ALASKA DEPARTMENT OF FISH AND GAME

JUNEAU, ALASKA

STATE OF ALASKA
Bill Sheffield, Governor

ALASKA DEPARTMENT OF FISH AND GAME
Don W. Collinsworth, Commissioner

DIVISION OF GAME
W. Lewis Pamplin, Jr., Director
Robert A. Hinman, Deputy Director



# ANNUAL REPORT OF SURVEY-INVENTORY ACTIVITIES

## PART VI. DEER, BISON, SMALL GAME, ELK, MUSK-OXEN, AND WALRUS

Edited and Compiled by
Joann A. Barnett, Publications Technician

Volume XIII

Federal Aid in Wildlife Restoration

Project W-22-1, Job 2.0, 9.0, 10.0, 13.0, and 16.0



(Printed July 1983)

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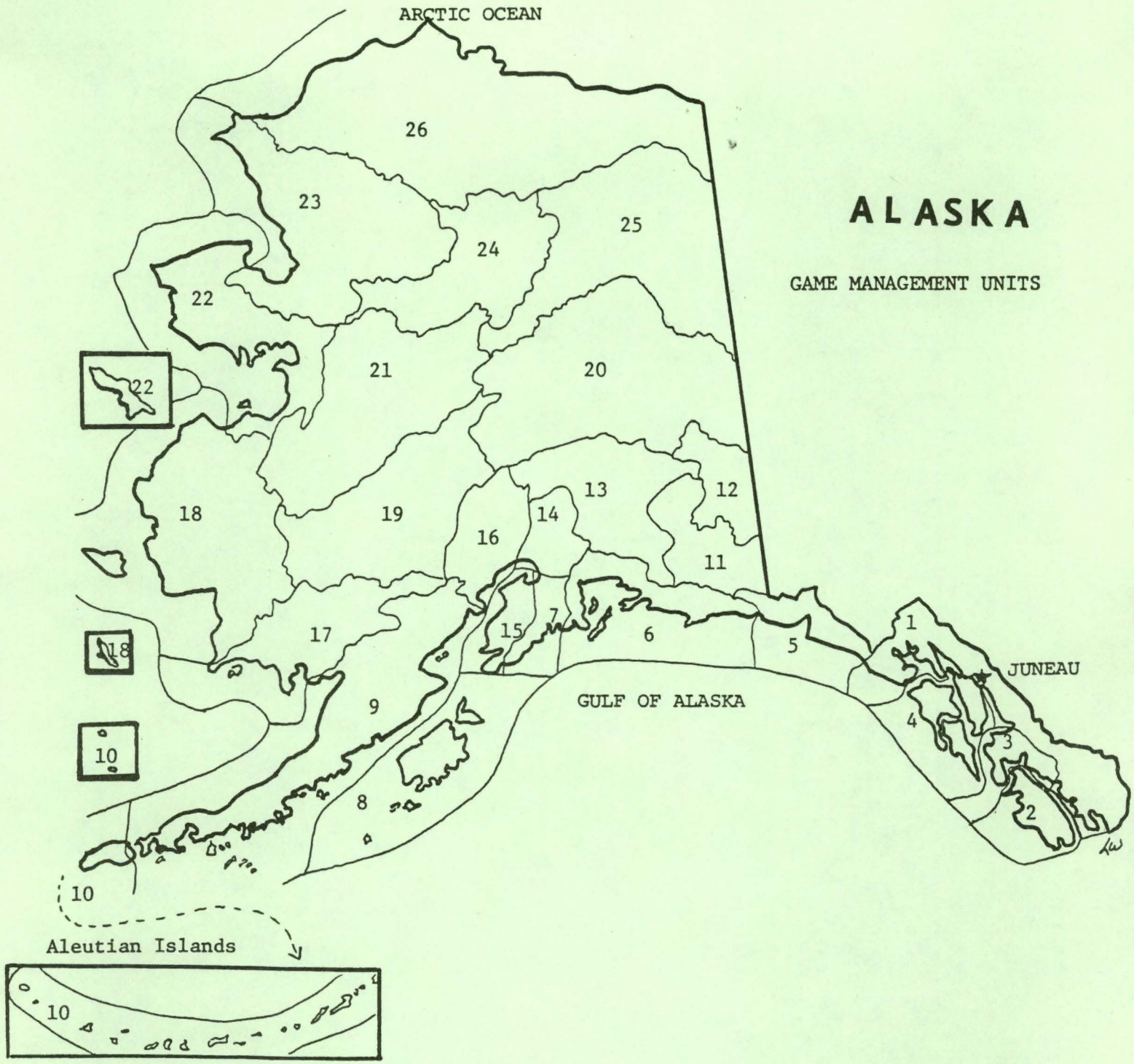
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## Statewide Harvests and Population Status

### Deer

Firm estimates of deer harvest are unavailable in many Units, so a statewide harvest estimate is unavailable. Deer harvest has been estimated from harvest report cards, telephone interviews, and questionnaires, none of which has been entirely satisfactory to date. Harvest was comparatively high in Unit 4 (estimated 4,190 to 7,227, highest in the last 6 years) and at a record high in Unit 8, where an estimated 5,500-6,000 deer were taken.

The winter of 1981-82 was moderately severe in Southeastern (Units 1-5), but winter mortality was moderate. In Units 6 and 8, the winter was relatively mild and mortality low. Populations in Units 4, 6, and 8 were at a high level.

### Bison

The statewide harvest of bison was 90, of which 3 were taken from the Chitina herd, 8 from Copper River, 11 from Farewell, and 58 from Delta. Bison hunting is strictly controlled by permits, so harvest figures are relatively accurate.

All 4 bison herds appeared to be in healthy condition. Summer counts of 56 bison in the Chitina herd and 129 bison in the Farewell herd were record high counts for these areas. The Copper River herd was estimated at 75 animals, and the Delta herd at 325.

### Small Game/Upland Game

Reports are included for small game in Units 18 and 23, and the results of the statewide upland game questionnaire are presented. Population trends vary by species and area. No harvest data are generally available.

### Elk

Elk are found only in Unit 8 (Raspberry and Afognak Islands). Populations were increasing; mild winters continued to allow good production and high survival. The population numbered over 900 elk.

The harvest of 112 was the highest in 15 years.

### Musk-oxen

Musk-oxen are present on Nunivak Island and 4 other locations to which they have been transplanted. The Nunivak population numbered about 600; 217 animals were estimated on Nelson Island

(prehunt), 100-150 on the Seward Peninsula, 64 at Cape Thompson-Point Hope, and 219 on the North Slope (Arctic National Wildlife Refuge). Except for Unit 23, all transplanted herds are thriving; the Cape Thompson herd is of uncertain status.

Hunts were held on Nunivak and Nelson Islands. A total of 64 animals (54 cows, 10 bulls) was taken in fall and spring seasons on Nunivak; 27 musk-oxen (19 cows, 8 bulls) were taken in a spring season on Nelson Island.

Walrus

Since marine mammals are under Federal jurisdiction, only 1 report is submitted for walrus. This report covers Unit 17, where the Department maintains the Walrus Islands State Game Sanctuary.

Robert A. Hinman
Deputy Director

# DEER

## SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 1A and 2

GEOGRAPHICAL DESCRIPTION: Ketchikan Area and Prince of Wales Island

PERIOD COVERED: July 1, 1981-June 30, 1982

### Season and Bag Limit

Aug. 1-Nov. 30 Three antlered deer

### Population Status and Trend

Population levels in most areas of Subunit 1A and Unit 2 appear similar to those of 1981. Gravina Island appears to have suffered a noticeable decline, and it is probable that the moderately severe winter of 1981-82 killed at least some deer in other areas. There are still moderately high deer populations on Gravina Island and many of the smaller islands along the west coast of Prince of Wales Island. In addition, on Prince of Wales Island, good deer populations are reported in the area north of Big Salt Lake, and this is the 1st year that fair deer numbers were reported in the Labouchere-Red Bay area. There are still major areas in both Units, however, where deer numbers remain at low levels.

### Population Composition

No data were available.

### Mortality

The winter of 1981-82 was moderately severe in certain areas. Fairly extensive snow cover was present from the beginning of January through March in most areas of Subunit 1A and some areas on the east side of Prince of Wales Island. The west coast of Prince of Wales Island did not experience the snow accumulation of the other areas.

Twelve beach mortality transects in Unit 2, plus 3 in Subunit 1A, were walked in late April. Only 1 dead deer was found, and it was attributed to predation. Deer sign was generally low everywhere except on the west side of Prince of Wales Island north of Craig, and on the Cleveland Peninsula.

Harvest and hunting data for the 1981 season were obtained from a mail questionnaire of all harvest ticket holders in Southeast Alaska. Final tabulation is incomplete, but some data are usable.

A total of 2,829 deer harvest tickets was issued to people residing in Subunit 1A and Unit 2. There were 535 questionnaires returned during the mail survey. Of these, 383 persons hunted and 152 did not.

In addition to the mail survey, approximately 10% of the non-respondents living in Ketchikan were contacted by phone for information concerning their deer hunting activities for 1981.

Data from the surveys indicated best hunter success occurred during August in both Subunit 1A and Unit 2. In Subunit 1A, the best hunting was again on Gravina Island; in Unit 2, Hecata Island produced the best hunter success. About twice as many deer were taken per day of hunter effort on Hecata Island as were taken on Gravina Island.

Hunter effort in Unit 2 was evenly distributed throughout the season while in Subunit 1A, pressure was greatest in October and November.

The Prince of Wales Island road system received the heaviest hunting pressure, accounting for 47% of the total hunting effort in both Units and for 44% of the total deer taken. Hunter effort along the Prince of Wales Island road system is high because many people working in the area who use the road system daily reported hunting during a large percentage of the open season.

Management Summary and Recommendations

With the exception of decreases in deer numbers on Gravina Island in Subunit 1A, populations have made no obvious changes for several years. Range conditions in unlogged areas are excellent, and winter conditions prior to 1981 have been favorable for deer.

Currently, populations are below carrying capacity. Deer numbers should be increasing; however, as far as can be determined, they have not been doing so. Wolf and black bear predation appears to be the most likely reason.

PREPARED BY:

Robert E. Wood
Game Biologist III

SUBMITTED BY:

Nathan P. Johnson
Regional Management Coordinator

# DEER

## SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 1B and 3

GEOGRAPHICAL DESCRIPTION: Unit 1B - Mainland from Cape Fanshaw to Lemesurier Point on Cleveland Peninsula

Unit 3 - Islands of the Petersburg, Kake, and Wrangell Areas

PERIOD COVERED: July 1, 1981-June 30, 1982

### Season and Bag Limit

| | | |
|---|---|---|
| Unit 1B | Aug. 1-Nov. 30 | Two antlered deer |
| Unit 3, that portion south of Sumner Strait and Eastern Passage, including Level, Vank, Sokolof, Rynda, and Kadin Islands | Aug. 1-Nov. 30 | One antlered deer |
| Remainder of Unit 3 | No open season | |

### Population Status and Trend

Sitka black-tailed deer are found on most of the islands in Game Management Unit 3 and on the mainland area of Subunit 1B. Populations in these Units have periodically reached peaks in the past and then crashed. The declines can be attributed to many factors, of which the most prominent are probably severe winter weather, predation by wolves, excessive or illegal hunting, and deterioration of the range from overpopulation and clear-cut logging.

Deer numbers in both Units are currently low, although increases are being noted in some localities. There are noticeable population gains on predator-free islands of less than 2,500 acres in size. Populations are increasing slowly on Mitkof, Kupreanof, Etolin, and Wrangell Islands, while the population on Zarembo Island declined during the period.

A survey of Unit 3 deer range in February 1982 (Fig. 1) indicated low deer populations throughout most of the Unit (Appendix A). Over 19 mi of shoreline habitat were walked, and the occurrence of deer sign (droppings, tracks, browsing, sightings) was noted.

A continuous surveillance of beaches was maintained and deer numbers recorded during 255 mi of travel by boat. Observability of deer on beaches depends on tide stage, visibility, wind velocity and direction, and other factors. Tracking conditions in winter ranges were good, with a few inches to 2 ft of snow in the old-growth wintering habitat.

Pellet group surveys were conducted only on Sokolof and Rynda Islands. In May 1982, a total of 1,880 plots (10 $m^2$) was examined on Sokolof Island, while 347 plots were examined on Rynda Island. The winter of 1981-82 was not severe, but snow depths and persistence were greater than in 1980-81. The surveys indicated a slight decline in population on Sokolof and an increase on Rynda over 1981 (Appendix B). Mortality surveys indicated a loss of deer on Sokolof during the winter. Late winter population declines will not be evident in pellet group deposition counts until spring 1983. It is anticipated that pellet group surveys will be repeated next year.

Population Composition

No data were collected.

Mortality

Deer mortality transects were conducted in May 1982 on Sokolof and Vank Islands in Sumner Strait. Two 1-mi transects were intensively searched on each island. The Sokolof transects yielded 4 dead deer (2.0 deer/mi), while the Vank Island surveys showed a winter kill of 5 deer (2.5 dead deer/mi). Excessive use of browse plants was noted during winter surveys on Vank, Sokolof, and Level Islands (Appendix A). Deer on Little Level Island were utilizing rusty menziesia (Menziesia ferruginea), hemlock (Tsuga heterophylla), and bull kelp (Nereocystis luetkeana) during the winter. No mortality surveys were conducted on the Level Islands, but mortality is known to have occurred (J. Doerr, pers. commun.). Sokolof, Vank, and the Level Islands have been extensively clear-cut.

The wolf continued to be a major predator on deer populations on the larger islands. Trappers reported seeing deer which had been killed by wolves on Mitkof Island and trapping wolves which had eaten deer. The actual extent of wolf predation is unknown, but is thought to be a major limiting factor of deer populations in Subunit 1B and Unit 3.

A questionnaire (Fig. 2) was sent to all licensed hunters who acquired mandatory deer harvest tickets in Southeast Alaska for the 1981 hunting season. The survey was undertaken to determine deer hunting success. A total of 198 hunters residing or hunting in Subunit 1B and Unit 3 responded (Appendix C). Based on this survey, 96 (49%) of the 198 harvest ticket holders did not hunt in 1981. Of those that did hunt, 28 (27%) were successful; 74 (73%) were unsuccessful.

To sample those harvest ticket holders who did not respond to the questionnaires, a 10% random sample of the residents in Petersburg, Wrangell, and Kake were interviewed by telephone. Of the 104 sampled (Appendix C), 72 (69%) did not hunt. Of those that hunted, 6 (19%) were successful and 26 (81%) were unsuccessful. Since successful hunters are more likely to report, any sampling of nonrespondents to the mail survey would be expected to show a lower success rate, with fewer people hunting. The actual values for the number of harvest ticket holders who hunted and their success rates probably fall between these 2 sets of values.

Within Unit 3, the success rate for deer hunters on Vank, Level, and Sokolof Islands in Sumner Strait declined from 1980 and stayed about the same for Subunit 1B.

## Management Summary and Recommendations

A comparison of hunter surveys by telephone and mail shows reported success rates to be from 19 to 27%. The effort involved in a telephone survey of nonrespondents is great, and the mail survey should provide sufficient data. It is recommended that the telephone survey be conducted every other year as a check on the accuracy of the mail survey.

Population surveys were conducted on winter range for the 1st time in many years. Spring pellet group counts in wintering areas should be utilized to supplement winter surveys and quantify deer use of forest types. The major limiting factor on deer populations is currently predation, but clear-cut logging and residential development are permanently eliminating deer range in Subunit 1B and Unit 3, and can be expected to reduce the potential population by lowering carrying capacity.

PREPARED BY:

E. L. Young, Jr.
Game Biologist III

SUBMITTED BY:

Nathan P. Johnson
Regional Management Coordinator

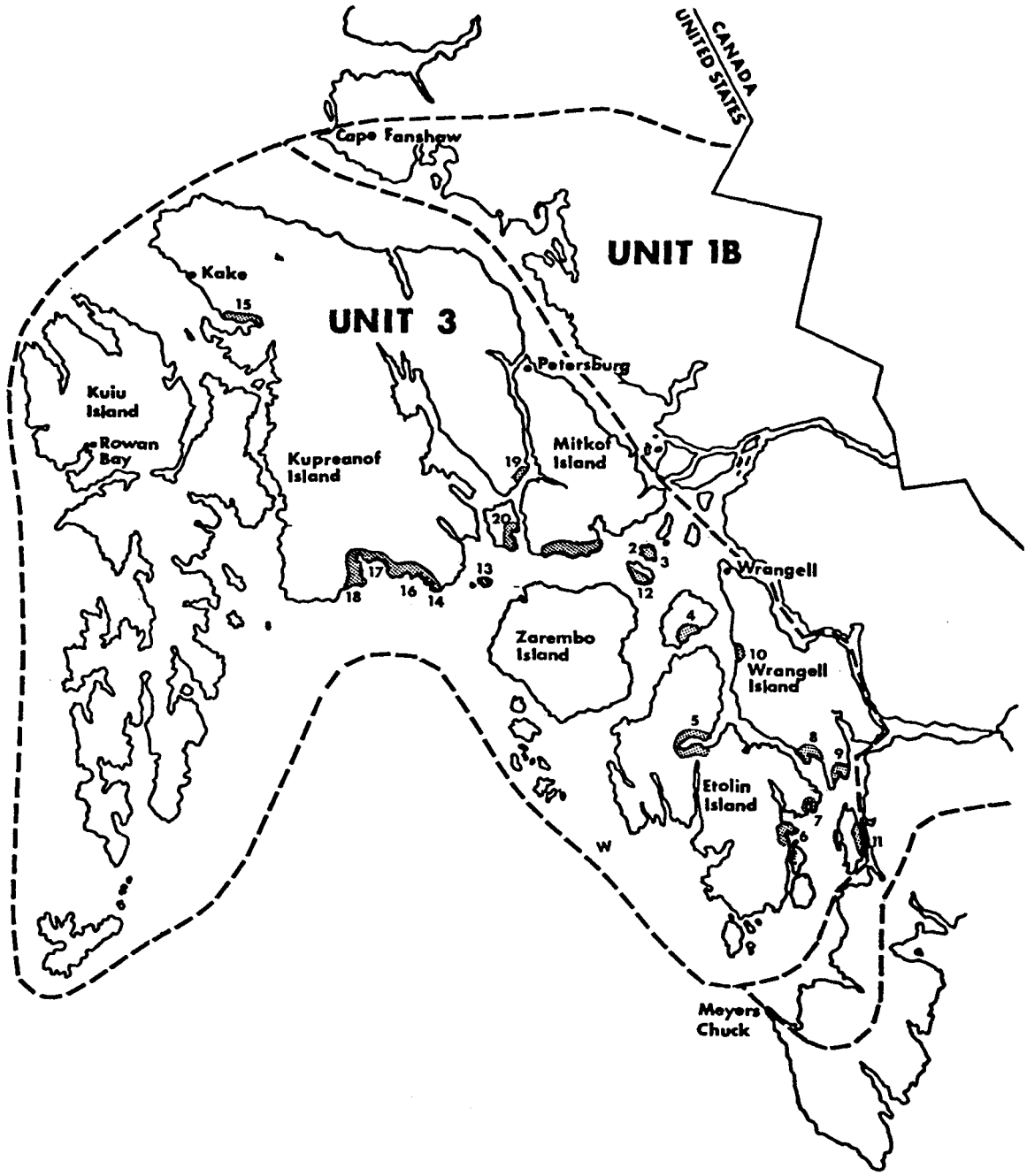


Fig. 1. Winter deer population surveys, February 1982.

Dear Southeastern Deer Hunter:

Deer hunting is an important activity in Southeast Alaska. If we are to improve the quality of deer hunting, it is vital that we have the best information for making management decisions.

I would appreciate your taking a few minutes to fill out the attached questionnaire on your deer hunting activities this past hunting season (1981). Your responses will be confidential. Please return your completed questionnaire within one week.

If you cannot remember all the information, please estimate as closely as you can. Include in your answers all deer hunting activities from August 1, 1981 through December 31, 1981. It is important that you return this questionnaire whether you hunted and got some deer, hunted but did not get any deer, or did not hunt at all.

Thanks for helping us maintain deer habitat and hunting in Alaska.

Donald E. McKnight
Regional Supervisor, Game Division

**********

INSTRUCTIONS:

1. If you did not hunt deer in 1981, check this box ☐ and go to #3. If you did hunt, go to #2.
2. This survey contains maps (see seperate sheet) of the Game Management Units (GMU) in Southeast and a short table to be filled out by you concerning your deer hunting if you hunted in Southeast Alaska in 1981.
   - A. Locate and mark on the map the general area(s) within each GMU in which you hunted in the 1981 season.
   - B. Write the number of each GMU and area hunted in the column labeled "GMU Hunted" and "Area Hunted".
   - C. For each "Area Hunted", fill out the total number of days hunted in the area throughout the whole season (include all hunts to that area, the names of the months in which you hunted in the area, and the total number of bucks and does harvested.
   - D. If you hunted outside Southeast, please indicate under "comments" the GMU(s) in which you hunted and the number of bucks and does harvested.
   - E. Feel free to use the blank lines under the table for listing additional hunts or for general comments.
3. Please stamp and return the entire completed survey within one week to the Fish and Game office nearest you (listed on the back of this sheet). Better yet, bring it in person to your local Game Biologist and spend a few minutes "talking

| GMU Hunted* | Area Hunted* | Total # of Days Hunted in Area | Name Month(s) Hunted | # of Deer Killed | |
|---|---|---|---|---|---|
| | | | | Bucks | Does |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

*Use numbers from maps on separate sheet.

Comments_____

Fig. 2. 1981 deer survey questionnaire.

APPENDIX A. Unit 3 deer use surveys, February 1982.

| Map No.[a] | Location | Date | Deer observed | Evidence of deer[b] |
|---|---|---|---|---|
| | Mitkof Island | | | |
| 1 | Woodpecker Cove to Blind Slough | 2/17/82 | 3 | Good |
| | Sokolof Island | | | |
| 2 | Southwest Cove | 2/17/82 | 0 | Common |
| 3 | Southeast Cove | 2/21/82 | 0 | Abundant |
| | Woronkofski Island | | | |
| 4 | Circle Bay | 2/18/82 | 0 | Rare |
| | | | | -- |
| | Etolin Island | | | |
| 5 | Anita Bay to Dog Salmon Creek | 2/18/82 | 0 | Rare |
| 6 | Canoe Passage-Menefee Point | 2/20/82 | 3 | Common |
| 7 | Southwest Cove (viewed from boat) | 2/20/82 | 3 | -- |
| | Wrangell Island | | | |
| 8 | Thoms Place | 2/19/82 | 0 | Rare |
| 9 | Southeast Cove | 2/19/82 | 0 | Common |
| 10 | Turn Island (viewed from boat) | 2/20/82 | 2 | -- |
| | Deer Island | | | |
| 11 | Eastern shore | 2/20/82 | 2 | Good |
| | Vank Island | | | |
| 12 | Southwest Point to Southeast Point | 2/22/82 | 7 | Abundant |
| | Level Islands | | | |
| 13 | Little Level | 2/23/82 | 6 | Abundant |

APPENDIX A. Continued.

| Map No.[a] | Location | Date | Deer observed | Evidence of deer[b] |
|---|---|---|---|---|
| | Kupreanof Islands | | | |
| 14 | Moss Island | 2/23/82 | 2 | Common |
| 15 | Hamilton Bay | 2/5/82 | 0 | Absent |
| 16 | Douglas Bay | 2/23/82 | 0 | Absent |
| 17 | Totem Bay | 2/23/82 | 0 | Absent |
| 18 | Little Totem Bay | 2/24/82 | 0 | Absent |
| 19 | Wrangell Narrows (viewed from boat) | 2/24/82 | 1 | -- |
| 20 | Woewodski Island | 2/24/82 | 0 | Common |
| Total | | | 29 | |

[a] See Fig. 1 for map location.

[b] Abundant - recent evidence of excessive use of browse, many tracks and droppings; good - browsing evident, tracks and/or droppings seen;common - tracks and/or droppings seen, sign of 3 or more deer; rare - tracks of less than 3 deer observed; absent - no tracks, droppings, or evidence of browsing.

APPENDIX B. Results of spring deer pellet group surveys, 1981-1982.

| Island | Total acres | No. of 1981 plots | No. of 1982 plots | Mean groups/ acre, 1981 | Mean groups/ acre, 1981 |
|---|---|---|---|---|---|
| Rynda | 2,100 | 561 | 347 | 49.1 | 72.9 |
| Sokolof | 2,076 | 1,800 | 1,880 | 346.7 | 303.5 |

APPENDIX C. Comparison of telephone and mail questionnaire results, 1981.

| Method | No. respond. | Hunted in 1B & 3 | Unsuccessful | | Successful | |
|---|---|---|---|---|---|---|
| | | | No. | % | No. | % |
| Mail | 198 | 102 (52%) | 74 | 73 | 28 | 27 |
| Telephone | 104 | 32 (31%) | 26 | 81 | 6 | 19 |
| Totals | 302 | 134 (44%) | 100 | 75 | 34 | 25 |

DEER

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 1C

GEOGRAPHICAL DESCRIPTION: Mainland from Cape Fanshaw to the Latitude of Eldred Rock

PERIOD COVERED: July 1, 1981-June 30, 1982

Season and Bag Limit

| | |
|---|---|
| Aug. 1-Dec. 31 | Four deer provided that antlerless deer may be taken only from Sept. 15-Dec. 31. |

Population Status and Trend

Available information indicates that the prewinter deer populations in Subunit 1C appeared similar to 1980. During the moderately severe 1981-82 winter, populations were probably reduced. The extent of these reductions is not fully known. High winter mortality, reported in some areas on Admiralty Island adjacent to Subunit 1C, was not substantiated in Subunit 1C.

Population Composition

No data were collected.

Mortality

In 1981, all deer harvest ticket holders in Southeastern Alaska were mailed questionnaires to assess harvest and hunter pressure. No additional mailings were sent to nonrespondents as was done in 1980. About 22% of all harvest ticket holders in Southeastern Alaska responded to the mail survey, and a few additional responses were obtained by telephone. The results of both surveys showed that 263 responding hunters spent 915 days hunting deer in Subunit 1C in 1981 and took 116 deer (79 males and 37 females). The success per hunter day was 0.127 deer. No comparisons were made between the 1980 and 1981 data because of the extreme differences in mail questionnaire response levels of 60% and 22%, respectively.

Appendix A and Fig. 1 show the distribution of hunter effort and success by sub-area for Subunit 1C in 1981-82. Douglas Island (sub-area 7) continues to be the most heavily hunted area in the Unit, followed by the Favorite Channel Islands (sub-area 6), and the mainland near Juneau (sub-area 5).

Distribution of Juneau area hunters (including Douglas and Auke Bay) by Unit indicated 19% hunted in Subunit 1C only, 27% hunted

in both Subunit 1C and Unit 4, 53% hunted exclusively in Unit 4, and 1% hunted in some other Unit(s).

Management Summary and Recommendations

The reported harvest of 116 deer for Subunit 1C in 1981 was about 32% below the 1980 reported kill, but was probably not indicative of a change in deer abundance; rather, it was probably the result of a much lower hunter report response rate over 1980. Based on hunter comments, 1980-81 deer abundance and harvest appeared similar to the previous year.

Fewer deer are expected for the 1982-83 season due to the 1981-82 moderately severe winter of 1981-82. The effects of the winter on deer abundance will not be known until the 1982-83 deer hunter questionnaire survey is completed.

The loss of deer habitat in Subunit 1C due to continued urbanization and logging will reduce deer population levels in those areas affected.

Since harvest data are the only indirect measures available which may relate to deer abundance, attempts must be made to develop a more accurate and consistent means by which hunter information is obtained. The deer hunter questionnaire mail survey used since 1979 appears to be a potentially good vehicle to solve this problem, however, improvements in hunter sampling will be necessary.

PREPARED BY:

David W. Zimmerman
Game Biologist II

SUBMITTED BY:

Nathan P. Johnson
Regional Management Coordinator

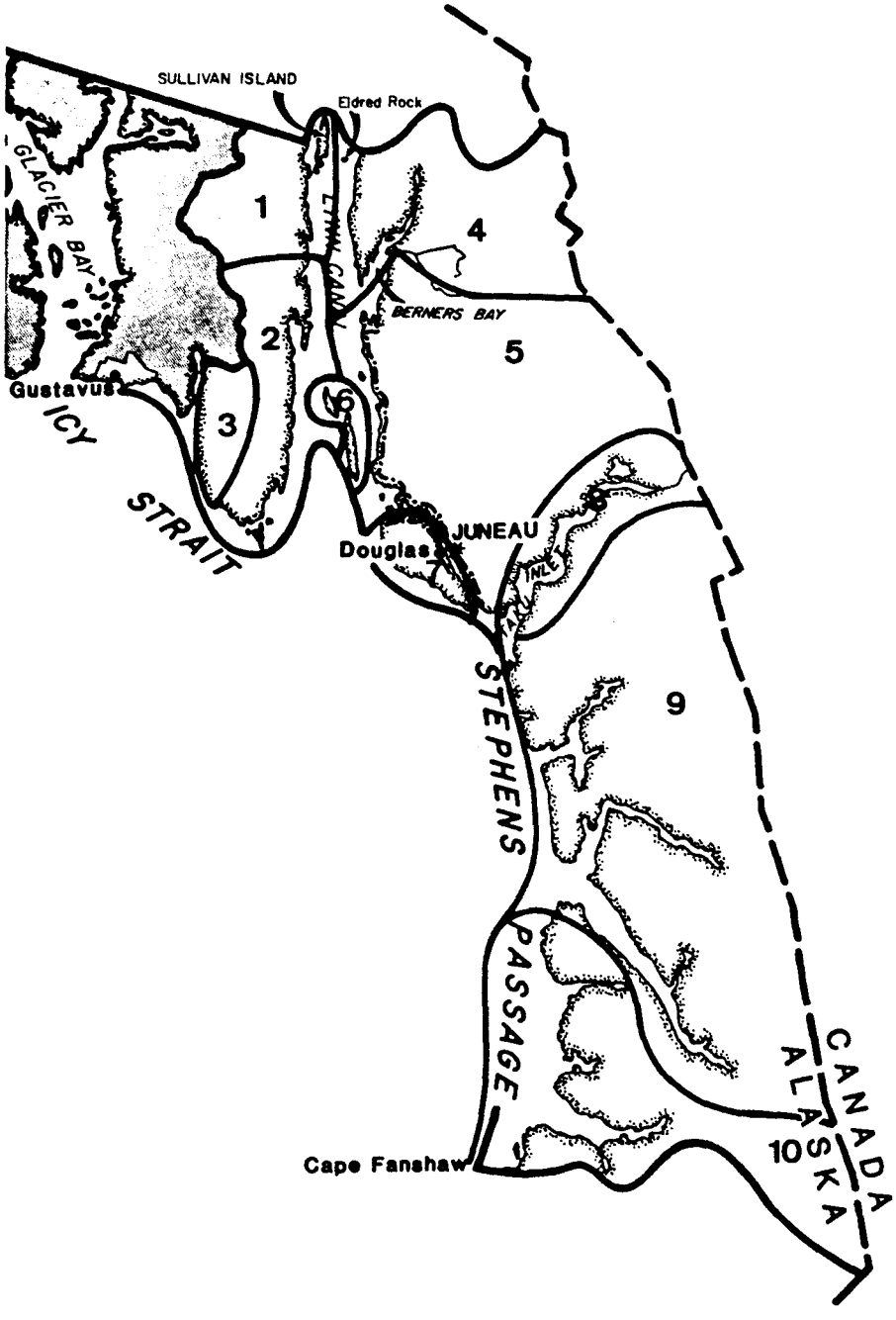


Fig. 1. Deer harvest sub-areas in GMU 1C for 1981-82.

APPENDIX A. Distribution of hunter effort and success by sub-area in GMU 1C for the regulatory year 1981, Southeastern Alaska.

| Sub-area | Hunter days | Deer killed | | Total deer killed | Deer per hunter day |
|---|---|---|---|---|---|
| | | Male | Female | | |
| 1 | 15 | 1 | 0 | 1 | 0.067 |
| 2 | 18 | 1 | 1 | 2 | 0.111 |
| 3 | 1 | 1 | 0 | 1 | 1.000 |
| 4 | 2 | 0 | 0 | 0 | 0 |
| 5 | 164 | 7 | 6 | 13 | 0.079 |
| 6 | 294 | 32 | 15 | 47 | 0.160 |
| 7 | 410 | 37 | 15 | 52 | 0.127 |
| 8 | 4 | 0 | 0 | 0 | 0 |
| 9 | 5 | 0 | 0 | 0 | 0 |
| 10 | 2 | 0 | 0 | 0 | 0 |
| Totals | 915 | 79 | 37 | 116 | 0.127 |

DEER

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 4

GEOGRAPHICAL DESCRIPTION: Admiralty, Baranof, Chichagof, and Adjacent Islands

PERIOD COVERED: July 1, 1981-June 30, 1982

Season and Bag Limit

| | | |
|---|---|---|
| That portion of Admiralty Island north of a line along the divide between Woody Point on the west side and Pleasant Bay on the east side, including Pleasant Bay; and that portion of Chichagof Island east of a line running along the divide between Column Point on the north coast and Point Hayes on the southeast coast in Chatham Strait | Aug. 1-Dec. 31 | Four deer, provided that antlerless deer may be taken only from Sept. 15-Dec. 31. |
| Unit 4, remainder of Admiralty Island | Aug. 1-Nov. 30 | Three deer, provided that antlerless deer may be taken only from Oct. 15-Nov. 30. |
| Remainder of Unit 4 | Aug.1 -Nov. 30 | Four deer, provided that antlerless deer may be taken from Oct. 15-Nov. 30. |

Population Status and Trend

Based on spring mortality transects, no measurable winter mortality has occurred in 4 of the last 5 years, and the lack of snow in the fall has made deer less vulnerable to hunters. In addition, season and bag limit restrictions over the past 3 years in parts of the Unit may have reduced harvests. Consequently,

the deer population over Unit 4 probably has been at high levels for several years.

Population Composition

Opportunistic counts made during 1981-82 resulted in age classification of 1,264 deer, of which 302 (23.9%) were fawns. Similar counts in 1980-81 yielded about 30% fawns. With no comparable data from prior years, the significance of these percentages is not clear. R. D. Taber (pers. commun.) feels that counts made during late spring-summer, the time when the bulk of these counts were made, should indicate about 1 fawn per adult doe for mule and black-tailed deer. With about 25% fawns and assuming 20% yearlings, 30% adult does, and 25% bucks for the remainder of the population, the percentage of fawns observed is somewhat below Taber's optimum. This is understandable in Unit 4 where most suitable ranges are fully stocked and, with little turnover, conditions favor older age class animals.

Mortality

Winter mortality was measured on 23 permanent transects, each 1 mi in length. These transects, established in the late 1950's, are surveyed annually.

The winter of 1981-82 was the first severe winter in Southeastern Alaska since 1971-72. An average of 1.26 dead deer were found per mile of beach examined. Winter losses of deer normally occur when snow comes early and remains continuously until April-May. However, the heavy snowfall did not begin until about mid-January, so the winter was fairly short. During the past several years, mild winter weather has prevailed allowing high deer populations over Unit 4. Thus, mortalities that occurred in 1981-82, while fairly significant in numbers, were less significant than mortality in 1968-72 because of the much higher population levels than those of the earlier period. The 1981-82 mortalities were primarily limited to those animals least able to survive (young, small fawns, and very old animals), whereas the mortalities in 1971-72 included many prime-aged animals.

Winter losses were fairly evenly distributed over Unit 4 in 1981-82 except on northern Admiralty Island, especially upper Seymour Canal; there, 6 carcasses were found on 1 mi of beach in King Salmon Cove. Some of the carcasses could have drifted in from other areas, however.

Deer sign was extremely abundant throughout Unit 4, and most food plants showed very heavy use. Large numbers of deer were sighted throughout Unit 4 during extensive field observations in May. The age classes most vulnerable to winter mortality (fawns, yearlings, and old bucks) were well represented in the deer observed.

Game Division personnel surveyed an additional 29 mi of beach throughout the Unit to augment data from permanent mortality transects. Mortality averaged 1.24 deer/mi.

Sitka black-tailed deer have a high reproductive capability. The severe winters of 1968-72 significantly reduced deer numbers throughout Southeastern Alaska. But with mild winters and no changes in seasons or bag limits, one of the all-time high Unit 4 deer harvests occurred in 1975. In just 4 years, the Unit 4 deer population had rebounded to a level where large numbers of deer were available for harvest.

The estimated Unit 4 sport harvest for the 1981 hunting season was 4,190 to 7,227 deer based on a hunter questionnaire mailed to all harvest ticket holders (Appendix A). This survey was supplemented by a telephone interview of about 10% of those persons who did not return the questionnaire in Sitka, Ketchikan, Petersburg, Wrangell, and a 1% sample of Juneau nonrespondents. Hunters expended an estimated 18,000 man-days of effort and averaged about 3.8 days per deer bagged. Active hunters took about 1.5 deer each. The 1981-82 harvest compares favorably with historic levels (Appendix B).

The high harvest estimate of 7,227 deer was calculated by expanding the voluntary harvest questionnaire returns assuming no sampling bias between respondents and nonrespondents. The low harvest estimate for Sitka, Juneau, Ketchikan, Petersburg, and Wrangell was calculated by adding the actual number of deer harvested by questionnaire respondents to the expanded telephone interview of nonrespondents. Harvest estimates for the remaining communities (except "Other" which is a pure estimate) were calculated by using the Sitka telephone interview as constant, i.e., 71% nonrespondents actually hunted and each took 1.21 deer with 100% of their effort in Unit 4.

Management Summary and Recommendations

The relatively severe winter of 1981-82 resulted in a moderate population reduction of the Unit 4 deer herd. Most of the loss consisted of deer least able to survive, the very young and the very old. This was an insignificant reduction, because the deer population entering the winter was very high as a result of a series of mild winters and moderate harvests. The harvest in 1981 was perhaps above average as might be expected in view of the high standing population.

The current regulations (1981-82) are reasonably commensurate with deer population levels, except around Sitka where they are perhaps overly conservative. It makes little sense to protect a highly renewable resource from harvest only to have large numbers of that resource lost to natural causes. Winter mortality along

with accelerated timber harvests which are concentrated in the critical high volume stands of old-growth timber are the only serious causes of deer mortality in Unit 4.

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Nathan P. Johnson
Regional Management Coordinator

APPENDIX A. Game Management Unit 4 deer harvests by community, 1981-82.

| Community | Total no. harvest tickets issued | Total Unit 4 hunters | Harvest | |
|---|---|---|---|---|
| | | | High est. | Low est. |
| Sitka | 1,972 | 1,447 | 2,590 | 1,904 |
| Juneau | 3,193 | 2,159 | 2,613 | 1,172 |
| Petersburg | 583 | 172 | 537 | 253 |
| Ketchikan + 1A & 2 residents | 2,829 | 28 | 109 | 54 |
| Wrangell | 691 | 47 | 105 | 30 |
| Hoonah | 205 | 197 | 398 | 190 |
| Angoon | 87 | 65 | 163 | 75 |
| Pelican | 84 | 69 | 153 | 75 |
| Kake | 101 | 72 | 87 | 85 |
| Port Alexander | 13 | 13 | 26 | 12 |
| Tenakee Springs | 73 | 61 | 132 | 65 |
| Gustavus | 46 | 42 | 67 | 42 |
| Haines/Skagway | 143 | 72 | 125 | 111 |
| Elfin Cove | 9 | 9 | 18 est. | 18 est. |
| Funter Bay | 2 | 2 | 4 est. | 4 est. |
| Other | 418 | 100 est. | 100 est | 100 est. |
| Totals | 10,449 | 4,555 | 7,227 | 4,190 |

APPENDIX B. Deer harvest data, Game Management Unit 4.

| Year | Total kill[a] | % males | Days of effort/deer | Deer/ hunter | Winter mortality/mile |
|---|---|---|---|---|---|
| 1981 | 15,700[b] | 77 | 3.8 | 1.5 | 1.26 |
| 1980 | 4,500 | 75 | 6.7 | 1.4 | 0.00 |
| 1979 | 950 | 70 | 4.5 | 1.0 | 0.00 |
| 1978 | 2,024 | 70 | 2.5 | 1.1 | 0.72 |
| 1977 | 2,945 | N/A | 1.6 | 1.2 | 0.00 |
| 1976 | 1,475 | 67 | 7.5 | 0.7 | 0.00 |
| 1975 | 4,247[c] | 57 | 2.2[d] | 2.1[d] | 0.96 |
| 1974 | 7,118 | 57 | 3.1 | 2.3 | 0.41 |
| 1973 | 7,000 | 67 | 3.5 | 2.5 | 0.78 |
| 1972 | 2,500 | 54 | 4.9 | 1.4 | 0.64 |
| 1971 | 3,040 | N/A | 3.3 | 1.7 | 1.11 |
| 1970 | 4,040 | 56 | N/A | 2.1 | 1.61 |
| 1969 | 1,756 | 45 | 8.0 | 0.8 | 0.00 |

[a] Hunter questionnaire 1980-1981, harvest ticket/report data 1975-1979; hunter interview through 1974.

[b] Range 4,190-7,227.

[c] Hunter interview data calculated harvest of 14,700.

[d] Data for Sitka hunters only before 1975.

# DEER

## SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 6

GEOGRAPHICAL DESCRIPTION: Prince William Sound

PERIOD COVERED: July 1, 1981-June 30, 1982

### Season and Bag Limit

| | |
|---|---|
| Aug. 1-Dec. 31 | Four deer, provided that antlerless deer may be taken only from Sept. 15-Dec. 31. |

### Population Status and Trend

Prince William Sound deer populations were at a moderate level during the mid-1970's and gradually increased to a high level through 1981 due to a series of mild winters.

### Population Composition

Determined by tooth eruption and wear, age data were obtained from deer jaws ($N$ = 90) collected from Cordova hunters and were as follows: 30.0% fawns, $N$ = 27; 32.2% 1-year-olds, $N$ = 29; 6.7% 2-year-olds, $N$ = 6; 10.0% 3-year-olds, $N$ = 9; 16.7% 4-year-olds, $N$ = 15; and 4.4% 5-year-olds, $N$ = 4 .

### Mortality

Deer harvest characteristics for Cordova hunters were obtained by interviewing 100 license holders (Appendix A). The data were extrapolated and revealed a harvest of 784 deer by an estimated 490 Cordova hunters. Males composed 61% of the harvest. The average harvest for all hunters afield was 1.6 deer, whereas successful hunters averaged 2.4 deer. Cordova hunters primarily hunted Hawkins Island. The majority of their harvest was distributed evenly over October, November, and December.

### Management Summary and Recommendations

No statewide harvest data were collected during 1981. Neither the deer hunter report card (1969-1979) nor the deer hunter questionnaire (1980) were utilized in 1981.

The estimated harvest of 784 deer by Cordova hunters is considered a good harvest but not excessive. Snow depth moved the deer onto the timbered beach fringes twice during the season, but heavy rains following each major snowfall allowed deer to disperse before hunters could kill many deer.

All aspects of the deer harvest by Cordova hunters appear to be normal.

Traditionally, Hawkins Island receives the brunt of Cordova hunting pressure. Age data collected from deer killed by Cordova hunters indicated an abundance of fawns and yearlings. The percentage of males and the number of deer killed per hunter also suggest that the population is increasing..

A field trip in early March indicated Prince William Sound deer herds to be in excellent physical condition for late winter. Their condition is probably a result of a cold, but relatively snow-free winter. No mortality was observed, even though much of the winter range is of poor quality.

Due to a recent series of mild winters and the subsequent build-up of deer numbers, a 5-deer bag limit is recommended for the 1982 season. The winter range in Prince William Sound is in poor condition and will only support the present deer population during mild winters.

PREPARED BY:

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SUBMITTED BY:

Leland P. Glenn
Survey-Inventory Coordinator

APPENDIX A. 1981 Cordova deer hunter survey, 1981.

| Item | | Interview sample | Est. number[a] | % |
|---|---|---|---|---|
| No. of hunters | | 100 | 700 | 100.0 |
| Hunters afield | | 70 | 490 | 70.0 |
| Unsuccessful hunters | | 23 | 161 | 32.9 |
| Successful hunters | | 47 | 329 | 67.1 |
| Deer harvested | | 112 | 784 | |
| Males harvested | | 68 | 476 | 60.7 |
| Deer/hunter afield | | 1.6 | 1.6 | |
| Deer/successful hunter | | 2.4 | 2.4 | |
| Days afield | | 316 | 2,212 | |
| Harvested: | 1 deer | 17 | 119 | 36.2 |
| | 2 deer | 9 | 63 | 19.1 |
| | 3 deer | 7 | 49 | 14.9 |
| | 4 deer | 14 | 98 | 29.8 |
| Chronology: | Aug | 1 | 7 | 0.9 |
| | Sep | 16 | 112 | 14.3 |
| | Oct | 32 | 224 | 28.6 |
| | Nov | 34 | 238 | 30.4 |
| | Dec | 29 | 203 | 25.9 |
| Location: | Montague | 31 | 217 | 27.7 |
| | Hinchinbrook | 25 | 175 | 22.3 |
| | Hawkins | 47 | 329 | 42.0 |
| | Mainland | 3 | 21 | 2.7 |
| | Other islands | 6 | 42 | 5.4 |

[a] Approximately 700 Cordova hunters obtained deer harvest tickets in 1981. Thus, the sample was multiplied by 7 to give estimated harvest figures.

DEER

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 8

GEOGRAPHICAL DESCRIPTION: Kodiak and Adjacent Islands

PERIOD COVERED: July 1, 1981-June 30, 1982

Season and Bag Limit

| | | |
|---|---|---|
| Unit 8, that portion of Kodiak Island draining into Ugak Bay west of Pasaghak Road, ending at the mouth of Pasagshak River east of a line from the mouth of Saltery Creek to Crag Point | Aug. 1-Jan. 31 | One deer, provided that antlerless deer may be taken only from Oct. 1-Oct. 31. |
| Unit 8, that portion of Kodiak Island north of the access road from Port Lions to Crescent Lake, and east of a line from the outlet of Crescent Lake to Mount Ellison Peak and from Mount Ellison to Pokati Point at Whale Passage and remainder of Kodiak Island east of the Saltery Creek-Crag Point Line | Aug. 1-Oct. 31 | One deer, provided that antlerless deer may be taken only from Oct. 1-Oct. 31. |
| Remainder of Unit 8 | Aug. 1-Jan. 31 | Five deer, provided that anterless deer may be taken only from Sept. 15-Jan. 31. |

## Population Status and Trend

The deer population continued to increase and is probably at the highest level since its introduction.

## Population Composition

Hunters reported seeing large groups of deer along western Kodiak Island beaches in October.

Forty-nine deer were classified by foot surveys on November 20-21, 1982, southwest of Kupreanof Strait on Kodiak Island. The composition was 16 bucks (33%), 19 does (39%), and 14 fawns (29%); 11 of the 19 does (57%) had fawns.

## Mortality

The total 1981-82 deer harvest was estimated at 5,500-6,000 deer. This estimate was based on a telephone survey of Kodiak Island hunters and on the estimated harvest by hunters from the mainland. Kodiak residents probably composed about half of the hunters afield, and they probably took about half the kill during the 1981-82 season.

A telephone survey of 6% (144) of Kodiak residents who purchased a hunting license provided the only quantitative harvest data for the 1981-82 season. These data were extrapolated to arrive at an estimated harvest of 3,190 deer by 1,041 residents of Kodiak (Appendix A). This harvest was only slightly below the 3,294 deer extrapolated from a telephone survey of Kodiak resident hunters for the 1980-81 season. The survey indicated 36% of the harvest came from the northern islands: Afognak, Raspberry, and Shuyak. Kodiak and adjacent islands accounted for 64% of the kill. Seventy-seven percent of the hunters took more than 1 deer, and 25% took the season bag limit of 5 deer. Most of the harvest was taken in October (23%), November (31%), and December (25%).

Natural mortality during the winter of 1981-82 was light. Only 6 deer carcasses were found after searching 21 mi of coastline by foot on Kodiak, Afognak, Raspberry, and Whale Islands during May and June 1982. Local residents reported finding some weak deer and a few dead deer in the northern Afognak Island, Shuyak Island, and the Uganik Bay areas. Although relatively heavy snowfall occurred in April, deer observed during aerial surveys on northern Kodiak Island in April and early May appeared to be in good physical condition.

## Management Summary and Recommendations

Although hunting pressure and harvest have been increasing each year, the deer population continues in an upward trend. Only in more accessible areas of northeastern Kodiak Island, southwestern Afognak Island, and Raspberry Island has the harvest been

intensive enough to dampen the increasing population trend. A continuation of the recent trend toward mild, snow-free winters will allow the deer population to continue to increase.

Additional hunting pressure should be directed to Unit 8 by continuing to publicize the high deer population levels. Increases in bag limits and season length would result in a minor increase in harvest. Further increases in bag limits would probably encourage waste, but if public demand favors such increases, the deer population can support the additional harvest in all but the most accessible areas.

PREPARED BY:

Roger B. Smith
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SUBMITTED BY:

Leland P. Glenn
Survey-Inventory Coordinator

APPENDIX A. Deer hunting effort and harvest extrapolated from a telephone survey of 6% of Kodiak residents who purchased hunting licenses.

| Item | Number | % |
|---|---|---|
| License buyers | 2,580 | -- |
| License buyers interviewed | 144 | 6 |
| License buyers not hunting | 1,039 | 40 |
| License buyers hunting | 1,541 | 60 |
| Female kill | 842 | 26 |
| Male kill | 2,348 | 74 |
| Total kill | 3,190 | 100 |
| Successful hunters | 1,075 | 70 |
| Unsuccessful hunters | 466 | 30 |
| Days hunter/deer | 2.7 | -- |
| Mean deer/hunter afield | 2.1 | -- |
| Mean deer/successful hunter | 3.0 | -- |
| Total days hunted | 8,637 | -- |

# BISON

## SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 11

GEOGRAPHICAL DESCRIPTION: Chitina River

PERIOD COVERED: July 1, 1981-June 30, 1982

### Season and Bag Limit

| | |
|---|---|
| Sept. 1-Oct. 31 | One bison every 5 regulatory years by drawing permit only. |

### Population Status and Trend

Fifty-six bison were counted on July 12 between the Tana River and Bear Island. The population is increasing. The 1981 count was the highest since their introduction in 1962.

### Population Composition

Forty-four 44 adults and yearlings and 12 calves (21%) were counted in 1981, compared to 36 adults and yearlings and 6 calves (14%) in 1980.

### Mortality

Six of 8 people with permits hunted. Three were successful and killed bulls. Of 3 hunters reporting the number of days hunted, 2 were successful and hunted 10 days and 1 was unsuccessful and hunted 4 days.

### Management Summary and Recommendations

The Chitina bison herd has exceeded the management goal of 30 animals. Therefore, in order to reduce the size of the herd, the number of permits issued will be increased from 8 to 12.

The hunt is a difficult one that seems to require an extended stay in the field to be successful. With new restrictions on access in national park lands, it may be difficult to obtain the desired harvest.

PREPARED BY:

Patricia Martin
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SUBMITTED BY:

Leland P. Glenn
Survey-Inventory Coordinator

# BISON

## SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 11

GEOGRAPHICAL DESCRIPTION: Copper River

PERIOD COVERED: July 1, 1981-June 30, 1982

### Season and Bag Limit

| | |
|---|---|
| Sept. 21-Nov. 10 | One bison every 5 regulatory years by registration permit only. |

### Population Status and Trend

Seventy-five bison were counted in the Copper River herd during an aerial survey flown on July 26, 1981. The estimated number of overwintering adults was 58, slightly below the management guideline of 60.

### Population Composition

The composition of bison counted on July 26 included 65 adults and yearlings and 10 calves (13%).

### Mortality

Eight bison (4 bulls, 3 cows, and 1 male calf) were killed during the 1981 hunting season. A total of 110 permits was issued for the registration hunt. All successful hunters used aircraft and averaged 5.4 days to make their kill. Thirty-one permittees (28%) did not hunt, and 5 permittees (4.5%) did not report.

### Management Summary and Recommendations

The number of permits issued declined from the previous year (132 to 110), with a corresponding decline in the number of successful hunters (15 to 8). Six of the 8 bison were killed by local residents, thus substantiating the popularity of this hunt among residents of the Copper River Basin.

The number of bison counted this year (75) declined compared to the previous year (86). The posthunting season population estimate of adult bison (58) was 2 adults below the management

guidelines. Based on that estimate, the allowable kill during 1982 will be restricted to 7 bison.

PREPARED BY:

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SUBMITTED BY:

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Survey-Inventory Coordinator

# BISON

## SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 19C and 19D

GEOGRAPHICAL DESCRIPTION: South Fork Kuskokwim River

PERIOD COVERED: July 1, 1981-June 30, 1982

### Season and Bag Limit

| | |
|---|---|
| Sept. 1-Oct. 10 | One bison by drawing permit only. 20 permits will be issued. See 5 AAC 81.005 and separate permit hunt supplement. |

### Population Status and Trend

Bison in the Farewell herd originated from a transplant of 18 from the Delta herd in 1965 and a 2nd release of 20 in 1968. The area proved to be suitable bison habitat, and the herd had nearly doubled in size by 1972 when a limited permit hunt was initiated. Each year calves have averaged 21% of the herd except in 1972 when only 2 of 4 calves survived. Apparently, calf survival was adversely affected by the deep snows and severe winter of 1971-72. In 1981, a minimum of 129 bison composed the prehunt population which marks the highest population on record for the Farewell herd.

As a result of the Bear Creek fire in 1977, carrying capacity of bison habitat along the South Fork of the Kuskokwim River increased substantially. Therefore, the earlier desired population level of 90-100 bison set by the Department should be revised upward.

### Population Composition

Herd composition data for this reporting period were collected by BLM personnel. Results of surveys conducted in December indicated that 93 adults and 25 calves composed the posthunt population.

### Mortality

Hunting is the principal mortality factor affecting the Farewell herd.

There were 522 applicants for the 20 permits available in the 1981 hunt. Eight of the 20 permittees failed to participate in the hunt, while 11 of 12 participating permittees harvested 10 bulls and 1 cow. Residency of the permittees was as follows: Anchorage (8), Fairbanks (3), Soldotna (2), Clam Gulch (2),

McGrath (2), Haines (1), Homer (1), and Delta (1). The residency of the successful hunters was as follows: Anchorage (6), Soldotna (2), Fairbanks (1), Haines (1), and McGrath (1). The unsuccessful hunter was from McGrath.

Most of the bison were in the Bear Creek burn during the hunting season, and only 2 of the 11 bison were taken outside the burn. Successful hunters averaged slightly over 2 days of hunting. Several hunters commented on the difficult hunting conditions because of downed timber in the burn.

Natural mortality of female bison apparently has been low. In the 1970's, hunters took 2 of 6 adult cows and 1 of 2 yearling females released in 1965 as well as 5 of 9 adult cows and the sole yearling female released in 1968.

On the other hand, none of the 13 males released in the transplants has been reported taken by hunters, which suggests that natural mortality among males was relatively high. The difference between male and female losses is probably a function of the age of bison released rather than differing mortality rates between sexes. All of the males were young when released (3 2-year-olds, 4 yearlings, and 6 calves). Of the young females released (1 3-year-old, 1 2-year-old, 3 yearlings, and 5 calves), only 2 yearling females have been reported taken by hunters.

Management Summary and Recommendations

The Farewell herd has been productive, increasing 10% annually since 1972. A harvestable surplus has been available for sport hunting after the population reached 70 bison, and permit hunts have been conducted for 9 seasons since the herd was established.

Based on tag recoveries, it appears that transplanted adults may survive better than younger animals, the future transplants should be comprised primarily of adults.

In 1977, a large block of predominantly black spruce bog adjacent to the bison herd's winter range burned. Much of this area has been converted into a sedge-grassland type, and since 1979 a substantial part of the herd has overwintered in the burn. Winter distribution surveys flown by BLM personnel have shown that from 1979 to 1981 the bison were moving farther into the burned area each winter. Range surveys by BLM crews also indicate that there is sufficient winter forage to support a bison herd substantially larger than 90-100 animals. The sedge-grassland seral stage is expected to last 10 or more years and could probably be maintained indefinitely by controlled fire management.

There is considerable interest in hunting the Farewell herd; there are over 500 applicants for the permits annually. As demonstrated in 1979, a registration permit system or regular

open hunting season could be implemented whenever a large number of bison need to be taken.

Management practices should be directed toward rapidly increasing the size of this herd to take advantage of a short-term surplus of winter forage. Long-term goals may dictate habitat manipulation for increased sedge-grass production.

I recommend that the current season and drawing permit hunt be maintained to provide for a limited take of 10 adult bulls while allowing the herd to expand into the new winter habitat.

PREPARED BY:

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SUBMITTED BY:

Oliver E. Burris
Regional Management Coordinator

# BISON

## SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 20A and 20D

GEOGRAPHICAL DESCRIPTION: Delta Junction

PERIOD COVERED: July 1, 1981-June 30, 1982

### Season and Bag Limit

| | |
|---|---|
| Sept. 21-Dec. 9 | One bison by drawing permit only. 55 permits will be issued. See 5 AAC 81.055 and separate permit hunt supplement. |

### Population Status and Trend

The 1982 precalving population of the Delta bison herd is estimated to be 325. The 1981 estimate was 310. Both estimates exceed the population goal of 275 animals suggested in the Delta Bison Management Plan.

### Population Composition

A composition survey was conducted on October 4, 1981 in which 123 bison were classified. Herd composition consisted of 32% bulls, 37% cows, 12% yearlings, and 19% calves.

I suspect these data to be inaccurate because of the small sample size, observer inexperience, or both. Specifically, the number of yearlings appeared lower than normal; adults appeared to be more abundant than normal.

### Mortality

Sport hunting accounted for the largest source of known mortality (Appendix A). Applications for 5,237 permits were received; 55 permits were issued. Fifty-eight bison were reported killed by hunters, although additional wounding loss (approximately 8) is suspected. Four hunters each shot and killed 1 extra bison. One of these was given to a hunter who did not care to harvest an animal herself. The other 3 bison were disposed of as prescribed by Department policy. In addition, 2 bison were shot and killed by a farmer who claimed that they charged him.

### Range and Habitat

A summer range rehabilitation program was initiated in mid-June 1981. A broadleaf herbicide (Tordon 10K, produced by Dow Chemical Co., was applied to approximately 20 acres at the rate

of 12 lb/acre. This herbicide was applied only to areas of woody vegetation to test its usefulness for improving the quantity of grasses available on the summer range. Fertilizer was applied at the rate of 250 lb/acre on approximately 50 acres of the summer range, including a portion of the area treated with the herbicide. The fertilizer, applied aerially with a Piper AG-Cat, consisted of 100 lb of 32/0/0 and 150 lb of 8/32/10.

Twenty wire exclosures constructed of 12-gauge, 6-inch square steel reinforcing mesh were placed in treated areas, so effects of the treatments could be measured. Exclosures were not anchored, and they were moved by bison. Consequently, it was impossible to objectively determine the effect of treatments on forage quantity. However, subjective examination of the treated areas suggest that both herbicide and fertilization increased the quality of bison forage.

As of June 1981, approximately 300 acres had been cleared on the Delta Junction Bison Range. Approximately 120 acres of oats and various perennial grasses were planted in 1981 to provide alternate fall and winter forage for bison. Bison used the planted areas extensively, and little forage remains. Additional clearing and planting is planned for 1982 but is contingent on funding.

Management Summary and Recommendations

Habitat manipulation programs on the summer range and the Delta Junction Bison Range should be continued. Control of crop depredations and the continued well-being of the herd are contingent on these programs. Bison Range habitat improvements will also provide a long-term winter range, which will become more important as the agricultural lands nearby are fenced.

Size of the precalving herd should be reduced through sport hunting to achieve the population goal of 45 bulls, 115 cows, and 115 yearlings and 2-year-olds. It appeared that the either-sex limit of the 1981 hunt did not force hunters to be selective in the animals harvested. This probably accounted for high wounding loss and extra bison being shot. Consequently, the sex of bison to be taken should be specified on each permit.

PREPARED BY:

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Game Biologist III

SUBMITTED BY:

Oliver E. Burris
Regional Management Coordinator

APPENDIX A. Known mortality, Delta bison herd, April 1981-February 1982.

| Mortality source | Bull | Cow | Yearling | Calf | Unknown | Total |
|---|---|---|---|---|---|---|
| Hunting | 37 | 15 | 2 | 0 | 0 | 54 |
| Illegal, hunting-related | 1 | 1 | 1 | 1 | 0 | 4 |
| Defense of life and property | | 1 | 1 | | | 2 |
| Poaching | 1 | 1 | | | | 2 |
| Road kills | | 1 | | | 1 | 2 |
| Totals | 39 | 19 | 4 | 1 | 1 | 64 |

SMALL GAME

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 18

GEOGRAPHICAL DESCRIPTION: Yukon-Kuskokwim Delta

PERIOD COVERED: July 1, 1981-June 30, 1982

Season and Bag Limit

| | | |
|---|---|---|
| Grouse | Aug. 10-Apr. 30 | 15 per day, 30 in possession |
| Ptarmigan | Aug. 10-Apr. 30 | 20 per day, 40 in possession |
| Hares/Rabbits | No closed season | No limit |

Population Status and Trend

Little information is available concerning the status of arctic hares in Unit 18. Their distribution is restricted to coastal drainages, and they are reported to be abundant in only a few northern drainages near the mouth of the Yukon River.

Snowshoe hares were reported to be moderately abundant throughout Unit 18 and very abundant in localized areas. While big game surveys were being conducted, numerous "hot spots" were observed in the upper Andreafsky and Chuilnuk River drainages. Populations appeared to be increasing slightly or stable in most areas of the Unit. Examination of willow stands along the Yukon and Andreafsky Rivers indicated hares at their present density were having little impact on vegetation.

Willow ptarmigan appeared to be less abundant this year than last year, although Bethel residents reported ptarmigan to be quite numerous. A factor that contributed to the difficulty in assessing ptarmigan abundance was a thaw during early February lasting about 10 days. Much of the snow in the hills disappeared, and movement of birds to the willow draws and river bottoms either did not occur or occurred later than normal. Flocks of up to 100 birds were occasionally seen during big game surveys, although most flocks averaged less than 20-30 birds.

Little information exists concerning the status of rock ptarmigan. Although they are commonly sighted on Nelson Island, Nunivak Island, the Askinuk Hills, and the rocky outcrops of the Andreafsky and Kilbuck Mountains, populations appear to be localized in areas removed from human population centers.

Both spruce and ruffed grouse inhabit the wooded drainages of Unit 18 upriver from Pilot Station on the Yukon and from Bethel on the Kuskokwim. Of the two, spruce grouse are the more common. Although population levels of both species are considered low, residents along the Yukon River reported an increase in the number of grouse observed this past fall compared with the previous fall.

Population Composition

No surveys were conducted to determine the composition of any small game population.

Mortality

Many of the river villages below Marshall on the Yukon and Kalskag on the Kuskokwim do not have ready access to moose or marine mammals. Consequently small game, particularly snowshoe hares, takes on added importance as a food resource and is heavily sought after by residents of these villages. In areas near villages, mortality from hunting and snaring can be substantial but in the Unit overall, hunting mortality is light. Little is known about the other types of mortality affecting small game populations in Unit 18.

Management Summary and Recommendations

Ptarmigan abundance was reported to be low to moderate in most areas of the Unit, and the population appeared stable. Snowshoe hares were reported to be moderately abundant throughout the Unit, although high-density pockets were observed in numerous areas. Little information exists concerning the status of arctic hares and grouse. Reports, however, indicated that populations were locally abundant and appeared stable. Although hunting mortality can be substantial in areas adjacent to villages, it was light overall, and probably did not significantly influence population levels of small game.

No changes in seasons and bag limits are recommended at this time.

PREPARED BY:

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SUBMITTED BY:

David A. Anderson
Survey-Inventory Coordinator

SMALL GAME

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 23

GEOGRAPHICAL DESCRIPTION: Kotzebue Sound

PERIOD COVERED: July 1, 1981-June 30, 1982

Seasons and Bag Limits

| | | |
|---|---|---|
| Grouse | Aug. 10-Apr. 30 | 15 per day, 30 in possession |
| Ptarmigan | Aug. 10-Apr. 30 | 20 per day, 40 in possession |
| Hares/Rabbits | No closed season | No limit |

Population Status and Trend

Ptarmigan populations were moderate to low over most of the Unit. The highest populations were observed in the Wuluk and Kivalina drainages. An unusual rain, resulting in heavy snow crusting, occurred in early February. This may have resulted in additional natural mortality by preventing the birds from burrowing into snow to protect themselves from the cold. These conditions lasted for approximately 10 days until the next snowfall.

Snowshoe hare populations continued to decline over most of the Unit. Populations were moderately low in all areas, except the Selawik and Buckland drainages and on the northern Seward Peninsula where the hare population remained moderate to high.

During a moose survey on the northern Seward Peninsula, large concentrations of arctic hares were observed along the Goodhope River. An estimated 600-800 hares were observed in 1 tightly packed "herd"; 2,000-3,000 hares were observed during the entire survey. No other groups of arctic hares were observed along the Immachuk or Kugruk Rivers east of the Goodhope River. Area residents took advantage of hare abundance and harvested 100-200 of these "jack rabbits" which are good eating and also provide a useful pelt.

Mortality

There is no estimate of the amount of small game taken by local residents for human and dog food. Hunting has little, if any, impact on small game populations in Unit 23.

Management Summary and Recommendations

Trends in both hare and ptarmigan populations are downward. Seasons and bag limits are adequate to meet the needs of local residents, and no changes are recommended at this time.

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SUBMITTED BY:

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# UPLAND GAME ABUNDANCE

## SURVEY-INVENTORY PROGRESS REPORT

STATEWIDE

PERIOD COVERED: July 1, 1981-June 30, 1982

### Techniques

The standard small game abundance questionnaire was mailed in mid-October 1981 to 350 people throughout the State, and by the end of January 1981, 160 replies had been received. As in the past, the bulk of replies came from the Interior and Gulf regions. Replies were tabulated and analyzed as in previous years (see Game Bird Report. March 1966. Pages 3-4. Fed. Aid in Wildl. Rest. Rep. Vol. VII. Proj. W-6-R-6, Work Plan I and Proj. W-13-R-1, Work Plan B). A summary of responses was mailed to cooperators. Replies to the questionnaire are summarized in Appendix A.

### Findings

Replies to the 1981 questionnaire indicated that grouse populations declined in the Interior, but remained much the same in most other areas in the State. Grouse numbers were considered moderately low in most areas.

Numbers of ptarmigan (all species) were reported to be at moderately low levels in all areas except western Alaska, where populations were reported to be moderately high. Numbers of ptarmigan remained about the same or increased slightly in the Southeast, Gulf, Brooks Range, and Alaska Peninsula areas but declined in the Interior. Kodiak reported a definite increase in ptarmigan abundance.

Snowshoe hare populations were reported at moderate to moderately high levels statewide with increasing populations reported from every region except the Brooks Range and Alaska Peninsula. Moderately high hare populations were reported by cooperators in the Interior and Western regions.

### Management Summary and Recommendations

The standard small game abundance questionnaire has repeatedly indicated that grouse, ptarmigan, and hare populations fluctuate considerably throughout the State. Hunting pressure has little effect on fluctuations over broad geographical regions of Alaska.

The management goals of providing the maximum opportunity to participate in small game hunting is being met under the current long seasons and liberal bag limits. Therefore, no changes in the current approach to small game management are recommended.

| PREPARED BY: | SUBMITTED BY: |
|---|---|
| Jeannette R. Ernest | Oliver E. Burris |
| Game Biologist II | Regional Management Coordinator |

APPENDIX A. Summary of replies to questionnaire on grouse, ptarmigan, and hare populations, 1981.

| Area and species | Present abundance[a] | | | | Comparison with 1980[a] | | | |
|---|---|---|---|---|---|---|---|---|
| | High | Mod. | Low | Index[b] | More | Same | Fewer | Index[b] |
| Brooks Range-10 replies | | | | | | | | |
| Grouse (general) | 0 | 3 | 4 | 2.7 | 2 | 1 | 2 | 5.0 |
| Spruce grouse | 0 | 1 | 2 | 3.5 | 1 | 1 | 1 | 5.0 |
| Ptarmigan (general) | 1 | 2 | 5 | 3.0 | 1 | 2 | 5 | 3.0 |
| Rock ptarmigan | 0 | 3 | 0 | 5.0 | 1 | 2 | 0 | 6.3 |
| Willow ptarmigan | 0 | 2 | 3 | 2.6 | 1 | 1 | 2 | 4.0 |
| Snowshoe hare | 2 | 0 | 3 | 4.2 | 1 | 1 | 2 | 4.0 |
| Western-8 replies | | | | | | | | |
| Grouse (general) | 0 | 2 | 2 | 3.0 | 1 | 1 | 2 | 4.0 |
| Spruce grouse | 2 | 0 | 1 | 6.3 | 1 | 2 | 1 | 5.0 |
| Ptarmigan (general) | 4 | 0 | 2 | 6.3 | 3 | 0 | 3 | 5.0 |
| Willow ptarmigan | 3 | 1 | 0 | 8.0 | 3 | 1 | 1 | 6.6 |
| Snowshoe hare | 4 | 0 | 2 | 6.3 | 5 | 0 | 2 | 6.7 |
| Alaska Peninsula-12 replies | | | | | | | | |
| Ptarmigan (general) | 0 | 4 | 6 | 2.6 | 4 | 5 | 1 | 6.2 |
| Willow ptarmigan | 0 | 1 | 3 | 2.0 | 0 | 3 | 1 | 4.0 |
| Snowshoe hare | 0 | 1 | 6 | 1.6 | 1 | 5 | 1 | 5.0 |
| Kodiak-6 replies | | | | | | | | |
| Ptarmigan (general) | 0 | 3 | 2 | 3.4 | 2 | 1 | 1 | 8.0 |
| Snowshoe hare | 1 | 3 | 1 | 5.0 | 4 | 0 | 0 | 9.0 |
| Southeastern-16 replies | | | | | | | | |
| Grouse (general) | 1 | 6 | 3 | 4.2 | 3 | 2 | 2 | 5.6 |
| Spruce grouse | 0 | 1 | 6 | 1.6 | 2 | 4 | 2 | 5.0 |
| Blue grouse | 0 | 3 | 5 | 3.5 | 3 | 6 | 2 | 5.4 |
| Ptarmigan (general) | 1 | 5 | 5 | 3.1 | 2 | 2 | 3 | 5.9 |
| Willow ptarmigan | 0 | 4 | 1 | 4.2 | 3 | 1 | 0 | 8.0 |
| Snowshoe hare | 0 | 2 | 5 | 2.1 | 3 | 2 | 1 | 6.3 |
| Gulf-41 replies | | | | | | | | |
| Grouse (general) | 1 | 12 | 8 | 3.7 | 4 | 11 | 6 | 4.6 |
| Ruffed grouse | 0 | 2 | 1 | 3.7 | 0 | 2 | 1 | 3.7 |
| Spruce grouse | 2 | 20 | 8 | 4.2 | 5 | 15 | 8 | 4.6 |
| Sharp-tailed grouse | 0 | 3 | 3 | 3.6 | 2 | 2 | 2 | 5.0 |
| Ptarmigan (general) | 1 | 11 | 15 | 2.9 | 3 | 14 | 6 | 4.5 |
| Rock ptarmigan | 1 | 5 | 6 | 3.3 | 1 | 7 | 4 | 4.0 |
| Willow ptarmigan | 0 | 13 | 9 | 3.4 | 2 | 12 | 7 | 4.0 |
| White-tailed ptarmigan | 1 | 5 | 4 | 3.8 | 2 | 3 | 4 | 4.1 |
| Snowshoe hare | 9 | 14 | 11 | 4.8 | 17 | 10 | 5 | 6.5 |

APPENDIX B. Continued.

| Area and species | Present abundance[a] | | | | Comparison with 1980[a] | | | |
|---|---|---|---|---|---|---|---|---|
| | High | Mod. | Low | Index[b] | More | Same | Fewer | Index[b] |
| Interior-59 replies | | | | | | | | |
| Grouse (general) | 0 | 24 | 24 | 3.0 | 4 | 7 | 38 | 2.2 |
| Ruffed grouse | 1 | 15 | 34 | 2.4 | 1 | 10 | 30 | 2.2 |
| Spruce grouse | 0 | 23 | 18 | 3.2 | 2 | 13 | 27 | 2.6 |
| Sharp-tailed grouse | 0 | 3 | 22 | 1.5 | 2 | 7 | 17 | 2.7 |
| Ptarmigan (general) | 2 | 21 | 20 | 3.3 | 9 | 13 | 25 | 2.9 |
| Rock ptarmigan | 2 | 5 | 9 | 3.3 | 2 | 5 | 10 | 3.1 |
| Willow ptarmigan | 1 | 14 | 9 | 3.7 | 4 | 9 | 13 | 3.6 |
| White-tailed ptarmigan | 2 | 3 | 7 | 3.3 | 2 | 5 | 5 | 4.0 |
| Showshoe hare | 17 | 36 | 6 | 5.7 | 32 | 19 | 8 | 6.6 |
| Statewide-152 replies | | | | | | | | |
| Grouse (general) | 2 | 47 | 38 | 3.3 | 14 | 22 | 50 | 3.3 |
| Ruffed grouse | 1 | 21 | 37 | 2.6 | 3 | 14 | 34 | 2.6 |
| Spruce grouse | 5 | 46 | 35 | 3.6 | 12 | 36 | 39 | 3.8 |
| Sharp-tailed grouse | 0 | 7 | 27 | 1.8 | 9 | 11 | 20 | 3.7 |
| Ptarmigan (general) | 9 | 46 | 55 | 3.3 | 24 | 37 | 44 | 4.2 |
| Rock ptarmigan | 5 | 13 | 18 | 3.6 | 6 | 17 | 14 | 4.1 |
| Willow ptarmigan | 4 | 35 | 25 | 3.7 | 13 | 27 | 24 | 4.3 |
| White-tailed ptarmigan | 4 | 9 | 11 | 3.8 | 6 | 8 | 9 | 4.5 |
| Snowshoe hare | 33 | 56 | 34 | 5.0 | 63 | 37 | 19 | 6.5 |

[a] Based on the number of answers to each question, not all cooperators answered questions.

[b] Index values range from 1.0 through 9.0 and were derived by giving an arbitrary value of 9.0, 5.0, and 1.0 to each "High" (More), "Moderate" (Same), and "Low" (Fewer) answer, respectively. The total value of the answers to each question for each species was divided by the number of answers to that question. An index of 9.0 indicates High (More), 5.0 indicates Moderate (Same), and 1.0 indicates Low (Fewer).

ELK

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 8

GEOGRAPHICAL DESCRIPTION: Kodiak and Adjacent Islands

PERIOD COVERED: July 1, 1981-June 30, 1982

Season and Bag Limit

| | | |
|---|---|---|
| Unit 8, Raspberry Island | Oct. 1-Oct. 31 | One elk by drawing permit only. 65 permits will be issued. See 5 AAC 81.055 and separate drawing permit hunt supplement. |
| Unit 8, that portion of Afognak Island west and south of a line from the Malina Bay to the head of Back Bay | Oct. 1-Nov. 20 | One elk by registration permit only; 35 elk, with up to 20 females may be taken. See 5 AAC 81.055 and separate registration permit hunt supplement. |
| Remainder of Unit 8 | Aug. 1-Dec. 31 | One elk by registration permit only. See 5 AAC 81.055 and separate registration permit hunt supplement. |

Population Status and Trend

The elk herds on Afognak and Raspberry Islands are increasing. The overall increase from 1980 (800) to 1981 (900) was estimated at 10-15%.

Population Composition

Sex and age composition surveys of the 7 herds on Raspberry and Afognak Islands were flown in July, August, and September 1981 (Appendix A). Five hundred eighty-three elk (126 bulls, 324 cows, and 133 calves) were classified during 11.6 hours of aerial surveys. The calf:cow ratio of 41:100 was above average; the bull:cow ratio of 39:100 was the highest recorded since 1971.

Local residents continue to report observations of elk on the main island of Kodiak. During 1981, elk were reported to have been sighted in the following locations: Karluk Lagoon, Ugak Bay, Uganik Island, Uganik Bay, Larsen Bay, and Spiridon Bay. All elk were reported to have been bulls, and the largest group

sighted was 7 animals. These sightings occurred during the months of June, August, September, and November.

Mortality

The winter of 1980-81 was relatively mild with little snow accumulation. Elk mortality relating to climatic conditions was neither observed nor reported.

Hunters killed 112 elk from Afognak and Raspberry Islands. Composition of the harvest was 80 males (71%) and 32 females (29%). Overall hunter success was 18%; 619 permittees reported hunting.

Registration Hunt 750 - Parts of Afognak Island

On the northern and eastern part of Afognak Island, 420 hunters reported killing 69 elk, including 53 males (77%) and 16 females (23%). Hunter success was 16%. Distribution of the elk harvest was as follows: Tonki Peninsula/Seal Bay--18, Izhun Bay/Gretchen Lake--10, Paramanof/Malina Bays--18, Waterfall Lake/Red Fox Bay--7, Discoverer Bay/Portage Lake--4, Duck Mountain/Kazakof Bay--8, unknown location on logging road--3, and unknown location--1.

Registration Hunt 751 - Southwest Afognak Island

On southwest Afognak, 174 hunters reported killing 34 elk, including 21 males (62%) and 13 females (38%). Hunter success was 20%. One additional elk was reported killed and left in the field near Afognak Lake.

The southwest Afognak hunt was closed by emergency order 2½ weeks before the scheduled November 20 closure. This closure was necessary when permit reports indicated the allowable harvest of 35 elk had been taken.

Drawing Hunt 702 - Raspberry Island

Sixty-five permits were issued for the Raspberry Island hunt. Twenty-five permittees hunted and took 9 elk, including 6 males (67%) and 3 females (33%). Hunter success was 36%.

Management Summary and Recommendations

Good overwinter survival continued to allow an increase in the elk population. The bull:cow ratio continued to increase; the calf:cow ratio was above average. The prehunting season population on Afognak and Raspberry Islands was estimated at a minimum of 900 elk.

Hunting effort continued to increase, and the harvest of 112 elk was the highest in the last 15 years. A record 619 permittees reported hunting, a 15% increase from the 538 permittees that

reported hunting in 1980. High selectivity for bulls continued (71% males). Although the number of registration hunt permittees increased substantially, the harvest was within the management guidelines for the Afognak Island herds.

Only 25 of 65 permittees hunted elk on Raspberry Island. These hunters killed 9 elk (7% of the preseason population). Additional permits should be issued for this drawing hunt in 1982.

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SUBMITTED BY:

Leland P. Glenn
Survey-Inventory Coordinator

APPENDIX A. Summary of Unit 8 elk composition counts by herd, 1981.

| Herd | No. bulls | No. cows | No. calves | No. unclassified | Total no. | Bulls/ 100 cows | Calves/ 100 cows | Est. pop.[a] |
|---|---|---|---|---|---|---|---|---|
| Raspberry Island herd | 20 | 45 | 14 | 0 | 79 | 44 | 31 | 125 |
| Southwest Afognak herd | 27 | 80 | 36 | 0 | 143 | 34 | 45 | 175 |
| Northeast Afognak | | | | | | | | |
| Duck Mtn. herd[b] | 6 | 79 | 31 | 0 | 116 | 8 | 39 | |
| Tonki Cape Pen. herd | 12 | 26 | 9 | 0 | 47 | 46 | 37 | 150-175 |
| Tonki Bay herd | 4 | 24 | 14 | 0 | 42 | 17 | 58 | |
| Waterfall Lake herd | 18 | 70 | 29 | 98 | 215 | 26 | 41 | 225-250 |
| Paramanof Pen. herd | 39 | -- | -- | 181 | 220 | -- | -- | 225-250 |
| Totals | 126 | 324 | 133 | 279 | 862 | 39 | 41 | 900-975 |

[a] Preseason population estimate.

[b] Data from 2 surveys flown on different dates.

# MUSK-OXEN

## SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 18

GEOGRAPHICAL DESCRIPTION: Yukon-Kuskokwim Delta

PERIOD COVERED: July 1, 1981-June 30, 1982

### Seasons and Bag Limits

| | | |
|---|---|---|
| Unit 18, Nunivak Island | Aug. 1-Sept. 20 | One bull by drawing permit; 5 permits will be issued. See 5AAC 81.055 and separate drawing permit hunt supplement. |
| | Feb. 15-Mar. 15 | One bull by drawing permit; 5 permits will be issued. See 5AAC 81.055 and separate drawing permit hunt supplement. |
| | Residents<br>Sept. 1-Sept. 20<br>Feb. 1-Mar. 15 | One cow by registration permit only; 55 cows may be taken. See 5AAC 81.055 and separate registration permit hunt supplement. |
| | Nonresidents<br>Aug.1-Sept. 20<br>Feb. 15-Mar. 15 | One cow by drawing permit only; 10 permits will be issued. See 5AAC 81.055 and separate drawing permit hunt supplement. |
| Unit 18, Nelson Island | Residents<br>Feb. 1-Mar. 15 | One cow by registration permit. Up to 30 cows may be taken. See 5AAC 81.055 and separate registration permit hunt supplement. |

### Population Status and Trend

Nunivak Island:

The current musk-ox population level on Nunivak Island is approximately 600 animals. Census efforts in March 1982 enumerated

506 animals. The addition of animals harvested during the spring season prior to the census (32), and the assumption that not all animals were observed during census efforts, established the prehunt/precalving population estimate at 500 musk-oxen.

The harvest of 56 animals during the spring hunt and the recruitment of approximately 100 calves (the number of yearlings observed in spring censuses has averaged 18% of the total population) puts the summer 1982 musk-ox population at about 600 animals. Appendix A shows the musk-ox population trends on Nunivak Island since 1976. Sizable harvests of cows in the springs of 1981 and 1982, and the transplant of 47 animals in spring 1981, have reduced the population to a level close to the 500 animal nucleus herd suggested by an agreement between the U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game.

Nelson Island:

Ground censuses of Nelson Island musk-oxen, conducted from February 28 to March 2, 1982 enumerated 197 animals. Harvests prior to these dates accounted for 20 animals; thus, the prehunt/precalving herd numbered at least 217 animals. Appendix B shows the trends in the Nelson Island population. The reduction in the population from 1981 to 1982 is not totally explained by the harvest of 20 cows and the known natural mortality of 4 animals in spring 1981. This disparity is possibly due to population overestimation in 1981, underestimation in 1982, emigration, or undocumented removal of animals from the herd.

Population Composition

Nunivak Island:

As in the past, biologists from the Yukon Delta National Wildlife Refuge conducted a fall aerial survey of the Nunivak Island musk-ox population. During the survey, 310 animals were enumerated in 53 groups. Of the total number observed, 64 were identified as calves and the remaining 246 were classified as adults or as animals of unknown age. Using a formula similar to that reported in the 1980-81 S&I report, the total fall musk-ox population on Nunivak Island was estimated at 519-727 animals.

Annual ground composition counts were conducted on Nunivak Island on March 1-4 by refuge and Department biologists. An unprecedented 3 days of clear weather provided the opportunity of making one of the most complete censuses in several years. Thirty-six discrete groups were located, enumerated, and classified by age and sex. The north, west, and south sides of the island were completely covered by census efforts, and the interior and east side were known to be mostly devoid of animals at the time of the census. The census accounted for 538 animals; however, some animals were probably missed. I believe the best estimate for

the Nunivak Island population prior to the spring hunt is 550 animals.

Precalving structure of the Nunivak Island musk-ox population is presented in Appendix C. Ages of harvested bulls were directly determined in the field. However, 31 harvested cows were prorated to the 4+ and 3-year age classes on the basis of proportions determined during the March census.

Nelson Island:

Ground censuses of the Nelson Island musk-ox population were conducted from February 28 to March 2, 1982 by Fish and Game staff, with the logistic assistance of residents of the island. The age and sex composition of 197 animals observed during these efforts, plus that of 20 animals harvested prior to fieldwork, are given in Appendix D.

Sixteen musk-ox groups were enumerated and classified during 3 days of excellent weather. The combination of good weather, extensive ground coverage, and an aerial survey conducted on February 28, during which 189 animals were enumerated in 12 herds, led observers to believe that a fairly complete census was obtained this year.

Mortality

Nunivak Island:

Twenty-one resident and 13 nonresident applications were received for the 5 permits available for the fall 1981 bull musk-ox hunt. Of the 4 resident and 1 nonresident permittees, 1 resident did not hunt and the remaining hunters were successful in taking bulls. Ten cow permits were available for residents hunters on a $25 fee schedule during this same season. Five permits were issued, the 4 permittees who hunted successfully took cows, and 1 permittee did not hunt. No interest was shown in the 5 cow permits available for nonresident hunters. Appendices E and F illustrate some parameters of the fall 1981 Nunivak Island musk-ox harvest.

Forty-nine applications (33 from residents and 16 from nonresidents) were submitted for the spring 1982 Nunivak Island bull musk-ox hunt. Because 4 of 5 available permits were filled during the fall 1981 hunt, 6 bull permits were issued (and subsequently filled) for the spring hunt. Four residents and 2 nonresidents were successful in taking bulls.

Interest in cow musk-ox hunting by nonresidents was low, as in the past. One permit was applied for, issued, and filled.

The February 1-March 15 resident cow season was lengthened by 2 weeks by the Board of Game during the spring 1981 Board meeting. Permits were issued on January 29, 1982 at Anchorage, Bethel, and

Fairbanks Fish and Game offices. Inclement weather prevented Game Division staff from traveling to Mekoryuk until February 1, when permits were issued there. Fifty-one permits were issued to residents wishing to take cow musk-oxen, with the following distribution: Anchorage (8), Bethel (21), Fairbanks (9), and Mekoryuk (13). More interest in the hunt was shown by Bethel residents and less by Anchorage hunters in 1981. Five of the original permittees did not hunt, and 1 of these permits was reissued and filled. Consequently, 47 permits were filled during the season. However, 3 resident hunters holding cow permits inadvertently shot and killed bulls. In addition, 2 other musk-oxen were taken illegally. One yearling and 1 2-year-old cow was killed by bullets that first passed through "target" animals. Appendices G and H show hunting effort and chronology of the harvest for Nunivak Island musk-oxen during the spring 1982 season.

Residency was determined for successful hunters participating in the spring 1982 Nunivak Island musk-ox hunt. Most hunters (35%) were from Bethel (Appendix I), followed by Mekoryuk, Anchorage, and Fairbanks (22%, 19%, and 13%, respectively).

Pregnancy status was determined for 45 cow musk-oxen harvested from Nunivak Island by uterine examinations by hunters and Game Division staff. Thirty-five (78%) were found to be pregnant, and at least 3 females were carrying twin fetuses at the time of their death. Of 15 fetuses for which sex was determined, 9 were females and 6 were males.

Incisors were collected from 51 animals taken from Nunivak Island during the reporting period. Studies on aging techniques by counting cementum annuli has begun; information on preparation of samples, analysis of apparent age of known-age animals, and problems with the procedures will be reported in a future manuscript.

Unlike recent past years, no reports of musk-oxen wandering onto sea ice were received by the Department. It is reasonable to assume that some animals did perish due to this poorly understood phenomenon. However, there is a possibility that this wandering promotes a density-dependent form of mortality and that the current population level of Nunivak Island musk-oxen is low enough that there is little pressure on the animals to attempt such ill-fated emigrations.

Nelson Island:

Permits for the harvest of 30 cow musk-oxen were issued in Tununak on Nelson Island on January 30, 1982. Unlike the 1981 hunt, when well over 100 applicants were on hand for 20 permits, interest in the hunt was limited.

Only 15 potential hunters were on hand when permit issuance began, but all 30 permits were issued as hunters trickled into

the city office. As in 1981, an orientation course was provided to indicate to hunters the distinguishing features of cow musk-oxen and what samples were required under the terms of the permit.

An error in the 1981-82 Alaska hunting regulations listed the Nelson Island season dates as February 1 through March 15. This was due to staff misunderstanding of Board of Game actions at its spring 1981 deliberations. Although the Board's intent was to lengthen only the the Nunivak Island spring season, Game Division staff was unaware of this disparity until after the musk-ox seasons closed.

The known harvest of musk-oxen from Nelson Island during the February 1-March 15, 1982 season was comprised of 8 bulls and 19 cows. Two permittees were unsuccessful in their hunting efforts, and 1 individual never returned his hunter check-out form. Thus, the status of his hunt remains unknown at the time of this writing. A reminder letter following attempted telephone contact was sent to this hunter, as well as to 9 other permittees who failed to provide incisor samples to the Department.

All hunters who killed bull musk-oxen voluntarily called the Bethel Fish and Game office to report the incidents. All such cases were investigated by the Division of Wildlife Protection to determine if bulls rather than cows were intentionally shot. Six of the 8 bulls taken were in the 3-year age class, and hunters indicated that because the animals had a considerable amount of hair between the halves of the boss they were identified as cows.

One successful and 18 successful hunters reported completing their hunts in 1 day, while 1 successful hunter indicated that 2 days were needed to harvest his animal. Due to the proximity of the musk-oxen to the village of Tununak, it is not surprising that most animals were taken during 1-day trips.

Appendix J illustrates the chronology of harvest of musk-oxen from Nelson Island during the 1982 season. The chronology of harvest is somewhat misleading, because the season was closed by emergency order from February 25 through March 3 in order to present orientation material a 2nd time.

The residency of permittees for the 1982 Nelson Island musk-ox hunt reflected the fact that permits were issued in Tununak this year. The 30 permits were distributed to 4 villages on or near Nelson Island in the following pattern: Tununak, 22 (74%); Newtok, 4 (13%); Toksook Bay, 3 (10%); and Nightmute, 1 (3%).

Of the 27 musk-oxen known to have been harvested from Nelson Island, pregnancy status was determined for all 19 cows. Two were not pregnant, and 17 (89%) were carrying single fetuses. The sex of 4 fetuses was determined; 2 were males and 2 were females.

Precalving structure of the Nelson Island musk-ox population is given in Appendix D. Ages of harvested bulls were directly determined in the field. However, most harvested cows were prorated to age classes according to proportions determined during the March census.

Incisors were collected from 18 of 27 animals taken from Nelson Island. Because many of these were from bulls of known age (determined by horn symmetry and development), work on aging technique by counting cementum annuli will be facilitated by comparing laboratory readings with age noted in the field.

As on Nunivak Island, no incidents of musk-oxen straying onto sea ice and drowning were known to occur during the reporting period. However, several reports were received of 7 animals that had moved to a relatively high ridge of tundra north of the village of Tuntutuliak on the Kialic River approximately 75 mi from the eastern side of Nelson Island. It was further reported that 2-5 of these musk-oxen were killed in 2 separate time periods, February and May. Reconnaissance flights made by Department biologists and the local Wildlife Protection officer failed to document musk-oxen, living or dead, in this location.

Management Summary and Recommendations

Nunivak Island:

Game Board action in spring 1982 set the cow musk-ox quota at 45. Five of these were allocated to nonresident and 40 to resident hunters. The quota on bulls was raised from 10 to 30 animals, Due to the reduction of the Nunivak Island population during the spring 1982 season to the recommended level of approximately 500 animals, the decrease in the cow quota was deemed appropriate. The increased bull quota is justified by the anticipated spring 1983 adult (4+) bull increment, which approaches 130 animals, well over the estimated needs for the breeding of approximately 220 4+ and 3-year-old cows.

If yearling recruitment is average (18%) in spring 1983, then about 110 yearlings will be present at that time. Thus, the harvest of 45 cows and 30 bulls in the 1982-83 hunting season will remove about 70% of the year's recruitment. Because the Nunivak Island musk-ox population continues to grow, transplants to other locations within Alaska should be given serious consideration.

Nelson Island:

The quota for the spring 1983 Nelson Island musk-ox hunt was established at 25 bulls by the Board of Game during its 1982 spring meeting. As shown in this report, 4+ and 3-year-old bulls made up over 40% of the precalving population on the island, while cows in next year's breeding age classes (4+, 3, and 2) composed only 28% of the population at that time. If yearling

recruitment in spring 1983 is the average of the past 2 years (16%), then about 35 yearlings will be added to the population. Thus, the percentages of breeding-age bulls (4+) and cows (4+ and 3-year-old) expected in the 1983 prehunt population will be 35 and 24, respectively. Taking these figures into account, the bulls-only hunt appears to be an effective management tool for achieving a better balance in this population.

To help ensure the ability of local residents to participate in the 1st legal bull season on Nelson Island, the Game Board reduced the tag fee to $25 at its spring 1982 deliberations. This reduced fee schedule was considered for all resident bull musk-ox hunts in Alaska. However, Section 16.05.346 of Title 16 specifies that for any musk-ox season for which the tag fee has been reduced or eliminated, the hunt will be conducted under the terms of a registration permit. Faced with the possibility of trying to administer the Nunivak Island bull hunt on a first come, first served basis, only the Nelson Island bull hunt fee was reduced.

If calving adds the expected number of animals to the population and no excessive winter mortality occurs, the population will increase 225 animals before hunting and calving in spring 1983. Preliminary range evaluations in August 1981 and March 1982 indicated that range quality is high and precalving population levels of about 200 animals can probably be maintained on a long-term basis. However, because recent winters have been atypically mild, range condition should be monitored in the future to determine any changes in this apparent relationship.

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SUBMITTED BY:

David A. Anderson
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APPENDIX A. Sex and age composition of musk-oxen observed during spring surveys on Nunivak Island, 1976-1982.

| Year | 4+ years M | 4+ years F | 3 years M | 3 years F | 2 years M | 2 years F | Yrlg. | Unclass. | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1976 | 175 | 89 | 51 | 64 | 37 | 27 | 71 | 40 | 554 |
| 1977 | 164 | 144 | 41 | 72 | 32 | 44 | 100 | 53 | 650 |
| 1978 | 94 | 142 | 34 | 88 | 19 | 19 | 92 | 11 | 499 |
| 1979 | 82 | 160 | 12 | 43 | 35 | 38 | 114 | 45 | 529 |
| 1980 | 63 | 215 | 33 | 42 | 64 | 54 | 121 | 9 | 601 |
| 1981 | 105 | 169 | 63 | 84 | 49 | 70 | 134 | 28 | 702 |
| 1982 | 80 | 114 | 46 | 86 | 34 | 41 | 91 | 46 | 538 |

APPENDIX B. Sex and age composition of Nelson Island musk-oxen.

| Year | 4+ years M | 4+ years F | 3 years M | 3 years F | 2 years M | 2 years F | Yrlg. | Unclass. | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1968 | -- | -- | -- | -- | -- | -- | -- | -- | 23 |
| 1973 | -- | -- | -- | -- | -- | -- | -- | -- | 44 |
| 1975 | -- | -- | -- | -- | -- | -- | -- | -- | 66 |
| 1977 | -- | -- | -- | -- | -- | -- | -- | -- | 132 |
| 1978 | -- | -- | -- | -- | -- | -- | -- | -- | 107 |
| 1980 | -- | -- | -- | -- | -- | -- | -- | -- | 167 |
| 1981 | 50 | 48 | 27 | 16 | 24 | 13 | 45 | 42 | 265 |
| 1982 | 62 | 36 | 20 | 13 | 24 | 20 | 33 | 9 | 217 |

APPENDIX C. Precalving structure of the Nunivak Island musk-ox population based on March census and spring harvest, 1982.

| Chronology | 4+ years M | 4+ years F | 3 years M | 3 years F | 2 years M | 2 years F | Yrlg. | Total |
|---|---|---|---|---|---|---|---|---|
| March census | 88 | 127 | 49 | 99 | 38 | 44 | 105 | 550 |
| Spring harvest | 7 | 27 | 2 | 18 | 0 | 1 | 1 | 56 |
| Precalving population | 81 | 100 | 47 | 81 | 38 | 43 | 104 | 494 |

APPENDIX D. Precalving structure of the Nelson Island musk-ox population based on March census and spring harvest, 1982.

| Chronology | 4+ years M | 4+ years F | 3 years M | 3 years F | 2 years M | 2 years F | Yrlg. | Total |
|---|---|---|---|---|---|---|---|---|
| Spring census | 65 | 37 | 21 | 14 | 25 | 21 | 34 | 217 |
| Spring harvest | 1 | 12 | 6 | 5 | 1 | 2 | -- | 27 |
| Precalving population | 64 | 25 | 15 | 9 | 24 | 19 | 34 | 190 |

APPENDIX E. Hunter effort during Nunivak Island musk-ox season, fall 1981.

| Days hunted | Hunters | Hunter days | Mean effort (days/hunter) |
|---|---|---|---|
| 1 | 1 | 1 | 1 |
| 2 | 1 | 2 | 2 |
| 3 | 2 | 6 | 3 |
| 4 | 2 | 8 | 4 |
| 5 | 1 | 5 | 5 |
| 6 | 0 | 0 | 0 |
| 7 | 1 | 7 | 7 |
| Totals | 8 | 29 | 3.6 |

APPENDIX F. Chronology of Nunivak Island musk-ox harvest, fall 1981.

| Dates | Harvest | | |
|---|---|---|---|
| | Cows | Bulls | Total |
| 8/1-8/8 | -- | 2 | 2 |
| 8/9-8/15 | -- | -- | 0 |
| 8/16-8/22 | -- | 1 | 1 |
| 8/23-8/29 | -- | -- | 0 |
| 8/30-9/5 | 2 | -- | 2 |
| 9/6-9/12 | 1 | 1 | 2 |
| 9/13-9/20 | 1 | -- | 1 |
| Totals | 4 | 4 | 8 |

APPENDIX G. Hunter effort during Nunivak Island musk-ox season, spring 1982.

| Days hunted | Hunters | Hunter days | Mean effort (days/hunter) |
|---|---|---|---|
| 1 | 29 | 29 | 1 |
| 2 | 17 | 34 | 2 |
| 3 | 4 | 12 | 3 |
| 4 | 2 | 8 | 4 |
| Totals | 52 | 83 | 1.6 |

APPENDIX H. Chronology of Nunivak Island musk-ox harvest, spring 1982.

| Dates | Harvest | | | |
|---|---|---|---|---|
| | Resident cows | Nonresident cows | Bulls | Total |
| 2/1-2/6 | 1[a] | -- | -- | 1 |
| 2/7-2/13 | 7[a] | -- | -- | 7 |
| 2/14-2/20 | 7[a] | -- | 1 | 8 |
| 2/21-2/27 | 9[b] | -- | -- | 9 |
| 2/28-3/6 | 16[b] | -- | 4 | 20 |
| 3/7-3/15 | 9[b] | 1 | 1 | 11 |

[a] One bull taken by cow permittee.
[b] Includes 1 illegally taken cow.

APPENDIX I. Residency of successful musk-ox hunters on Nunivak Island, spring 1982.

| Residency | Resident cow permits | Nonresident cow permits | Bull permits | Total | (%) |
|---|---|---|---|---|---|
| Ambler | 1 | N/A | -- | 1 | (2) |
| Anchorage | 8 | N/A | 2 | 10 | (19) |
| Bethel | 19 | N/A | -- | 19 | (35) |
| Fairbanks | 6 | N/A | 1 | 7 | (13) |
| Kodiak | -- | N/A | 1 | 1 | (2) |
| Mekoryuk | 12 | N/A | -- | 12 | (22) |
| Quinhagak | 1 | N/A | -- | 1 | (2) |
| Nonresident | -- | 1 | 2 | 3 | (5) |
| Totals | 47 | 1 | 6 | 54 | (100) |

APPENDIX J. [a]Chronology of Nelson Island musk-ox harvest, spring 1982.[a]

| Dates | Harvest | | |
|---|---|---|---|
| | Cows | Bulls | Total |
| 2/1-2/6 | -- | -- | -- |
| 2/7-2/13 | 3 | 3 | 6 |
| 2/14-2/20 | 1 | -- | 1 |
| 2/21-2/27 | 8 | 5 | 13 |
| 2/28-3/6 | -- | -- | -- |
| 3/7-3/15 | 7 | -- | 7 |
| Totals | 19 | 8 | 27 |

[a] Season closed from 2/25/82 to 3/3/82.

# MUSK-OXEN

## SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 22

GEOGRAPHICAL DESCRIPTION: Seward Peninsula

PERIOD COVERED: July 1, 1981-June 30, 1982

### Season and Bag Limit

No open season.

### Population Status and Trends

Indigenous musk-ox populations were not found on the Seward Peninsula in recent historical times. However, there is evidence that musk-oxen occurred in the area prior to visitation by early explorers. Reports from the mid-1800's described large numbers of unfossilized musk-ox bones in deposits along the shore of Eschscholtz Bay. Eskimos living up the Buckland River were familiar with the species when contacted by Beechy in 1825.

Musk-oxen were most likely extirpated from Alaska about the middle of the 19th century by human hunters. Their distribution prior to that time is not well recorded because few exploring parties had ventured into the Interior during the period when the musk-ox's range must have receded northward.

Reestablishment of musk-oxen to formerly occupied ranges in Alaska was the primary objective of a program initiated in 1930 by congressional authorization at the urging of the Alaskan Territorial Legislature. Prior to 1970, musk-ox populations had been successfully transplanted to Nelson Island and the Arctic National Wildlife Range. In 1970, 85 musk-oxen were moved from the nucleus herd on Nunivak Island and released at Cape Thompson, the Arctic Slope, and the Seward Peninsula. Thirty-six of these animals (19 males and 17 females) were transplanted to the Seward Peninsula. During the next 2 years, these musk-oxen moved to the western end of the peninsula and occupied 2 general areas. One group wintered on Black Mountain, a 1300-ft peak northwest of Brevig Mission. During spring and summer, these animals move south onto the flats between the Don and California Rivers. The other herd normally wintered in the hills between the Nuluk and Pinguk Rivers. It is thought that they moved in a northwesterly direction during spring and summer and spent that period of time between these 2 rivers.

Calves were observed in the Black Mountain herd the summer following the introduction. Apparently, no calves were produced in 1971, but calves were seen in subsequent years. Recent

observations have indicated good calf production among both herds.

Even with optimum reproduction, the growth of newly established musk-ox herds has been slow due to the small size of the initial population. In order to provide a larger base and thus increase the incremental growth of the population, an additional 36 animals (10 males and 26 females) were brought from Nunivak Island and released at Port Clarence in March 1981. A partially successful attempt was made to drive the new animals to the Black Mountain area and integrate them into the existing herd. Although some of the animals from the 1981 transplant joined the existing herd, small groups have dispersed widely. Five marked musk-oxen introduced in 1981 moved 90 air mi from the release site.

Four adult female musk-oxen carried radio collars during this reporting period. Two of them could not be located either because the transmitter failed or the animals moved beyond the range of areas covered in tracking flights. Neither of the 2 musk-oxen with functional radio collars remained in areas where the majority of Seward Peninsula musk-oxen are found. One of the radio-collared females wintered with a group of 4 animals 90 mi from the release site. The other radio-tagged musk-ox moved east into the headwaters of the American River, 60 mi from the release site as of May 1982.

Six additional musk-oxen were collared on June 23, 1982. The animals, 5 females and 1 male, were darted from a helicopter using a mixture of 7.5 mg M99 (etorphine) and 35 mg Rompun (xylazine). M50-50 (etorphine) was used as an antagonist; 7.5 mg were administered intravenously or in 1 case an intramuscular injection was used. The capture went well, although difficulties were experienced in achieving full-dose injection with 10cc Palmer darts. The results of the capture effort are given in Appendix A.

All 5 of the females had calves. All of the animals were extremely thin, probably as a result of severe icing conditions which prevailed in winter 1981-82. Thawing temperatures, rain, and subsequent refreezing that occurred in February made foraging conditions very difficult for musk-oxen.

A complete census of Seward Peninsula musk-oxen has never been obtained. Occasional sightings and extrapolation from observed rates of calf production suggest that a population of 100-150 musk-oxen may now inhabit the Seward Peninsula.

Population Composition

Appendix B shows composition data from groups classified on the Don River during this reporting period.

Composition counts were made at the height of the rut which explains the low number of adult bulls in mixed-sex herds. The numbers of yearlings and calves in the groups compared to the number of reproductive age females indicates good reproductive performance of these animals in the last 2 seasons and apparently very low 1st-year mortality.

Mortality

No musk-ox mortalities were recorded during the reporting period. Appendix C summarizes known mortality data since the 1970 introduction.

Observed mortalities of Seward Peninsula musk-oxen have been rare, although deaths could easily go unrecorded because of the isolation of the areas that are occupied. Illegal harvest is not known to have occurred.

Management Summary and Recommendations

Musk-oxen appear to have become well established on the Seward Peninsula. Reproduction has been good, and losses appear to be low. Dispersal of the animals transplanted in 1980 can be viewed as a positive development even though it was not anticipated. Enormous tracts of land appear to provide potential habitat on the Seward Peninsula and the moving herds can be expected to colonize areas not now occupied by musk-oxen. There has been some concern expressed by reindeer herders that the expanding musk-ox population may compete for forage with reindeer. Studies done in other areas of Alaska and in Canada on the relationship between caribou/reindeer and musk-oxen that occupy the same range have shown significant differences in plant species selection and preferred habitat. In light of these studies, it does not appear likely that competition will occur between musk-oxen and reindeer on the Seward Peninsula. It is even less likely that musk-oxen will compete with moose.

The information acquired from the 2 radio-collared musk-oxen has demonstrated the value of this tool. The 6 musk-oxen which were equipped with transmitters in spring 1982 should provide important information on the dynamics and stability of musk-ox groups and their fidelity to a home range. The data gathered from this program will be valuable in planning transplants to other areas of the State and in the management of established herds.

Because of the uncertainty in the actual size of the Seward Peninsula musk-ox population, a hunting season is not recommended at this time.

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APPENDIX A. Musk-oxen radio-collared on the Seward Peninsula, June 23, 1982.

| Visual collar no. | Radio frequency | Sex | Est. age (years) | Location |
|---|---|---|---|---|
| 43 | 150.119 | F | 13[a] | California River |
| 61 | 150.180 | F | 3 | Nuluk River |
| 62 | 150.240 | F | 6 | Nuluk River |
| 63 | 150.200 | F | -- | Nuluk River |
| 64 | 150.161 | F | 3 | Pinguk River |
| 65 | 150.221 | M | 4 | Pinguk River |

[a] Known-age animal from 1970 transplant.

APPENDIX B. Composition of musk-oxen observed on the Seward Peninsula, September 1981.

| | Age (years) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 4+ | | 3 | | 2 | | | | | |
| Date | M | F | M | F | M | F | Yrlg. | Calves | Unclass. | Total |
| 9-24-81 | 2 | 16 | 2 | 1 | 2 | 2 | 14[a] | 9 | 4 | 52 |
| | 2 | | | | 4 | | 1[b] | | 3 | 10 |
| | 1 | | | | | | | | | 1 |
| | 1 | | | | | | | | | 1 |

[a] 5 yearlings with red ear tags.
[b] Yearling with green ear tag.

APPENDIX C. Observed mortality of musk-oxen on the Seward Peninsula since introduction.

| Year | Sex/age | Location | Probable cause of death |
|---|---|---|---|
| 1970 | No mortalities reported | | |
| 1971 | Yearling female | On beach 30 mi east of Nome | Fell through ice |
| | 2-3-year-old female | Foothills between Sinuk and Feather Rivers | Bear kill? |
| 1972 | Adult, sex unk. | 10 mi below Tin City on beach | Drowned |
| 1973 | No mortalities reported | | |
| 1974 | No mortalities reported | | |
| 1975 | 6-year-old male | Near Selawik | Mistaken for a bear and shot |
| 1976 | No mortalities reported | | |
| 1977 | No mortalities reported | | |
| 1978 | No mortalities reported | | |
| 1979 | No mortalities reported | | |
| 1980 | No mortalities reported | | |
| 1981 | Radio-collared adult female | 2 mi off Port Clarence | Fell through ice |
| | Yearling, sex unk. | Nuluk River | Unknown |
| | Adult male | Golden Gate Creek | Unknown |
| 1982 | No mortality reported | | |

# MUSK-OXEN

## SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 23

GEOGRAPHICAL DESCRIPTION: Kotzebue Sound

PERIOD COVERED: July 1, 1981-June 30, 1982

### Season and Bag Limit

No open season.

### Population Composition

Two musk-ox surveys were conducted in the Point Hope area since the last Survey-Inventory report was written. On June 2, 1981, 3 groups of musk-oxen were located, including a group of 6 large bulls, a group of 25 musk-oxen (7 of which were yearlings), and a group of 38 musk-oxen (9 of which were yearlings). The total count was 69 animals. On March 19, 1982, 3 groups were also located, including a group of 2 large bulls, a group of 18-20 with no short yearlings, and a group of 36-37 containing some short yearlings. The total count was 56-59 animals, at least 10 fewer than seen during the June 1981 survey. Due to turbulence, it was impossible to accurately determine the number of short yearlings in the 3rd group.

The cause of the observed population decline in the Point Hope area has not been determined. Aerial coverage during the March survey was thought to be sufficient to locate all groups of musk-oxen in the area. It is possible, however, that dispersal may have occurred or that a 4th group of musk-oxen was present but not located.

Several times during winter 1982, a group of 7-9 musk-oxen was reported in the Mulgrave Hills between Kotzebue and Kivalina. During a wolf survey conducted on April 10, 1982, this group was observed to contain 8 adults. When these animals are added to the March 1982 count in the Point Hope area, the minimum musk-ox population estimate for Unit 23 becomes 64. The 8 animals in the Mulgrave Hills do not account for the observed decline in the Point Hope area population because musk-oxen have been present between Kotzebue and Kivalina for several years.

### Mortality

No direct evidence of mortality was obtained. However, reports by reliable sources indicated that some musk-oxen were being poached from the population in the Point Hope area.

Management Summary and Recommendations

Musk-oxen are expected to persist in Unit 23, but it is now questionable that there will ever be a population large enough to support an open season. Efforts to monitor the population, to enforce the closed season, and to determine the cause of the observed decline will be increased.

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# MUSK-OXEN

## SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 26

GEOGRAPHICAL DESCRIPTION: Arctic Slope

PERIOD COVERED: July 1, 1981-June 30, 1982

### Season and Bag Limit

No open season.

### Population Status and Trend

Musk-oxen were historically indigenous to Alaska's North Slope, but the demand for meat and hides, together with the introduction of firearms, eliminated them from the State by 1860. Thirty-one musk-oxen were reintroduced from Greenland to Nunivak Island in 1935-36, and 51 musk-oxen from Nunivak Island were transplanted to the vicinity of Barter Island in 1969. Thirteen additional animals were transplanted from Nunivak Island to the Kavik River in 1970. Musk-oxen in Unit 26 are now found primarily within the boundaries of the Arctic National Wildlife Refuge (ANWR) between the Canning River and the Canadian border, and from the coast to the foothills of the Brooks Range. Major concentrations occur near the Canning River, the Sadlerochit River, and between the Jago and Kongakut Rivers. In recent years, increasing dispersal from, and fragmentation of, large groups has occurred. Occasional sightings of individuals from this population have been made as far west as the Trans-Alaska Pipeline corridor.

The U.S. Fish and Wildlife Service (USFWS) began conducting musk-ox surveys in the ANWR in 1978. These efforts have continued to the present and constitute the data source for this report (D. Ross, unpubl. rep., USFWS, 1978, 1979, 1981; P. Reynolds, unpubl. rep., USFWS, 1982). Precalving counts conducted by the USFWS on the ANWR are as follows: 86 in 1978, 112 in 1979, 148 in 1980, 186 in 1981, and 219 in 1982.

The population grew only slightly from the time of the initial transplant until 1978, but between 1978 and 1982 increased from an estimated 86 animals to 219 animals, or at an average annual rate of 26%.

### Population Composition

Only 66% of the animals observed in April 1982 were classified by sex and age (Appendix A). However, if unclassified animals are assumed to have the same sex and age composition as classified animals, then 19% of the herd consisted of yearlings, a result comparable to the 22% average for previous years. Because this

value is less than the estimated average annual increment (26%, see above), it is likely that the proportion of yearlings among unclassified animals exceeds the proportion in the classified population, or else early surveys underestimated the size of the herd.

Mortality

Natural mortality is low. The annual rate of increase in 1981-82 was estimated to be 19%, and short yearlings composed 19% of the classified population, indicating little or no adult mortality. Adult mortality, when it occurs, is probably due mostly to old age and susceptibility of wandering isolated individuals to predation.

Management Summary and Recommendations

Population composition data (Appendix A) suggest that the bull:cow ratio is high enough to allow a limited harvest of bulls. At its spring 1982 meeting, the Board of Game adopted a staff proposal to create a resident drawing permit season for 5 bull musk-oxen in the ANWR. The Kaktovik Advisory Committee requested that 1 permit be allocated to a resident of Kaktovik. After determining that musk-oxen do not inhabit the traditional hunting area of Kaktovik, and that there was no apparent shortage of red meat as indicated by the fact that not all sheep permits were used, the Board denied this request.

In April 1982, the USFWS radio-collared 14 musk-oxen on the ANWR in an on-going population study (P. Reynolds, unpubl. rep., USFWS, 1982). Knowledge of movement patterns obtained from this effort will aid in the management of mainland populations elsewhere in the State.

Major management goals for musk-oxen in arctic Alaska include the reestablishment of viable herds on historic ranges and the provision of a high-quality recreational hunt. The Department should formally oppose any activities, such as large-scale oil exploration and development in key musk-ox habitat, that jeopardize those goals. Monitoring of the herd should continue, and more complete sex and age composition data should be obtained. In the absence of these data, a conservative approach to seasons and bag limits is recommended.

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APPENDIX A. Musk-ox composition counts on the Arctic National Wildlife Refuge, April 1982.[a]

| Group | 4+ year | | 3 year | | 2 year | | Yrlg. | Unclass. | Total |
|---|---|---|---|---|---|---|---|---|---|
| | M | F | M | F | M | F | | | |
| Jago R. | 6 | 4 | 5 | 2 | 5 | 1 | 8 | 12 | 43 |
| Sadlerochit R. | 6 | 14 | 4 | 8 | 9 | 7 | 12 | 19 | 79 |
| Canning R. | 11 | 9 | 2 | 5 | 3 | 4 | 7 | 14 | 55 |
| Katakturuk R. | 11 | 2 | -- | -- | -- | -- | -- | -- | 13 |
| Totals | 34 | 29 | 11 | 15 | 17 | 12 | 27 | 74 | 219 |

[a] P. Reynolds, Unpubl. rep., USFWS, 1982.

# WALRUS

## SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 17

GEOGRAPHICAL DESCRIPTION: Northern Bristol Bay

PERIOD COVERED: July 1, 1981-June 30, 1982

### Seasons and Bag Limits

Marine mammal management was under Federal jurisdiction during this regulatory year. Federal regulations allowed unlimited harvests of walrus by Natives for subsistence or use in handicrafts.

### Population Status and Trend

General observations by field staff indicated the walrus population which utilize Round Island remained at previous levels of 10,000-12,000 animals during peak haulouts.

On November 14-18, 1981, U.S. Fish and Wildlife Service personnel reported a major haulout of 2,800 walruses at Nanvak Bay. Nanvak Bay may be a temporary haulout for walruses from Round Island on their northern migration. Radio-telemetry data indicated that some males which utilized Round Island during summer migrate to the Punuk Island in the fall (J. Taggart, pers. commun.).

### Mortality

No mortality studies were conducted in 1981.

### Research Activities

Nine radio transmitters were attached to walruses during July and August 1981. Two research biologists from the USSR visited Round Island in July to observe the tagging technique and exchange information.

A proposal for a radio-telemetry program using satellite tracking to determine seasonal distribution and migration routes of the Pacific walrus was drafted and submitted to the National Oceanic and Atmospheric Administration. This project, unlike previous studies, would require immobilization of walruses.

### Management Summary and Recommendations

Traffic of large boats near Round Island is increasing. Walruses frequently stampeded from the beaches even when boats passed .50 mi or more from the shoreline. The distance prohibiting

trespass should be increased from .50 mi to 1.0 mi around Round Island to reduce the frequency of disturbance.

A marine VHF base radio was purchased for Round Island to aid in communication with boat traffic. While communications with inbound boats has improved, problems still persist when boats fail to radio the island prior to their arrival as requested. Contacting island personnel during a scheduled radio time should be included as a condition of the visitor permit.

Permit conditions are not presently enforceable in criminal court, as there is no penalty clause for sanctuary or refuge permits. Permit conditions should be included under Miscellaneous Game Regulations to correct this problem.

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