukpayak	9
3	10/23	SE of Suklowlik	12
2	10/23	Alloulikruk	8
1	10/23	Suklowlik Mt.	4
3	10/24-25	N of Angmarok Mt.	6
5	10/26-27	N of Kukpayak Cr.	20
1	10/31	N of Suklowlik Mt.	2
1	11/1	N of Suklowlik Mt.	1
<u>2</u>	<u>11/16</u>	<u>Suklowlik-Kukpayak</u>	<u>5</u>
26			98

Hunting equipment and supplies used by the caribou hunters differ little from man to man. About 80 per cent of all sleds used are light-weight basket types, which are well suited to inland travel on relatively level terrain. The other sled type is a modified design of the traditional Eskimo kamotik, with solid wood runners and a low center of gravity.

Some of the additional equipment carried includes: two-burner Coleman stoves, Coleman lanterns, sleeping bag, caribou skin mattress, one or two boxes of ammunition, gasoline, extra socks, gloves, light-weight pants and perhaps an extra parka. Food usually consists of coffee, tea, salt, sugar, rice or noodles, oatmeal, crackers, sour dough biscuits or bread, meat and seal or whale oil.

When traveling as a hunting party it is usual for members to decide, before departure, upon what items shall be shared. One man might bring a tent while another will contribute the stove, but both will share the cost of gasoline for the stove and light.

Each man is responsible for the maintenance of his team, and, as already mentioned, it is usual to carry dog food sufficient for a 3 to 5 day trip. Dogs and men frequently share the same meat supply.

Perhaps 40 per cent to 50 per cent of Point Hope's hunters own

telescopic sights, although not all men use them the year around. These sights are not well suited to caribou hunting by dog sled, since any sharp blow will dislodge the telescope and cause a high degree of inaccuracy in shooting, especially at long range. Either mounted telescopes or binoculars, however, are indispensable for spotting caribou herds.

When hunting as a group, all game is evenly divided between party members regardless of an individual's hunting success.¹ Should a lone hunter or small party join with another group, they are considered hunting partners, and are entitled to an equal share of all animals killed during their stay. It is also customary, when a group kills several caribou, to consider the animals as shot by all men. Unless an Eskimo is hunting alone one never inquires about how many caribou he shot, but rather about how many he loaded on his sled, or the total number of animals killed by his party.

In fall, caribou hunters are influenced by three factors. First and foremost, is the location of the animals. For the past decade or so large numbers of caribou have migrated through the middle Eepeevek and Kukpuk Rivers, during September to November. The animals are usually on a southerly route destined for the headwaters of the Kivalina and Wulik Rivers.

Hunting success by Point Hope men will vary from year to year, according to the route taken by the migrating caribou. In 1959, about 10,000 or more caribou crossed the middle Eepeevek, but only small bands reached as far seaward as the traditional hunting area of Angmarok Mt. and Kukpayak Creek.

Total absence of the caribou from the middle Kukpuk River will draw the hunters northward along the Eepeevek or upper Kukpuk River for about 2 or 3 days' traveling; the limit of available dog food.

Relatively smooth travel routes are the second important factor in fall caribou hunting since snowfall, during September-November, is rarely extensive inland from Point Hope. A lightly loaded basket sled can be used with little difficulty or risk of damage on frozen, tundra hummucks, down steep river cut-banks and across river-bed boulders and pebbles. However, the same sled, loaded with 1000 lbs. of meat and equipment, is not usually risked on bumpy or difficult terrain. Snow-free areas are avoided, because most teams are unable to pull a heavily-weighted sled an appreciable distance without a smooth running surface.

For these reasons most autumn travel routes are over water. Before freeze-up, boats are used. After freeze-up, sled trails follow lagoon and

1. Upon request, the returned hunter may supply any village family with meat. One hunter in early October, 1959, had his sled almost completely emptied by village women, who flocked to his home within minutes of his arrival.

lake shore ice, river and creek bottoms and the incipient kaimoo of the ocean beaches.

The kaimoo is of the utmost importance to successful fall, winter and spring travel. During autumn, and before the appearance of pack ice, the ocean surface water remains above freezing, although air temperatures may decrease to below zero. In a short time the surface beach gravels attain a temperature equal to the air, and, should this be below the freezing point of salt water, the kaimoo forms.

As each successive wave slides over the beach, a thin film of water and gravel remain frozen. This process continues until a level platform of sea ice and stratified gravel builds up to heights of 6 feet above sea level. In its final stage, sea water with little or no gravel washes over the kaimoo's top, and undercuts the thawed and loose gravel below the kaimoo's seaward edge.¹ The finished formation is a glazed, level highway 10 to 30 feet wide, usually decked with wind-packed snow in winter.

River ice formation is also important in overland travel. Initially, the Kukpuk River began freezing before September 27th, but rain and thawing temperatures set in on September 28th, and lasted until about October 8th or 9th.

As the river freezes, the flow of water over shallows is often blocked, and over-ice flooding can take place. In time, smooth ice will reach from one river bank to the other, completely covering sand and gravel bars which were exposed during the low water of fall.

At other spots, the release of dammed-up water will allow the river ice to collapse into jumbled masses of ice blocks, or leave a raised dome of ice over a shallow spot. Such rough ice was not prevalent on the river during October, 1959, and traveling conditions were excellent.

However, fresh water ice can break without warning, and in the case of moving river water, open holes can occur throughout the winter. For these reasons traveling parties attempt to follow closely the most recent and well-used river trails.

Wind is the third limiting factor to Point Hope fall caribou hunting. Although the animals are easily approached in high winds, the hunter is greatly hindered by blowing snow and sand. Often a dog team will refuse to face such a wind, and must be led by hand. In the case of smooth ice traveling, it is difficult to keep even a loaded sled upright and steered in the desired direction. Lastly, winds gusting to speeds of 60 or 80 m.p.h. can prevent the accurate aiming of a rifle and correct compensation for the bullet's drift downwind.

1. The extent of gravel carried across the well-developed kaimoo has not yet been determined.

Since traveling is an individual decision, it is impossible to state categorically what extremes of weather will prevent a Point Hope hunter from moving. In most cases, however, it can be assumed that hunting parties, provided with adequate camping gear, food and dog food, and not motivated by an emergency, will erect a camp in stormy weather with winds of 50-60 m.p.h. and over. Hunters with ample supplies, but who have not yet obtained a kill of caribou, are more apt to camp throughout a storm than those who are returning to the village with loaded sleds. Camps are usually constructed in spots sheltered from the direct wind, but exposed enough to prevent an accumulation of drifting snow over the tent and dog team.

The after effects of high winds both hinder and help inland travel near Point Hope. Wind-packed snow in the smaller creek bottoms provides excellent dog team routes, while the snow-free surfaces of wider rivers, lakes and lagoons prevent dogs, men and sleds from obtaining the adequate friction necessary for easy traveling. In addition, the occurrence of packed snow on the windward sides of small depressions offer excellent camp sites. Snow blocks, about two feet square, are cut to form a hole up to four feet deep, the size of a tent. The blocks are used as a wall around the hole, which is covered with a tent or canvas sled cover.

In the Augotorux Valley wind-packed snow first occurred during October 26th-28th, 1959, and lasted until at least April 15th or April 20th, 1960. Except for the slopes and bottoms of creeks and streams this packed snow did not cover the tundra tussocks. It did deck the uplands with a snow cover 5 to 7 inches thick and solid enough to support a sled.

Nearly all caribou hunting in the fall of 1959 followed a similar pattern. Hunting parties, lightly loaded, stopped overnight at the Kukpuk River camps to fish, relax and exchange information on the movement and whereabouts of the caribou.

From the fishing camps the parties took a direct course along the Kukpuk River ice, crossing over the uplands between large meanders. Frequent stops were made to boil tea, to scan the local area for caribou and, sometimes, to fish. All hunters eventually centered their activities on the Angmarok-Suklowlik Mt. area, with camps along Kukpayak Creek.

A camp can be erected before or after the actual hunting takes place, depending upon the lateness of the day, weather and proximity of the caribou. Some hunters will hunt from a base camp, others will travel until a kill is made and establish camp near the butchering site.

Caribou are sought by dog team and binoculars. Once a herd is spotted, the hunters attempt to move their teams to a concealed point, downwind from the animals, but within reasonable walking distance. During this part of the stalk, it is important to prevent the caribou from scenting men or dogs, and it is equally important to prevent the dogs from smelling or seeing the caribou. Eskimo dogs become almost uncontrollable in the proximity of live caribou. For this reason, when the hunter finally proceeds on foot, he leaves his team well secured with

both the sled and lead dog firmly anchored.

The hunter walks upwind toward the caribou, utilizing all available cover. Given a suitable wind, perhaps 10 to 20 m.p.h. and terrain which provides adequate concealment, a clever hunter can approach to within 20 or 30 yards of feeding or resting caribou.

Before the actual shooting commences, the hunting party may spread out, especially in those directions which the caribou might naturally follow when frightened.

Point Hope hunters, as those of Noatak and Kivalina, prefer caribou does and fawn during the autumn hunt. Male animals are still in rut at this time, and their meat is considered undesirable.¹ On the other hand, when a small band of animals is stalked or conditions indicate that further hunting may prove poor, selective shooting is not practiced, and as many animals as needed are killed, regardless of sex. As a rule, however, even then large bucks are avoided.

When shooting the caribou, a hunter tries first for a killing wound in either the neck or shoulder. Nearly all Point Hope men carry weapons of sufficient caliber to insure an immediate kill, but the caribou is an extremely tenacious animal. Should the hunter be close enough, he can hear his bullet's impact, and he can shift targets without hesitation. At longer ranges, however, caribou may show no evidence of being struck except those animals which stop running and stand or walk slowly.

In most cases, the caribou are taken at ranges of 150 yards or less. The open or gently rolling landscape of the hunting area allows a hunter to follow possible wounded animals with his binoculars, and wounded animals can be quickly spotted. Some wounded caribou must escape detection or a second killing shot, but there is nothing to suggest that the frequency of this occurrence is augmented by Point Hope hunting methods or equipment. During October-November, 1959, only 2 or 3 known wounded caribou escaped capture.

At Point Hope, it is common practice to shoot only a sled load of animals, from 5 to 7 depending upon their weight. Exceptions to this rule usually occur during fall, when a hunter may cache excess meat at a near-by fishing camp. In October, 1959, one such cache was constructed at Ogsaghaek, but wolverines and foxes destroyed it before the hunter returned in early December.

A good hunter could, conceivably, exterminate many more caribou than he could transport, although this seldom happens. Frightened caribou tend to run in a rough column, led by one animal. Should this leader be struck or shy from a bullet fired in his path, the herd will commonly

1. An exception to this rule was in October, 1959, when a male caribou charged two Point Hope hunters who killed the animal in self defense. It was used as dog feed.

reverse its direction of travel. Thus, a hunter can keep the herd moving back and forth across a limited range of fire, and will have time to load and reload his weapon's magazine.

Butchering of the kills takes place at once. The caribou is first skinned completely; the head is included in cases where the skin is to be used for clothing. The carcass is then gutted and quartered. Of the entrails, the heart, kidneys and sometimes the stomach and liver are saved, while the lungs and intestines are discarded or used as dog feed. There is no fast rule governing the use of caribou, however, since what one hunter may save for his family, another may choose for his dogs.

If possible, the hunting party will divide its kill while the meat remains unfrozen. This allows the sled to be loaded in a neat, compact manner, with a low center of gravity, because each piece of warm, pliable flesh can be pressed to fit the sled's contours.

Sometimes, when a hunter wishes to prepare a special brand of raw, frozen caribou kok, the dead animal is left untouched under an insulating layer of snow for about one day. In this way the meat becomes flavored, but the carcass does not freeze hard enough to prevent butchering.

At the time of butchering, hunters may eat, raw, the heart, liver, kidneys and windpipe, and drink the blood. Fresh, unfrozen caribou meat and entrails are desirable dog food, especially if a large bull animal has been killed inadvertently.

When a hunter takes care in skinning, the preparation of an adult caribou carcass takes about 30 to 45 minutes, depending upon the temperature and wind. Although not a common practice, the kill can be gutted and quartered without skinning if conditions warrant a rapid butchering.

Because the stalk, kill and butchering is time consuming, it is usual to establish a camp at or near the kill site. Should a party be satisfied with its take, they will return to the village as soon as possible. Otherwise, hunting will continue until all members have sufficient loads. During October-November, 1959, hunting parties remained away from Point Hope an average of 4.57 days. The longest interval was 9 days; the shortest 2 days.

Fall Seal Hunting

Before the formation of winter sea ice, the best seal hunting occurs in the delta of the Kukpuk River, from Kanek to Eechowikto Sinyak.

Boats plying the coast and Tigara Lagoon, in search of ducks and driftwood, commonly hunt these river seals, which are almost always spotted, and bearded seals. On September 7th, 14th, 17th, 20th and 28th, 1959, seals were known to have been hunted from Eechowik to the first rapids of the Kukpuk River. In almost every case where seals were active, the surface water had no discernable taste of salt. On September 14th

and 28th, 1959, bearded seals were killed and successfully hooked, even though the animals sank immediately.

On October 10th, 1959, the first concentrations of ocean seals were reported two miles northeast of Point Hope. This was three weeks before the appearance of sea ice. Dog team travel to Sinyak began about October 20th, 1959, and from that date to November 15th, 1959, more than 36 trips were taken. The kill at Sinyak for this period was 29 spotted seals, 2 ringed seals and 5 seals lost due to sinking and stormy weather.

Sinyak is uncommonly rich in marine organisms which, apparently, are deposited there by a combination of ocean and river currents. But the late autumn hunting of seals, which congregate at this inlet or along the coast, is not always rewarding.

First, although dog team travel is possible on the Tigara Lagoon, the ice near Sinyak is thin or non-existent due to ocean waves and the river current. At some point, usually a mile or two before Sinyak, the traveler must cross onto the incipient kaimoo, with its gravel and pebble-strewn surface, or merely run his sled along sand and sparse patches of grass.

Secondly, hunters are attracted to Sinyak before the arrival of firm ocean ice, but this very absence of ice allows storm waves and swells to reach heights which can prevent the use of small, sled-borne sealing boats. In addition, among ocean waves a seal presents a difficult target, as its head is never motionless, it is often obscured by a wave's trough, and it blends harmoniously into the varying shades of moving water.

Thirdly, the lower salinity of Sinyak's moving water greatly increases the chances of a dead seal sinking. The action of currents can also carry the seal far from its point of disappearance.

Ocean ice first appeared on October 29th-30th, 1959, in the form of small ice cakes 6 to 8 inches thick and about two or three weeks old. Pack ice remained along the western horizon, at a distance of 10 to 15 miles.

The presence of ice always acts as deadening effect on the open ocean, and extensive wave action decreases. Once calm, the sea begins to freeze; first as an oily film, then as thin mush ice 1/8th to 1/4th inch thick. During the last days of October, 1959, temperatures averaged about 10 degrees F. above zero and two days after the arrival of ocean ice, Point Hope's north shore had an area of young ice 1/2 inch or more in thickness and about 2 miles wide.

With the sea ice, the ringed seals become more numerous. On November 2nd, 1959, at Point Hope, an estimated 300 seals were seen on top of young ice, as it moved slowly westward from Nuwuk.

During the first weeks of sea ice formation, however, seal hunting still retains many of the handicaps associated with the open ocean

and hunting at Sinyak. For example, at Point Hope, ice was forming or present from October 29th until November 4th, 1959, when winds up to 45 m.p.h. cleared the ocean and raised high waves.

Until the ocean is sufficiently covered with pack ice, and until new ice forming along the shore is thick enough to support a man, seal hunting is carried on from the kaimoo. In rough weather, with winds of 35 m.p.h. or above, the hunter has little chance of hitting his target or retrieving a kill. Should a killed seal be floating within 150 or 175 feet of shore, the hunter can retrieve it with his man-nak-toon, which is a hook, line and wooden float, even though ocean waves preclude the use of a small boat.

Although seal hunting took place from Sinyak to Pinguchaek from October 29th to November 15th, 1959, very few seals were killed or landed; the majority being spotted seals killed in the open ocean.

Summary of Seal Hunting: September 14 to November 15, 1959

<u>Number of hunters</u>	<u>Date of kill</u>	<u>Location of kill</u>	<u>Size of kill</u>
3	9/14	Eechowwik	1*
4	9/28	Eechowwik-Kanek	1*
2	10/22-3	Sinyak	3
1	10/24	Sinyak	1
1	11/2	Sinyak	4
1	11/3	Sinyak	2 (1 ring seal)
2	11/3	Nuwuk	2
1	11/4	Pingoo	2 (1 ring seal)
2	11/4	Sinyak	9
1	11/6	Nuwuk	1 (ring seal)
1	11/7	Sinyak	2
3	11/12	Sinyak	4
3	11/14	Sinyak	3
2	11/14	Nuwuk	2 (ring seal)
1	11/15	Jabbertown	1 (ring seal)
<u>1</u>	11/15	Sinyak	<u>1</u>
29			39

* bearded seal

Whales

Whaling is no longer carried on at Point Hope in the fall, but whales are often seen on their southbound migration during late August to early September or October. On September 9th and October 10th, 1959, whales were sighted from Point Hope. It has also been reported that these southward moving animals congregate off Cape Lisburne, in numbers up to 10 or 20, before again continuing their migration.

Walrus

From September through November, walrus can be seen and killed. On September 7th, 1959, a small walrus was killed on the beach by a boat party. Other walrus sightings were made on September 11th, October 8th, 12th, 20th and 25th, 1959. Three animals were killed, but one was lost in the surf.

The walrus is most easily obtained when the animal has "hailed out" on the beach, and can be shot or clubbed to death. In the water, a walrus presents a more difficult problem since it is usually capable of withstanding more than one medium sized (.243-.270 cal.) rifle slug.

Although walruses present a welcome addition to the village meat supply, they seldom appear in large numbers.

Birds

Common eiders, pin tails, old squaws, loons, brant, snowy owls and Glaucous gulls are the usual birds killed at Point Hope in the fall. More than 80 owls, 250 ducks, 20 loons and 30 gulls were taken during September and October, 1959.

Duck hunting was done at Nuwuk, Ipiutak, Jabbertown and Pingoo-Sinyak from early September to the first week of November, 1959. The hunters, armed with 16, 12 and 10 gauge shotguns, wait for the southward migrating flocks to sweep low over the beach or peninsula. Some hunters, using boats in search of caribou, walrus or drift wood, take ducks on the Tigara Lagoon, the Kukpuk River delta and at Sinyak.

Snowy owls are shot and trapped within walking distance of Point Hope village. Whale bone or wooden posts, about two feet high, are placed at numerous points along the beach ridges and spit. These posts are capped with a light, metal trap, which springs shut on any owl which might alight. One falcon was also reported captured in this manner during autumn, 1959.

Although Glaucous gulls are not commonly killed, their meat need not be considered a starvation ration. Hunting of the birds is done with shotguns, and most often during windy days when the gulls plane over the surf and beach. Under such conditions, the bird offers a steady, low

target, and the kill can be retrieved from land or shallow water.

Other Land Animals

Until late October, squirrel hunting was conducted at Ipiutak and Jabbertown-Beacon Hill, where old house sites and middens provide ideal burrows. Over 100 animals were retrieved during the fall of 1959.

Because the squirrel skin is desired for clothing, and the amount of meat obtained per cartridge is small, the .22 cal. long rifle, with or without telescopic sights, is considered the best weapon for squirrel hunting.

The squirrel is an extremely resistant animal, however, and unless the shot is through the brain or heart, most wounded squirrels will escape into their burrows. The ratio of animals lost to recovered may be as high as 1:5, depending upon the individual hunter's skill.

Other Activities

During September and October, 1959, many men in Point Hope village worked on the construction of a new National Guard Armory, and on unloading the MS Northstar and a Kotzebue Transport Company's barge. Some employment was also obtained at the local Episcopal mission. Several village households carried on major house repairs or improvements, and nearly all families prepared their homes for the coming winter. Such preparation consisted of cutting new sod-blocks for insulation, nailing tar paper to roof and walls and installing stoves left unused in summer.

On September 23rd, 1959, the community stopped pumping water from the village well to a central system of 24 50-gal. drums. During summer the consumption of water was about 1200 gallons per day, but once the direct flow of water into the village center stopped, the daily consumption decreased. From September 24th to November 9th or 10th, 1959, residents continued to haul water from the well, by hand or sled, a distance of about one quarter mile.

Ice, from Aiaugatak Lagoon and the small lakes behind Beacon Hill, was first carried to the Bureau of Indian Affairs school on October 31st, 1959. A week later, the ice on these lagoons and the Tigara Lagoon was reported to be over two feet thick. Between October 31st and November 10th, 1959, more than 60 dog team trips were made to the Aiaugatak-Beacon Hill area for drinking water ice. This traffic continued throughout the winter, until early May, 1960. The average Point Hope family uses more than two sled loads of ice per month from November to April.

Summary of Food Uses: Autumn

Fish: About 80 per cent of all fresh water fish are eaten frozen and raw. The skin and most of the entrails, except the eggs, are removed and not eaten. Twenty per cent of the fish are boiled with only the entrails removed. In most cases, all portions of the fish, frozen or boiled, are eaten, except the bones, tail and fins.

Caribou: About 50 per cent of the meat is eaten, raw and frozen, and 50 per cent well boiled, often as a soup or stew with brown gravy, rice or noodles. Rarely, caribou is fried in a flour and fat gravy. All parts of the animal can be considered edible.

Birds: All birds, skinned and cleaned, are eaten cooked; usually in a soup or stew. Some hunters salvage the duck down, others do not. Wings are commonly used as small brooms. Discarded innards are used as dog feed. In the case of gulls, the breast meat is eaten, the remainder utilized as dog food. Owls and loons are especially prized meats.

Land Animals: Bear and squirrel meat is eaten well cooked. Wolverine meat can be eaten by humans or dogs.

Walrus: Walrus meat is usually eaten well boiled. It can be used by humans or dogs.

Water: From late June until late October, 1959, the entire village used water from the community well, situated about one quarter mile southeast of Point Hope. After November 10th, 1959, the population used local snow deposits or ice from the Aiaugatak-Beacon Hill lagoons.

Statistical Summary: September 6 to November 15, 1959

Hunting: (Verified Kill)

Caribou	98	14,700 lbs.
Seals (ring and spotted)	37	3,700
Bearded seals	2	600
Walrus	3	1,300
Fresh water fish	ca. 150 sacks	15,000
Birds	ca. 580	500
Brown bear	1	400
Squirrels	ca. 150	<u>150</u>
	Total	36,350 lbs.

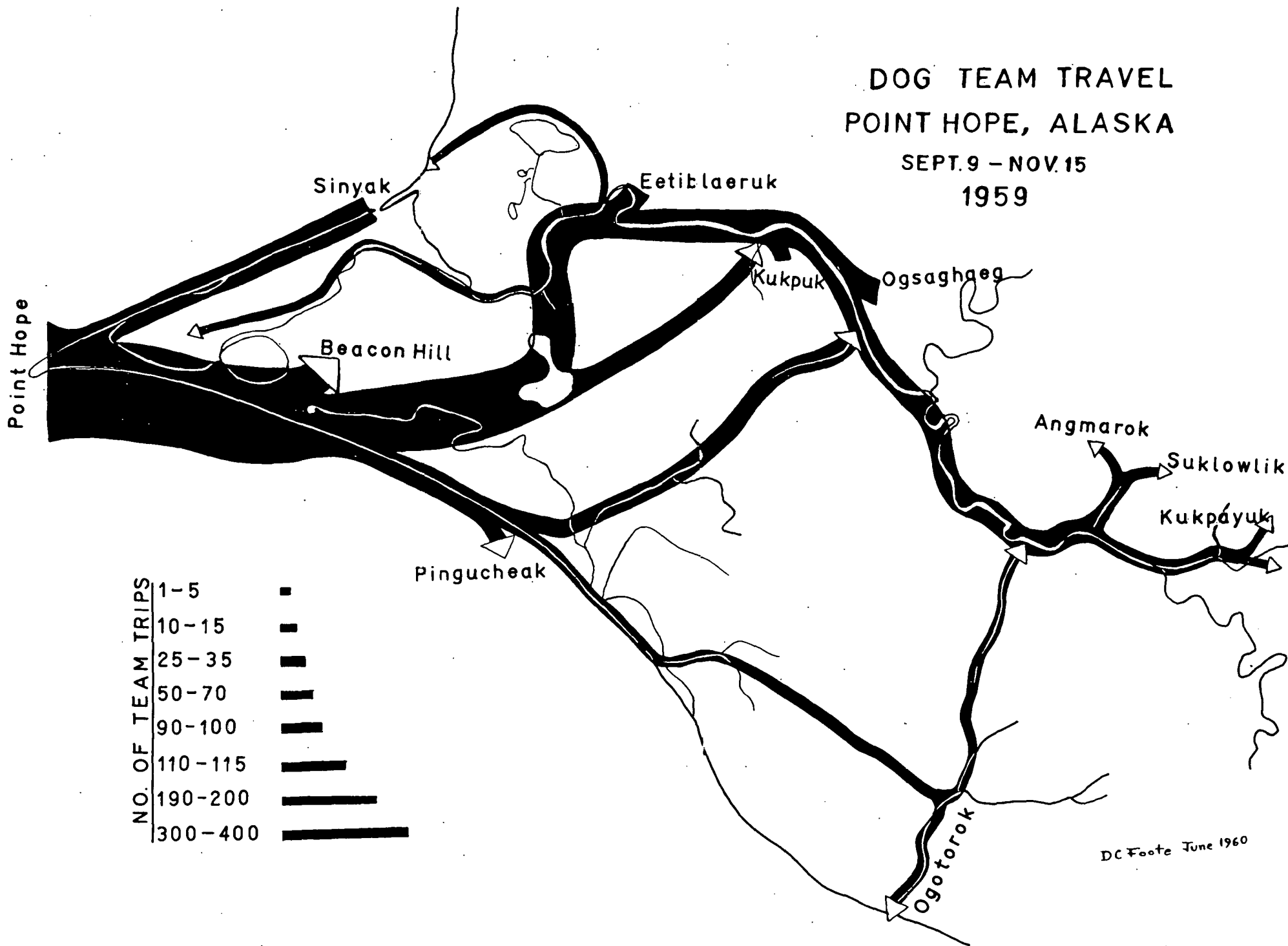
Travel: (minimum number of known trips)

	<u>No. of trips</u>	<u>Miles traveled</u>	<u>Passenger miles</u>
<u>Boat</u> (Sept. 6 - Oct. 10)			
Kukpuk River	17	562	2028
Other	<u>18</u>	<u>657</u>	<u>1643</u>
Total	35	1219	3671

Dog Team (Oct. 9 - Nov. 18)

Beacon Hill-Aiaugatak	69	1491	1491
Pinguchaek	12	415	415
Kukpuk River - Kukpayak	118	4885	7550
Sinyak-Pingoo	<u>36</u>	<u>790</u>	<u>790</u>
Total	235	7581	10,246

DOG TEAM TRAVEL POINT HOPE, ALASKA SEPT. 9 - NOV. 15 1959



PART II

WINTER-SPRING

Winter hunting at Point Hope centers on the sea ice and coastal highlands, because marine mammals, fish and caribou are the primary food sources during this season. For the convenience of this report, winter began on November 16, 1959, and ended on April 3, 1960.

Factors Effecting Hunting

Four factors limit winter hunting at Point Hope: religion, weather, ice and animal behaviour.

Religion

The great majority of Point Hope's population are members of the Episcopal faith who, in observance of Sunday, attend the local St. Thomas Mission once or twice (11:00 a.m. and 4:00 p.m.), and abstain from their daily occupation of hunting. If one counts the number of seals killed on Saturdays, Sundays and Mondays, from November 14, 1959, to May 1, 1960, this abstention is clearly evident: Saturdays 160 seals killed, Sundays 27 and Mondays 200. On Sunday, January 10th, 1960, 13 seals were killed. Otherwise Sunday hunting never exceeded a catch of 2 animals per day and no seals were killed on 15 of the 25 Sundays between mid-November and the first of May.

Weather

Winter at Point Hope is heralded by a series of savage wind storms in late October and November. December and January are characterized by an almost rhythmical pattern of northerly winds, calms and an infrequent southerly wind. As the sun returns, in late January and February, wind shifts to the south, with associated fluctuations in temperature, become more frequent and prolonged. Again in March and April, high winds from the north usher in spring, leaving the summer weather erratic and similar to the temperature zone.

Northeasterly kaiak gales, which can occur in any month, are most common from late October until late May. In nearly every case studied at Point Hope during 1959-60, these winds were characterized by a uniform sequence of events. The best examples of the kaiak storms were on October 26-29th and November 11-29th, 1959, and January 19-23rd, January 28th-February 1st, April 3-5th, April 11-14th, May 3-4th, and May 26-28th, 1960.

At Point Hope, a barometer, anemometer and maximum-minimum thermometers were installed on January 26, 1960. Prior to this date, wind speeds were measured by the Beaufort scale and the Episcopal Mission's venturi

anemometer. Temperatures were recorded from a single, partly sheltered thermometer.

The typical kaiak storm exhibits the following observable phenomena. Immediately before the storm, there is a period of clear skies, a high barometer and seasonal or above seasonal temperatures. During the darker winter months, a particular arch-like formation of aurora commonly appeared in the northeastern sky for several consecutive nights before the storm. The axis of this aurora was always NW-SE.

A light haze of thick, lenticular clouds over the eastern mountains were the first concrete indications of the storm. This cloud preceded a steady decline in air temperatures and barometric pressure, but was followed, a day or two later, by the appearance of thin, white, individual clouds along the mountain front to the east or northeast. These clouds, called kaiak by the Point Hope residents, because their shape resembles that of the small Eskimo skin boat, normally have an axis parallel to the coast or slightly NNW-SSE. Initially, they are stationary at elevations of 5000 to 6000 feet, while the remainder of the sky is clear. At this time a light northeast wind builds steadily in strength.

A good example of the kaiak storm began during the nights of January 26th and 27th, 1960, when an aurora arch appeared in the northern sky. At 1:00 p.m. on the 27th, the eastern mountains became haze covered, the temperature was +11 degrees F., the sky clear, wind NE at 8 m.p.h. and the barometer read 991.5 m.b., rising. After 1:00 a.m. on January 28th, the pressure began to fall, and between 3:00 p.m. and 4:00 p.m., when the first kaiak clouds formed, the pressure read 987.5 m.b., the temperature was -2 degrees F., the wind NE at 12 m.p.h. and the sky clear. At 10:00 p.m., the wind increased to 30 m.p.h. from the northeast, six hours after the first kaiak clouds. On the 29th, 30th, and 31st, temperatures and pressure continued to decline to a low of -22 degrees F. and 966.0 m.b. on the morning of January 31st. At this time, the highest wind velocities reached 70 m.p.h.

In the final stages, the wind gusts to high velocities, with longer and longer intervals of calm, the kaiak clouds move slowly westward until they reach the vicinity of Point Hope and descend to heights of about 2-3000 ft. and the pressure fluctuates over short periods of time, each low associated with an increase in wind speed. The storm ends with a rise in pressure and formation of a strato cumulus overcast. Within an hour or two, the wind speeds can decrease from 60 m.p.h. to 8 or 10 m.p.h. or less.

All Eskimo hunters at Point Hope are well acquainted with the kaiak gales, since these winds attain their greatest velocities between Capes Seppings and Lisburne, with Augotorux Creek as the storms' center, and offer the most adverse conditions which can hinder or prevent mid-winter hunting.

The kaiak gales have the characteristics of strong, katabatic (gravity) winds. Should this be true, one explanation for their occurrence lies in the topography northeastward from Augotorux Creek.

A natural, level lowland, walled in to the north and south by mountains and screened from Point Hope by the Lisburne Hills, extends from

Augotorux Creek to the Utukok and Kokolik Rivers' drainage divide. This lowland provides an excellent escape route for dense, cold arctic air which can be trapped in valleys north of the De Long Mountains.

With Augotorux Creek as the primary outlet for a katabatic wind, one would expect lower temperatures and higher wind velocities there than at Point Hope. This appears to be the case.

<u>Date</u>	<u>Augotorux</u>		<u>1900 hrs.</u>		<u>Point Hope</u>		<u>1900 hrs.</u>	
	<u>1300 hrs.</u>		<u>1300 hrs.</u>		<u>1300 hrs.</u>		<u>1300 hrs.</u>	
	<u>wind</u>	<u>temp.</u>	<u>wind</u>	<u>temp.</u>	<u>wind</u>	<u>temp.</u>	<u>wind</u>	<u>temp.</u>
<u>1960</u>								
Jan.27	26	0	25	+4	8	+11	18	+8
" 28	22	-8	32	-10	10	0	6	-2
" 29	43	-22	35	-23	28	-12	22	-14
" 30	43	-26	48	-26	39	-16	38	-17
" 31	64	-23	34	-18	40	-14	26	-14
Feb. 1	12	+3	11	-14	8	-2	4	-7

Apparently the kaiak gales are motivated by the great temperature differences which occur between the dry, cold inland air and warmer maritime air over open water and sea ice. The gales may also be triggered by the passage or proximity of migrating atmospheric disturbances, which can penetrate the Chukchi Sea by way of the Arctic Ocean or Bering Straits. In springtime, precipitation often falls on the inland mountains as snow, leaving the interior with a higher albedo as compared with the snow-free, coastal lowlands; again creating a seaward temperature gradient. April and May gales last only a day or two, however, presumably because the dense air source is less extensive than in winter.

The second important synoptic situation associated with Point Hope winter weather is the occasional mid-winter shift of northerly winds to the southern quadrant. This happened on January 12-13th, January 24-25th, February 15-19th and 21st and March 4th, 1960. Often this wind shift is evident in the upper clouds long before it is observed at the surface. Southerly winds aloft on February 4-6th and 14th, 1960, were all opposite the ground wind. On April 14th, 1960, the surface wind was 48 m.p.h. from the north, while upper clouds moved from the SSW.

Southerly winds bring above-normal temperatures, extensive cloud-cover and, nearly always, precipitation in the form of snow or rain. Temperatures increase so perceptibly, and remain so constant during these periods, that it can be assumed that a distinct air mass has migrated into the Chukchi Sea region. According to Point Hope residents, such anomalies in winter weather are the rule rather than the exception.

Among other significant meteorological phenomena observed at Point Hope, was the rapid surface cooling during calm, clear weather. On January 2, 1960, for example, the temperature at 1:30 p.m. was +5 degrees F., the wind E at 5 m.p.h. and the sky 8/10s covered. At 5:00 p.m. there was no wind, the sky was clear and the temperature 0 degrees F. In the next 7 hours, the thermometer declined to -21 degrees F., but returned to 0 degrees F. when a light, 5 m.p.h. wind arose on the morning of January 3rd. to destroy the inversion and carry in warmer, maritime air. During calm weather, temperatures have been known to go below -50 degrees F., but this is rare. It is under these conditions that the ice-free ocean can freeze solid enough to hinder drastically Point Hope winter seal hunting.

"Sea smoke" or condensation over open water, is common throughout the winter. In the proximity of this fog, vision is hindered, but at greater distances the presence of such smoke is an excellent indication of ice conditions. "Sea smoke," combined with the reflected pattern of water and ice on the ocean sky (ice blink), furnishes the experienced arctic traveler with a perfect map for 10 to 20 miles or more in each direction. A further aid to the surface traveler is a mirage effect produced by the air's temperature structure. On February 6, 1960, Iglaik Mountain was clearly identified from Point Hope, at a distance of about 110 miles.

Blowing snow is of particular importance at Point Hope. Light, dry snow will first begin to move at wind speeds of 10 to 15 m.p.h., but it adheres to a laminar flow about 8 to 10 inches thick. At wind speeds of 20 to 30 m.p.h. the snow reaches heights of 10 feet above ground level, and at 45 to 55 m.p.h., and above, the layer can be 100 to 200 feet in depth. During severe storms, the blowing snow is usually mixed with fine sand. Snow must also be transported great distances by strong winds since, on two occasions, snow clouds moving with 55 to 60 m.p.h. winds were timed 20 and 30 minutes before they reached the observer, situated down wind.

At velocities of 25 to 30 m.p.h. and over, the blowing snow packs into drifts hard enough to support the heaviest loaded sled, making inland and coastal travel best after several storms have covered the tundra and kaimoo with a thin veneer of hard snow.

Sea Ice

There was nothing "unusual" about ice conditions in the vicinity of Augotorux Creek and Point Hope during the winter of 1959-60. It has long been known that some of the most dynamic ice movements in the arctic occur between Bering Strait and Point Barrow. As in most of the arctic, open water can be found in the Chukchi Sea during any season of the year.

Of all the northwest Alaskan coast, the area between Cape Lisburne and Cape Thompson is most certain to offer open leads, broken and scattered pack ice, or large tracts of ice-free ocean throughout the winter. This open water is the basis for winter living at Point Hope.

Sea ice near Point Hope is essentially of two types: polar ice more than one year old, and winter ice of the current year. Paleocrystic ice is

of no consequence.

The annual pattern of sea ice movement in the vicinity of Point Hope appears to be as follows. As autumn temperatures decrease in the central, polar basin, winter ice begins to form. With the onset of strong, northerly storms in late October-early November, this winter ice, with some incorporated polar ice, moves slowly south as a loose pack, easily influenced by currents and winds. During periods of relative calm, new ice forms quickly, increasing the areal extent of the parent pack. At Point Hope, the pack usually appears some time in October.

During November and December, new ice develops continually, while older winter ice thickens. In mid-winter 1959-60, stationary ice near Point Hope increased in thickness about 10 inches a week for the first month, and at a slower rate thereafter. By and large, only winter ice plays an important role near Point Hope. In 1959-60, no polar ice (7-10 feet thick with a salt free layer) was observed.

Driven by northerly winds, the autumn pack ice begins to pile at Nuwuk; first along the kaimoo and then northwestward on the Point Hope shoals. In 1959, the first beach pressure ridges began on November 1st, and the first floes grounded on the shoals on November 28th.

By December 3rd, the Nuwuk beach ridges were 20 feet high. Four days later, grounded ice piles, 20 to 30 feet above sea level, extended west-northwest from Nuwuk for about one half to three quarters of a mile.

Until this Nuwuk barrier ridge is formed, the pack ice is seldom stationary near Point Hope, and open water visible to the horizon is frequent on either side of the Tigaraq Peninsula. On December 5th, however, pack ice moved onto the north beach and, sheltered by the Nuwuk barrier, it remained fast and freezing until February 27, 1960, when persistent southerly winds and currents drove this heavy winter ice (4 to 5 feet thick) north.

From December 5-7th, 1959, to February 13-15th, 1960, the sea ice pattern at Point Hope remained the same; a barrier ridge, extending 4 to 6 miles WNW from Nuwuk, acted as a pivot point for pack ice movements from the north or south. During calm weather, with little ocean current, new ice formed to the south of Point Hope, while the north side remained ice-locked.

Northerly winds, at speeds as low as 20 to 25 m.p.h. set the young ice, south of Point Hope, in motion. Apparently, higher wind speeds at Augotorux-Cape Thompson often initiate this movement and provide open water at Pinguchaek-Beacon Hill, while Nuwuk remains ice-locked for 6 to 18 more hours. Northerly storms will produce an open lead from Cape Thompson to Cape Lisburne to the Nuwuk barrier, with a wide tract of open water southward from the Tigaraq Peninsula.

On February 13-15th, 1960, the pattern was reversed when southerly winds became more frequent and intense. By then, the pack ice had increased

in thickness to an average of one or two feet.¹ This ice, moving from the south, began piling along the Tigaraq Peninsula, grounded on the Beacon Hill shoals² and perhaps on shoals 2 or 3 miles westward from Cape Thompson.

Open water, which appeared along the peninsula's north shore on February 27, 1960, began to freeze solid on March 4th and by late April it was 3 feet thick.

A third pattern of ice conditions was firmly established by March 12th, 1960. Winter ice was fast in Kotzebue Sound to a line between Cape Krusenstern and Cape Espenberg. Westward from this line was an area, 50 to 75 miles or more wide, of open water, brash and young ice. Northward, along the coast past Kivalina, winter ice was held fast to a coastal strip about 3 miles wide, seaward from which there was young ice, brash and open water.

From near Cape Seppings, however, this firm coastal ice stretched northwestward to the Nuwuk barrier ridge, leaving an embayment of thick winter ice along the Tigaraq Peninsula's south shore. Open water extended in a rough V from Cape Lisburne-Dyer to the Nuwuk barrier, and from a point about 3 to 4 miles west of Augotorux Creek to the barrier. At Point Hope the width of solid, coastal ice between the land and open lead was about 4 to 6 miles, and represented the only real anomaly in the winter's ice pattern. Normally, the March-April lead is no more than 3 miles South from the village.

The final stages of sea ice conditions near Point Hope involve the periodic opening and closing of the Thompson-Lisburne lead, centered on the Nuwuk barrier. This pattern continues from early March until early June, and it governs the annual whale hunting at Point Hope.

Melting can begin as early as late March, but no pronounced effects take place in the sea ice until late April or early May. The ocean pack then begins to wane, the coastal ice along the Tigaraq Peninsula gradually melts and breaks up, and eventually it joins the main ocean pack to drift in and out along the beach until late June or early July. Destruction or floating of the Nuwuk barrier and grounded Beacon Hill shoal ice usually determines when the thick coastal ice to the south of Point Hope will leave the shore.

At any time during winter, there can be vast areas of open water north and south of the Tigaraq Peninsula, depending upon the prevailing winds and currents. Should the Nuwuk barrier ridge be floated or driven

1. It is really misleading to speak of an average thickness of winter ice, since the moving pack is composed of ice fields each varying in age and therefore in thickness. The February ice grounding along the Tigaraq Peninsula's south beach ranged in depth from 4 feet to 8 inches.

2. The first grounded ice off Beacon Hill occurred on January 6, 1960.

off,¹ the entire ice picture may revert to the early autumn state, where open water occurs more regularly on either side of the peninsula.

It must be remembered that the ocean pack is almost always in motion. Ice which is at Point Barrow one day may pass Cape Lisburne four days later, or a hunter drifted out from Cape Prince of Wales may walk ashore at Point Hope.

Other Kinds of Sea Ice

There are more than twenty kinds of minor ice phenomena which influence the Eskimo hunter, but time and space prevents a detailed discussion in this report. One type of ice formation, the tuwuk needs explanation, however.

When sea ice becomes stationary beside open water in mid-winter, new ice begins to form. Wind can prevent the solid ice development in the wider tracts of sea, but along the immobile ice front a level ice foot often builds outward for 10 or 20 feet. This is the tuwuk; the primary avenue of travel for winter hunters.

Ice Movements and Ocean Currents

Although daily maps were made of ice conditions and direction of movement, there has been no time available to prepare these data in a meaningful manner. However, the general pattern of ice movement, as observed from November 1, 1959, to May 1, 1960, was as follows.

Until November 14th, the autumn ice moved freely, with the dominant direction of motion from the south. From this date to December 27th, most recorded movements were from the north. During early January, directions varied between ESE and NE, but on January 23rd, a prolonged movement began from the SSE and SE. This continued until March. Through March and April the flow of ice fluctuated between the north and south, with drift from the south predominating. The fastest rate of ice movement observed was 5 m.p.h. from the SE on November 28, 1959.

Apparently, when there is little or no surface wind near Point Hope, most ice drift will be from the ESE or SE. It was observed that ice movement usually parallels the direction of upper air flow, as evidenced by clouds. Under such circumstances the direction of ice motion can precede a surface wind shift by 24 to 72 hours. On January 11th, the ice began moving 20 hours before the wind shift, on January 24th, the interval was 7 hours and on February 13th, 72 hours.

Strong northerly winds usually produce open water south of the Tigaraq Peninsula during winter, but this does not mean that the primary ice drift is from the north. On April 28-29th, 1960, for example, sea ice

1. The Nuwuk barrier is not usually floated until open tracts of ocean produce a substantial storm or wind tide.

moved northward at 3 m.p.h. against a 12 to 15 m.p.h. surface wind. It would seem that the ice regime around Point Hope can best be viewed as occurring in embayments beside the main ice body of the Chukchi Sea and Arctic Ocean.

Although intense warm ocean currents have been reported at Point Barrow during mid-winter, no evidence of the same phenomenon has been disclosed or observed at Point Hope.

Winter Tides

Winter tides seldom exceed one foot in height, but their action is extremely important. Along the kaimoo and stamukhi (grounded shoal ice piles), a tidal zone forms when new ice, or the pack, becomes locked tight against land. In new ice, up to 10 inches thick, this zone is usually mushy and wet. Older ice exhibits distinct tide cracks.

Because of this tidal zone, no matter how thick, hummocked and permanent may appear the attachment of floating ice to shore, it can drift out at any time when the correct winds and currents prevail. An Eskimo hunter never forgets this fact.

Animal Behaviour: Seals

Although seals can nap on top of sea ice during any month of the year it is not a common mid-winter habit. Near Point Hope, the animals were last seen on the ice November 2nd, 1959, and the first appeared February 6th, 1960.¹ Almost all seals killed in winter are found in open water.

The ocean near Point Hope appears rich enough in marine life to support a year-round seal population. Fluctuations in occurrence of winter seals is probably governed, therefore, by ice movement and "rouge" walrus more than any other factor.

A seal must breath, perhaps five to eight times or more each hour. In moving ice there are always open holes, leads and areas of mush ice, thin enough for a seal to penetrate and extensive enough to allow some seals to migrate from one place to another. When the seal becomes trapped beneath new ice over four inches thick, he must gnaw open a system of five or six breathing holes and remain confined to this ice field home.

Should a large area of new ice freeze solid, it will contain a resident seal population nearly equal to the number of animals previously present in the open water. Given enough time, perhaps a week or ten days, the new ice will form the nucleus of an ice field capable of enduring tangential stresses within the moving pack. When the ice field moves, so must the seals beneath it.

1. About the same time, Mr. H. Spencer counted 187 seals on young ice westward from Augotoruk Creek.

Some fields develop in the absence of seals, others capture large numbers. But when open leads or cracks exist, some seals are certain to migrate, thus making every ice field a potential home for the animals.

Open water or mush ice occurs along an abrasion (flaw) zone between stationary, land-locked shore ice and moving ice. Cracks, leads and holes may also open up within the drifting pack. Seals in the vicinity of such areas will leave their breathing holes to range along the open water. Should ice movement cease, however, and new ice form, the animals must once again construct breathing holes. Each ice field, therefore, can have an active seal population in areas of open water which is, presumably, proportional to the total ice field colony.

At Point Hope, the ringed and bearded seal (oogruk) are the usual winter visitors. The latter species does not appear near shore in large numbers, but seems to prefer a winter residence further seaward.

Seal pups are born during March and April, on top of winter ice. It is necessary, at this time, for the female to enlarge a breathing hole beneath drifted snow, and there construct a small chamber where the young are born. In the vicinity of Point Hope, this activity must take place on winter ice older than one week to ten days, or on locked, coastal ice, because other ice types normally do not offer adequate snow cover or permanency. Baby seals are occasionally found on the coastal ice surrounding the Tigaraq Peninsula, even though hunters make no deliberate effort to seek them out.

Polar Bear

The primary food source of the polar bear is the ringed seal, and since both the bear and Point Hope Eskimos hunt the same animal the two are bound to meet.

Although polar bears can apparently capture seals at their breathing holes, through young ice and at the seal pup dens, most of their kill is taken near open water. For this reason, the bears near Point Hope usually range along the flaw zone of moving winter ice fields and not on thick polar ice.

Winter Seal Hunting

In brief, the 1959-60 winter seal hunting at Point Hope was as follows. From November 16th to December 5th, 1959, hunters ranged from Sinyak to Pinguchaek, shooting from the kaimoo or tuwuk and retrieving their kills with a mannaktoon (throwing line) or boat. Hunting along the north shore then ceased, and until December 22nd, 1959, seals were taken from Pinguchaek to the western and northwestern extreme of the Nuwuk barrier. After this date, periodic hunting began on new ice south of Point Hope, when ice conditions were suitable, or along the Nuwuk barrier and south beach to Pinguchaek and Eesook. This pattern remained constant until February 18th, 1960, when hunting shifted to the western and north-

western ice. Between December 23rd, 1959, and February 18th, 1960, no seals were killed northward from Point Hope.

Hunting continued on the north ice until March 12th, 1960, when teams began moving west and west-south-west from the Nuwuk barrier. On April 6th, 1960, whaling started, and from that date until May 1st, 1960, the terminal date for this report, nearly all seals were killed at whaling camps situated to the west or south of the Nuwuk ridge.¹

Winter Seal Kill: November 16, 1959-May 1, 1960:

<u>Place</u>	<u>Ringed</u>	<u>Bearded</u>	<u>Spotted</u>	<u>Lost</u>
Nuwuk Beach	8	1	4	1
Nuwuk Ice	231	9		7
North Side*	220	10	2	9
South Side**	125	6		8
Pingoo	10			
Sinyak				
Jabbertown	40		1	
Beacon Hill	128			2
Aiaugatak	31			
Pinguchaek-Eesook	27			1
	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Total	820	26	7	28

* North Side = Ipiutak to Nuwuk, from beach to 10-15 miles out.

** South Side = Jabbertown to Nuwuk, from beach to 10-15 miles out.

From about March 10th to April 5th, 1960, some hunting was conducted at breathing holes on new ice which formed along the Tigaraq Peninsula's north shore. However, the Point Hope hunter is almost always in search of those animals which frequent open water, not breathing holes.

1. Nearly all spring sealing (late May through June) takes place along the Tigaraq Peninsula's south shore.

The Seal Hunter

A Point Hope seal hunter's equipment, simple and essential, consists of a rifle¹ and its carrying case, an oonax or ice-stick, six to ten feet long and tipped with a metal hook and point, a nickeevordax or three-legged sealing stool about ten inches in height and width, a mannaktoon or throwing line, with wooden float and three-pronged hook and a drag line for hauling seals. Some men carry an additional shoulder bag with ammunition, cigarettes and perhaps food. Most hunters wear white, cloth parka covers.²

Most hunters own small, open sealing boats about six feet long and covered with oogruk skin. These are carried on the dog sled or pulled on a short hand sled. Oars or hand-hooks are used to propel these boats through open water, mush or new ice. The hooks are also necessary to secure the floating seal approached by boat.

The mannaktoon is employed when ice or ocean conditions do not allow or do not warrant the use of the sealing boat. A skilled hunter can hook and retrieve a seal at distances up to 200 feet. If a Point Hope Eskimo does not think that he can recover his kill, he does not shoot.

Mid-winter sealing from the kaimoo offers the same handicaps as mentioned in connection with autumn hunting. However, in winter there are the added obstacles of dense sea smoke and reduced light.³ Young, new-forming ice can hinder the use of small boats, or prevent the mannaktoon from penetrating deep enough to hook a floating seal. At temperatures well below zero, all equipment used in the water quickly becomes ice coated and requires special care.

Open ocean hunting from the winter kaimoo has distinct advantages, too. When the pack moves a short distance from land, the hunter can easily traverse the shore for 20 or more miles with complete confidence that his return journey will not be disrupted, and that he will not come home empty handed. Drift wood and ice for drinking water can always be picked up should the man travel far enough. When open water occurs to the south of the Tigaraq Peninsula, numerous dog teams travel to Pinguchaek and Eesook each day of hunting.

When a lead opens in the pack ice, seaward from land, and ice condi-

1. The preferred sealing rifles at Point Hope are: .22 hornet, 220 Swift, .243, .25-35, .270 and .30-30 cal. Telescopic sights are increasing in use, and offer some distinct advantages in mid-winter hunting.

2. In winter, the seal hunter prefers to conceal his movements and presence from the unsuspecting seal.

3. During the period of winter twilight, in late December and early January, effective hunting can take place from about 8:00 a.m. to 3:30 p.m. By the 1st of February, shooting light lasts from about 7:30 a.m. to 5:30 p.m.; in mid-March from 5:00 a.m. to 8:30 p.m. and in early April from 3:00 a.m. to 10:00 p.m.

tions are considered safe for travel, hunting is conducted in a manner similar to the technique used along the kaimoo. Either walking or with a dog team, the men move along the ice edge or wait behind low ice hummocks until a seal appears in the open water.

If only occasional holes are open, or should the ice be thin and in sporadic motion, most men will walk to likely hunting spots, directed there by sea smoke and the "iceblink". Under such conditions, some hunters will push a teamless sled and boat or pull a hand-sled and boat. Once at open water, the hunter may construct a low blind of ice blocks, sit down on his sealing stool and wait.

Seal hunting is a skilled activity. In mid-winter twilight the animal, in open water, usually presents a target about four to six inches in height and width. Should there be a coating of young ice, the seal commonly exposes only his muzzle. A seal napping on the surface rarely exposes more than two inches of his back, but the same animal, with his curiosity aroused, may raise his head a foot or more above water. About one out of every eight or ten seals affords the hunter such an improved target.

Although a seal may be on the surface for only four to eight seconds, Point Hope men kill them repeatedly at ranges of 200 and 300 yards.¹ Perhaps 95 per cent of all killing wounds are in the head, and about 90 per cent of animals so struck, in winter, float.

When traveling by dog team or stationed on the ice near the village, a hunter will kill as many seals as possible. Seven to nine ringed seals or one large oogruk and one or two ringed seals is considered a good sled load. Seldom does one man kill more than this much during a winter day. However, the same hunter, if walking on the pack, will usually take no more than two seals, because of the time and effort involved in dragging the animal back to land.

Since an unfrozen seal drags easily, its skin is not readily damaged by rough ice, and the animal can be easily butchered. A hunter afoot who wishes to take more than one seal, therefore, may temporarily store his first kill below sea water or in snow, in order to prevent the seal from freezing. Otherwise, it is common practice for such a hunter to return to land soon after he has landed one seal.

Point Hope men, when on the sea ice, exercise the utmost caution to prevent two events from happening; breaking through the ice when walking or

1. Open, battle sights are effective up to about 100 or 150 yards in reduced winter light and sea smoke. A telescopic sight can double this killing range. However, these sights are easily clouded by a hunter's breath, condensation can form and freeze inside the optical tube should the weapon be warmed and suddenly cooled and, at very short ranges, the hunter may undershoot. Since even a slight blow can dislodge the sight and cause inaccuracies and wasted ammunition, many men prefer to carry rifles equipped with telescopic sights slung across their backs when using a dog team.

driving a dog team, and being trapped on pack ice which has drifted out from shore. Despite knowledge and experience, each year some hunters fall through the winter ice or find themselves unable to reach land or stationary ice unaided. The winter of 1959-60 was no exception.

Since sea ice hunting can be uncommonly dangerous, it is readily curtailed by weather, ice conditions and ocean currents.

Normally a hunter will not venture onto ice less than one day old, although he may shuffle across areas where the ice surface bends beneath him like rubber. He will not usually cross onto ice which is obviously moving out from land, although here again, he may travel with a pack as it drifts parallel to shore. Most exceptions to this latter rule seem to occur in the case of polar bear hunting, when men often cross onto the freely-moving pack to obtain a known bear kill.

Nevertheless, the average Point Hope hunter usually traverses only that ice which is drifting, or was recently in motion, toward shore. Once on the pack, he is constantly alert to changes in ocean currents, surface and upper winds and to a variety of other signs which can forecast the state of ice and weather near Point Hope.

Surface winds, more than temperature, limit winter hunting. Most men wear adequate fur clothing, but some depend upon second-hand furs obtained through the local mission or some other philanthropic organization. These furs, commercially tanned and often in a state of disintegration through old age, do not provide the same degree of protection as do Eskimo-tanned furs. A cold seal hunter may lose several kills a day, merely because he is not prepared to shoot when the time comes.

But inadequate clothing is not the major hindrance to a Point Hope seal hunter during strong winter winds. Rather, it is blowing snow, rapid and almost unpredictable ice movements, waves in open water, limited use of dogs, extreme difficulty in shooting and the arduous task of retrieving any kill.

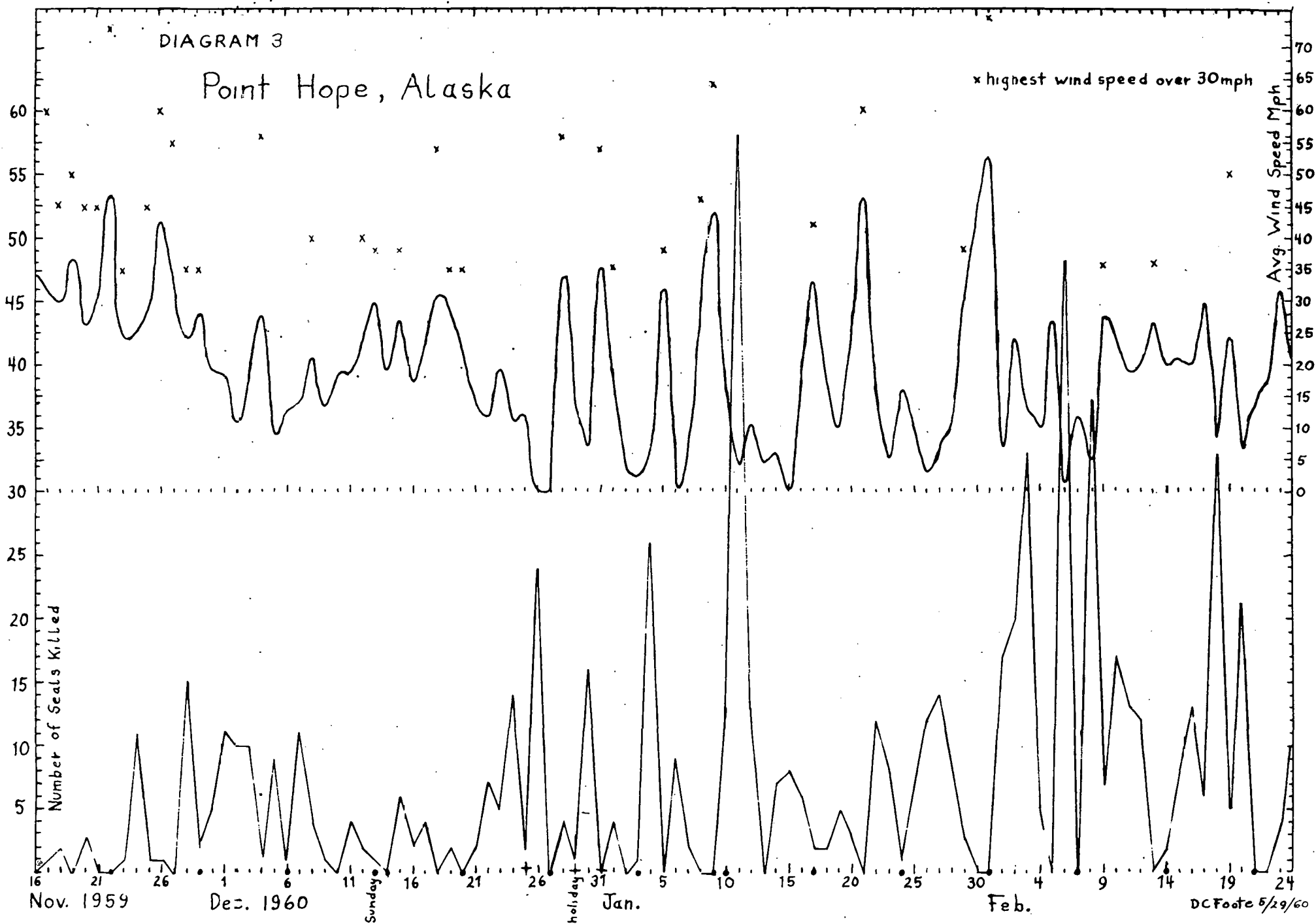
Undoubtedly, there is a limit to what physical conditions a Point Hope hunter can endure but a man dressed in Eskimo clothing and well-fed on Eskimo food should withstand the severest Point Hope winter storm.

Diagram Number Three shows the relationship between the average surface wind speeds¹ and the landed kill of seals, from November 16th, 1959, to February 24th, 1960. During this period, there were 18 days when the average wind exceeded 30 m.p.h. and 12 seals were landed. Since four of these days were Sundays, which cannot be considered hunting days, it must be

1. Wind speeds at Point Hope prior to January 26th, 1960, were determined by the Beaufort scale. In the case of close agreement (3-4 m.p.h.) and for speeds over 40 m.p.h. recorded data from Augotorux Creek were used. The average wind was measured between 7:00 a.m. and 7:00 p.m.; the limits of most winter hunting.

DIAGRAM 3

Point Hope, Alaska



reckoned that 10 seals were landed during 14 days of hunting, for an average of 0.72 seals per day when average winds were over 30 m.p.h.

In contrast, there were 50 hunting days¹ when the average wind was 20 m.p.h. or less, and 566 seals were landed; an average of 11.3 seals per hunting day. It would seem, therefore, that from December through January, an average daily wind of 30 m.p.h., or higher, will curtail seal hunting at Point Hope. In spring, higher temperatures, thicker ice and longer daylight allow, perhaps, more hunting during strong winds.

Average Seal Kill per Hunting Day: November 16, 1959-February 24, 1960

<u>Month</u>	<u>Average wind:</u>			
	<u>20 m.p.h. or less</u>	<u>21-25 m.p.h.</u>	<u>26-30 m.p.h.</u>	<u>31 m.p.h. or over</u>
Nov.	5.0	9.0	2.0	0.33
Dec.	6.65	3.33	3.0	1.33
Jan.	10.25	--	--	0.00
Feb.	20.30	12.5	3.25	4.00
Overall				
Average:	11.3	7.8	2.8	0.72

Further definition of a "hunting day" requires due regard for ice conditions which prevent hunting. These conditions include ice which is so thin that a hunter cannot walk upon it, or ice in motion. In addition, blowing snow and ocean waves in early winter can hinder seal hunting perceptibly. From November 16th, 1959, to February 24th, 1960, there were three days when blowing snow and waves drastically affected hunting, and six days when ice conditions were prohibitive.

Given the foregoing limitations, there were 61 normal hunting days between November 16th, 1959, and February 24th, 1960, during which Point Hope hunters landed 674 seals for a daily average of 10.9 seals. Most hunters considered the season average or slightly below average.

1. A hunting day is considered a day other than Sunday, or observed holiday, when average daily wind speeds are 30 m.p.h. or below.

Summary of Seal Hunting: Winter 1959-60: (Recorded Kills)

<u>Week Ending</u>	<u>Ringed*</u>	<u>Bearded**</u>	<u>Spotted*</u>	<u>Lost</u>	<u>Weight</u>
Nov. 22, 1959	4		2		600
29	26	1	4	1	3,300
Dec. 6	46	1		1	4,900
13	23				2,300
20	12	1		3	1,500
27	51	1		1	5,400
Jan. 3, 1960	24			3	2,400
10	48			2	4,800
17	89	1		1	9,200
24	28	1			3,100
31	45				4,500
Feb. 7	118			5	11,800
14	85			3	8,500
21	83	5			9,800
28	40				4,000
Mar. 6	29				2,900
13	3				300
20	13	4		1	2,500
27	18	5	1		3,400
Apr. 3	8	1			1,100
10	4				400
17	6			3	600
24	6	5		4	2,100
May 1	<u>11</u>	<u> </u>	<u> </u>	<u> </u>	<u>1,100</u>
24 Total	820	26	7	28	90,500 lbs.
Plus 20%	<u>164</u>	<u>5</u>	<u> </u>	<u> </u>	<u>17,900</u>
Total	984	31	7	28	108,400 lbs.

* Average weight = 100 lbs.

Bearded Seal (Oogruk)

If a Point Hope hunter has a choice between taking a ringed seal or a bearded seal, it can be assumed that he will shoot the latter. This is because the animal is three to nine times larger than a ringed seal, its meat is preferred food and its skin serves a wide variety of uses in Eskimo life.

Oogruks, however, are seldom abundant in winter: only 26 animals were landed and 6 lost between September 29th, 1959 and May 1st, 1960. Of these, 77 per cent were killed after January 14th, 1960, and all were killed at a distance of three to twelve miles from shore. Plotted against distance, the distribution of winter oogruk was: 0-2 miles out, 6; 3-4 miles out, 8; 5-6 miles out, 11; and 7 to 12 miles out, 7.

Normally, a hunter walking on the sea ice cannot manage to land or drag a medium or large size bearded seal, without the aid of a dog team or another hunter. Since winter oogruk seem most common three or more miles from shore, it can be assumed that ice conditions stable enough to allow such hunting also permit the use of dog teams.

Walrus

Several Eskimo hunters of Point Hope have reported seal oil in the stomachs of walrus, scars on the skins of seals caused by walrus tusks and accounts of eye witnesses to the attack and capture of seals by walrus.

Each winter, there seem to be small numbers of "rouge" walrus, who frequent the open water and thin ice near Point Hope. Sighting of winter walrus were made on December 11th and 17th, 1959, and January 11th, 23rd, and 27th, 1960.

Summary of Walrus Hunting: November 16th, 1959 - May 12th, 1960.

<u>Date</u>	<u>Location</u>	<u>Number killed</u>	<u>Lost</u>
December 11	Jabbertown beach		1 (old)
December 17	South beach 1 mile SE	3*	1
January 27	Nuwuk Ice 1 mile out	1* (old)	

* Female

All Point Hope hunters agree that there will be a marked absence of seals in the vicinity of these winter walrus.

Tom Cod

Although tom cod fishing usually does not begin until mid or late December, the fish are sometimes washed ashore during autumn gales. On October 8th, 10th, and 27th, and on November 1st, 1959, beached tom cod were collected from Nuwuk to Pinguchaek and eaten by some Point Hope families.

Winter fishing began on January 4th, 1960, and continued until March 11th, 1960. All the fish taken were hooked within one mile of the village, along the south shore or at Nuwuk.

Tom cod are caught on an arrangement of two to six unbaited hooks, which are jigged in shallow waters no more than 500 to 800 feet from shore. Holes are chopped through thin ice, in tide or pressure cracks where young ice is present, or through old ice probably up to four feet thick. In 1960, about 60 per cent of those people fishing were women and children, and 40 per cent able hunters. High winds and low temperatures will increase the number of men fishing, because the men often try for tom cod when seal hunting is poor or prohibitive.

The landed fish are allowed to freeze solid on the ice before being transported home. They can be eaten fresh and frozen at the fishing site, and raw-frozen or boiled for family meals. All parts of the fish are considered human food except, perhaps, the innards.

Summary of Tom Cod Fishing: 1960

<u>Date</u>	<u>No. of Fishermen</u>	<u>Approximate weight of fish</u>
January 6	5	250 lbs.
7	16	400
8	11	250
10	3	100
22	4	50
23	28	400
24	12?	300
25	16	450
26	23	400
27	21+	1,000
28	7	50
29	8	150
February 2	2	25
4	8	125
6	20	600
8	18	750
9	2	150
17	9	25
19	7	350
20	5	0 (crab fishing)*
22	4	200
23	2	150
March 1	4	200
3-11th	<u>?</u>	<u>400</u>
Total: c.	235	6,775 lbs.

*Crab fishing usually takes place from February to March, but in 1960, it would seem that extremely thick winter ice over the traditional Nuwuk crab-fishing area and poor success among those people who tried, discouraged the annual harvest of bottom crabs. Bait for the crab is commonly a seal's nose.

Polar Bear

During the past two decades, the polar bear has become more valuable than any other single species of animal taken at Point Hope in winter or, perhaps, during the entire hunting year. However, for the past six years, the seasonal kill of these animals has been decreasing, from about 70 bears in 1954-55, to 18 bears in 1959-60.

The first bears were sighted on November 30th, 1959, on moving winter ice just west of Nuwuk. From this date until the arrival of non-resident airborne sportsmen on February 14th, 1960, Point Hope hunters sighted and killed bears when conditions permitted. At least three bears entered the village proper during the period, and 90 per cent of all kills were within 10 miles of Nuwuk.

Polar bears are most commonly encountered by the sled-borne seal hunter, who ranges along open water between the moving pack and stationary landfast ice, or who seeks out holes and cracks when the shore lead has closed. Although the bears can be present on either side of the flaw zone, it is most common to find them on the moving pack. This means, of course, that a hunter must often leave secure, fast ice to retrieve a kill.

Should open water or bad ice prevent an Eskimo hunter from approaching a bear, he will not shoot. However, some men venture onto ice ordinarily considered unsafe, because a captured polar bear means from \$120 to \$200 in earnings plus 600 or more pounds of good meat. The hunters of Point Hope are also motivated to take uncommon risks to procure this animal, because of a growing belief that the arrival of airborne sportsmen will terminate Eskimo bear hunting for the season. In 1960, this was true.

When a Point Hope hunter is in search of bears, he commonly travels long distances, 15 to 20 miles, across ice which is in motion toward land. Even though seals may be seen, he will usually not attempt to take them until he feels that there is no possibility of a bear kill. In 1960, bear hunters ranged on the winter ice from Cape Lisburne to Cape Thompson, with the most concentrated activity, near the latter, from January 11th to February 14th, 1960.

Summary of Polar Bear Hunting: (1959-1960)

<u>Date</u>	<u>Location</u>	<u>Killed</u>	<u>Sighted</u>
November 30	Nuwuk-west 1 mi.		3
December 6	Nuwuk-south 1-2 mi.	2	2
8	Northside 2-3 mi.	1	2
9	Northside 3-4 mi.	1	2*
10	Northside 4 mi.	1	1
22	Nuwuk-west 1 mi.		1
27	Nuwuk		1
30	Nuwuk-west 15-20 mi.	1	1
January 1	Nuwuk		1
7	Southbeach		2
7	Nuwuk-south 4 mi.		2
11	Southside 8 mi.	3	3
13	Nuwuk-south 12 mi.	1	1
14	Nuwuk-south 10-13 mi.	2	2
17	Northside 10 mi.		tracks
19	Nuwuk-west	2	2
19	Pinguchaek 3 mi.	1	1
23	Aiaugatak		1
February 4	Cape Thompson-west 15 mi.		2
4	Nuwuk-south 1 mi.		3
7	Cape Lisburne	1	1
11	Jabbertown 1 mi.		1
11	Nuwuk-south		1
12	Nuwuk-south 2 mi.	2	2
		18	38

* jammed rifle allowed wounded bear to escape.

Airborne Polar Bear Sportsmen

For the past six years, there has been a steady increase of airborne sportsmen seeking polar bear trophies on the Chukchi Sea and Arctic Ocean west of Alaska. As safer aircraft, navigation equipment, search and rescue organizations, radar sites and pilot experience have developed, this sport has grown from a late winter-spring pastime of Alaskans to include sportsmen from many states of the Union.

Of all the single engine, high-wing aircraft used in this activity, the ski-equipped Piper Supercub seems to be the most popular. This model normally carries enough gasoline for about six to eight hours flying, depending upon airspeed, wind direction, wind velocity and load and richness of fuel mixture. When fitted with a belly fuel tank, the Supercub can fly for nine or ten hours, non-stop.

In most cases, a day's flying is from four to eight hours; time enough to reach a point 200 or 300 miles from the plane's home base. Given satisfactory winds and extra gasoline, the distance can be greater.

Navigation is usually done by dead reckoning and contact flying. Perhaps no more than one in every ten polar bear hunting planes has high quality, powerful radio-navigation equipment. Sometimes such items have been sacrificed to the desire for more gasoline.

Flight plans are usually not filed at all, or they are submitted as a "block" plan for a given time span, within a given general area. For example, a pilot may declare that he will be flying for several weeks within a region 600 miles in diameter and centered on Point Hope. A block flight plan can be closed-out, extended, or refiled by any convenient means of communication.

Because the best polar bear hunting commonly occurs beyond sight of land, the plane navigating by contact flying must contend with variable and often poorly defined winds,¹ and with an ice surface moving at the whim of wind and ocean currents. A pilot must be constantly alert, even when surface snow drifts offer satisfactory directional bearings. Without doubt, no pilot can tell his location, once he is several hours out over the sea ice, unless he has the appropriate radio navigation equipment or unless he receives a radar fix from coastal DEW line stations.

It is not uncommon for lost or confused flying sportsmen to request aid from military radar posts. To furnish an exact radar fix, the lost plane must climb to 4000 feet and maneuver in a series of left and right-hand turns. The plane must also have a radio transmitter capable of reaching the desired radar site.

When low on gasoline, a pilot may be reluctant to climb his aircraft, and instead may continue on a dead reckoning course, hopeful of a landfall. This was the case when two planes were lost through the sea ice,

1. A plane "slow flying" to conserve gasoline and observe bears, can be more effected by wind than when flying at greater speeds.

west-southwest of Augotorux Creek, on February 26th, 1960.

There are two methods of bear sportshunting with airplanes: the aircraft either drives the bear to level ice and lands for the kill, or one plane lands and allows a second machine to drive the bear to the desired point of kill.¹ One, two, or three planes may hunt together, the preferred number being two.

Hunting planes fly between 300 and 500 feet above the ice, and about 1000 feet apart. The bears are either tracked in new snow, or spotted as they range along leads, cracks and holes. For such hunting good sunlight is necessary.

The Supercub requires from 300 to 600 feet of level ice for take-off, depending upon the surface wind and load. Since bears seek out open water, the animals are often located near expanses of new, level ice suitable for landings. Otherwise, the bear must be driven to level ice, in some cases twenty or more miles.

During 1960, polar bear hunting planes traversed the sea ice westward from Point Hope from February 14th to April 28th. Many sportsmen agreed that the best bear hunting occurs between Point Lay and Kotzebue, about 150 miles west from Point Hope, in March and April. An estimated 38 planes hunted polar bears from Kotzebue in 1959, and in 1960 between 20 and 30 planes. Some sportsmen and guides predicted that as many as 40 light planes, with an estimated 200 sportsmen, could fly between Point Hope and Kotzebue, during a good March-April bear season.

Four planes were based in Point Hope from February 14-18th to March 4th, 1960.² A greater number do not use the village because, until late spring 1960, there were limited tourist accommodations and limited stocks of aviation-type fuel. At the moment there is a new tourist hotel, and should flying guides freight their gasoline north by ship, as has been suggested, Point Hope can become the center of very intense flying activity. Already, the effects of this sport are evident, as illustrated by the following table:

1. Most hunters use telescopic sights. The bear is immediately skinned and in nearly all cases the meat is left and not returned to shore.

2. Two of these planes were lost through the sea ice on February 26, 1960.

<u>Month</u>	<u>Number of aircraft known to be at or over Point Hope</u>
September 1959	19
October	19
November	8
December	12
January 1960	14
February	58
March	35
April	61

Although most pilots do not choose to fly in winds exceeding 30 or 35 m.p.h. sports planes have operated from Point Hope in 50 m.p.h. gale winds with blowing snow. On two occasions planes landed after dark, once only with the aid of flashlights. Overcast weather appears to be the most limiting factor to sportshunting over sea ice, since the aircraft then commonly cruise no more than 20 miles from shore.

Winter-Spring Caribou Hunting

From late November, 1959, through January, 1960, caribou hunting by Point Hope men was at a minimum. Single animals were killed on December 22nd, 1959, and January 2nd, 1960, near Eesook, and a two-man hunting party turned back from Cape Thompson in adverse weather on January 5th, 1960.

On the afternoon of February 3rd, 1960, a private plane reported caribou from Cape Seppings to Cape Thompson, and by February 5th, 1960, 30 per cent of Point Hope's active hunters were searching out caribou in Augotorux Valley and near Angmarok Mt. This caribou hunting continued in the Augotorux Creek-Suklowlik Mt.-Kukpayak Creek region until April whaling began, after which inland hunting became more sporadic. The last caribou hunted by dog team were killed near Cape Thompson on May 19th, 1960, and the first animals hunted by boat were taken June 4th, 1960, near Eetiblaeruk on the Kukpuk River.

Winter-spring caribou hunting provided the most important source of food to Point Hope from late February to late April, 1960. This hunting is motivated by a drastic need for meat, as the prevalence of seals slowly wanes during late February through April. Caribou meat is also vital to a successful spring whaling season.

Hunting techniques in winter and spring are similar to those described for autumn. The most important difference between fall and winter is,

however, the fact that a thin layer of wind-packed snow and full developed kaimoo allow dog teams to range along the coast and across upland divides. During February to mid-March, 1960, most Point Hope teams crossed into Augotorux Creek by way of Saleevik Mt., but from mid-March through April, the Kukpuk River and ocean ice past Cape Thompson were the primary avenues to the hunting grounds.

Unlike autumn, when wind-packed snow drifts have not attained great depth, winter-spring camps are almost always snow houses covered with a canvas tent or sled cover. Drinking and cooking water is usually snow, although river or stream ice can be used.¹ The primary food of all caribou hunters and their teams is the fresh meat of the current kill.

1. In autumn it is customary to chop through the thin river ice to obtain water for cooking. This saves fuel. Winter ice is too thick to warrant this technique.

Summary of Winter-Spring Caribou Hunting: February 1-May 10, 1960

<u>Group Ref. No.</u>	<u>No. of hunters</u>	<u>Date of Kill</u>	<u>General Location of kill</u>	<u>No. of animals</u>
5	2	Feb. 4	Augotorux Lakes	7
6	2	6-8	Angmarok Mt.	11
7	6	6	Augotorux Cr.	26
8	1	15	Kukpayuk Cr.	10
9	2	16	Augotorux Lakes	16
10	7	18-21	Pinguchaek-Augotorux	31
11	1	23	Tellaveeruk Mts.	3
12	5	25	South Muktuk Hills	22
13	2	Mar. 2	Suklowlik Mt.	10
14	1	7	Suklowlik Mt.	7
15	2	8	Kukpayuk Cr.	16
16	7	8	Suklowlik Mt.	60
17	2	9	Suklowlik Mt.	14
18	1	8-9	Kukpayuk Cr.	5
19	3	11-12	Suklowlik Mt.	24
20	1	13	Suklowlik Mt.	4
21	2	11-12	Suklowlik Mt.	10
22	2	17-20	South Muktuk Hills	13
23	1	23-24	Kukpayuk Cr.	5
24	1	28-29	Augotorux Cr.	9
25	2	24	Augotorux Lakes	7
26	1	31	Augotorux Cr.	5
27	4	27-28	Augotorux Cr.	24
28	2	30-31	Augotorux Cr.	10
29	2	31	Augotorux Cr.	10
31	1	Apr. 9	Tellaveeruk Mts.	3
32	2	25	Augotorux Cr.	8
33	1	May 10	Pinguchaek	6
Total	66			376

Winter-spring caribou hunting was more profitable in the autumn. The average round trip took 3.93 days, with at least one or two over-night camps in the hunting area. Fourteen days was the longest period that any hunter remained away from the village, and two days the shortest. An average of 5.5 animals per trip were obtained during the February-April hunting, in contrast to 3.76 animals per sled in October-November.

Spring Whaling

Whaling at Point Hope is a traditional and important economic and cultural activity. Many aspects of annual village life gain meaning only in their relationship to the seasonal whale hunt, which lasts, ordinarily, from April to June.

Early in March, each whaling captain begins to prepare his hunting gear. New oogruk skins are placed on many boats, new camp stoves are made, paddles, oars, flensing knives, darting guns, bombs, seal skin floats and the multitude of other essential items are all cleaned and readied or manufactured anew. Although whales were not sighted near Point Hope until April 10th, 1960, they have appeared as early as March 19th, and many crews wish to be prepared for an early season.

In order to attack the northward migrating whales, Point Hope hunters must move to open water and base their whaling camps on secure, immobile ice. Invariably, late winter winds and ocean currents drive thick winter ice against the Tigaraq Peninsula's south shore (February 13th-March 3rd, 1960), to form a belt of landfast ice from Cape Thompson to the Nuwuk barrier ridge. It is in the flaw zone between this fast ice and moving pack that all Point Hope whaling takes place.

Whaling in 1960 was extraordinary, because for the first time in 60 or 70 years or more, heavy ice concentrations south of Nuwuk prompted most crews to hunt further west than the customary south-ice locations. Regardless, all whalers prefer the south side because open water will remain there longer with a north wind and south moving pack ice but, at the same time, the south ice lies sheltered behind the Nuwuk barrier and Tigaraq Peninsula.

On April 6-7th, 1960, the village men chopped out a wide sled trail across rough sea ice from Nuwuk to the open lead, four to six miles west-northwest of Point Hope. From April 15th to May 12th, thirteen whaling crews with 111 persons and about 400 dogs spent nearly 22 days on the sea ice. Whaling was curtailed for short periods, of a day or two, when south winds closed the open lead with a violently moving pack. Strong northerly winds, which might set the fast ice adrift, can also force the whalers back to land.

The average whaling crew in 1960 consisted of nine or ten persons, of which one was a female cook and one or two young boys who acted as camp helpers. Each crew had from one to three dog teams.

Once the sled trail to open water is prepared, whaling can begin whenever the animals are sighted, and when weather and ice conditions do not

prevent hunting. In moving to the open lead, two dog teams are commonly hitched in tandem; the first sled is loaded with provisions, the second is attached directly to the boat sled with its load of an umiak (large skin boat), filled with additional equipment. The umiak is always fastened to a low, flat sled, which can be drawn by hand or dog team. In 1960, it took the average crew of five or six adult men and two dog teams about two or two and one half hours to haul the whaling gear and boat four to six miles to open water.

Upon arrival at the open lead, the various crews erect camps from ten to one thousand yards or more apart, depending upon available tenting space, ease of movement through rough ice and the individual desires of the crew captains. Cooking and heating is done on hand-made oil drum stoves, burning blubber or gasoline pump stoves. Snow is the only source of drinking and cooking water.

Arctic whaling at Point Hope takes place predominantly in open water extensive enough to permit boat travel, but it may also take place in the open water of cracks and holes amid the pack ice. Whales may also penetrate new ice and be attacked. Although examples of all three whale hunting techniques were witnessed during 1960, only the former will be discussed in this report.

The primary whaling weapon used at Point Hope is the darting gun; the gun is a hand-thrown wooden shaft 5 to 6 feet long, tipped with a metal harpoon and trigger-rod and brass bomb-gun containing a propelling charge and fused bomb. The harpoon, which is attached to about 25 fathoms of three-quarter inch hemp rope and an inflated seal skin float of 2-300 pounds buoyancy, slants 10 inches or more beyond the trigger rod.

When approaching the whale the harpooner, in the boat's bow, prepares the darting gun by extracting an arming pin. Then, before the boat touches or grounds on the whale, or passes over a submerged animal, the harpooner stands and grasps the darting gun in both hands.¹ With great deliberation, the gun is cast in a short, powerful thrust usually at a range of two to four feet.

Upon contact the tripper rod trips a hammer and cartridge which, in turn, fires a brass-cased bomb, about ten inches long, into the whale. The recoil of the darting gun releases the already deeply seated harpoon, and allows the harpooner quickly to retrieve the darting gun. In the meantime, the large seal skin float has been cast overboard.² Five to ten seconds after penetration the bomb explodes inside the whale inflicting a killing or crippling wound.

In practice, many errors can occur. The harpoon may not be deeply embedded; a bomb may fail to explode or it may pass through the whale before detonation; a darting gun may not fire and it becomes fastened to the harpoon

1. In their left hand some harpooners will hold a light line attached to the darting gun and a small, skin float.

2. When hunting at narrow cracks or holes in pack ice, the harpoon and float are often detached to prevent their loss should the whale sound beneath thick ice.

and submerging whale; or the gun may foul amid the harpoon-float line and be lost. No season passes without some costly mishap. In 1960, five darting guns were lost, and at least 14 whales struck but only 4 killed.

Because whales are extremely sensitive to noise, all whaling is done as silently as possible. Only paddles and oars are used, there is a minimum of talking and dogs or other camp sounds are restrained. Whales are also alerted by foreign smells such as cigarette and stove smoke or oil and blood from a recent kill, but in these cases few preventative measures are taken.

After the cooking tents are erected the boats and crews station themselves along the water's edge; each crew seated behind a white-cloth wind break, but always free to watch the southern horizon. The boat is propped on ice blocks ready for an immediate and effortless launching.

The black whales seen in 1960 usually surfaced every 15 to 20 minutes, in a series of three to seven slow rolls. Normally, the whales were on the surface between $1\frac{1}{2}$ and 2 seconds while breathing, and seven to eleven seconds below water between breaths. After the final breath, the animals dived, exposing their entire back in a slow, three-to-four second movement. About one in every fifty whales seen in 1960 brought its tail out of water during this maneuver.

Black whales can also behave in a variety of ways, many of which seem quite contrary to the whale's normally docile nature. Some whales bump each other repeatedly as if in play, while others expose their heads above water to buffet against approaching waves. The most impressive are those animals which surface vertically, in a tremendous surge so powerful that the animal's flukes clear the surface. Some whales rub their bodies along the thick fast ice, or lie motionless on the surface as if sleeping. These latter two habits are of particular importance to the Eskimo whale hunter.

The Point Hope whalers usually strike those whales swimming in a normal manner, which means that they have between 40 and 90 seconds from the time a whale first surfaces until it sounds. Sometimes an animal may be sighted 20 minutes before his arrival at a hunting site,¹ in which case the whaling crew may predict a point where the whale will reemerge, launch their boat and wait in readiness. Since whales often tend to follow the same course, as if migrating on a given line, some crews may drift their boats in a general area of previous sightings, hopeful that an unseen whale will appear.

Nevertheless, most whales taken by Point Hope crews surface within one minute's paddling time of the ice edge. For this reason, some members of the crew remain constantly alert and, ideally, the watchsite and boat are never left undermanned. When April sunlight allows 24 hour hunting,

1. Mirage effects produced by air temperatures are especially useful in spotting surfaced whales at great distances.

many crew members will not leave the boat site for several days. All meals are served at the boat, and the crew will take turns sleeping throughout the day and night.

The black bowhead whale can be killed by one bomb or nine or ten bombs, depending upon the animal's size, the successful detonation of a bomb and the extent of injury to the whale's vital organs. Usually a whale dies only after a series of wounds.

It is for this reason that the seal skin float and harpoon are used. A wounded whale must be followed. Once struck, the animal can sound for one hour or more, but invariably the float will rise ahead of the whale to guide the alerted crews to a spot above the wounded and exhausted animal.

The landing and butchering of a whale is a complicated and highly formalized procedure, which cannot be described in this short discussion. It is enough to say that the animal is butchered on or along the fast ice as soon after the kill as possible, and that crews present at the site of kill or arriving before the whale has reached the butchering site are entitled to shares of the animal according to set rules.

About 20 to 25 men are needed for the butchering operation, which can be completed in six to seven hours. Except for the head bone, which is returned to the sea, the blood which drains away, and segments of the backbone which may go unclaimed, the unused portions of a 15 to 20 ton whale can be placed in a five gallon gasoline can.

Muktuk, the skin of the black whale, is a popular Eskimo food, and within days after the first butchering at Point Hope, chartered aircraft and air freight had carried this meat from Point Barrow to Anchorage or beyond.

As previously mentioned, caribou meat obtained during February and March is an important food source for the whaling crews. This is so because seals are not usually plentiful in April, birds do not offer abundant meat and the capture of white or black whales may not occur until late in the hunting season. In addition, when the whales are running, other animals are not killed.

Considering the nature of Point Hope whaling, as briefly described here,¹ the 1960 season was extremely successful. During the 22 days of active whaling, at least 124 whales were sighted, of which 29 were approached and 14 struck. This means that about one in every four whales seen was approached, and half of these were struck.

1. There are numerous other factors which govern a successful kill, but space is too limited in this report for a detailed discussion.

Summary of Whale Hunting: April 15 to May 12, 1960

<u>Date</u>	<u>Known Number of Whales Seen</u>	<u>Number of Whales Approached</u>	<u>Number struck</u>	<u>Number Killed</u>
April 11	7	-		
15	2	1	1	
16	9	0		
17	0?	0		
18	17	6	2	1
19	4	2	2	
20	1	0		
21	2	0		
22	0	0		
23	4	0		
25	4	2	1	
26	7	3		
27	6	1	1	
28	24	5	1	1
29	19	6	3	2*
30	0?	0		
May 1	3	1	1	
2	1	0		
3	2	0		
5	0?	0		
6	0?	0		
10	5	0		
11	7	2	2	
22	124	29	14	4

*one whale killed was identified as a right whale.

CARIBOU & WHALE HUNTING ACTIVITY POINT HOPE, ALASKA Feb. 1 - May 12, 1960

Map Key:

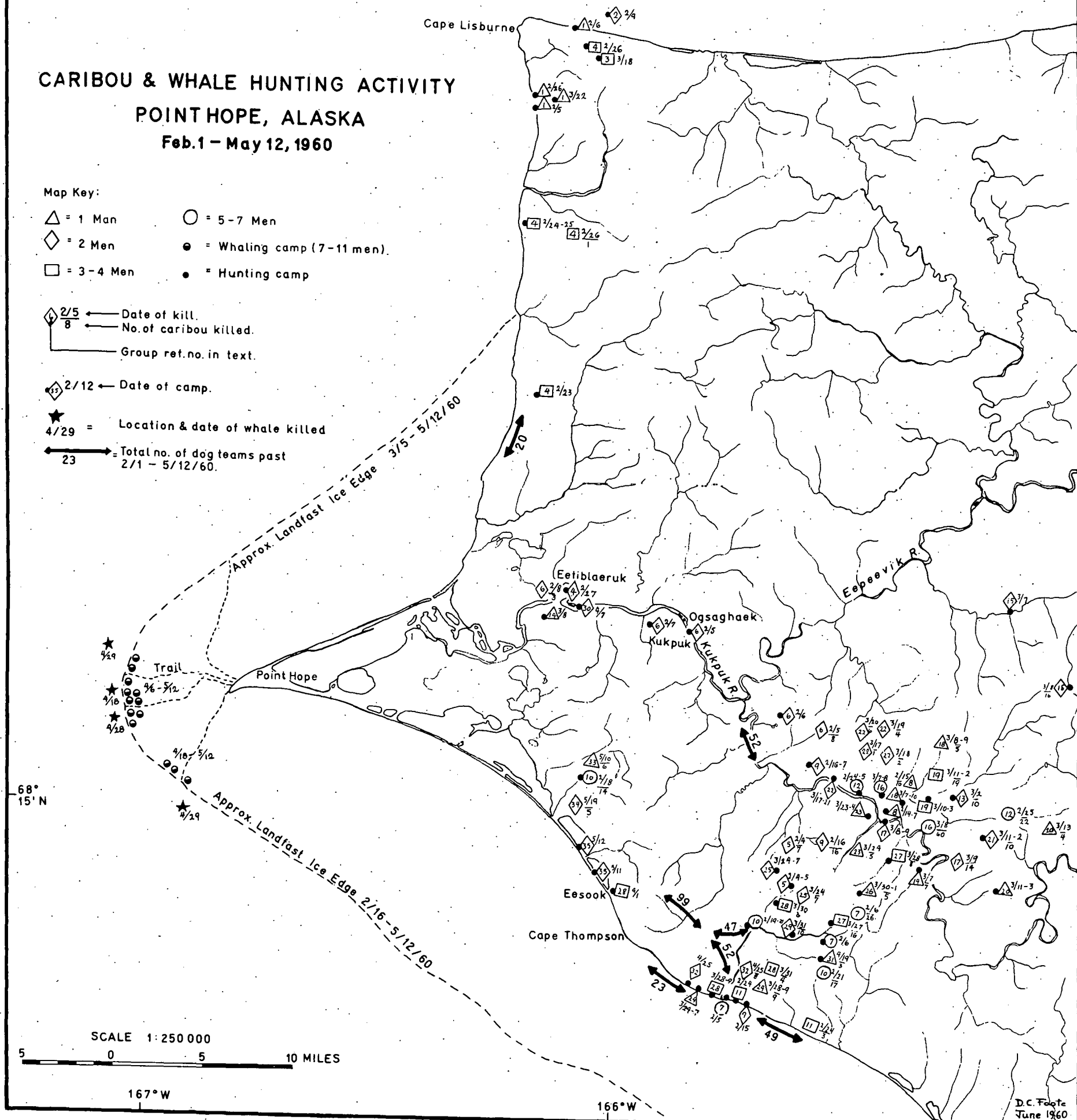
- △ = 1 Man
- ◊ = 2 Men
- = 3-4 Men
- = 5-7 Men
- = Whaling camp (7-11 men)
- = Hunting camp

◊ $\frac{2/5}{8}$ ← Date of kill.
 No. of caribou killed.
 Group ref. no. in text.

◊ $\frac{2/12}{}$ ← Date of camp.

★ $\frac{4/29}{}$ = Location & date of whale killed

→ 23 ← Total no. of dog teams past
 2/1 - 5/12/60.



White Whales

White whales, or beluga, usually frequent the same waters as the black whale, but their travel routes are more often closer to the fast ice. The appearance of either the black or white whale is a good indication that the other species is also present. The first beluga were sighted on April 11th, 1960, the same date as the first black whales.

White whales are shot either from whaling boats in open water or from the ice along a lead, crack or hole. The problem presented by these animals is their tendency to sink when dead. Beluga skin is so soft that a hunter must be extremely clever to embed the retrieving hook¹ firmly before the animal sinks. Because of this, many men use the more practical retrieving-harpoon, line and float, an implement which antedates the hand-thrown hook.

Despite the difficulty in landing the white whale, Point Hope whalers will attempt to kill these animals whenever the black whales are not present and the beluga are near enough to be retrieved. It is common practice for two or three men to work together at these times, one man with a rifle, the others ready with ingeeloks.

Summary of White Whale Hunting: April 15 to May 12, 1960

<u>Date</u>	<u>Location</u>	<u>No. Killed</u>	<u>No. Lost</u>
April 15	West lead		1
21	South lead	1	
25	West lead		1
27	West	1	
28	West	1	
29	South	1	3
30	South	4	
30	West	1	
May 1	West	5	4
2	West		2
5	West	1	
6	West	2	1
6	South	1	2
10	South	1	
11	South		<u>1</u>
		19	15

1. The mannaktoon, adapted to spring-summer hunting, has a lead or brass weight instead of a wooden float. In this form, the retrieving hook, line and sinker is called an ingeelok.

✓

Butchering of the white whale involves as much formalism and tradition as that of the black whale. Of a half-ton beluga, only the backbone is not utilized for human food, but is usually fed to the dogs.

Spring Birds

Since field notes on all birds seen at Point Hope were furnished the University of Alaska, these data need not be repeated here. It should be noted, however, that the first bird migrations began sometime before April 7th, 1960. From this date onward, flocks of king and common eiders, murres, gulls and black guillemots could be seen in numbers of several hundred each day to several thousand each hour. Duck hunting began on April 16th, 1960, and continued through June. Statistics on this activity will not be included in this report.

Late Winter-Spring Travel

Springtime is the season for intervillage dog team travel in northwestern Alaska, especially travel between Point Hope and other Eskimo communities. All teams traveling to Point Hope from the south must pass over ground zero in Augotorux Creek. A summary analysis of this activity during the winter and spring of 1959-1960 is as follows:

Dog Teams Crossing Augotorux Creek Proper

<u>Month</u>	<u>Number of teams</u>		<u>Total number of teams</u>	<u>Total number of people</u>
	<u>Hunters</u>	<u>Transients</u>		
Oct.-Dec.	9	8	17	22
Jan.	0	1	1	1
Feb.	44	5	49	58
Mar.	17	6	23	25
Apr.	12	18	30	36
May	0	20	20	25
Total: Year	82	58	140	167
Total: Spring	73	49	122	144

The annual whaling at Point Hope is undoubtedly the primary stimulant for most springtime travel by other village residents. This is not a social activity, but merely another old tradition which allows Noatak and

Kivalina hunters to profit during a season when the inland caribou herds have moved north, when overland travel becomes more difficult, and when coastal sealing is at a minimum. Every team leaving Point Hope in the Spring of 1960 carried a load of food back to its home village.

Summary of Intervillage Dog Team Travel: Late-winter-Spring, 1960

<u>Home village</u>	<u>Arrived Pt. Hope</u> <u>teams</u>	<u>persons</u>	<u>Departed Pt. Hope</u> <u>teams</u>	<u>persons</u>	<u>Month</u>
Noatak	5	6	4	5	April
	<u>5</u>	<u>7</u>	<u>5</u>	<u>7</u>	May
	10	13	9	12	Total
Kivalina	1	1	0	0	Feb.
	0	0	1	1	Mar.
	6	10	3	4	April
	<u>4</u>	<u>4</u>	<u>6</u>	<u>7</u>	May
	11	15	10	12	Total
	<u>departed</u>		<u>arrived</u>		
Pt. Hope	3	5	1	3	Feb.
	<u>2</u>	<u>3</u>	<u>3</u>	<u>4</u>	March
	5	8	4	7	Total

Total: 49 trips with 67 persons.

Drinking and Cooking Water: Winter-Spring

A special note should be added about sources and storage of winter-spring drinking water in Point Hope. It has long been known that the Eskimo consumes an above average amount of water each day. Eighteen to twenty cups of tea or coffee, plus soup and clear water, are not an unusual daily fare for a single hunter at a whaling camp.¹ This intake may be higher in the village.

Water used in the BIA school, in the form of lagoon ice, is hauled from Aiaugatak-Beacon Hill in October-November, as mentioned. This source is also used by at least half of the village families from November to

1. An average whaling crew in 1960 used about 10 to 12 gallons of melted snow water each day.

late March. However, ice is nearly always supplemented by melted snow taken from drifts near the village during winter. Hence, a family may use 50 per cent lagoon ice and 50 per cent snow for drinking and cooking water.

Since it is common practice to store the unused snow or ice blocks outside, the onset of spring warming quickly destroys any small surplus. By the end of March, almost the entire village is dependent upon snow for water. When the drifts begin to wane in late April and early May, snow and fresh sea ice become the only sources of drinking and cooking water in Point Hope.

Lagoon ice is not used from late April-early May onwards, because of the difficulty in travel, the softness of the ice which prevents it from splitting into manageable blocks, the tendency for fresh water ice to rot quickly into thin vertical columns and the inevitable band of open water along the lagoon or lake edge which prohibits one from reaching the central ice body.

All dogs depend upon snow for drinking water, from the first snow fall until the disappearance of the last drifts and coastal sea ice.

Summary of Point Hope Hunting: Sept. 14, 1959 to May 1, 1960

<u>Week</u> <u>Ending</u>	<u>Fish</u> <u>lbs.</u>	<u>No.</u> <u>carib.</u>	<u>No.</u> <u>bear</u>	<u>No.</u> <u>fox etc.</u>	<u>No.</u> <u>seal</u>	<u>No.</u> <u>walrus</u>	<u>No.</u> <u>Wh.</u> <u>Whale</u>	<u>No.</u> <u>Bl.</u> <u>Whale</u>	<u>No.</u> <u>birds</u>
Sept. 20	565			17	1				65
27	740			17					65
Oct. 4	1380		1	17	1				65
11	1930			17					65
18	3740			17					65
25	3500	70		17	4	2			65
Nov. 1	1790	23		17					65
8	795			17	22	1			65
15	555			19	11				65
22		5			6				65
29					31				
Dec. 6			2		47				
13			3		23				
20				1	13	3			
27		1			52				
Jan. 3			1		24				
10	1000	1			48				
17			6		90				
24	750		3		29				
31	2050				45	1			
Feb. 7	750	44	1	1	118				
14	900		2	1	85				
21	375	57		1	88				
28	350	25			40				
Mar. 6	200	10			29				
13	400	140			3				
20		13			17				
27		36			24				
April 3		34			9				
10		3			4				
17					6				10
24					11		1	1	100
May 1	<u>21770</u>	<u>8</u> 470	<u>19</u>	<u>159</u>	<u>11</u> 892	<u>7</u>	<u>13</u> 14	<u>3</u> 4	<u>100</u> 795

If minimum weights are given to animal species listed in the foregoing table, and if the daily need for meat is figured at two pounds per pulling dog and per person over 14 years of age, Point Hope requires at least 7000 pounds of meat each week for minimum living conditions.

Estimated Minimum Weights

Ringed and Spotted Seals	100 lbs.
Bearded Seals	300
Walrus	400
White Whale	1000
Black Whale	20000
Bears	500
Caribou	150
Fox	10
Wolverine	25
Birds and Squirrels	1

Meat Requirements, Surplus or Shortage: Sept. 14, 1959-May 1, 1960

<u>Week</u> <u>Ending</u>	<u>Minimum amount meat required</u>	<u>Surplus +</u> <u>Shortage -</u>
Sept. 20	947 lbs.	- 6053 lbs.
27	822	- 6178
Oct. 4	2062	- 4938
11	2012	- 4988
18	3822	- 3178
25	15282	+ 8282
Nov. 1	5322	- 1678
8	3477	- 3523
15	1757	- 5243
22	1350	- 5650
29	3300	- 3700
Dec. 6	5900	- 1100
13	3800	- 3200
20	2710	- 4290
27	<u>5550</u>	<u>- 1450</u>
Total	58,113 lbs.	Surplus + 8,282 lbs. Shortage -55,169 lbs.
Jan. 3	2900 lbs.	- 4100 lbs.
10	5950	- 1050
17	12200	+ 5200
24	5350	- 1650
31	6950	- 50
Feb. 7	19660	+12660
14	10410	+ 3410
21	18735	+11735
28	8100	+ 1100
Mar. 6	4600	- 2400
13	21700	+14700
20	4450	- 2550
27	8800	+ 1800
Apr. 3	7200	+ 200
10	850	- 6150
17	610	- 6390
24	23200	+16200
May 1	<u>75400</u>	<u>+68400</u>
Total	237,065 lbs.	Surplus + 135,405 lbs. Shortage - 24,340 lbs.

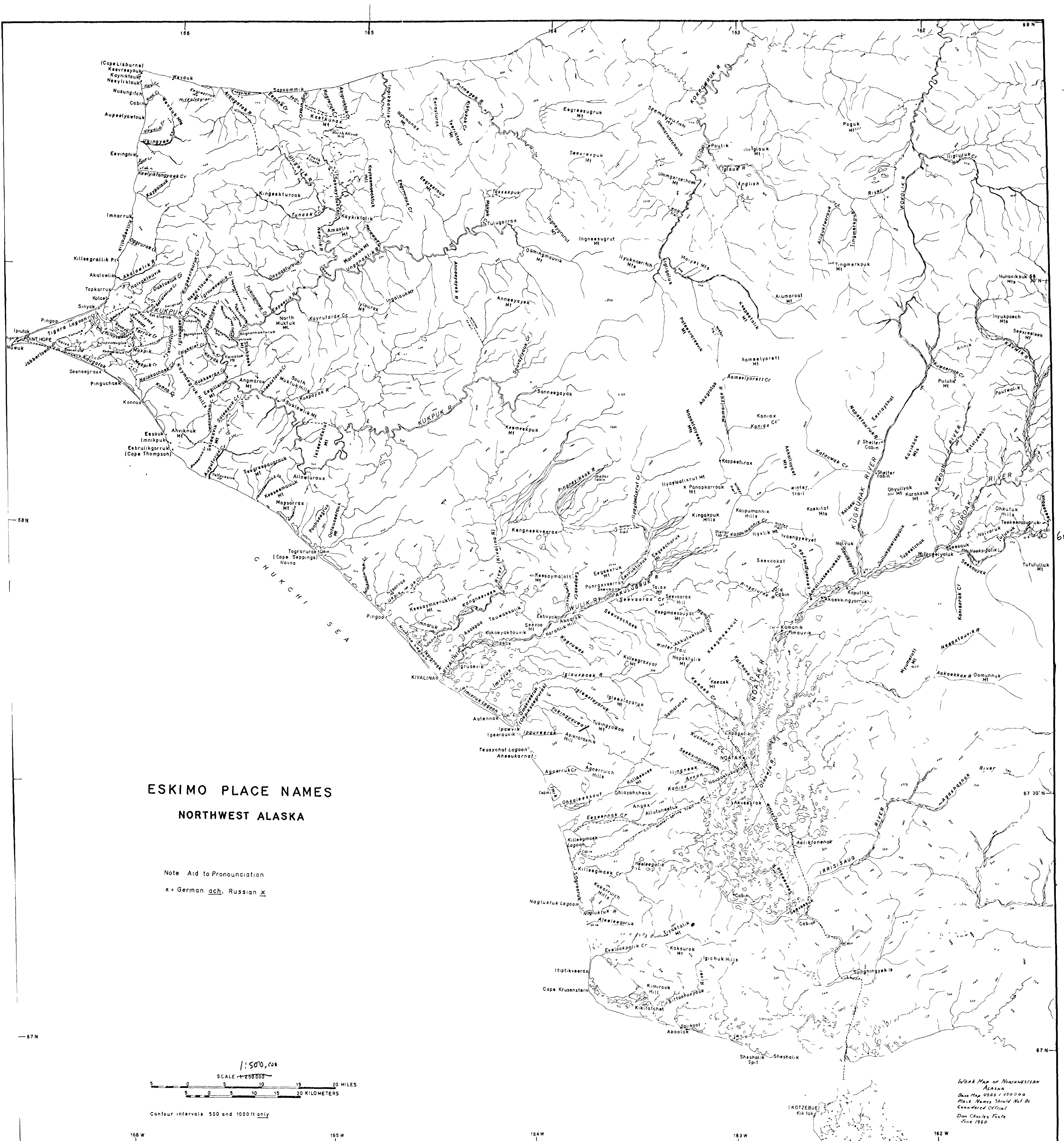
CONCLUSIONS

Despite a maximum hunting effort during the thirty-three weeks from mid-September, 1959, to the first of May, 1960, Point Hope's minimum demand for meat was met or exceeded for only eleven weeks. Although these eleven fruitful weeks resulted in a net surplus of meat equal to the requirements of nine additional weeks, the surplus was largely due to a highly successful whaling season.

Point Hope is now, as it always has been, a village oriented to subsistence living. In autumn, Kukpuk River fishing and caribou hunting prevent an undue drain on meat stored since spring, and aid greatly the returned summer laborer who may have foregone the important June seal hunting. During mid-winter, maximum hunting does not fill the daily meat demand. From February to late June, the village either achieves a surplus meat supply, which brings minimum living conditions for the coming year, or it fails in the late winter-spring hunt and suffers hardship. Earned income and other cash receipts may prevent disaster, but the greatest privations are caused by wants which money cannot satisfy. At no time can the village long forsake its hunting activity, and yet remain confident of the future.

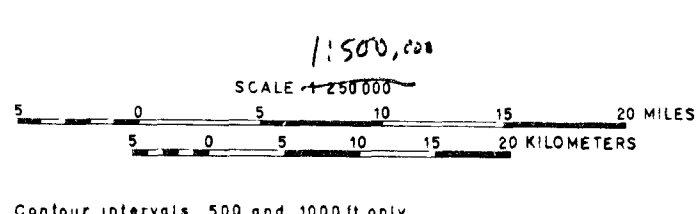
Any event which would prevent the Point Hope hunters from reaping a harvest during any month of the year, but most especially in those periods from mid-January to early July and from September to December, could bring profound and prolonged hardship to the village. Although inland and coastal hunting can be extensive during late July and August, it is of the least important to the over-all welfare of Point Hope Eskimo inhabitants.

Of all months in the year, March and April are in many ways the most critical for the residents of Point Hope. This is the period when inland hunting activity in and near Augotorux Creek, and coastwise traffic over Augotorux Creek, can be and usually are at their annual maximum. In addition, it is a season when extensive sea ice hunting takes place for distances of ten to hundreds of miles westward from Augotorux Creek.



ESKIMO PLACE NAMES
NORTHWEST ALASKA

Note: Aid to Pronunciation
x = German ach, Russian sch



WORK MAP OF NORTHWESTERN
ALASKA
Base Map USGS 1:250,000
Place Names Should Not Be
Considered Official
Don Charles Foote
June 1960