REFUGE NARRATIVE REPORT

Calendar year 1951

Nunivak National Wildlife Refuge

Mekoryuk, Alaska

UNITED STATES DEPARTMENT OF THE INTERIOR

Fish and wildlife service

Mekoryuk, Alaska

CONTENTS

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This report is based largely on observations made during the period June 18-24, 1951, when the writer and Federal Aid Biologist E. Chatelain made the annual trip to the Island. Reports of interest are received from time to time through the cooperation of the natives on the Island, the Alaska Native Service, and this summer from the U. S. Coast & Geodetic Survey field parties. References to surveys in former years are included. We have no information on many of the items usually included in a narrative report. A report reporting results of the muskox survey was submitted at its conclusion, and this report includes data forwarded at that time.

A. Weather Conditions

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II WILDLIFE

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A few pintails and little brown cranes were observed nesting over the Island. Old squaws are relatively abundant. Several hundred harlequins were observed in the sea at the base of the cliffs in the Tachibuguniut area. The sea cliffs in this area and near Cape Mohican have large numbers of colonial nesting birds; murres, kittiwakes and puffins being most abundant.

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Ptarmigan are reported on the Island, but have not been observed on any of our trips.

An account of the bird life of the Island is to be found in "Birds of Nunivak Island", by Harry S. Swarth, 1934, Cooper Ornithological Club, Pacific Coast Avifauna #22.

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Muskox:

Inventories: The following table summarizes surveys for the past four years:

	Adults &sub-adults	Calves	Total
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* The 1950 survey was considered unsatisfactory due to prevailing fog in the Cape Mohican area. The total was reported as 59, but this year's survey disclosed it should have been at least 61. The finding of 57 adults in 1949 also indicates that the total for 1948 was at least 57.

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Herd Composition and Increase: The 1951 count was classified as follows:

Adult bulls	24*
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* An adult bull to be recognized as such from the air is thought to be approximately 5 years or older, since at 6 years, the horns are reported to be matured with the boss meeting over the top of the head.

The cow figure of 36 probably includes at least 15 animals (both cows and bulls) under two years old with possibly a few 3-4 year bulls. These animals would be the calves observed in 1949 (8) and 1950 (7). Therefore it is likely that the herd contains not more than 21-23 cows of breeding age. Cows are thought to breed at 3-5 years of age, so this figure may still be too high for the number of breeding cows. However some of the 1949 and 1950 calves may have died, and the above figure of breeding cows is about the best estimate we can make with the data at hand.

Muskox apparently do not produce a calf with regularity every year. Considering all factors it is apparent that the production of 7 in 1950 and 16 in 1951 is a good calf crop for this herd. Since our increase so far has barely exceeded the deaths, the loss of any breeding cows such as the one noted above, will have a substantial effect on the increase of the herd.

Mortality: The deaths that were reported to us this year were as follows:
1 bull died apparently from old age on a hill (named Muskox Mountain by the U. S. C. & G. party) about 10 miles inland near the Nekoryuk River. It had apparently died about late May. We examined this animal and collected the skull, samples of the wool, and stomach contents.
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1 reported at Twin Mountains was examined and found to be the cow whose skull Hollingsworth had sent us in 1950.

The information on losses does not seem to fall into any definite pattern. Many of the deaths of which we have knowledge could be attributed to old age. This is to be expected since the animals were placed on the Island 16 years ago. It would seem that there has also been enough deaths among the cows to retard the increase to some extent.

Survey accuracy: The surveys are believed to be fairly accurate. For the 1951 survey we have no reason to believe that there are more muskox on the Island. To be more sure of the count it would be necessary to make an extensive winter survey with snow cover. There is room for error during June since the Island is large and the muskox are pretty well scattered around the coastal area. Frequently when a herd moves a few miles they are extremely difficult to locate on later flights. However, with thorough surveys continued over a period of years, we begin to gain an accurate knowledge of the animals on the Island. For example, this year it was possible to fly around to all probable locations on the Island and observe 71 of the 76 animals on the first flight.

Feeding Habits and Range: The stomach sample from the dead muskox was submitted to the Denver Research lab for analysis, however we have not yet received a report. A cursory field examination of the contents suggests the animal went over the tundra somewhat like a vacuum cleaner gathering up representative bits of vegetation as they were encountered. Noted in the contents were crowberry Empetrum nigrum, dwarf birch Betula sp. (probably nana), Willow Salix sp., sphagnum, unidentified grasses and sedges. The contents probably represents the food of this animal in late May, shortly following disappearance of snow cover. This forage would also be available during the winter under the snow.

On all June surveys muskox, particularly solitary bulls have been observed ranging in the sand dune areas on the south side of the Island. The vegetation here is mainly dune grass Elymus mollis see photograph. At Nikisagimiut in June 1951, it was noted that the muskox had been feeding on this grass. Since the animals have been noted ranging in the dune grass type, it probably occupies an important place in their diet. Whether this is just in early summer or throughout the year we do not know. The meanderings of a herd of 1 adult male, 1 cow and calf, and 1 young cow were followed in the Tachikugamiut area. It was noted that they sought out and fed on angelica (Angelica lucida) in preference to other plants. Also a species of Rumex had been taken (Rumex acetosa?)

In the June surveys, muskox have been observed ranging in 3 major tundra types as follows:

1. Sand dune type, principally solitary bulls.
2. Dryer tundra type composed mainly of grasses and sedges (Cape Mohican-Tachikugamiut area). However a major attraction in this broad type seems to be the small interspersed moist areas with more luxuriant growths of sedges, grasses, and a few forbs. The larger herds are noted in this type. Near the sea cliffs this type
3. contained small patches which had been denuded of vegetation through overgrazing and trampling by reindeer or muskoxen or both.
3. The heath type such as occurs near Nekeryuk and in the Twin Mountains area. This is composed mainly of browse species, sedges and mosses. The muskox from which the stomach sample was taken had evidently grazed in this type.

At present we have no reason to believe the area in which muskox range changes much during the year.

The following lists references to muskox feed habits:

Wooley, 1894: November--stomach contents of 40 animals entirely moss. In the summer-willows.

Shields 1890: August 11. Dryas octopetala, Saxifraga aizoonitifolia, Salix arctica, unidentified grasses.

Mouse 1948. Prostrate browse species of greatest importance in winter. Some grasses.

From the fragmentary bits of information we have concerning the food habits, it would appear as though muskox will subsist on a large number of the plants found in abundance on the Island. There does not appear a range problem at the present time. I am more inclined to believe that any nutritional difficulties would arise from such weather factors as ice storms which would make forage unavailable. It is reported that such storms have occurred in the past.

Hunting Habits: The following table lists the herd sizes by frequency of occurrence for all three recent surveys:

	Herd Size	Frequency
(Solitary Adult Males)	1	29
	2	1
	3	2
	4	4
	6	2
	7	1
	8	2
	9	1
	10	2
	12	1
	17	1
	20	2

Larger herds in June commonly consist of 1-2 adult males, cows, sub-adults, and calves. Never more than 3 adult bulls have been seen in a group. Usually they will be found solitary in the sand dune area on the south side of the Island. Sometimes 2-3 males will range together for a period. On June 23, 1951, two bulls that had been ranging in the Dellamute area came together and apparently had some disagreement as they were butting their heads together in a determined fashion.

Although occasionally herds are observed in June as far inland as 10 miles (Nekeryuk herd), the greater majority are found very close to the coast, seldom as much as a mile inland. We have no evidence that the animals change their range much at other times of the year. Herds which by numbers and composition are subject to identification may be found in approximately the same location year after year. We have records indicating that the Nekeryuk herd, now consisting of 4 females or sub-adults and 2 calves, has been within about 10 miles of Nekeryuk over a 4 year period. The dead bull found this year was within 2 miles of the herd and is presumably the bull noted ranging with the herd last year. It will be of interest to note future calf production in this herd, since the nearest known bulls are now 20 miles away (at Twin Mountains and Nash Harbor). However solitary bulls evidently travel to a greater extent than herds as in a couple of instances during the course of surveys, bulls have been observed travelling considerable distances along the coast. This year a herd of 17 animals moved from Cape Mohican to Nikisagimiut, a distance of seven miles, during a two day period. Some of these movements during the surveys are thought to be the result of disturbance.

Reaction to Humans: Two herds were approached on the ground. One herd of 17 had us in sight the whole time. We were unable to get closer than 1/8 mile to these. We approached another group of 4 under cover, permitting ourselves to be seen at a distance of about 75 yards. These animals, who had been lying down, got up, snorted a few times and departed on a run. They were last seen disappearing over a hill 3 miles away. Reports from the natives and surveyors indicate the solitary bulls show little fear of man.

Wool: Muskox are shedding their wool in early summer. Large patches hang loosely from the animal (see herd photograph) and fall off or is rubbed off at frequent intervals. The animals seek out hummocks and similiar places where they may rub themselves. A number of these locations were noted with bits of wool adhering to the vegetation (see photograph). It is apparently not possible to shear this wool as with a sheep since the long heavy coat of hair is interspersed through it. In a wild state, the naturally shed wool is so widely scattered as to preclude its collection in quantity. In a fenced enclosure, some might be gathered through the erection of rubbing racks. The wool is of high quality; however, the uses might be restricted due to the presence of the long guard hairs through it. Mr. Chatelain sent a sample to the Wyoming wool research station for analysis. He does not have a report of this analysis as yet.

Illegal Kill: We have no information in recent years that would indicate any illegal kill. Through the Regional and Central offices, survey parties and others going to the Island have been advised of the status of the muskox and have been cooperative in the protection of the animals. The resident native realizes the importance of the muskox, and it is believed that they have killed none in recent years. Reindeer are easily available, and the native has some preference for the meat of sea mammals. A number of years ago, a bull muskox became entangled in a dogteam and was shot in defence of life and property. For this reason, muskox are usually avoided during winter when the natives do their travelling over the Island.

Recommendations for Management: If the herd continues to show reasonably satisfactory increase, no additional management measures are needed for the present. The establishment of other herds by transplanting should not be attempted until the number of animals is sufficiently large to provide a safe margin of increase in both the remaining Nunivak herd and the transplanted herds. With an estimated 21-23 breeding cows, the herd now falls considerably short of this adequate size.

If the rate of increase is not satisfactory, or if decreases are noted, it will be necessary that an investigator be placed on the Island. His duties would be to determine the nature of detrimental factors and to investigate means of capturing and transplanting the animals. He would make periodic checks on the composition and numbers of the various herds, seek out all possible evidences of mortality and observe conditions generally. Such a survey would not be highly productive of data since a large portion of the effort would be expended in battling distance, weather, and difficult travelling conditions. The investigator would need to be provided with a native assistant and dog team for travel over the Island in winter. For the close checking and observation of herds, ground travel would be necessary.

If investigations show that factors exist on the Island which are a hazard to the increase of the herd and which cannot be corrected, steps should be taken toward transferring the herd or portions of it to a safer area.

Miscellaneous Notes: It seems possible that muskox may occasionally fall over the sea cliffs. In view of this, herds in close proximity to the cliffs are approached on the aerial surveys from the seaward side to drive them back from the cliff.

The June 1951 distribution of muskox is shown on the map included with this report. The map, an enlargement of the aerial chart, is far from accurate. A couple of the mountains are misplaced and these are shown corrected. In general, a range of volcanic peaks and hills extends east and west through the center of the Island. The highest, Mt. Roberts, is about 1800 feet in elevation.

It is believed that the most satisfactory aerial photographs of the herds will be obtained through the use of a negative 4 X 5 or larger given fine grain development. The larger photograph is a K-20 (4X5) photograph with regular development. The photograph with the largest images is 35 mm with fine grain development. None are sufficiently resolved to permit accurate determination of sex from the photographs.

Reindeer:

On each survey an estimate of the reindeer has been made. A representative of the Nunivak Reindeer Project (ANS) accompanies us for this purpose. Our tally this year was about 5000, with an estimated population of 5000-5500 including calves. In 1950, 919 were butchered and 4246 returned to range. Of the total in 1950, 1243 were fawns. This year (1951), 1040 were butchered. With the herd at its present size, the yearly increase is over 1000 animals. During mild winters, few deer are lost to winter kill. Our brief checks of the range indicate that although widespread remenants of lichen growth remain, it has been so damaged by over use in by high populations in the past that little is available as winter feed for the deer. There seems slight chance of lichen recovery even with the present herd. The management of the herd then seems to consist of removal of the annual increase each year. The herd should not be allowed to increase above the present size, in fact a reduction in this size would provide for greater chance of range recovery. During the periodic severe winters, loss will be sustained, the percentage loss probably varing directly with the size of the herd. Our recommendations the past two years have been to harvest as many deer as possible (Reindeer Project facilities can handle about 1000-1100 deer per year).

We saw no evidence of reindeer-muskox competition at this time, although this could occur with a very high reindeer population.

D. Fur Animals, Predators

Persistent reports of a wolf on the Island crystallized with the reported take of a wolf in the winter of 1950-51 by one of the natives. The residents believe this was the only wolf on the Island. Remains of the wolf were not seen, however it was certified for bounty.

Foxes are relatively numerous.

We have no information as to the fur take on the Island, although this could be readily obtained.

IV ECONOMIC USE OF THE REFUGE

No change in the Economic Use plan is recommended

Human Population: Nekoryuk is the village on the Island, inhabited at one time or another during the year by nearly all the residents of the Island. I do not have the census figure for the Island, but estimate the population at 3-400. Nearly all are full blooded Eskimos. The ANS maintains a school at Nekoryuk. Locations inhabited during parts of the year are as follows: Nash Harbor, Cape Stolin, Cape Manning, Cape Corwin (Kwigamiut), Nunathloogagamiut, Cape Mendenhall (2-3 camps), Tachyhimiut (Dolomute), and Tachikugamiut. These locations, all on the coast, are used as seasonal fishing, sealing, and trapping camps. Two or three are occupied during most of the year by family units or small groups. Transportation around the Island is by small sailing vessels in the summer and by ~~an~~ dog team in winter.

VI PUBLIC RELATIONS

B. Refuge Visitors

U. S. Coast and Geodetic Survey party, about 16 men, June-August 1951. establishing stations for aerial mapping. Headquartered at Nekoryuk.

U. S. Hydrographic Survey party, about 6 men, June 1951. Station established at Tachikugamiut to tie in with vessel working offshore.

OTHER ITEMS OF INTEREST

The Alaska Native Service Has been most cooperative in furnishing aircraft gasoline and facilities at Nekoryuk during these surveys.

It would be advantageous to investigate conditions during late winter, possibly March or April. This would include a thorough census of the muskox with snow cover and observations of forage and other conditions during the critical winter period. Such a trip has been beyond the capacity of our facilities to date.

With the appointment of Paul D. Adams on 12/23/51 as Refuge Manager of the Hazen Bay, proposed Yukon Delta, and Numivak Refuges, we will have closer contact with the Island. The headquarters at Marshall is roughly 175 air miles from Nekoryuk. No aircraft has been assigned to this area as yet. Other than brief aerial surveys such as the annual June survey, any work on the Island will be time consuming. Mail flights and hence commercial plane transportation from Bethel to Nekoryuk are infrequent and sometimes delayed for weeks due to unfavorable weather.

The rusted and battered Refuge shield sign at Nekoryuk should be replaced with a large, appropriate sign. I have in mind a sign similiar to that used on the Moose Range if a satisfactory design showing a muskox could be developed. The point is that Nekoryuk is the likely landing spot for all visitors and travellers to the Island, and a suitable sign will inform them at a glance that this Island is a National Refuge principally for the muskox. Small boundary signs should be erected at various landing points around the coast of the Island.

January 25, 1952

Submitted by:

David L. Spencer
Refuge Supervisor

Approved by:

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Wool: Muskox are shedding their wool in early summer. Large patches hang loosely from the animal (see herd photograph) and fall off or is rubbed off at frequent intervals. The animals seek out hummocks and similiar places where they may rub themselves. A number of these locations were noted with bits of wool adhering to the vegetation (see photograph). It is apparently not possible to shear this wool as with a sheep since the long heavy coat of hair is interspersed through it. In a wild state, the naturally shed wool is so widely scattered as to preclude its collection in quantity. In a fenced enclosure, some might be gathered through the erection of rubbing racks. The wool is of high quality; however, the uses might be restricted due to the presence of the long guard hairs through it. Mr. Chatelain sent a sample to the Wyoming wool research station for analysis. He does not have a report of this analysis as yet.

Illegal Kill: We have no information in recent years that would indicate any illegal kill. Through the Regional and Central offices, survey parties and others going to the Island have been advised of the status of the muskox and have been cooperative in the protection of the animals. The resident native realizes the importance of the muskox, and it is believed that they have killed none in recent years. Reindeer are easily available, and the native has some preference for the meat of sea mammals. A number of years ago, a bull muskox became entangled in a dogteam and was shot in defence of life and property. For this reason, muskox are usually avoided during winter when the natives do their travelling over the Island.

Recommendations for Management: If the herd continues to show reasonably satisfactory increase, no additional management measures are needed for the present. The establishment of other herds by transplanting should not be attempted until the number of animals is sufficiently large to provide a safe margin of increase in both the remaining Nunivak herd and the transplanted herds. With an estimated 21-23 breeding cows, the herd now falls considerably short of this adequate size.

If the rate of increase is not satisfactory, or if decreases are noted, it will be necessary that an investigator be placed on the Island. His duties would be to determine the nature of detrimental factors and to investigate means of capturing and transplanting the animals. He would make periodic checks on the composition and numbers of the various herds, seek out all possible evidences of mortality and observe conditions generally. Such a survey would not be highly productive of data since a large portion of the effort would be expended in battling distance, weather, and difficult travelling conditions. The investigator would need to be provided with a native assistant and dog team for travel over the Island in winter. For the close checking and observation of herds, ground travel would be necessary.

If investigations show that factors exist on the Island which are a hazard to the increase of the herd and which cannot be corrected, steps should be taken toward transferring the herd or portions of it to a safer area.

Miscellaneous Notes: It seems possible that muskox may occasionally fall over the sea cliffs. In view of this, herds in close proximity to the cliffs are approached on the aerial surveys from the seaward side to drive them back from the cliff.

The June 1951 distribution of muskox is shown on the map included with this report. The map, an enlargement of the aerial chart, is far from accurate. A couple of the mountains are misplaced and these are shown corrected. In general, a range of volcanic peaks and hills extends east and west through the center of the Island. The highest, Mt. Roberts, is about 1800 feet in elevation.

It is believed that the most satisfactory aerial photographs of the herds will be obtained through the use of a negative 4 X 5 or larger given fine grain development. The larger photograph is a k-20 (4X5) photograph with regular development. The photograph with the largest images is 35 mm with fine grain development. None are sufficiently resolved to permit accurate determination of sex from the photographs.

Reindeer:

On each survey an estimate of the reindeer has been made. A representative of the Nunivak Reindeer Project (ARS) accompanies us for this purpose. Our tally this year was about 5000, with an estimated population of 5000-5500 including calves. In 1950, 919 were butchered and 4246 returned to range. Of the total in 1950, 1243 were fawns. This year (1951), 1040 were butchered. With the herd at its present size, the yearly increase is over 1000 animals. During mild winters, few deer are lost to winter kill. Our brief checks of the range indicate that although widespread remenants of lichen growth remain, it has been so damaged by over use ~~im~~ by high populations in the past that little is available as winter feed for the deer. There seems slight chance of lichen recovery even with the present herd. The management of the herd then seems to consist of removal of the annual increase each year. The herd should not be allowed to increase above the present size, in fact a reduction in this size would provide for greater chance of range recovery. During the periodic severe winters, loss will be sustained, the percentage loss probably varing directly with the size of the herd. Our recommendations the past two years have been to harvest as many deer as possible (Reindeer Project facilities can handle about 1000-1100 deer per year).

We saw no evidence of reindeer-muskox competition at this time, although this could occur with a very high reindeer population.

D. Fur Animals, Predators

Persistent reports of a wolf on the Island crystallized with the reported take of a wolf in the winter of 1950-51 by one of the natives. The residents believe this was the only wolf on the Island. Remains of the wolf were not seen, however it was certified for bounty.

Foxes are relatively numerous.

We have no information as to the fur take on the Island, although this could be readily obtained.

IV ECONOMIC USE OF THE REFUGE

No change in the Economic Use plan is recommended

Human Population: Nekoryuk is the village on the Island, inhabited at~~x~~ one time or another during the year by nearly all the residents of the Island. I do not have the census figure for the Island, but estimate the population at 3-400. Nearly all are full blooded Eskimos. The ANS maintains a school at Nekoryuk. Locations inhabited during parts of the year are as follows: Nash Harbor, Cape Etolin, Cape Manning, Cape Corwin (Kwigamiut), Nunathloogagamiut, Cape Mendenhall (2-3 camps), Tachyhimiut (Dolomute), and Tachikugamiut. These locations, all on the coast, are used as seasonal fishing, sealing, and trapping camps. Two or three are occupied during most of the year by family units or small groups. Transportation around the Island is by small sailing vessels in the summer and by ~~gx~~ dog team in winter.

VI PUBLIC RELATIONS

B. Refuge Visitors

U. S. Coast and Geodetic Survey party, about 16 men, June-August 1951. establishing stations for aerial mapping. Headquartered at Nekoryuk.

U. S. Hydrographic Survey party, about 6 men, June 1951. Station established at Tachikugamiut to tie in with vessel working offshore.

OTHER ITEMS OF INTEREST

The Alaska Native Service has been most cooperative in furnishing aircraft gasoline and facilities at Nekoryuk during these surveys.

It would be advantageous to investigate conditions during late winter, possibly March or April. This would include a thorough census of the muskox with snow cover and observations of forage and other conditions during the critical winter period. Such a trip has been beyond the capacity of our facilities to date.

With the appointment of Paul D. Adams on 12/23/51 as Refuge Manager of the Hazen Bay, proposed Yukon Delta, and Nunivak Refuges, we will have closer contact with the Island. The headquarters at Marshall is roughly 175 air miles from Nekoryuk. No aircraft has been assigned to this area as yet. Other than brief aerial surveys such as the annual June survey, any work on the Island will be time consuming. Mail flights and hence commercial plane transportation from Bethel to Nekoryuk are infrequent and sometimes delayed for weeks due to unfavorable weather.

The rusted and battered Refuge shield sign at Nekoryuk should be replaced with a large, appropriate sign. I have in mind a sign similiar to that used on the Moose Range if a satisfactory design showing a muskox could be developed. The point is that Nekoryuk is the likely landing spot for all visitors and travellers to the Island, and a suitable sign will inform them at a glance that this Island is a National Refuge principally for the muskox. Small boundary signs should be erected at various landing points around the coast of the Island.

January 25, 1952

Submitted by:

David L. Spencer

David L. Spencer
Refuge Supervisor

Approved by: