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Movements and Distribution of the Western Arctic Caribou Herd Across the Buckland Valley and Nulato Hills, Winter of 1987-88

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Movements and distribution of Western Arctic Herd (WAH) caribou (*Rangifer tarandus granti*) were monitored in the Buckland Valley and Nulato Hills by personnel from the Bureau of Land Management (BLM) and Alaska Department of Fish and Game (ADFG) during the 1987-88 winter. This undertaking was part of a much larger multi-agency project, including participation by the U.S. Fish and Wildlife Service (USFWS) and National Park Service (NPS). Locations of reindeer (*R.t. tarandus*) in Merlin Henry's allotment were also noted whenever possible. This report summarizes caribou movements across the Buckland Valley and Nulato Hills, and fulfills partial implementation of the Buckland Valley Habitat Management Plan (HMP) (Adams 1982). Results from previous caribou surveys for this area were reported by Adams and Connery (1983), Smith (1984, 1985), Smith and Machida (1986), and Robinson and Field (1987). Funding was provided by each agency for its respective share of the accomplished work.

Objectives of this project are (1) to document seasonal migration patterns and winter range of WAH caribou in the Buckland Valley and Nulato Hills and (2) to make available for public inquiry timely information concerning caribou distribution and movements.

STUDY AREA

The Buckland Valley and Nulato Hills encompass approximately 6,299,000 acres of BLM lands. This area is bounded on the north by the Selawik Hills and Purcell Mountains, on the east by the Koyukuk and Yukon rivers, on the south by the Unalakleet River, and on the west by Norton Sound and the Seward Peninsula (Figure 1). The Buckland Valley is broad in nature, but is dissected by several drainages. Generally, the Nulato Hills have rounded summits with gentle slopes dropping into narrow valleys.

The northern portion of Buckland Valley is characterized by graminoid vegetation, whereas the southern portion is covered by low shrub scrub. The Nulato Hills are covered by black spruce (*Picea mariana*) forest at lower elevations, and graminoid and low shrub scrub above tree line. Tall willows (*Salix spp.*) and white spruce (*Picea glauca*) line the riparian zone and lush lichens grow throughout the study area.

Key wildlife species for this area are caribou, moose (*Alces alces*), grizzly bear (*Ursus arctos*), wolf (*Canus lupus*), furbearers, and waterfowl. A variety of small game and non-game species are also present. A detailed description of the study area can be located in the Buckland Valley HMP, Northwest Unit Resource Analysis, and Central Yukon Resource Management Plan (Adams 1982, BLM 1982, 1986).

METHODS

ADFG personnel affixed 42 new radio-transmitting collars on caribou as they crossed the Kobuk River at Onion Portage between 27 August and 8 September 1987. Three of these collars transmit signals to orbiting satellites (Fancy et al. 1988). This brought the total number of WAH caribou with active radio-transmitting collars to about 90. Personnel from ADFG and BLM tracked the movements of caribou eight times during the 1987-88 winter (Table 1). The surveys conducted in November and December were incomplete due to inclement weather, and the January survey conducted by BLM suffered from either equipment malfunction or human error. The entire study area was flown as high as 10,000 feet with either a Cessna 185 or 206 travelling at the airplane's cruising speed. General location of individual animals were recorded and later transferred to a dBase III Plus file for storage on a PC computer.

Polygons representing distribution were manually mapped by encompassing the outermost locations of observed caribou.

Table 1. Aerial Surveys of Western Arctic Herd Caribou
Buckland Valley and Nulato Hills, Winter of 1986-87

FLIGHT NUMBER	SURVEY DATE	TOTAL BLM FLIGHT HOURS	TOTAL NUMBER RELOCATIONS	AGENCY	NUMBER OBSERVERS
1	10/05-06/87	0.00	50	ADFG	2
2	10/27-28/87	10.90	23	BLM	1
3	11/25/87[a]	5.73	2	BLM	1
4	12/12/87[a]	5.50	9	BLM	1
5	1/15-16/88[b]	11.00	2	BLM	1
6	1/20/88	0.00	42	ADFG	2
7	2/08-09/88	12.67	31	BLM, ADFG	3
8	3/08/88	10.00	25	BLM	1

[a] Incomplete survey due to inclement weather.
[b] Equipment malfunction/human error.

RESULTS

For purposes of this report, location data from the satellite radio-collars were not used. Of the 90 active collars, 26 to 56 percent were relocated throughout the winter months. Several collared caribou were not located because they inhabited other portions of their winter range throughout northwestern Alaska.

In early October, caribou distribution within the study area stretched from the Selawik Hills south to the North Fork of the Unalakleet River (Fig. 1). This included the Buckland Valley and the backbone of the Nulato Hills. By late October, the northern limit of distribution remained the same, but the southern limit shifted northward to the upper Shaktoolik River (Fig. 2). The general north-south distribution observed in January, February, and March was similar to that observed in late October

(Figs. 3, 4, 5). During this same time, caribou made extensive use of the South Fork of the Buckland River and Tagagawik River. Major winter range shifted westward from the central portion of the Nulato Hills to three drainages of Norton Sound: the Inglutalik, Ungalik, and Shaktoolik rivers.

Within this winter range, two zones of concentrated caribou use were observed. The northern zone (20-52% of all relocations) was first observed along the South Fork of the Buckland River in early October, but shifted eastward to the Tagagawik River in late October. By January, it shifted northwest to the Selawik Hills, where many caribou stayed for the remainder of the winter. The southern zone (16-44% of all relocations) was first observed in the upper Inglutalik and Ungalik rivers. This zone shifted southward to the upper Shaktoolik and Ungalik rivers in late October, but shifted to the upper Inglutalik and Ungalik rivers in January. In February, this zone shifted westward to the middle Inglutalik River, but moved back to the headwaters of the Inglutalik and Ungalik rivers in March.

In early December, Merlin Henry, a reindeer herder from Koyuk, indicated that due to serious problems with caribou entering his winter range near the lower Inglutalik River, he was forced to move his reindeer from this area closer to the village of Koyuk. On December 10, Henry's herd was observed on the west side of the Koyuk River just north of the village. Caribou and signs of caribou use were are all over the range traditionally used by the Henry reindeer herd. The most concentrated use by caribou was in the lower and middle Inglutalik River and the lowlands immediately west of this area. On January 5, Merlin reported that he had moved his animals to about 1.5 miles west of the village of Koyuk due to continued problems with caribou in his grazing permit area.

DISCUSSION

Smith (1984) reported thousands of animals had moved west of the Kiwalik River during the 1982-83 winter and again the following winter. More caribou had apparently moved onto the Seward Peninsula in 1983-84 than in 1982-83. Furthermore, they ranged farther (Koyuk River) and remained longer in 1983-84 than in previous years. Thousands of caribou moved southward to the upper Shaktoolik and upper Kateel rivers in 1983-84. Smith (1985) reported small numbers of caribou in the Selawik Hills and Buckland Valley during the 1984-85 winter. Caribou ranged as far south as the Koyuk and Shaktoolik rivers, but not along the north coast of the Seward Peninsula west of the Kiwalik River. Smith and Machida (1986) reported "substantial numbers of caribou" migrated southward to the upper Anvik River and "several thousand caribou" migrated westward to the Kiwalik and Koyuk watersheds during the 1985-86 winter. Robinson and Field (1987) reported caribou migrating along the Tagagawik River to spend most of the 1986-87 winter in the Nulato Hills.

Buckland Valley has been an important winter range of WAH caribou since the 1950s (Adams 1982). Tens of thousands of caribou have been known to occupy it in past winters. Data collected during the most recent five winters show expansion of their winter range to the Koyuk, Shaktoolik, and Kateel rivers in 1983-84 and 1984-85; to the Unalakleet River in 1985-86 and 1986-87; and North Fork Unalakleet River in 1987-88. Caribou must first cross the Buckland Valley before reaching these new areas, and again during their return trip north. In addition to being used as transition range, Buckland Valley also served as winter range in 1987-88. This range expansion parallels population growth of the herd from 75,000 animals in 1976 to 230,000 in 1986.

Buckland Valley has also been used for reindeer grazing in past years (Adams and Robus 1981). Where ranges of caribou and reindeer overlap, resident reindeer will link with transient caribou. NANA lost several thousand reindeer during the 1982-83 and 1983-84 winters, but none were reported lost during the 1984-85 winter (Smith 1984, 1985). During fiscal year 1986, NANA lost approximately $375,000 in the value of their herd due to reindeer being lost to migrating caribou and have consequently disposed of their herd (NANA 1986). This year, caribou moved within close range of Merlin Henry's reindeer for the third consecutive year. Some reindeer were apparently lost during the first year (Smith and Machida 1986), but none were reported lost during the second and third years. Obviously, economic hardship to reindeer herders can occur when their animals leave with migrating caribou.

As a means of resolving this conflict, BLM will accept a permit application for reindeer grazing in Buckland Valley only after five consecutive years of non-use by caribou (Adams 1982, BLM 1982). ADFG (1984) will recommend against issuing additional reindeer permits on ranges currently occupied by caribou or with a high probability of being occupied by caribou in the future.

CONCLUSIONS AND RECOMMENDATIONS

Western Arctic caribou have traditionally used the Buckland Valley as winter range. For the third consecutive year, relocations of radio-collared animals have demonstrated caribou migrating across the valley to spend a major portion of the winter in the Nulato Hills. However, many caribou also inhabited the Buckland Valley in the 1987-88 winter. BLM should continue working with ADFG, USFWS and NPS to monitor movements and distribution of WAH caribou in future years.

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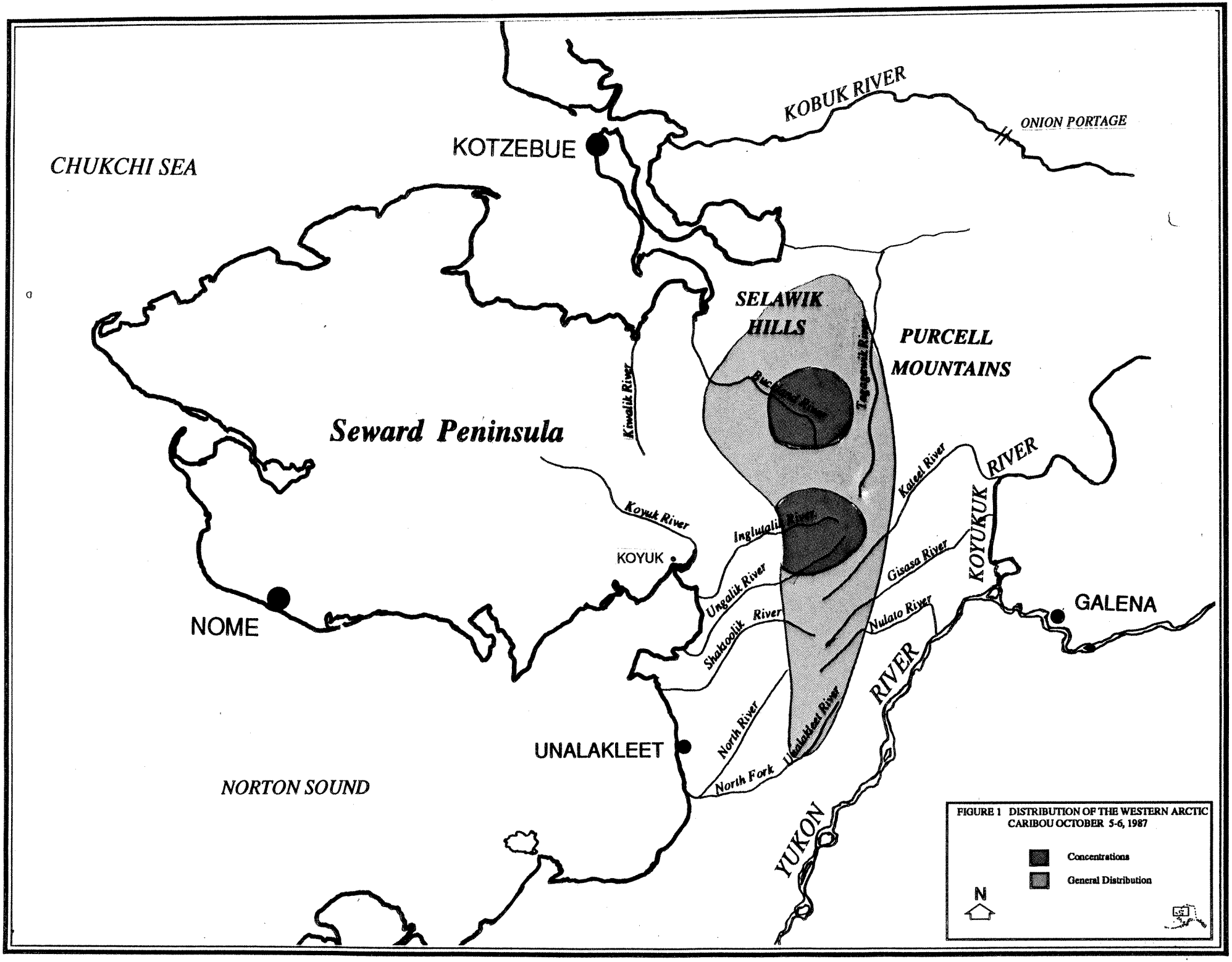
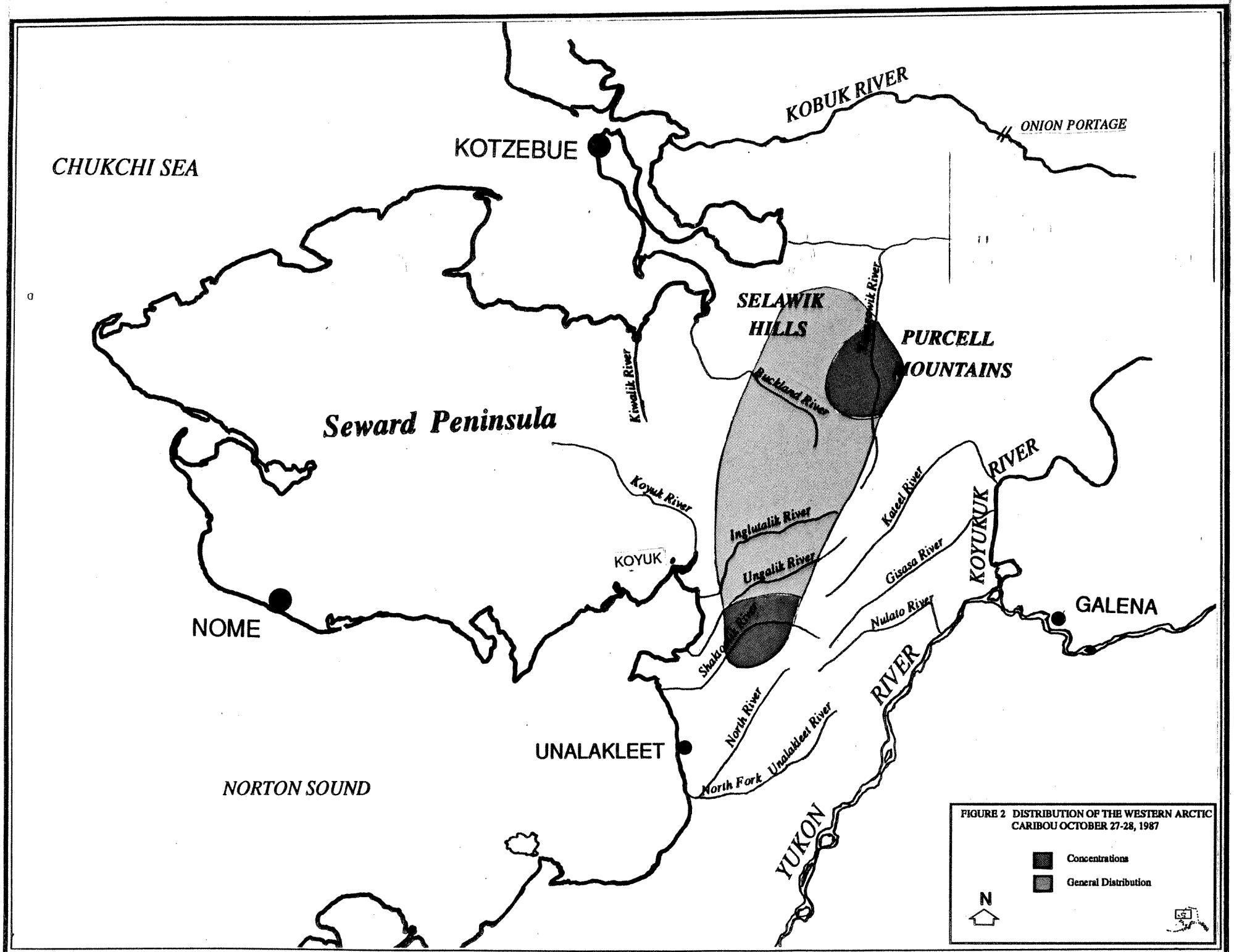
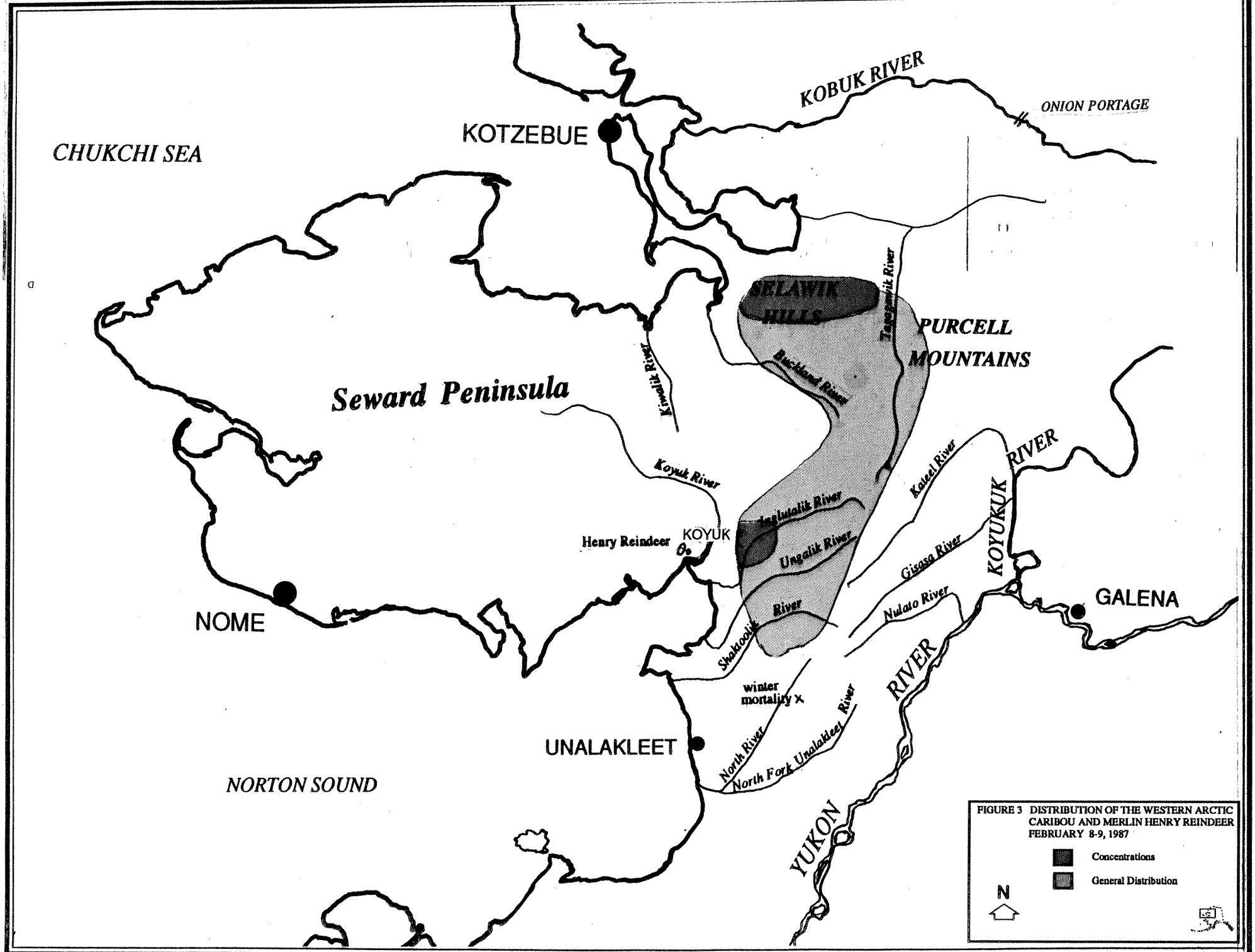
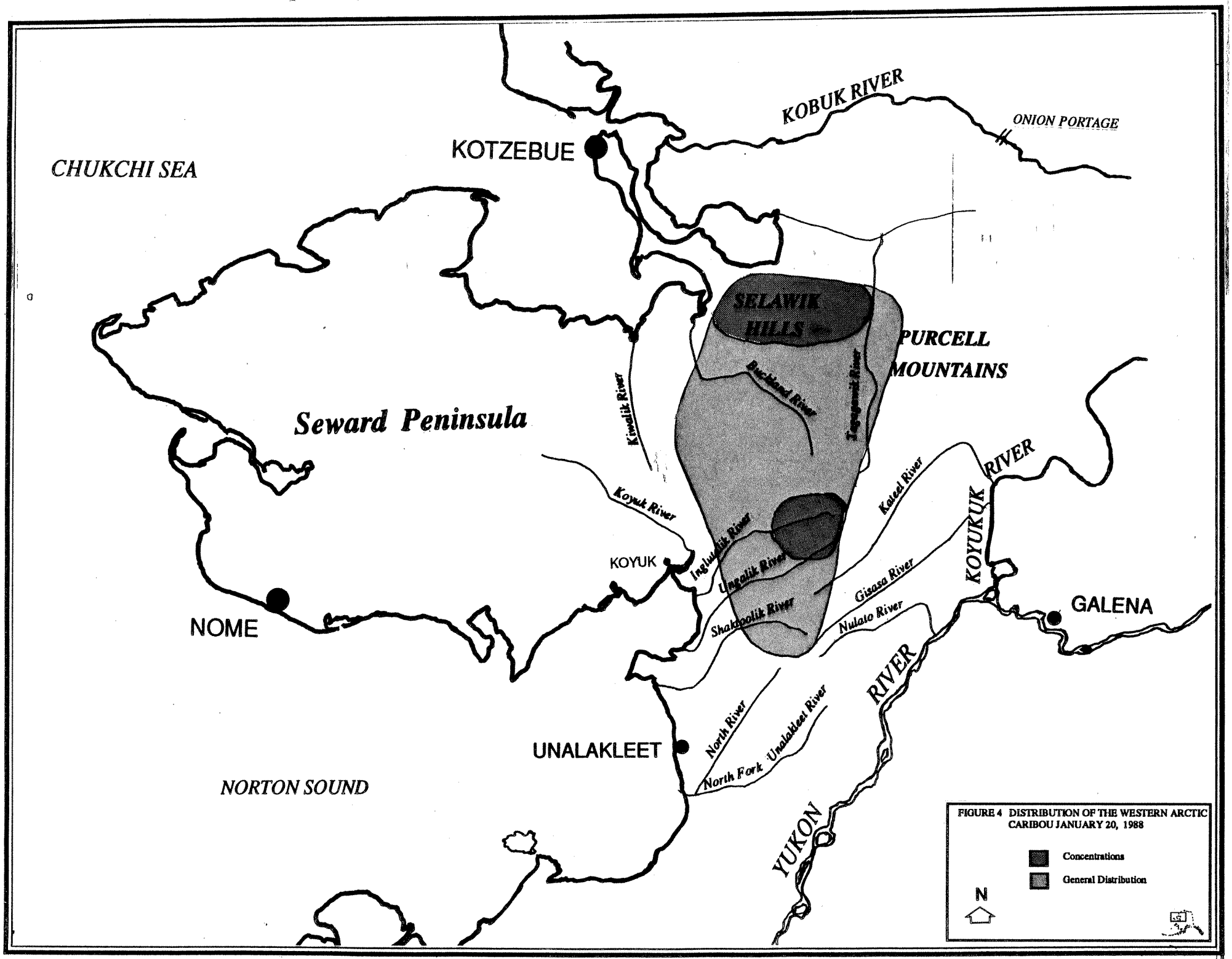
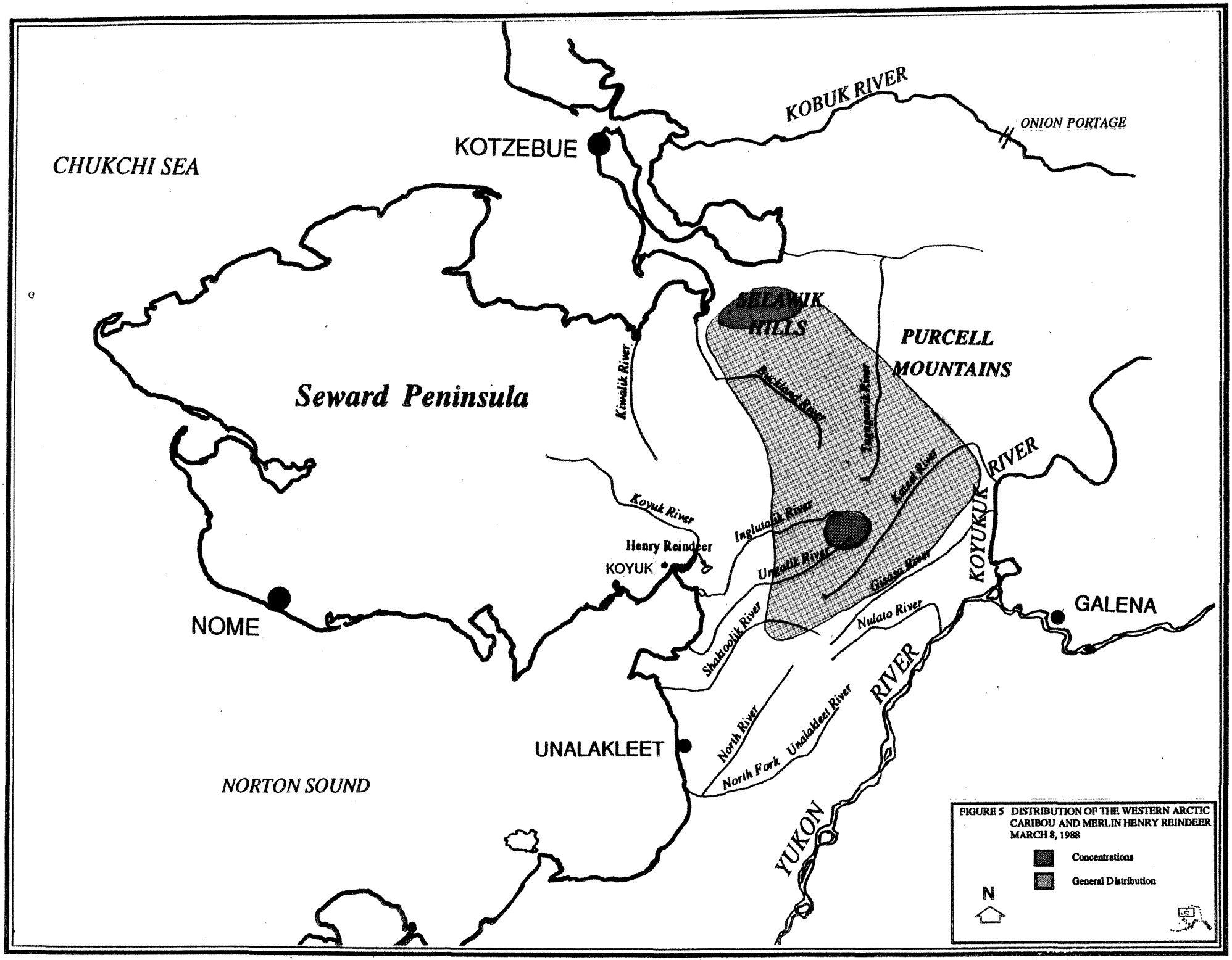
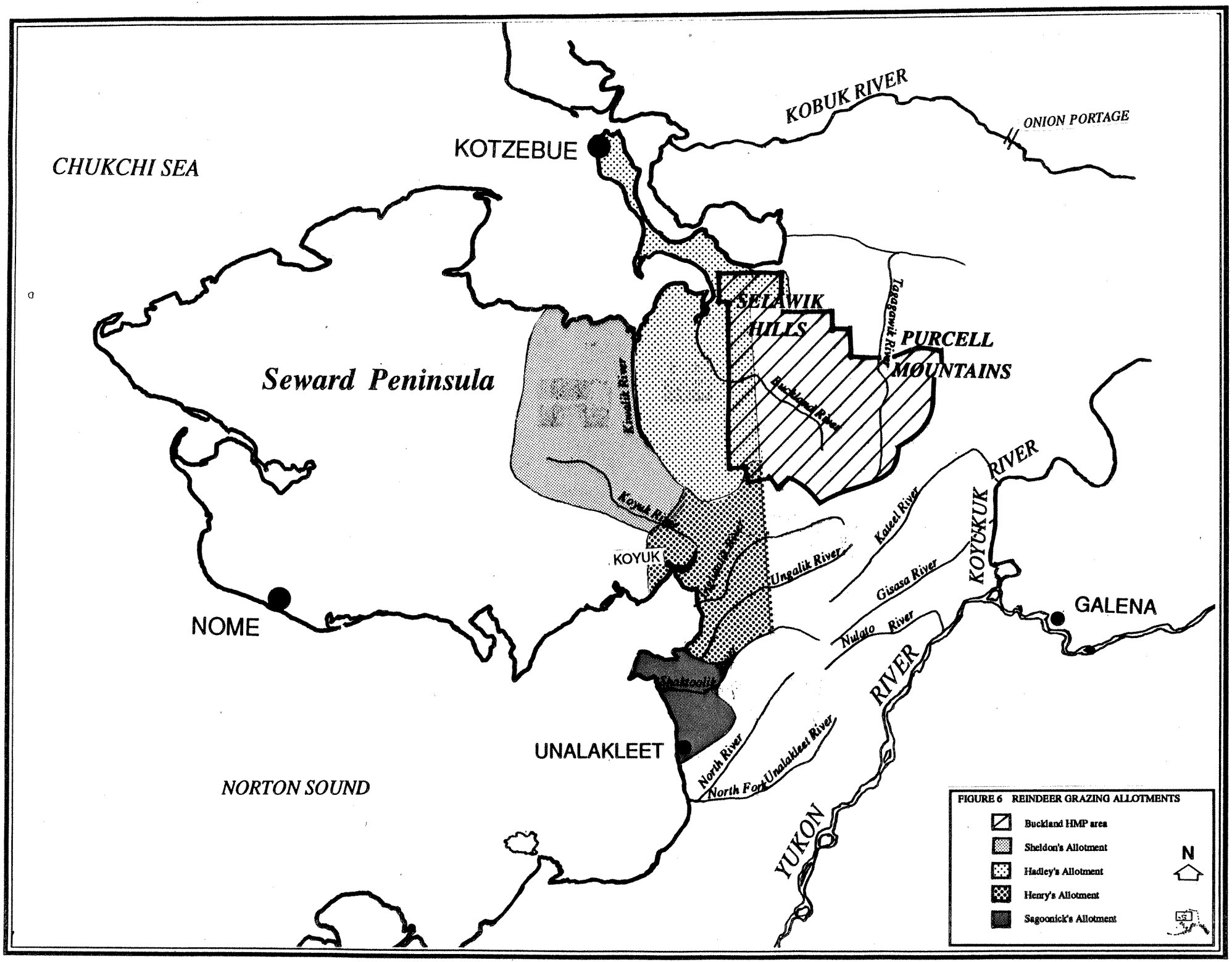

KOBUK RIVER
ONION PORTAGE
KOTZEBUE
CHUKCHI SEA
SELAWIK HILLS
PURCELL MOUNTAINS
Seward Peninsula
Kiwalik River
Tagagawik River
Buckland River
Kateel River
KOYUKUK RIVER
Koyuk River
Inglutalik River
KOYUK
Gisasa River
Ungalik River
Shaktoolik River
Nulato River
GALENA
NOME
North River
North Fork
Unalakleet River
UNALAKLEET
NORTON SOUND
YUKON RIVER
FIGURE 1 DISTRIBUTION OF THE WESTERN ARCTIC CARIBOU OCTOBER 5-6, 1987
Concentrations
General Distribution
N


KOBUK RIVER
ONION PORTAGE
KOTZEBUE
CHUKCHI SEA
SELAWIK HILLS
PURCELL MOUNTAINS
Selawik River
Kiwalik River
Buckland River
Seward Peninsula
Koyuk River
KOYUK
Inglutalik River
Unyalik River
Kateel River
Gisasa River
KOYUKUK RIVER
Nulato River
GALENA
NOME
Shaktoolik River
North River
North Fork Unalakleet River
UNALAKLEET
NORTON SOUND
YUKON RIVER
FIGURE 2 DISTRIBUTION OF THE WESTERN ARCTIC CARIBOU OCTOBER 27-28, 1987
Concentrations
General Distribution
N


KOBUK RIVER
ONION PORTAGE
KOTZEBUE
CHUKCHI SEA
SELAWIK HILLS
PURCELL MOUNTAINS
Tagagawik River
Buckland River
Seward Peninsula
Kiwalik River
Koyuk River
KOYUK
Henry Reindeer
Inglutalik River
Unglalik River
Kaeel River
KOYUKUK RIVER
Gisasa River
Nulato River
GALENA
NOME
Shaktoolik River
winter mortality
UNALAKLEET
North River
North Fork Unalakleet River
YUKON RIVER
NORTON SOUND
FIGURE 3 DISTRIBUTION OF THE WESTERN ARCTIC CARIBOU AND MERLIN HENRY REINDEER FEBRUARY 8-9, 1987
Concentrations
General Distribution
N


KOBUK RIVER
ONION PORTAGE
KOTZEBUE
CHUKCHI SEA
SELAWIK HILLS
PURCELL MOUNTAINS
Seward Peninsula
Kiwalik River
Buckland River
Tagagawik River
Koyuk River
Kateel River
KOYUKUK RIVER
Inglutalik River
Ungalik River
KOYUK
Gisasa River
Shaktoolik River
Nulato River
GALENA
NOME
North River
North Fork Unalakleet River
UNALAKLEET
YUKON RIVER
NORTON SOUND
FIGURE 4 DISTRIBUTION OF THE WESTERN ARCTIC CARIBOU JANUARY 20, 1988
Concentrations
General Distribution
N


KOBUK RIVER
ONION PORTAGE
KOTZEBUE
CHUKCHI SEA
SELAWIK HILLS
PURCELL MOUNTAINS
Seward Peninsula
Kivalik River
Buckland River
Tagagawik River
Kateel River
KOYUKUK RIVER
Koyuk River
Inglutalik River
Henry Reindeer
KOYUK
Unakalik River
Glaska River
NOME
Shaktoolik River
Nulato River
GALENA
UNALAKLEET
North River
North Fork
Unalakleet River
YUKON RIVER
NORTON SOUND
FIGURE 5 DISTRIBUTION OF THE WESTERN ARCTIC CARIBOU AND MERLIN HENRY REINDEER MARCH 8, 1988
Concentrations
General Distribution
N


KOBUK RIVER
ONION PORTAGE
KOTZEBUE
CHUKCHI SEA
SELAWIK HILLS
PURCELL MOUNTAINS
Seward Peninsula
Tagagawik River
Buckland River
Kiwalik River
Koyuk River
KOYUK
Ungalik River
Kaeel River
KOYUKUK RIVER
Gisasa River
Nulato River
GALENA
NOME
Shaktoolik
UNALAKLEET
North River
North Fork Unalakleet River
RIVER
YUKON
NORTON SOUND
FIGURE 6 REINDEER GRAZING ALLOTMENTS
Buckland HMP area
Sheldon's Allotment
Hadley's Allotment
Henry's Allotment
Sagoonick's Allotment
N