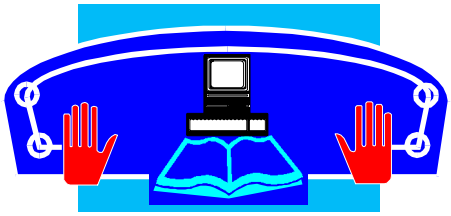

Canada-northwest Territories Wildlife Research Projects
Type of Study: Reference Material Wildlife Products, Nwt Wildlife General
Date of Report: 1985
Author: Canada - Indian And Northern Affairs
Catalogue Number: 5-1-41

Canada-Northwest Territories

Wildlife Research Progress Reports 1983-84

Wildlife Research Projects 1984-85

CANADA-NORTHWEST TERRITORIES

WILDLIFE RESEARCH PROJECTS

FOR 1984-85

WITH

RESEARCH PROGRESS REPORTS

FOR 1983-84

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and

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Canadian Wildlife Service

Western and Northern Region

Edmonton, Alberta

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The Canada-N.W.T. Cooperative Wildlife Research Agreement was negotiated under the authority of Section 5 of the Canada Wildlife Act, and was signed in 1979 by the Ministers of Environment and Indian and Northern Affairs on behalf of Canada, and by the Commissioner on behalf of the Northwest Territories.

The implementation of the Agreement is the responsibility of a Wildlife Research Committee that is supported by a Technical Advisory Committee. One of the duties of the Research Committee is to produce a yearly compendium of the research projects being undertaken by the agencies participating in the cooperative program. The 1984-85 compendium herewith includes as well a brief description of the progress made during 1983 on each of the projects listed in the 1983-84 report. In addition this report includes a listing of research or management projects that are conducted by single agencies. This list is provided to increase the exchange of information. The projects undertaken by CWS and Parks Canada are listed at the end of this report.

Information about any of the projects may be had by writing to the lead agency listed for the project, at the following addresses:

Regional Director
Canadian Wildlife Service
#1000, 9942 - 108 Street
Edmonton, Alberta
T5K 2J5

Chief, Wildlife Management Division
Department of Renewable Resources
Yellowknife, N.W.T.
XIA 2L9

Regional Director
Northern Affairs Program
Department of Indian
and Northern Affairs
Yellowknife, N.W.T.
XIA 2R3

CANADA/NWT WILDLIFE RESEARCH PROJECTS

1983 PROGRESS REPORTS

RESEARCH PROGRESS REPORTS 1983-84

79-1 Experimental use of aerial photography for censusing caribou.

79-9 Studies of the behaviour of polar bears and their ecological inter-relationships.

79-11 Population ecology studies of polar bears in northern Foxe Basin.

79-13 Bear detection and deterrent program.

79-14 Polar bear laboratory and computer services.

79-15 Wood bison rehabilitation.

80-1 Reproductive ecology of polar bears.

80-3 The ecological relation of migratory barren-ground caribou to and their behaviour on the Beverly calving ground, N.W.T.

81-1 Mortality of migratory barren-ground caribou calves with emphasis on predation.

81-3 Population ecology of polar bears along northeast Baffin Island.

82-1 Evaluation of calf survival during first year of life in the Beverly herd of migratory barren-ground caribou.

82-2 Winter range relationships of the Beverly herd of barren-ground caribou with emphasis on the effects of fire.

82-3 Modelling of polar bear populations.

82-4 Keewatin peregrine falcon research.

82-5 Pilot study of caribou behaviour at the Lupin Mine Site, Contwoyto Lake, N.W.T.

82-7 Toxic chemicals in polar bear tissues.

82-8 Population ecology of gyrfalcons in the Northwest Territories.

82-9 Caribou movements across Prince of Wales Strait, and the taxonomy of Victoria Island and Banks Island caribou.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 79-1

TITLE: Experimental use of aerial photography for censusing caribou.

LEAD AGENCY: NWT Wildlife Service

PROJECT LENGTH: 1980 ongoing

PROGRESS TO DATE:

Photographs of five calving ground surveys have been completed with caribou counted on four of these so far. The fifth will be counted by December 1983.

A review of the counting procedures was undertaken in January 1983 and the technique was considered accurate. That review Involved an examination, by a second air photo interpreter, of 300 sample frames. Those frames were marked by the original interpreter and as such did not constitute a "blind" experiment.

PROJECTED ACTIVITIES:

A blind experiment is now in progress in which four different interpreters are counting caribou on a sample of photographs. Their results will be compared to the original count.

Results will be available in January 1984.

Photo surveys will be conducted on the Beverly and Bathurst herds in June 1984.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 79-9

TITLE : Studies of the behaviour of polar bears and their ecological inter-relationships.

LEAD AGENCY: Canadian Wildlife Service

PROJECT LENGTH: Continuing, in a series of problem oriented phases.

PROGRESS TO DATE:

The following reports were completed:

Calvert, W. and I. Stirling. 1983. Winter distribution of ringed seals in the Barrow Strait area, Northwest Territories, as determined by underwater vocalizations. Rpt. prepared by the Canadian Wildlife Service and the University of Alberta for the Arctic Pilot Project. 17 pp.

Kingsley, M.C.L. and N. Lunn. 1983. Abundance of seals in the eastern Beaufort Sea, Amundsen Gulf and Prince Albert Sound, 1982. Report prepared by the Canadian Wildlife Service for Dome Petroleum Ltd. and Gulf Canada Resources Inc. 16 pp.

Stirling, I. 1983. The evolution of mating systems in pinnipeds. pp 489-527. In J.F. Eisenberg and D.G. Kleiman (Eds.) Recent Advances in the Study of Mammalian Behaviour. Spec. Pub. No. 7, American Society of Mammalogists.

Stirling, I. and W. Calvert. 1983. Environmental threats to marine mammals in the Canadian High Arctic. Pola-Record, 21:433-449.

The following field work was completed on this project:

a) Four weeks of observations and underwater recordings were made of polar bears, walruses and seals at the Dundas Polynya. There was more activity than in 1982 and a bit less than in 1981. An aerial survey of the distribution of walruses and polynyas was made in Penny Strait, augmented by underwater recordings. The ice edge in Lancaster Sound was far to the east so few polar bears were seen and only four were tagged.

b) Four weeks of observation of polar bear behavior were completed at Radstock Bay S.W., Devon Island in July.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 79-11

TITLE : Population ecology studies of polar bears in northern Foxe Basin

LEAD AGENCY: Canadian Wildlife Service

PROJECT LENGTH: 3 years from start

PROGRESS TO DATE:

The Federal-Provincial Administrative Committee for Polar Bear Research and Management supported the need for this research at its 1982 and 1983 meetings but no funds have been provided by any of the agencies involved.

The problem is scheduled for discussion at the wildlife Minister's meeting in mid-September 1983 and at a joint meeting between the Makivik Corporation CWS, QWS and NWT-WS in late September 1983.

PROJECTED ACTIVITIES:

This till be largely dependent on funding. At present the limited amount of CWS internal funding is fully committed. Even if it were not, it would be inadequate for studying polar bears in this area.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 79-13

TITLE : Bear detection and deterrent program

LEAD AGENCY: NWT Wildlife Service

PROJECT LENGTH: 1981-84

PROGRESS TO DATE:

The second field season of the bear detection and deterrent research program was completed at Cape Churchill, Manitoba from 16 September to 5 November 1982. Polar bears (Ursus maritimus) were attracted to the study site by the use of beluga whale (Delphinapterus leucas) and ringed seal (Phoca hispida) carrion bait. Field tests were conducted on: microwave motion detection units, which were interfaced with audio sirens; a trip wire fence system; a recording of barking dogs; rubber batons; plastic slugs; and flare/scaring cartridges. Testing was carried out during daylight hours, and with the aid of an electric floodlight system, during periods of darkness A capture/marking program enabled the return rates of 30 bears to be determined.

Two hundred and fifty-seven polar bears were tested during the study. Microwave motion detection units were 100% successful in detecting approaching bears (N=187), however, the activated audio sirens did not deter bears from continuing their approach. The trip wire detection system was also 100% effective in detecting approaching bears (N=50).

The recording of barking dogs did not stop the approach of any of the bears tested (N=131). Rubber batons fired from a 38 mm anti-riot gun were 100% successful in deterring both experiment (N=131) and control (N=126) bears from the bait site. Rubber batons were not effective when fired from a pistol. . Plastic slugs proved ineffective in deterring bears (N=25) from the bait site. Flare/scaring cartridges were successful in deterring the approach of 77% of the bears tested (N=75) while the field crew was engaged in equipment repair and maintenance operations.

PROJECTED ACTIVITIES:
1. Complete testing of the 38 mm antiriot rubber batons.
2. Continue testing of plastic slugs.
3. Test a trip wire fence system in which scaring flares are incorporated.
4. Continue to develop the training and education package.

REPORTS:
Stenhouse, G. 1982. Bear Detection and Deterrent Study, Cape Churchill, Manitoba, 1981. NWT Wildlife Service File Report No. 23. 65 pp.
Stenhouse, G. 1983. Bear Detection and Deterrent Study, Cape Churchill, Manitoba, 1982. NWT Wildlife Service Report File Report No. 31. 58 pp.

No. 79-14

CANADA N.W.T. WILDLIFE RESEARCH PROJECT

TITLE : Polar bear laboratory and computer services

LEAD AGENCY: Canadian Wildlife Service

PROJECT LENGTH: Continuing

PROGRESS TO DATE:

New specimens from polar bears and seals are being analyzed for age and they reproductive status. Data continued to be entered into the computer as are collected, edited and corrected. Data transferred from the system previously used has now been cleaned in essential categories and magnetic tape copies of the files have been sent to NWT-WS in Yellowknife. There are over on file, including the mark-recapture data and the data 10,000 separate records of data are being sent to NWT on all the nature kills. Requested extractions and Manitoba in particular. Work is continuing on enhancement of existing programs to improve correcting, extracting and compiling data.

PROJECTED ACTIVITIES:

1. Continue in same capacity.
2. New techniques will be introduced as necessary.
3. The collection of polar bear teeth will be used for a detailed analysis of aging techniques.
4. In view of the present size of the files and the maintenance required, the cost and user effectiveness of the present system will be reviewed, and possible alternatives explored.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 79-15

TITLE : Wood bison rehabilitation

LEAD AGENCY: NWT Wildlife Service

PROJECT LENGTH: 1983+

PROGRESS TO DATE:

An aerial survey was carried out on 15 April 1983 over all areas in the Liard Valley where wood bison had been observed in the past two years. Two groups of bison were located, one had 11 animals including 2 calves from 1982, and the other was comprised of 4 adult bison. On 26 June, 13 bison, including 2 new calves were seen on the Liard Highway. On 28 June, 5 adults with 2 calves were seen near the Flett Rapids which may be a separate group from the ones seen on the highway two days earlier. A single bull was observed near Fort Liard and 3-4 adults were in the Nahanni Butte area. One animal apparently drowned this spring since its carcass was observed in the Liard River below the South Nahanni Junction. These observations confirm that the bison are reproducing and appear to be established in the Liard Valley.

PROJECTED ACTIVITIES:

Observations will continue to be collected and a late winter aerial survey will be carried out to monitor the population. CWS are preparing a report on the wood bison introduction program.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 80-1

TITLE : Reproductive ecology of polar bears

LEAD AGENCY: Canadian Wildlife Service

PROJECT LENGTH: 1980-84

PROGRESS TO DATE:

Three hundred and five polar bears were captured/recaptured in 1982/83 in Manitoba, including 70 family groups with 118 cubs. Data were gathered on age specific productivity, breeding interval, time of first litter production, time of reproductive senescence, time of weaning, and cub mortality rates. Accurate estimation of these parameters are critical to a clear understanding of polar bear population dynamics.

Additional information has been gathered on site specific fidelity of adult females within the denning region in Manitoba, on the general movements of bears, by age and sex class, while ashore in Manitoba, and on the orientation ability of females polar bears when leaving the denning region in spring. Comparisons of weight changes of female bears in relation to their reproductive status have been made between western Hudson Bay and the High Arctic. The first observations of interactions between wolves and polar bears were recorded, including confirmed predation upon a cub.

Blood chemistry analyses has tentatively resulted in a method of determining pregnancy of females in autumn prior to the onset of winter denning and confirmation of onland fasting for the majority of polar bears in Manitoba between August and November.

Reproduction organs from 53 female and 56 male polar bears were collected during the 1982/83 hunting season but have not yet been examined. The collections from Southampton Island were very complete.

PROJECTED ACTIVITIES:

1. Extensive mark and recapture of adult female polar bears and family groups during the fall to gather data on reproductive parameters, on degree of fidelity to the denning region, on movements and denning activities of pregnant bears, and on the general movements of families prior to the formation of ice on Hudson Bay.

2. Extensive collection of reproductive organs with special emphasis being placed on the settlements from Keewatin and Southampton Island for anatomical study of the reproductive tract.

(.. continued)

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 80-1

PROJECTED ACTIVITIES:

3. Fixed-wing aerial surveys and radio-tracking, in conjunction with helicopter tagging operations, during the fall to determine the spatial and temporal distribution of polar bears ashore in Manitoba. This is being done to evaluate the use of the observed marked/unmarked ratios, for estimating population size in Manitoba.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT No. 81-1

TITLE : Mortality of newborn migratory barren-ground caribou calves with emphasis on predation

LEAD AGENCY: Canadian Wildlife Service

PROJECT LENGTH: May 1981 - March 1985
(field work completed June 1983

PROGRESS TO DATE:

The third and final field season of this investigation of the causes of death of newborn migratory barren-ground caribou (Rangifer tarandus groenlandicus) calves of the Beverly herd, District of Keewatin, Northwest Territories, was carried out in June 1983. The work was done on a 5000 km^2 segment of the traditional northern tundra calving ground of the Beverly caribou herd. Nonsystematic searches for dead caribou were flown during calving and early postcalving in a Bell-206B helicopter at about 10 to 30 m above ground level and speeds of 60 to 160 km/h on 12 days between 3 and 17 June 1983.

Results for 1981 and 1982 have been previously reported. In 1983, 101 calves and 11 cows (adult females) were found and necropsied. Calves of discernible sex (87) in the sample (101) were about equally represented by females, 43.6% (44); and males, 43.6% (43). All of the calves in the sample were estimated to be less than l-week-old at death: most, 76.2% (77) were estimated to be less than three days of age at death. The 11 cows were estimated to range from 3 to 8 years of age at death, based on the wear patterns of their mandibular teeth.

Causes of death were assigned to 87 calves with objective certainty: (1) 62 calves were victims of wolf predation; (2) 9 died from pneumonia; (3) 7 died from fetal or neonatal atelectasis (stillbirths, premature births, or poor fetal development); (4) 7 died from patho-physiological problems; and (5) 2 died from a malnutrition/starvation complex after becoming seParated from their mothers. The causes of death were determined for an additional 8 calves with only some objective assurance and they were classified as 'suspect' cases: 5 of those calves apparently died from fetal or neonatal atelectasis; and the other 3 apparently from wolf predation. The cause(s) of death from the remaining 6 calves could not be determined and they were classified as 'unknowns'. Six of the 7 calves that died from patho-physiological problems had been entrapped in slush mires at the edges of lakes in June 1983: 2 appeared to have drowned; and the other 4 appeared to have died from shock or stress. The 7th calf in the patho-physiological category died from a ruptured liver.

It was judged that 7 of the 11 adult cows necropsied were victims of wolf predation; and additional 3 were killed by grizzly bears; and the 11th cow died of peritonitis from a prolapsed uterus. Three of the wolf-killed cows had produced calves in 1983 and the other 4 were still in a state of pregnant when

(continued)

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 81-1

PROGRESS TO DATE: Continued

killed. Two of the grizzly bear-killed cows had already calved in 1983 and the remaining one was still in a state of parturiency. The cow with the prolapsed uterus had calved in 1983.

Wolf predation remained the single most important cause of death in the sample of newborn calves of the Beverly herd in 1983, as in 1981 and 1982. The sample of 11 cows is too small to evalute the relative importance of wolf predation to adult cows at about the time of calving in 1983.

PROJECTED ACTIVITIES:

1. Produce a detailed project progress report for the 1983 field season by 31 March 1984.

2. Produce a detailed project completion manuscript report (1981-83) by 31 March 1985.

3. Evaluate the need for and feasibility of doing more caribou calf mortality work, such as that in this study by 1 October 1984.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT

No. 81-3

TITLE : Population ecology of polar bears along northeast Baffin Island

LEAD AGENCY: NWT Wildlife Service

PROJECT LENGTH: 1981-84

PROGRESS TO DATE:

During the spring of 1983, 47 polar bears were captured, marked and released along the northeast coast of Baffin Island. Seven of the bears had been marked previously, six from this study and one from another study in an adjacent area. This brings the total of bears captured in the Clyde River/Broughton Island area to 129. The hunter kill continues to be monitored and a high percentage of marked animals is appearing in the harvest.

PROJECT ACTIVITIES:

Field work will continue in 1984.

CANADA N.W.T. WILDLIFE RESEARCH PROJECT No. R?-1

TITLE : Evaluation of calf survival during the first year of life in the Beverly herd of migratory barren-ground caribou.

LEAD AGENCY: NWT Wildlife Service

PROJECT LENGTH: 1982-83

PROGRESS TO DATE:

The spring composition count to measure the survival of 1982 calves over the first 10 months of life was a cooperative project with CWS. A large segment of the Beverly herd that had spent part of the winter in the Snowdrift River area moved out onto the Barrens in mid-March, 1983 and we sampled those caribou as they moved northeast from Tent Lake to Whitefish Lake and on to Tyrell Lake by early April. We also sampled caribou that had wintered further south as they began to migrate north on Alcantara, Spearfish, Esk, Abitau and Ivanhoe lakes.

We classified 21,409 caribou which is a considerably larger sample than has been obtained in the past. More important than the total sample size is that we were able to sample different segments at different times. The overall calf survival was 45 calves:100 cows, which represents a high calf survival.

The final report is in preparation, but in summary, the survival of the 1981 and 1982 calf crops was described from counts of calf to cow ratios in the fall of 1981 and 1982 and spring 1982 and 1983. Calf survival for the first 4 months of life was 72.3% in 1981 and 67.6% in 1982. Over-winter survival of calves was slightly higher in 1981-82 winter compared to 1982-83 winter. About half the 1981 and 1982 calf crops survived to 10 months of age which is relatively high survival for barren-ground caribou calves in the NWT. "

PROJECT ACTIVITIES:

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT No. 82-2

TITLE : Winter range relationships of the Beverly herd of barren-ground caribou, with emphasis on the effects of fire.

LEAD AGENCY: Canadian Wildlife Service

PROJECT LENGTH: 1982-83 to 1986-87 (4 years)

PROGRESS TO DATE:

In 1982-83, 75 and 150 caribou were obtained for autopsy in November and March, respectively, with the cooperation of the Fort Smith Hunters and Trappers Association (FSHTA), NWTWS and DIAND. Preliminary results of those samples revealed that caribou in the Beverly Herd were in relatively poor condition in November but there was a slight recovery by March. The poorer condition in winter was reflected in a lower than average pregnancy rate.

Movements of the herd were monitored from mid-October to April. The main segment of the herd, comprised of cows and subadults of both sexes, spent most of the winter in the northwest sector of the winter range, between Porter Lake and the east arm of Great Slave Lake. Most of December and part of January was spent on the tundra in the Whitefish Lake region. Migration onto the tundra began again in mid-March and continued until mid-April. Bulls that wintered in Saskatchewan were the last to depart the winter range. Reactions of caribou to burns of various sizes were recorded but more data are needed. Data were obtained in March and April on the frequency distribution of cover types and ages of forests from point observations obtained on aerial transects Snow depths were recorded in late winter throughout the winter range in the NWT

In July and August, data on lichen biomass in relation to age of forest were obtained at 45 sites in the Nonacho Lake region.

PROJECTED ACTIVITIES:

Plans are underway to sample 75 and 150 caribou in November and March, in cooperation with the FSHTA and NWTWS Winter movements in relation to burns will be monitored almost monthly from October to April. Data on snow depths and the distribution and frequency of habitat types and intervals since fire will be obtained on the transects flown to monitor caribou distributions and movements. Further information on the relationships between lichen biomass and the age and type of forest will be obtained in July and August 1984. Reports were produced on 1) the November sample, 2) the March sample, 3) early-winter movements, 4) current knowledge on caribou winter ecolgy, 5) field sampling of vegetation at Porter Lake, 6) digestibility studies and 7) results of rumen analyses

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 82-3

TITLE: Modelling of polar bear populations

LEAD AGENCY: NWT Wildlife Service

PROJECT LENGTH: 1981-84

PROGRESS TO DATE:

A workshop was held in Vancouver in January 1983. Dr. M.K. Taylor, a post-doctoral student lead discussion on his population model and the UBC model, to try to incorporate the best features of both models. Several subroutines on reproduction, survival and reconstruction model were assigned to groups of individuals for verification. Drs. DeMaster, F.L. Bunnell and D. Tait are also contributing much of their time to this exercise. Progress is continuing but, overall, at a slower rate than we originally expected.

PROJECTED ACTIVITIES:

Once the above packages have been checked, we intend to have them installed on the computers in Yellowknife and Edmonton. We intend to hold several more modelling workshops. If possible, they will be held in conjunction with the Polar Bear Technical Committee. In particular, we would like to develop the use of the models as interactive tools for future management and research.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 82-5

TITLE : Study of caribou at Lupin Mine Site

LEAD AGENCY: NWT Wildlife Service

PROJECT LENGTH: 1983

PROGRESS TO DATE:

Caribou were observed at the mine site in late August; however, Wildlife Service observers were not available until September. Therefore, observations at the mine site will begin in 1984. Permission to use the Lupin site was obtained from Echo Bay. A communication system was established and will be implemented in 1984.

PROJECTED ACTIVITIES:

1. Continue to maintain a good working relationship with Echo Bay.
2. Review the research design prior to the 1984 field season.
3. Describe the study area and make observations of caribou behaviour and movements.
4. Undertake to make recommendations respecting site facility design.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT No. 82-7

TITLE: Toxic chemicals in Polar Bear tissues

LEAD AGENCY: NWT Wildlife Service

PROJECT LENGTH: 1982+

PROGRESS TO DATE:

Samples of fat, liver, and hair were collected from 80 polar bears in the spring of 1982 from Tuktoyaktuk, Holman Island, the Central Arctic and Resolute Bay. These samples are now being analyzed at the Canadian Wildlife Service Toxic Chemicals Laboratory in Ottawa. No samples were collected in the 1982/83 hunting season.

PROJECTED ACTIVITIES:

A report on the 1982 findings will be provided by CWS, Ottawa by 31 December 1984.

Tissues will be collected in 1983/84 hunting season, if funds are available.

No. 82-8

CANADA N.W.T. WILDLIFE RESEARCH PROJECT

in the N.W.T.

TITLE : Population ecology of Gyrfalcons

LEAD AGENCY: NWT Wildlife Service

PROJECT LENGTH: 1982 Ongoing

PROGRESS TO DATE: 1983.

A ground survey by snow machine was conducted between 10 May and 10 June, and Fourteen gyrfalcon nests were located. Helicopter surveys were conducted between 26 June and 15 July in the vicinity of Coppermine, Bay Chime, still active with Spence Bay. Nine of the fourteen nests found in spring were located in the Kitikmeot Region. Sixteen young. Seven other active nests were of 2.5 young each. Density of nests was active nests contained an average lower than in 1982.

Between 27 July and 5 August, aerial surveys were conducted in the vicinity of Cape Dorset, Lake Harbour and Frobisher Bay. Some young had fledged, but remained in the immediate vicinity of nests (2). Nine young were associated with five nests, for an average of 1.8 young per nest* Nesting density was considerably lower than in 1982.

Thirty-five nestling gryfalcons, one adult and three passage birds have been banded to date during 1983.

PROJECTED ACTIVITIES:

Surveys will be repeated and expanded in 1984. Banding of young and adults will be continued. On-the-ground studies at nest sites will continue, with emphasis on how long the Young are dependent on adults after fledging. Food habits will be examined and compared between areas.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 82-9

TITLE: Caribou movements across Prince of Wales Strait and the taxonomy of Victoria and Banks Island caribou.

LEAD AGENCY: Canadian Wildlife Service

PROJECT LENGTH: 1982-84

PROGRESS TO DATE:

Surveys in June 1982 were reported last year and a more detailed report is in the final draft stage.

A survey from 4-6 June, 1983, of the strait and adjacent islands revealed no indication of crossings at that time. The plan to collect 15 caribou for taxonomic purposes was abandoned, after only two caribou were obtained, because of an early melt.

A count of muskoxen on the peninsula terminating in Bailey Point, Melville Island, revealed 36 calves and 233 older muskoxen. Twenty-four calves and 213 older muskoxen were observed along the southeastern coast of Melville Island from Winter Harbour to Nelson-Griffiths Point.

PROJECTED ACTIVITIES:

This project was terminated, however, in the summer of 1984 it was approved for funding under NOGAP. The project proposal will be revised to reflect this new funding.

CANADA/NWT WILDLIFE RESEARCH PROJECTS

1984-85 PROGRESS REPORTS

ACTIVE PROJECTS 1984-85

79-1 Experimental use of aerial photography for censusing caribou.

79-9 Studies of the ecological inter-relationships and behaviour of polar bears.

79-11 Population ecology studies of polar bears in Foxe Basin.

79-14 Polar bear laboratory and computer services.

79-15 Wood bison rehabilitation. 1983-84 update.

80-1 Reproductive biology of polar bears.

81-1 Mortality of migratory barren-ground caribou calves with emphasis on predation.

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82-1 Evaluation of calf survival during first year of life in the Beverly herd of migratory barren-ground caribou.

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82-7 Toxi c chemicals in polar bear tissues.

82-8 Population ecology of gyrfalcons in the Northwest Territories. .

82-9 Caribou movements across Prince of Wales Strait, and the taxonomy of Victoria Island and Banks Island caribou.

84-1 Ecological studies of Peary caribou and muskoxen.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 79-1

Title: Experimental use of aerial photography for censusing caribou.

Lead Agency: NWT Wildlife Service

Cooperating Agencies:

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead: $90K

Cooperating Agencies:

Location: Beverly and Bathurst calving grounds.

Project Duration: 1 Year (1984-85)

Description:

A repeat of previous censuses will be conducted in June 1984 using both standard visual techniques and aerial photography. Census results will be compared to determine the type and magnitude of visibility bias inherent in the standard visual techniques.

Need:

Aerial censuses of barren-ground caribou in the NWT are subject to visibility biases which add to sampling error and contribute to the uncertainty of the resulting population estimates. Visibility bias has not been determined for caribou surveys although we currently raise our estimates by 25% as an arbitrary factor. The 1980 survey showed that this factor may not be accurate. We must do further comparative surveys in order to arrive at a population estimate with workable confidence intervals which would allow the wildlife managers to make informed decisions. The feasibility of using aerial photography for an operational census of caribou on the calving grounds has been shown to be operational, but further refinements are needed.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 79-1

Expected Results:

This further experimental census will allow us to further refine our estimates of visibility bias and estimate the variability of observer bias. The census will further evaluate the potential for aerial photography as a tool for estimating caribou numbers.

Publications/Reports:

Consultantts report to be followed by an NWT Progress Report.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 79-9

Title: Studies of the ecology, inter-relationships and behaviour of polar bears.

Lead Agency: Canadian Wildlife Service

Cooperating Agencies: Department of Indian and Northern Affairs
NWT Wildlife Service
Polar Continental Shelf Project

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead: Cws - 1.5 PY + 10K

Cooperating Agencies: Polar Continental Shelf Project - 50K

Location: Mainly in high Arctic but inter-related data collected from other projects all over the Arctic.

Project Duration: Continuing, in a series of problem-oriented phases.

Description:

This project involves long-term observations of free-ranging polar bears to evaluate hunting abilities of polar bears of different age and sex classes, activity budget, utilization of habitat, interactions between bears, and the seasonal variation in those parameters. Specific in-depth studies are also being conducted of the influence on polar bears of ice conditions, seal distribution and abundance of polynyas.

Need:

Baseline data from the above studies will allow us to: evaluate the hunting ability of cubs of different ages and the effect of human harassment (eg: tagging) on polar bears; test the effects of radio-collars on polar bear behaviour; design experiments for research into man/bear conflicts; predict areas of management or assessment significance 'on the basis of environmental information; and develop an in-depth understanding of the relationship between polar bears and their habitats. This research, more than any other, provides results with which Canada can meet the requirement in the International Polar Bear Agreement to "...protect the ecosystems of which polar bears are a part..." and ". . ● anage polar bear populations in accordance with sound

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CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 79-9

Need: (continued)

conservation practices based on the best available scientific data." To do this requires a continuing series of well planned studies on subjects such as the role of seal distribution and polynyas on polar bears. Subprojects will be initiated and terminated as required depending on the results of research addressed to specific questions within the overall framework.

Expected Results:

1. An analysis of the behavior of undisturbed polar bears in the high Arctic.

2. An evaluation of the significance of polynyas to marine mammals and polar bears;

3. An evaluation of the use of underwater vocalization to study the winter distribution of seals in the high Arctic.

4. An evaluation of the importance of different habitat types to seals and bears in the western Arctic.

Publications/Reports:

Kingsley, M.C.S., I. Stirling and W. Calvert. 1982. The distribution and abundance of seals in the high Arctic, 1980-81. Reports prepared for the Arctic Islands Operating Advisory Committee, the Department of Indian and Northern Affairs, and the Department of Fisheries and Oceans. Canadian Wildlife Service, Edmonton. 68 pp.

Kingsley, M.C.S., W. Calvert and I. Stirling. 1982. The abundance of seals in the eastern Beaufort Sea, northern Amundson Gulf and Prince Albert Sound, 1981. Rept. prepared for Dome Petroleum Ltd., Esso Resources Canada Ltd., and Gulf Canada Resources Inc. Canadian Wildlife Service, Edmonton. 19 pp.

Stirling, I. 1974. Midsummer observations on the behaviour of wild polar bears. Can. J. Zool; 1191-1198.

Stirling, I. 1977. Adaptations of Weddell and ringed seals to exploit polar fast ice habitat in the presence or absence of predators. Pp. 741-478 In G.A. Llano (Ed.) Adaptations Within Antarctic Ecosystems. Proc. Third Symposium on Antarctic Biology. Washington, D.C.

Stirling, I. 1983. The evaluation of mating systems in pinnipeds. Pp. 489-527. In J.F. Eisenberg and D.G. Kleiman (Eds.) Recent advances in the Study of Mammalian Behavior. Spec. Pub. No. 7, American Society of Mammalogists.

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CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 79-9

Publications/Reports: (Continued)

Stirling, I. and R. Archibald. 1977. Aspects of predation of seals by polar bears. J. Fish Res. Bd. Canada 34:1125-1129.

Stirling, I. and W. Calvert. 1983. Environmental threats to marine mammals in the Canadian high Arctic. polar Record, 21:443-449.

Stirling, I. and T.G. Smith. 1977. Inter-relationships of arctic ocean mammals in the sea ice habitat. Proc. of the Circumpolar Conference on Northern Ecology. Ottawa. Sept. 1975. p. 121-136.

Stirling, I. and P.B. Latour. 1978. Comparative hunting abilities of polar bear cubs of different ages. Can. J. Zool. 56:1768-1772.

Stirling, I. 1980. The biological importance of polynyas in the Canadian Arctic. Arctic 33:303-315.

Stirling, I. 1980. Aspects of the influence of habitats on marine mammals. International Symposium on Habitats and Their Influences on Wildlife.

Stirling, I. and H. Cleator, Eds. 1981. Polynyas in the Canadian Arctic. Can. Wildl. Serv. Occ. Paper 45. 70 pp.

Stirling, I., D. Andriashek and W. Calvert. 1981. Habitat preferences and distribution of polar bears in the western Canadian Arctic. Report prepared for Dome Petroleum Limited, Esso Resources Canada Ltd., and the Canadian Wildlife Service. 49 pp.

Stirling, I., M.C.S. Kingsley and W. Calvert. 1982. The distribution and abundance of seals in the eastern Beaufort Sea, 1974-79. Can. Wildl. Serv. Occ. Pap. 47. 23 pp.

Projected Activities:

The high Arctic seal surveys, and sub-ice recordings are being re-written for publication in scientific journals.

Observational data from Dundas Polynya is being analyzed.

The data on the captured polar bears have been entered into the computer.

Plans are being made for polar bear tagging and observations in polynya areas in 1984, depending on internal budgets, external support, and other priorities.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 79-11

Title: Population ecology studies of polar bears in Foxe Basin

Lead Agency: Canadian Wildlife Service - Northern Foxe Basin, Hudson Strait
NWT Wildlife Service - Southern Foxe Basin

Cooperating Agencies: Keewatin Inuit Association, Quebec Wildlife Service, Newfoundland Wildlife Service, Makivik Corporation, Local Hunters and Trappers Associations

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)
Lead: CWS 25K 1984-86
NWT 100K 1984-86, other sources still to be investigated

Cooperating Agencies: Quebec Wildlife Service, Makivik Corporation

Location: Foxe Basin, northern Hudson Bay, Hudson Strait

Project Duration: Delayed for funding to 1984-86

Description:

a) Assess size and discreteness of the population.
b) Determine seasonal movement patterns.
c) Evaluate the relative contributions to the population of maternity denning in the area.
d) Determine reproductive parameters of the populations.
e) Review past kill statistics in relation to data on age and sex composition of the kill.
f) Evaluate harvest levels and recommend a safe total kill that can be sustained by the population.

Need:

Inuit communities in the NWT are harvesting polar bears from this population under a strictly controlled quota system. Quebec Inuit have no restrictions on their harvesting of polar bears. Preliminary results from mark and recapture studies indicate that at least some polar bears move between southern Foxe Basin and northern Hudson Bay to the Labrador coast via Hudson Strait. Management practices and quotas are being determined independently by each jurisdiction. This situation will become more critical in the near future when Quebec negotiates quotas on the basis of their harvest study. There are almost no biological data which can be used to help determine quotas. Consequently, the risk of overharvest is serious.

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CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 79-11

Need: (continued)

It is possible that industry may be Interested in bringing hydrocarbons from the high Arctic to southern markets through Foxe Basin. At present, there is virtually no baseline information from which to project possible environmental effects or to identify critical areas.

Expected Results:

a) Answer questions raised in items a) to f) in description.

b) Provide the biological basis for management of polar bears in Foxe Basin on northern Hudson Bay and Hudson Strait.

c) Provide baseline data for assessing a possible year-round shipping route for natural gas from the high Arctic through Foxe Basin and Hudson Strait.

Publications/Reports:

Stirling, 1. and H.P.L. Kiliaan. 1980. Population ecology studies of the polar bears in northern Labrador. CWS Occasional Paper 41, 19 p.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 79-14

Title: Polar bear laboratory and computer services.

Lead Agency: Canadian Wildlife Service

Cooperating Agencies: NWT Wildlife Service

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead: Cws - 0.7 PY and 15K

Cooperating Agencies: NWT - 7.5K

Location: Edmonton (and Yellowknife as required)

Project Duration: Continuing

Description:

This project involves conducting laboratory analyses of large numbers of specimens collected from polar bears killed by Inuit hunters and of specimens collected during the course of our own field research on polar bears, seals, and arctic foxes. The second part of the project involves coding and entering all data on polar bear mark and recapture studies and kill returns from CWS, NWT-WS, and other jurisdictions into a national computerized data base. From this data base, we then retrieve information as required.

Need:

Although simple to describe, both these functions are enormously time consuming and require substantial financial support. These two aspects together form the foundation of all polar bear research conducted by CWS and NWT-WS for both management and assessment purposes.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 79-14

Expected Results:

The laboratory methodology is pretty much routine now and can continue to function efficiently. However, we will continue to look for improvements as new techniques become available. In particular, because the data base continues to grow each year, we must periodically evaluate the appropriateness of our present storage and retrieval systems. We also have several new ideas which should be pursued.

The computer has just come to the point where it is functional, although improvements are needed in the coding and cleaning of data; retrieval and packaging of access programs.

As the quality of the data increases, present computer programs need to be revised to improve data retrieval and analysis.

Publications/Reports:

None specific to computor or lab application but these two facilities have contributed significantly to several major reports.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 79-15

Title: Wood bison rehabilitation - 1983-84 update

Lead Agency: NWT Wildlife Service (NWTWS)

Cooperating Agencies: Canadian Wildlife Service
(DIAND)-Department of Indian Affairs and Northern Development
World Wildlife Fund (Canada) (WWF)

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead:
1979-1980 - 0.2 PY and 4K
1980-81 - 1.3 PY and 6K
1981-82 - 0.3 PY and 10K
1982-83 - 0.3 PY and 2K ? NWTWS
1983-84 - 0.1 PY and 4K ? NWTWS

Cooperating Agencies: CWS - 1979-1980 - 2K
1982-83 - 1K
DIAND - 1979-1980 - Helicopter support as available
1980-81 - 3K
NWT Wildlife Service - 1981-82 - 4K
WWF (Canada) 1980-81 - 12K

Location: South Nahanni and Liard River valleys - primarily between Fort Liard and Nahanni Butte

Project Duration: 1979-1982 Completed 1982. Radio-collars ceased functioning 1983 - Monitoring as possible by NWTWS

Description:

Summer 1979 assess ranges along lower Liard River Valley between Nahanni Butte and Fort Simpson for potential habitat to transplant a free-roaming herd of wood bison. Completed July 1979. Report completed 1980.

When suitable range found, plan and execute a transfer during the fiscal year 1980-81. Transfer and release completed on 16 "June 1980.

Fo11ow up monitoring work pertaining to establishment of wood bison within the Liard River Valley using radiotelemetry techniques during fiscal year 1981-82. Radio-tracking surveys performed by NWTWS from July 1980 to September 1982.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 79-15

!?eed:

Wood bison are classified and recognized as an endangered subspecies of N.A. bison and, therefore, conservation measures are required to preserve the gene pool from extinction.

Wood bison are listed as endangered by the Committee on the Status of Endangered Wildlife in Canada which is a Federal-Provincial committee authorized by the Federal-Provincial Wildlife Conference. Wood bison are also Appendix 1 animals in the Convention on International Trade in Endangered Wild Flora and Fauna in which all trade is prohibited except for research purposes.

The International Union for the Conservation of Nature (IUCN) also lists wood bison as endangered. Establishment of another herd in the NWT would help to meet the objectives of the wood bison rehabilitation project of establishing a minimum of three free-ranging populations in the wild. The ultimate goal is to be able to remove wood bison from the lists of endangered wildlife and to keep this subspecies from extinction. Once three free-ranging, self-perpetuating herds are established in the wild, native people will be able, under management, to harvest the herds and thus add portein to their diets.

Expected Results:

Establishment of another wild free-ranging herd of wood bison to help preserve the gene pool from extinction. The result was obtained in summer 1982 when at least four new calves were seen traveling with a group of eight wood bison in the Fort Liard area.

Publications/Reports:

1. Reynolds, H.W., McGillis, J.R. and Glaholt, R. 1980. Range assessment of the Liard-South Nahanni river regions, Northwest Territories as habitat for wood bison. Unpubl. Rept. Can. Wildl. Serv., Edmonton. 39 pp.

2. Canada - N.W.T. Wildlife Research annual Progress Reports filed by H. Reynolds:
   (a) September 1979
   (b) September 1980 (combined 1979 and 1980)
   (c) September 1981
   (d) September 1982

3. Reports to be prepared:
   (a) Progress Report on monitoring for the period from June 1980 release, to end of radio-collar transmissions in September 1982.

   (b) Transfer Completion Report - regarding costs and details of the relocation.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 80-1

Title: Reproductive biology of polar bears.

Lead Agency: Canadian Wildlife Service

Cooperating Agencies: World Wildlife Fund; Manitoba Wildlife Branch
NUT Wildlife Service

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead: CWS 0.2 PY and 10K; 1 Ph.D Student full-time

Cooperating Agencies: World Wildlife Fund - 27K

Location: Western Hudson Bay from Manitoba coast to Southampton Island

Project Duration: 1980-84

Description:

This project is designed to study two aspects of the reproductive biology of polar bears which are critical to the sound conservation and management of that species. These two aspects, which are closely related and can be studied simultaneously, are:

1. The fidelity of adult female polar bears to maternity denning areas.
2. The reproductive cycle of female polar bears.

Need: Background to the Problems underlying this Project

1) Fidelity of adult female polar bears to maternity denning areas

Throughout the Arctic, extensive exploration and development activities are either underway or expected to begin in the foreseeable future. Many of these projects involve the potential for extensive disturbance of maternity denning areas of polar bears as a result of such activities as pipeline construction, road-building, and the establishment of logistic support installations.

In most areas of the Arctic in which polar bears have been studied, the geographic scale and logistic costs have been too large to facilitate studying the fidelity of female polar bears to the maternity denning areas.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 80-1

Need: (continued)

2) The reproductive cycle of female polar bears

In order to make recommendations on safe levels at which polar bear populations can sustain continued harvesting by Inuit hunters, accurate data are required on the age at which females first reproduce and on their litter size, breeding interval, and longevity. Population models are now being developed in which these data can be utilized to the maximum benefit of the species.

In most areas of the Northwest Territories, the Inuit Hunters and Trappers Associations understood and accepted the changes recommended from modelling done to date. However, on the Keewatin coast of Northwestern Hudson Bay, and on Southampton Island, most polar bear hunting has traditionally taken place during the fall when the bears were on the land. Inuit of the Keewatin settlements from Eskimo Point north to Repulse Bay argue that the female bears they kill along the coast are not pregnant. They maintain that pregnant females have already gone inland to den by October. The Inuit may or may not be correct but there are no data available with which to clear up the point.

Expected Results:

1) Fidelity of adult female polar bears to maternity denning areas

For three consecutive spring seasons, a large sample of adult female polar bears will be captured and tagged with their new-born cubs as they are leaving the denning area south of Churchill. Measurements will be taken and specimens collected for age determination. If a large enough sample is captured, we should be able to clearly demonstrate:

a) fidelity to the denning area and possibly to specific areas within it;
b) whether the normal reproductive cycle of females is two or three years long;
c) age of first reproduction; and
d) longevity of females.

2) Reproductive cycle of female polar bears

Reproductive specimens and lower jaws (for age determination) will be collected from polar bears killed by Inuit hunters on the Keewatin coast of Hudson Bay and Southampton Island in cooperation with the Wildlife Service of the Northwest Territories. Analysis of these specimens in the laboratory will enable us to demonstrate:

a) whether or not female polar bears being killed in the fall are pregnant;
b) corroborate conclusions on the age of first reproduction, breeding interval, and longevity drawn from the mark and recapture studies in the maternity denning area; and

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CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 80-1

Expected Results: (continued)

c) provide completely new insight into the extent and possible significance of intrauterine mortality, missed pregnancies, and reproductive senility.

Publications/Reports:

Ramsay, M.A. and I. Stirling. Reproductive biology and ecology of female polar bears in western Hudson Bay. Naturalist Canadien (in press).

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 81-1

Title: Mortality of migratory barren-ground caribou calves with emphasis on " predation.

Lead Agency: Canadian Wildlife Service

Cooperating Agencies: NWT Wildlife Service, Department of Indian Affairs and Northern Affairs, Polar Continental Shelf Project, Department of Energy, Mines and Resources

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead: Cws - 1.3 PY - $40K

Cooperating Agencies: NWTWS - 0.2 PY
PCSP - 100 hours of helicopter time

Location: Current range of the Beverly population

Project Duration: 1981-84

Description:

To obtain information that allows provision of sound biological advice to aid in the conservation of migratory barren-ground caribou while permitting maximum sustained yields for use by native peoples. This goal is pursued by investigating mortality of caribou calves from birth to l-year of life with emphasis on mortality caused by predation. In the first year (1981-82) we would make observations of caribou with emphasis on cow-calf pairs on the Beverly calving ground during pre-calving, calving and post-calving. We would do cow-calf ratio counts during calving and post-calving periods (and in autumn and spring if resources permit). We flew gridded aerial surveys of portions of the calving ground to locate carcasses of calves, once live caribou had left those areas after the peak of calving. We would perform necropsies on all carcasses found and recorded observations of predators and their interactions with caribou.

Need:

The migratory barren-ground caribou is classified as an "endangered species of wildlife" in the NWT and current information indicates that both the Beverly and Kaminuriak populations are in decline.

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CANADA - N.W. T. WILDLIFE RESEARCH PROJECT (continued) No. 81-1

Need: (continued)

Both the Beverly population and the Kaminuriak population are the principle source of fresh meat in the diets of several thousand Inuit and Indians in the NWT, Manitoba and Saskatchewan. If those populations of caribou continue to decline those native peoples will lose that vital food source and there are no suitable alternatives available now or in the immediate future to supply the same quantity of fresh meat for them or to allow them to continue a chosen way of life.

Expected Results:

We expect to obtain at least a qualitative measure with some supporting quantitative statistics of the mortality of migratory barren-ground caribou calves of the Beverly population. Such information will allow us to provide some sound advice on the conservation of migratory caribou while permitting minimum sustained yields for native peoples. Additional insight will be gained into the specific causes of mortality to calves. An attempt will be made to evaluate the relative importance of predation, especially by wolves, in calf mortality from birth to l-year of life. This work to serve as a baseline for future work on the impact of predation on caribou calves and the need for a wolf control program.

Rationale: A discrete population of animals increases in size when survival of individuals exceeds mortality. Annual survival of caribou over 2-years of age should be similar from year to year under steady harvest regimes, barring catastrophic events. Thus, growth of the population is achieved mainly through increased survival of calves to breeding age.

Most female caribou of the Beverly and Kaminuriak populations must live 3 to 4 years to produce their first calf and most males must live until they are at least 5 years old to be active breeders. Therefore, those populations cannot significantly increase in size until the rates of survival have been markedly greater than mortality for several consecutive years. Thus, obtaining indices of the survival of calves and an insight into environmental factors that influence survival are basically necessary for sound biological advice. Such knowledge will foster the conservation of migratory barren-ground caribou while helping to allow biological realistic harvest yields.

Publications/Reports:

Progress report 1981: Mortality of Newborn Migratory Barren-Ground Caribou Calves, Northwest Territories, Canada. Given at Third International Reindeer/ Caribou Symposium. August 1982, Finland.

Progress report 1983: Mortality of Newborn Barren-Ground Calves of the Beverly Herd, District of Keewatin, Northwest Territories, 1981-82.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 81-3

Title: Population ecology of polar bears along northeast Baffin Island

Lead Agency: NWT Wildlife Service

Cooperating Agencies: Polar Continental Shelf Project

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead: NWTWS - 0.5 PY, 100K

Cooperating Agencies: PCSP - 50K

Location: Northeast Baffin Island between Clyde River and Broughton Island

Project Duration: 1981-84

Description:

This project is a continuation of the studies conducted in Lancaster Sound by the NWTWS and those conducted along southeast Baffin Island by the CWS. Standard mark-recapture techniques are used to define sub-population range, abundance, population structure, movements, distribution, and important habitats. Since few bears have been marked during the past two years, a third year is required to increase our sample size to estimate population parameters.

Need:

The demarcation, if any, between Zones F and D remains unclear at this time. Since we have two groups of marked bears on either side of the study area, we hope that recapture of marked bears will delineate the boundary between those two populations. There may also be a separate subgroup of bears in this relatively huge area, that are now considered part of the Zone D or F populations. Now is the time to work in this area as we will lose bears marked in adjacent areas with the passing of time.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 81-3

Expected Results:

1. Assess movements, distribution and limits of subpopulation.

2. Determine important habitats for polar bears.

3* Assess population structure and size.

Publications/Reports:

NWT Completion Report.

Canada - N.W.T. WILDLIFE RESEARCH PROJECT NUMBER 82-1

Title: Evaluation of calf survival during first year of life in the Beverly herd of migratory barren-ground caribou.

Lead Agency: NWT Wildlife Service

Cooperating Agencies: Canadian Wildlife Service

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead: NWTWS 1 PY, 10K

Cooperating Agencies: CWS 0.2 PY, 10K

Location: Spring range of Beverly herd

Project Duration: 1982-86 with evaluation after 1983

Description:

Mortality of caribou Is the least described and understood aspect of caribou biology but is, never the less, basic to management. Previous studies have described relatively low survival of caribou in the first year of life. One-year-old and younger caribou are the only age class readily identifiable in the field. Thus, counts of the ratio of calves to cows from calving to the end of the first winter of life will allow evaluation of survival to the main phases of the annual cycle.

1) In April, 1983, cow-calf counts will be obtained during composition counts on spring ranges. Those counts will use distribution data from CWS and Saskatchewan to evaluate sampling approaches.

Need:

To manage caribou to provide continued harvests for native and other peoples, other sources of mortality besides hunting have to be described and evaluated. The management of caribou could be, in practice", limited to management of two mortality factors namely hunting and predation. Basic to any consideration of managing predation is an understanding of the timing, extent and causes of all mortality factors. Additionally, problems from the effect of different distributions of sex and age classes are believed to have biased some previous spring surveys, and it is proposed to attempt to evaluate the sampling problems and

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CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 82-1

Need: (continued)

solutions. The NWTWS is proposing to concentrate on describing first-year survival (timing and extent of mortality factors) while CWS proposes to describe the causes of mortality on the calving grounds, and the role of physical condition in calf mortality on summer and winter ranges.

Expected Results:

1. Documentation of overwinter survival of 1982 calves after their first winter.

2. Documentation of calf survival during calving and first summer of life for 1982 calves.

3. Data in aid of evaluation of possible approaches to methods and timing of predator control.

4. Data to contribute to extrapolation of data from CWS studies of calf mortality to population level.

5. Evaluation of sampling design and problems, especially the biases caused by group size and sex and age segregation.

Publications/Reports:

NWT Completion Report.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 82-2

Title: Winter range relationships of the Beverly herd of barren-ground caribou with emphasis on the effect of fire.

Lead Agency: Canadian Wildlife Service

Cooperating Agencies: Department of Indian Affairs and Northern Development
NWT Wildlife Service
Hunters and Trappers Associations

FINANCE & MANPOWER: $ (X 1000) and Person Years in parentheses)

	1983-84	1984-85	1985-86
CWS :	2.0 PY, 40K	2.0 PY, 40K	2.0 PY, 40K
DIAND :	55K	55K	55K

Location: Winter range of the Beverly caribou herd.

Project Duration: 1983-84 to 1986-87 (subject to review after 1984-85)

Description:

The monitoring of caribou movements and distributions in relation to recent burns is not difficult, obtaining details of the relationship between caribou and the winter range is more difficult, and assessment of the carrying capacity of the winter range is complex. The best indicator of the quality of the winter range is the performance of the caribou on it. One approach is to measure the physical characteristics of caribou as they leave the winter range. If they are then in good condition relative to indices for herds that wintered in regions with a low incidence of fires, we may assume that the winter range is adequate for the present population. However, if caribou are in relatively poor condition we cannot implicate the winter range unless we know that the caribou entered the winter in good condition. Therefore the degree of physical deterioration during the winter is the best measure we can obtain of the severity of the winter environment and the adequacy of winter range. Another index to the quality of the winter range is the composition and nutritional quality of forage present in the rumens of caribou.

The project has two major components:

1) the monitoring of physical condition of the Beverly herd in November and March, 1982-82 to 1984-85, and beyond if deemed necessary after the third year.

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CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 82-2

Description: (continued)

2) the monthly monitoring for three winters, of the movements and distribution of Beverly Herd in relation to burns, snow conditions, and major range types, with emphasis on ranges within the Northwest Territories.

Data will also be obtained on the proportions of the winter range considered to be productive or unproductive for wintering caribou, and on the biomass of forage at various successional stages after fire.

Need:

We need to evaluate the quantity and quality of the winter range for the Beverly Herd. The only feasible way to do that is to monitor the condition of caribou entering and leaving the winter range and to monitor annual use in relation to the total available winter range. There is need to obtain data on the quality of forage in the rumens of caribou as a further index of range quality and the relative value of various seral stages as caribou food sources.

There is need to obtain age-specific fertility rates as indicators of general well-being of the herd, and its age structure. Both statistics are necessary for NWTWS to be able to calculate herd size from calving-grounds surveys.

There is need to know the rate of burning that would result in optimum winter range conditions for caribou. If a caribou management plan is implemented in order to produce the maximum sustained harvest, then fire management may be necessary on portions of the winter range. Fires must be managed now in order to achieve optimal range conditions for caribou 50-100 years from now.

Expected Results:

1. The degree to which recent burns of various sizes, types, and configurations form barriers to caribou movements.

2. The degree and type of use of range in relation to interval since fire.

3. Data on the fire intervals at various locations on the winter range.

4. Data on successional stages post-fire on various habitats throughout the range.

5. The major forage species utilized seasonally on various portions of the winter range.

6. The changes in body weight and fat reserves from November to March in relation to range utilization and snow conditions.

(. . continued:

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 82-2

7. Age-specific pregnancy rates in relation to condition of females in November and March.

8. To recommend if, when, and where fire should be controlled on the winter range of the Beverly herd.

Publications/Reports:

Thomas, D.C. 1982. Winter range relationships of the Beverly Herd: A research proposal.

Thomas, D.C. and Kiliaan, H.P.L. 1982. A brief report on the March 1982 sample of barren-ground caribou from the Beverly Herd.

Thomas, D.C. and Kiliaan, H.P.L., and Broughton, E. 1983. A preliminary report on the November 1982 sample of barren-ground caribou from the Beverly Herd.

Thomas, D.C. and Kiliaan, H.P.L. 1983. Movements of the Beverly Herd of barren-ground caribou, October-December, 1982.

Progress reports upon completion of phases.

Publications as warranted by the data.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 82-3

Title: Modelling of polar bear populations

Lead Agency: NWT Wildlife Service

Cooperating Agencies: Canadian Wildlife Service
Norwegian Department of Environment
University of British Columbia

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead: NWT

Cooperating Agencies: Canadian Wildlife Service
Norway - 10K
(additional support still being sought)

Location: Vancouver, Yellowknife, Edmonton

Project Duration: September 1, 1981 to completion

Description:

a) To use and improve techniques for estimating the size of polar bear populations.

b) To develop and further utilize existing population models to explore the most effective use of harvest as a management technique (ie. evaluate the effects of harvesting different numbers, age classes, and sexes of bears).

c) To produce an interactive computer model that anon-computer trained researcher can interact with to test the possible consequences of different management strategies.

Need:

BACKGROUND:

a) Methods of estimating polar bear populations have improved in recent years but they remain imprecise, despite the substantial costs involved in collecting the data.

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CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. _82-3

Need: (continued)

b) Because of the continued increase in hunting pressure and man's industrial activities, more precise Information will be required in the future.

c) Recent modelling exercises conducted to date have indicated that the safe sustainable yield from a polar bear population may be as low as 1-3% but these suggestions have not yet been sufficiently investigated.

Problem:

In all jurisdictions we are in danger of overharvesting polar bear populations; some may be overharvested now.

Expected Results:

a) An updated review of the status of polar bear subpopulations in Canada.

b) A review of the consequences of different management strategies that could be applied to polar bear populations, within the limitation of the available data.

c) A computer model that can be directly interacted with by a non-computer trained researcher or manager wishing to examine some of the possible consequences of different management strategies.

Publications/Reports:

Background

Bunnell, F.L. and D.E.N. Tait. 1980. Bears in models and in reality - implications to management. Bear biology Association Conference Series No. 3:15-25.

Stirling, I., A.M. Pearson and F.L. Bunnell. 1976. Population ecology studies of polar and grizzly bears in northern Canada. North Amer. Wildl. Conf. Trans. 41:421-430.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 82-4

Title: Keewatin peregrine falcon research

Lead Agency: NWT Wildlife Service

Cooperating Agencies: Canadian Wildlife Service
Boreal Institute, University of Alberta

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead: NWT - 0.5 PY, 4K

Cooperating Agencies: Canadian Wildlife Service - 4K
Boreal Institute - 5K

Location: Keewatin district, Rankin Inlet area

Project Duration: 1982-1986

Description:

The project was designed to study annual variations In productivity and population dynamics of peregrine falcons. Every year an increasing proportion of adult birds are banded, making possible study of mating relationships, territorial behaviour and reproductive performance of known individuals in relation to pesticide loads and age. Adults are captured, weighed, banded and blood samples taken. Young are weighed at regular intervals prior to fledging in order to determine growth patterns relative to hatching asynchrony and order. Plasma samples from adults are analyzed for a spectrum of toxic chemical contaminants including DDE and DDT.

Need:

Peregrine falcon populations declined in many areas of Canada during the 1960s and 1970s. The dynamics of peregrine populations are poorly understood. This study will show whether the previous trend will continue and will examine some of the factors involved.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 82-4

Expected Results:

1. Roles of male and female peregrine in establishing and defending territories.

2. Annual data on density, breeding success and production.

3. Hatching asynchrony effects on survival and growth.

4. Correlation between tissue pesticide levels and productivity.

5. Information on distribution, mortality and recruitment based on band returns.

Publications/Reports:

C.C. Gates. 1983. Reproductive biology of peregrine falcons at Rankin Inlet, NWT (in preparation).

G. Court and C.C. Gates. 1983. A progress report on the Rankin Inlet peregrine falcon study in 1982 (in preparation).

G. Court. Hatching asynchrony and growth in peregrine falcon chicks. Poster presentation, American Ornithologists Union Conference. September 1983.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 82-5

Title: Study of caribou behaviour at the Lupin Mine site, Contwoyto Lake

Lead Agency: NWT Wildlife Service

Cooperating Agencies: Canadian Wildlife Service
INAC

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead: NWTWS - 0.2 PY and 5K (depending on costs for travel and accommodation)

Cooperating Agencies: Cws - 0.1 PY (as advice on statistical design)

Location: Contwoyto Lake, NWT

Project Duration: 1983-85*

Description:

Lupin gold mine is a complex of buildings and activities (including trucks, people, aircraft) situated on a spring and summer migration route of the Bathurst caribou herd. Mine production began in 1982 after a two year construction period. The only other study that has considered the effects of an industrial site (versus a specific activity) on caribou was a study by LGL (Alaska) Ltd., which described some caribou ranges of the Central Arctic herd (the studies results are proprietary, and as yet unavailable).

The presence of Lupin mine is a unique opportunity to test the feasibility of designing and implementing research to describe some of the behavioral effects of an industrial development on migratory barren-ground caribou during spring and mid-summer migration.

1. Approach Echo Bay Mines for permission to use the site and explain the nature of the proposal to management of the company and at the mine site. Good cooperation will be the basis of the project.

2. Establish communications such that NWTWS is" informed when caribou are at Lupin.

3. Use an ad libitum sampling approach to observations of caribou behaviour and movements to develop a practical experimental design.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 82-5

Iced:

The activities associated with mining exploration have generated concern among native peoples and government agencies responsible for caribou and land management. The escalation of exploratory activities into development sites will likewise escalate the potential problems to caribou and the resulting concerns of those people. We do not know the short or long-term effects at the individual or population level of migratory barren-ground caribou resulting from exposure to a mine site. We do not have a tested and evaluated methodology to describe those potential effects. The current state of physiological telemetry and restrictions of capturing, handling and marking caribou restrict the study design to describing only the behavioral short-term responses that can be attributed to the mine site and not natural environmental factors will require meticulously planned and evaluated design.

NOTE : The length of the study is dependent on caribou use of the mine site. Caribou do not always move through the site in sufficient numbers to warrant a data collection program.

Expected Results:

1. Working relationship with Echo Bay Mines Ltd.
2. Detailed research design for subsequent studies.
3. Description of study area and observations of caribou behaviour and movements.
4. Recommendations respecting site facility design.

Publications/Reports:

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT

No. 82 - 7

Title: Toxic chemicals in polar bear tissues

Lead Agency: NWT Wildlife Service

Cooperating Agencies: Canadian Wildlife Service Toxic Chemicals Laboratory, Ottawa

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead: NWTWS - 0.1 PY (collection of specimens)
NWT EPA 2.5K

Cooperating Agencies: CWS - Tissue Analysis

Location: Eastern Arctic

Project Duration: Second year of ongoing program

description:

Samples of fat, liver and hair will be collected from bears from the eastern Arctic. They will be analyzed for PCB'S, dioxin, heavy metals and a broad spectrum of other pollutants. These findings will be compared with levels from comparable animals collected in areas of high pollution in southern Canada. Information was obtained in 1982 from samples collected in the western and central Arctic.

Need:

With the spread of global airborne pollutants and the proliferation of industrial development in the north, it is probable that arctic ecosystems will become polluted with toxic chemicals. Since the polar bear is at the top of most arctic food chains, it is an ideal animal to detect the spread of these pollutants. Already PCB'S have been found in polar bear tissues and pollutants may have spread to such an extent that pre-disturbance levels may already be beyond reach. This possibility emphasizes the need for haste in acquiring present levels and establishing a tissue bank for future analysis.

CANADA N.W.T. WILDLIFE RESEARCH PROJECT (continuing) No. 82-7

Expected Results:

1. Baseline data indicating the levels of numerous toxic chemicals present today in polar bear tissue. These data can be used to compare present levels in southern predators, and to compare with future polar bear levels.

2. The beginning of a tissue bank which will be available for future analysis.

Publications/Reports:

Yearly progress reports.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 82-8

Title: Population ecology of gyrfalcons in the Northwest Territories

Lead Agency: NWT Wildlife Service

Cooperating Agencies: Canadian Wildlife Service
Polar Continental Shelf Project

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead: 1.5 PY, 120K

Cooperating Agencies:

Location: Central and eastern Arctic from Coppermine to Frobisher Bay

Project Duration: 1982-Ongoing

Description:

The project Involves helicopter surveys for nesting gyrfalcons, banding of gyrfalcons and studies of nest site occupancy, nest site fidelity, nesting phenology, reproductive success, food habits and factors affecting reproductive success. Included is a study of the duration of the time young are dependent on adults after fledging. Information on the regional density of nesting falcons is being gathered. Banding of young and adults will help to establish movements, distribution by age groups, and homing tendencies of adult birds.

Need:

Gyrfalcons have recently been removed from CITES Appendix I and placed on Appendix II. Although international trade of this species is now possible, it should only occur if data on the numbers, reproductive rate and distribution are available and indicate that a harvestable surplus exists. To date, this information has not been available. During the last few years the NWT has received several applications to capture gyrfalcons for personal and commercial use. Quotas of 50 in 1981 and 20 in 1982 were established but only 2 gyrfalcons were captured, both in 1982. Thus, there is an obvious need for baseline information on the population ecology of gyrfalcons in NWT.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 82-8

Expected Results:

1. The density of nesting gyrfalcons in the Kitikmeot and Baffin Regions, NWT .

2. The reproductive success of gyrfalcons, to the stage of fledged young.

3. The timing of several events in the natural history of the species that will be useful in managing harvests.

4. Information on correlates of reproductive success that may eventually be. used as predictors of reproduction.

5. The ability to decide whether harvests should occur and when and how they should occur so as to minimize the impact of the falcon population.

Publications/Reports:

Yearly progress reports.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT No. 82-9

Title: Caribou movements across Prince of Wales Strait, and the taxonomy of Victoria and Banks Island caribou.

Lead Agency: Canadian Wildlife Service

Cooperating Agencies: NWT Wildlife Service
Polar Continental Shelf Project
Agricultural University of Norway

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead:	1982-83	1983-84	1984-85
Cws	0.1 PY, 2K	0.2 PY, 2K	0.2 PY, 2K
PCSP	10K (aircraft)	15K	20K

Location: Prince of Wales Strait, Victoria Island, Banks Island,' southern Melville Island

Project Duration: 1983-84 to 1984-85

Description:

The project has two major components plus the incidental monitoring of muskoxen on southern Melville Island: (1) investigation of possible pre-calving movements of caribou across Prince of Wales Strait, (2) investigation of caribou forms on Victoria and Banks Islands and, the ongoing monitoring of muskox numbers and composition on southern Melville Island.

Using 20 hours of Twin Otter support from PCSP, preliminary searches for caribou and their trails were made over Prince of Wales Strait and adjacent Victoria Island in June 1982. Further reconnaissance flights in June 1982 and 1984 would help clarify if pre-calving movements take place across the Strait.

The taxonomy of caribou on Victoria and, to a lesser extent, Banks Island is uncertain. We propose to collect 10-15 caribou from northwest Victoria Island in June 1983 and the same number from central or southern Victoria Island in 1984. The taxonomic relationships will be investigated using morphological and serum-protein criteria. Additional samples of blood and skulls will be solicited from NWTWS biologists and others working on Banks and Victoria islands. The collections hinge on aircraft support from PCSP and cooperation from NWTWS and the communities on the two islands.

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CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 82-9

Description: (continued)

Observations of the numbers of muskoxen on southern Melville Island will be obtained on the flights between Resolute and Prince of Wales Strait. The count in the Bailey Point region on 7 June 1982 was only 227 adults compared with 543 adults in July 1981 (NWTWS). These data and the observations on the southern coast of southeastern Melville Island suggest considerable movements of muskoxen along the coastal zone.

Need:

1. There is need to investigate potential caribou movements between Banks and Victoria islands in light of proposed tanker and other marine 'use of Prince of Wales Strait.

2. There is need to identify what types of caribou occur on Victoria Island so that taxonomic boundaries can be drawn and populations and subpopulations can be identified for management, conservation, and "impact" functions.

3. There is need to continue the monitoring of muskoxen on southern Melville Island in relation to evaluating the effects of the proposed Arctic Pilot Project, especially the Bridport Inlet facility.

Expected Results:

1. Preliminary reconnaissance surveys in the Prince of Wales Strait region and discussions with hunters in Holman suggest there is no traditional movement of caribou across the Strait. Caribou do cross the Strait, but only sporadically. Further observations will tend to confirm or rebuke the current information.

2. Banfield, on morphological criteria, placed Banks Island caribou as R. t. pearyi, although 'e believed they 'ere intergrades, i.e., pearyi groenlandicus. Little information is available for Victoria Island caribou. Those in the northwest are believed to be similar or the same as Banks Island caribou. Those on southern and east-central Victoria Island are believed to be remnants of the Dolphin and Union Herd which was described as groenlandicus pearyi. More definitive typing will await the collection of much larger samples from all segments.

3. Observations of muskoxen on southern Melville Island will add to a fair base of data on fluctuations in numbers on 'various segments of the coast. They will detect population crashes such as occurred in 1973-74 and periods of poor recruitment, as in 1982.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 82-9

Publications/Reports:

Kiliaan, H.P.L. and D.C. Thomas. 1982. Reconnaissance surveys of Prince of Wales Strait and southern Melville Island in June 1982. (in prep.).

Thomas, D.C. and P. Everson. 1982. Geographic variations in caribou on the Canadian arctic islands. Can. J. Zool. 60:2442-2454.

NOTE : This project was approved subject to funding by NOGAP. This funding was approved in June 1984. A revised project description will be written in fall of 1984.

CANADA - N.W. T. WILDLIFE RESEARCH PROJECT No. 84-1

Title: Ecological studies of Peary caribou and muskoxen

Lead Agency: Canadian Wildlife Service

Cooperating Agencies: PCSP

FINANCE & MANPOWER (PY - Person Years and $K-$1000S)

Lead: 1.0 PY - $28K annually

Cooperating Agencies: $60+ K annually

Location: Study No. 1 - 1984-89 - primary western Queen Elizabeth Islands includes Bathurst, Melville, and Prince Patrick and all their satellite islands) secondary, High Arctic - north of 74 degrees latitude

Project Duration: 1984-89

Description:

Carry out aerial surveys of Peary caribou and muskoxen on Bathurst, Melville, and Prince Patrick Islands and their satellite islands to obtain estimates of densities, numbers, and distributions. Carry out ground studies during the same period and on the same study areas to obtain estimates of group sex and age compositions and sizes of calf crops. Undertake post-mortem examinations and make behavioral observations, when possible. The data obtained will be used to assess the present and future statuses of Peary caribou and muskoxen in the study areas.

Need:

Peary caribou and muskoxen are the only source of terrestrial fresh meat in the diets of high Arctic Inuit. Therefore, there is a concern in terms of preservation, and conservation and management to increase and then maintain the populations of these two species at levels that will sustain some annual human utilization. Man-induced activities and changes in the environment of Peary caribou and muskoxen are a real likelihood in the high Arctic, especially on the western Queen Elizabeth Islands. The western Queen Elizabeth Islands have been the most productive for both Peary caribou and muskoxen in the high Arctic and doubly warrant study and concern by our agencies.

CANADA - N.W.T. WILDLIFE RESEARCH PROJECT (continued) No. 84-1

Expected Results:

1. A review of densities, numbers, and distributions of Peary caribou and muskoxen in the high Arctic.

2. An evaluation of the current (1985-89) densities, numbers, and distribution: of Peary caribou and muskoxen on their principle ranges in the high Arctic.

3. An estimate of the potential for human utilization of Peary caribou and muskoxen in the high Arctic.

4. The provision of advice for preservation, conservation and management of Peary caribou and muskoxen in the high Arctic to such national and international agencies as (COSEWIC, IUCN, and WWF) as well as territorial and federal agencies which include (NWTG, DIAND, DOE, and ElfR).

5. Study No. 1, Phase 1 - exploratory year for developing and field testing techniques.
   (1) Spring (May-June 1984) - northeastern Prince of Wales Island, Mecham Island, Russell Island; the small islands of Barrow Strait; and southern Bathurst Island.
   (2) Summer (July-August 1984) - Melville Island.

Publications/Reports: (new project)

1. Annual progress reports.

2. Project completion report.

3. Scientific journal publications (as applicable).

Wildlife Research Projects Planned for 1984/85 by Canadian Wildlife Service in Northwest Territories

1. Monitoring spring migration of waterfowl through the Norman Wells Oilfield Expansion Area.

   Contact - Peter Boothroyd, Winnipeg, 949-5261

2. Determine residual impacts of historical industrial developments in the Mackenzie delta region.

   Contact - Dr. Thomas Barry, Edmonton 420-2515

3. Initiate feasibility study of using the red-throated loon as an indicator species for marine pollution.

   Contact - Lynne Dickson, Edmonton 420-2514

4. Monitor distribution of seaducks at McKinley Bay.

   Contact Lynne Dickson, Edmonton 420-2514

5. Research ecology of fulmars and eiders at Cape Vera, Devon Island.

   Contact - Alex Dzubin, Saskatoon 665-4104

6. Determine biological importance of the Cape Vera polynya, Devon Island, (5th year).

   Contact - Raymond Prach, Edmonton 420-2535

7. Monitor whistling swan habitat use and swan productivity in the Mackenzie Delta and coastal plains.

   Contact - Dr. Thomas Barry, Edmonton 420-2515

8. Contribute to the U.S. Fish and Wildlife Eskimo Curlew recovery plan.

   Contact - Dr. Thomas Barry, Edmonton 420-2515

9* Study the migratory bird use of Mackenzie Delta.

   Contact - CWS, Ottawa

10. Census whooping crane population and transplant eggs in Wood Buffalo National Park.

    Contact - Ernie Kuyt, Edmonton 420-2516

110 Survey of moulting geese In the Bathurst Inlet and Back River areas.

    Contact - Kevin McCormick, Yellowknife 420-8531

12. Survey of trumpeter swans in the South Nahanni River area.

Contact - Len Shandruk, Edmonton 420-2522

Wildlife Research Projects planned for 1984/85 by Parks Canada in NWT

1. Preliminary resource inventory of Wager Bay area.

   Contact Murray McComb, Ottawa

2. Bear and caribou distribution in Auyuittuq National Park Reserve.

3. Inventory of population size and nesting habitat and design of monitoring program of trumpeter swans in Nahanni National Park Reserve.

4. Monitoring of nesting habitat of upland sandpiper in South Nahanni River, Nahanni National Park Reserve.

5. Assessment of sheep licks along South Nahanni River, Nahanni National Park Reserve.

6. Ungulate monitoring program in Nahanni National Park Reserve.

7. Monitoring bear movements and assessment of bear habitat in Nahanni National Park Reserve.

8. Annual aerial bison census in Wood Buffalo National Park.

9. Study of garter snake hibernacula by K. Laren in Wood Buffalo National Park.

10. Annual waterfowl breeding surveys in Wood Buffalo National Park.

11. Mammal studies along the Slave River in Wood Buffalo National Park by LGL Ltd.

12. Bison disease study in Wood Buffalo National Park by Dr. S. Tessaro.

13. Migratory bird surveys along the Slave River in Wood Buffalo National Park.

    Contact appropriate Superintendents of each park.