



ARCTIC  
NATIONAL WILDLIFE REFUGE

Fairbanks, Alaska

US FISH & WILDLIFE SERVICE--ALASKA  
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Calendar Year 1983

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NATIONAL WILDLIFE REFUGE SYSTEM

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F. Mauer

17            14            13            15            16

Administrative Staff<sup>e</sup>

- 13. Paul Liedberg, Administrative Officer, GS-9, PFT
- 14. Elizabeth Aucoin, Financial Assistant, GS-5, PFT
- 15. Rittie Ramirez, Clerk Typist, GS-3, PFT
- 16. Carol Tate, Clerk Typist, GS-3, PFT
- 17. Gayle Hudson, Clerk Typist, GS-3, PFT

- e. Joint administrative staff under supervision of Kanuti NWR Manager
- f. EOD 2-20-83<sup>f</sup>
- g. EOD 8-7-83<sup>g</sup>



C. Moitoret

35	33	32	26	27
36	31	10	18	
			20	

The chief rooster and his brood.

Temporary

- 18. Pam Miller, Biological Technician, GS-5, EOD 5-15-83
- 19. Larry Martin, Biological Technician, GS-5, EOD 4-17-83
- 20. Cathryn Moitoret, Biological Technician, GS-5, 5-15 to 11-30-83
- 21. Terrance Doyle, Biological Technician, GS-5, 5-23 to 11-30-83
- 22. Thomas Wilmers, Biological Technician, GS-5, 5-9 to 11-30-83
- 23. Michael Phillips, Biological Technician, GS-5, 5-15 to 9-30-83

Volunteers

- |                      |                             |
|----------------------|-----------------------------|
| 24. Chris Babcock    | 34. Jody McCarthy           |
| 25. Connie O'Brien   | 35. Sara Klotz              |
| 26. Todd LaFlamme    | 36. Kathleen O'Reilly Doyle |
| 27. Cheryl Ann Moody | 37. Robert Phillips         |
| 28. Craig Buchanan   | 38. David Garner            |
| 29. Steve Albert     | 39. Creigh Limpach          |
| 30. Margaret Kerndt  | 40. Harold Haugen           |
| 31. Pam Ellinghausen | 41. Donna Devoe             |
| 32. Karen Kincheloe  | 42. Robert Lipkin           |
| 33. Rachel Brubaker  |                             |

YCC

- 43. Dennis Gramps

## INTRODUCTION

The Arctic National Wildlife Range (ANWR) was established by executive order in 1960 for the purpose of preserving unique wildlife, wilderness and recreational values. The ANWR, located in the northeastern corner of Alaska, contained approximately 8,900,000 acres. The area was withdrawn from all forms of appropriation under the public land laws, including the mining but not mineral leasing laws. This was the culmination of efforts begun over a decade earlier to preserve this unique part of Alaska.

In 1949, while the Navy was searching for oil and gas in Petroleum Reserve 4 (now National Petroleum Reserve Alaska) and adjacent areas, the National Park Service (NPS) began a survey of Alaska's recreational potential. The survey was directed by George L. Collins, Chief of the State and Territorial Recreation Division for Region Four of the NPS.

In 1954, following field work and consultation with prominent conservationists such as Olaus Murie and A. Starker Leopold, Collins recommended to the NPS that the northeast corner of Alaska be preserved for its wildlife, wilderness, recreational, scientific and cultural values. Collins also recommended that the area be an international park, to include contiguous lands between the Alaska-Canada border and the Mackenzie Delta (Ritchie and Childers 1976; Spencer et al. 1979).

During the next seven years there ensued a political struggle over the future of the arctic wilderness. While there was considerable support for such an action, there was strong opposition amongst those concerned with future industrial development in the territory and the restriction that such a designation would require. Among conservationists and federal representatives there was some disagreement over which agency should manage the land. George Collins had originally proposed a park, while Olaus Murie felt that rather than promoting "mass recreation" and related economic development, the area should be managed as wilderness by the U.S. Fish and Wildlife Service (USFWS). It was ultimately agreed that USFWS management should be sought (Ritchie and Childers 1976).

Public support for establishment of ANWR continued to grow, while opposition also increased from mining interests who desired entry, and Alaskan politicians who feared a growing federal role in Alaska. When the national elections of November 1960 brought eight years of Republican administration to an end, Secretary Seaton acceded to increasing public pressure during his final days in office and signed two public land orders: PLO 2214 created the ANWR and closed it to entry under existing mining laws, and PLO 2215 revoked PLO 82 of 1943.

Over the next eight years, opposition from Alaska's Congressional delegation successfully blocked appropriation of funds to manage ANWR. It was not until 1969 that funds for management of ANWR were appropriated for the first time. During the next decade, as an outgrowth of the Alaska Native Claims Settlement Act (ANSCA) of 1971, efforts were made to add unreserved public lands in Alaska into the National Park, National Forest, National Wildlife Refuge, and National Wild and Scenic Rivers Systems.

On December 2, 1980, President Carter signed into law the Alaska National Interest Lands Conservation Act (ANILCA). ANILCA was a compromise piece of legislation. It created an 18 million acre Arctic National Wildlife Refuge which encompassed the existing 8.9 million acre Arctic National Wildlife Range and an additional 9.1 million acres of adjoining lands west to the Trans-Alaska Pipeline and south to the Yukon Flats. An area of approximately 8 million acres, comprising most of the original ANWR, was designated wilderness, while 1.6 million acres of Arctic coastal plain within the refuge was opened to a limited exploration program (seismic testing) for oil and gas. Exploratory drilling, leasing, development and production of oil and gas in the refuge were prohibited and will require further congressional action before such activities can proceed.

Section 1002 of ANILCA required an assessment of the resources of the coastal plain of the ANWR. Legislatively mandated were an initial report and subsequent updates on the results of a continuing baseline study of fish, wildlife and habitat resources of the coastal plain. These results were to guide the development of an environmental impact statement and guidelines governing the seismic exploration program. In addition, the legislation required a report by the Secretary of Interior to Congress no later than September 2, 1986, on the oil and gas potential and an assessment of the impact that oil and gas development may have on the fish and wildlife resources on the Arctic coastal plain.

ANILCA also redefined the purposes of the refuge as follows:

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, the Porcupine caribou herd (including participation in coordinated ecological studies and management of this herd and the Western Arctic caribou herd), polar bears, grizzly bears, muskox, Dall sheep, wolves, wolverines, snow geese, peregrine falcons and other migratory birds and Arctic char and grayling;
- (ii) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats;
- (iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the refuge.

Within the boundaries of ANWR along the Arctic coast to the north, the surface estate to approximately 65,292 acres was conveyed to the Kaktovik Inupiat Corporation under the provisions of ANSCA. Under provisions of ANILCA the surface estate aggregating approximately 2,854 acres not previously conveyed under ANCSA on Barter Island was conveyed to the Kaktovik Inupiat Corporation. On August 9, 1983, Secretary of the Interior Watt signed an interim conveyance to the Arctic Slope Regional Corporation for the subsurface estate to lands previously conveyed to the Kaktovik Inupiat Corporation aggregating 65,292 acres.

A potential inholding of approximately 971,800 acres was added to the refuge as a donation by the State of Alaska in 1983. An adjacent tract of public land (app. 325,100 acres) is proposed for addition to the refuge as a withdrawal under Section 204(c) of P.L. 94-579.

In the Alaskan Arctic the ANWR offers unique wildlife, scientific, recreational, and aesthetic values. It is the only practicable area where people may travel on foot or by boat and traverse a full range of north slope landscape and habitats due to the close proximity of the arctic coast and mountains. Mt. Isto, 2,758 m; Mt. Chamberlin, 2,749 m; Mt. Hubley, 2,717 m; and Mt. Michelson, 2,699 m; the four tallest peaks in the Brooks Range are located in ANWR. The ANWR contains the only extensive glaciation in the Brooks Range as well as a full complement of arctic flora and fauna. This includes the critical calving ground for the Porcupine caribou herd, one of the largest in Alaska (approximately 135,000 caribou), reintroduced muskoxen, and critical habitat for the endangered peregrine falcon, snow geese and other migratory bird species.

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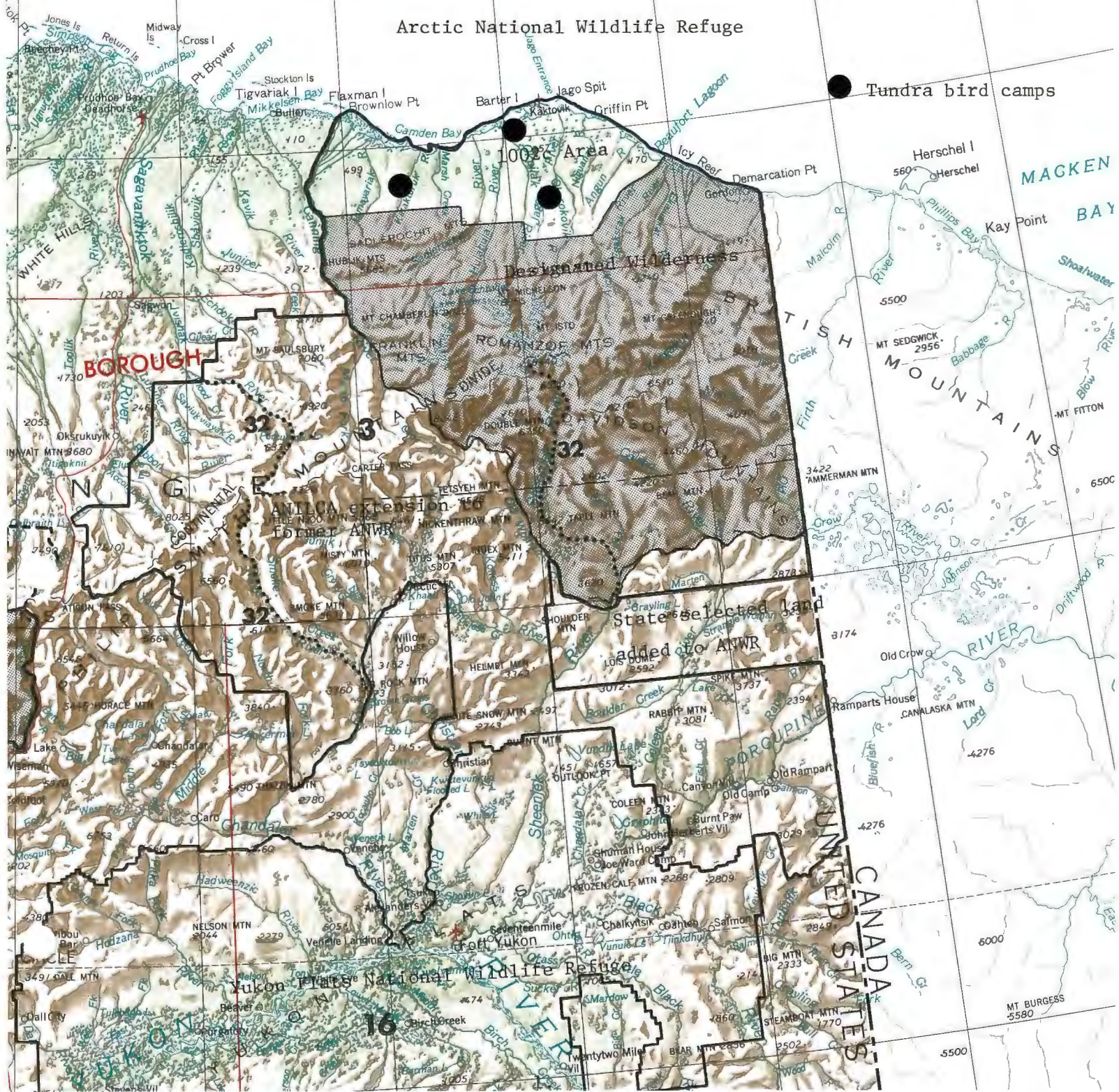
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K. FEEDBACK



# CENTRAL BEAUFORT SEA

## Arctic National Wildlife Refuge







Post calving aggregation of Porcupine caribou herd in Egaksrak River Valley.

D. Ross

#### A. HIGHLIGHTS

Work on the Baseline Study consumed most of the staff's time for biological studies (D.4. and 5.).

Regulations covering exploration activities in the 1002 area were developed and implemented (D.3.).

GSI was recommended by the Interagency Review Panel and selected by the Regional Director to conduct seismic exploration in the "1002" area (D.3.).

#### B. CLIMATIC CONDITIONS

There are no official weather reporting stations on the refuge except for one station located on the north shore of Barter Island. Unofficial weather reports from bird study camps located at Okpilak River Delta, Jago/Bitty and the Katakturuk River (Map page 1) on the northern coastal plain caught the essence of the summer weather with the following summary:

"The Arctic coastal plain is renowned for its miserable summer weather including high winds, rain, snowstorms in July, and gray dreary skies. 1983 lived up to this reputation with some exceptions - shirt sleeve



mornings in early June at Jago-Bitty and dips in the Okpirourak Creek, endless varieties of tundra wear at Katakturuk and Jago, sweltering tent temperatures in July and late night swing dances on the Jago tundra in June. Lest you not forget, there were winds so high at Jago that the Coleman oven had to be placed on the floor to bake pies since the tent was shaking so much; it rained day after day in June and August, a snow woman was made in mid-July at Katakturuk and the fog nearly drove people crazy at the end of the season."



Midnight sun over the nearly flooded Jago bird camp at breakup time.

C. Moitoret

For the more statistically inclined, snowmelt occurred during the first week of June on the coastal plain with surprisingly rapid breakup occurring at Jago-Bitty on June 1, due to high air temperature and clear skies. Snowcover at the Jago-Bitty camp on June 1, was 80%. By June 3, it had dropped to 50% in the camp vicinity and 10% on the Bitty foothills. By June 3, snow cover was less than 5%. Prevailing winds were from the northeast at Okpilak and Kakakturuk. In August northeast and west winds were equally prevalent at Okpilak and east wind prevailed at Katakturuk. The Jago-Bitty area, located further inland, differed by having prevailing east wind except in August when there were equal records of east and northeast winds. In all areas the majority of wind speed records were in the 9-16 km/h range during June and August but were most commonly in the 0-8 km/h range in July when there were more periods of calm weather. Cloud cover and precipitation levels were fairly similar between the study areas, with an extended period of clear weather from July 3-9. A mid-summer snowstorm on July 15, at Katakturuk and Okpilak covered the tundra with about 10 cm of snow which melted within 12



hours. All areas experienced more rain and fog in late July and August, although at Okpilak there were fewer days with rain than at the inland areas during this period.



"Katakturuk Kate" Karen Kinchloe, and Cheryl Moody construct a July snow beau at the Katakturuk bird camp. M. Spindler

### C. LAND ACQUISITION

#### 3. Other

On August 9, 1983, the Arctic Slope Regional Corporation (ASRC) received interim conveyance to the subsurface estate of 65,292 acres pursuant to Sec. 1302(h) of the Alaska National Interest Lands Conservation Act of 1980, Alaska Native Claims Settlement Act Sec. 22(f) of 1971 and as provided in paragraph 3 of the Agreement between Arctic Slope Regional Corporation and the United States of America. The subsurface estate granted to ASRC is coterminous with the interest in the surface estate of lands already conveyed to the Kaktovik Inupiat Corporation (KIC).

"Highlights" of the Agreement are as follows: acquisition by Secretary of



the Interior James Watt of the surface estate to 101,272 acres in Gates of the Arctic National Park in the Chandalar Lake and nearby areas by exchange for the subsurface owned or to be owned by KIC; finding by the Secretary that the Agreement will not undermine the essential integrity of ANWR, will not frustrate the purposes of ANWR, and will not significantly adversely affect the fish and wildlife, their habitats or the environment of ANWR; retention by ASRC until 1991 of the subsurface estate to lands in the Chandalar Lake and nearby areas the surface estate of which was conveyed to the United States; also authorized was the drilling of three exploratory oil wells on lands conveyed to ASRC under this agreement by May 1, 1987; the FWS may not oppose any application to any Federal, State or local government for permits or other approvals necessary to conduct activities on the lands conveyed to ASRC; (the Secretary's responsibilities under the Endangered Species Act are not affected) prohibition on production of oil and gas until authorized by Congress on refuge lands or ASRC lands or both; plan of operations required on ASRC lands to be reviewed by the Regional Director; requirement by the Regional Director to obtain a court order as the only way to halt implementation of the plan of operations by ASRC where agreement on a acceptable plan of operation cannot be reached by both parties.



Caribou gaining relief from insects by getting close on leftover river ice.  
D. Ross

On September 29, 1983, Secretary of the Interior Watt accepted the donation of approximately 971,800 acres of lands relinquished from selection by the State of Alaska to the ANWR according to Section 1302



(h)(i) of ANILCA. These lands were originally selected by the State of Alaska in 1972, and constituted a potential inholding within the refuge which would have extended from the Sheenjek River to the Canadian Border. Secretary Watt also ordered the BLM to begin the process that will allow the addition to the refuge of 325,100 acres of public land adjacent to the former State selection. The necessary public hearing and withdrawal report (Section 204c) of PL. 94-579) are scheduled for completion in 1984.



Bull caribou in Egaksrak River valley.  
D. Ross

#### D. PLANNING

##### 1. Master Plan

Refuge staff met with Norm Olson and Mike Evans, regional office planners, to discuss setting up spring meetings in several villages to obtain information from local residents for developing the refuge's comprehensive plan. The planning schedule was later revised several times and the ANWR is now scheduled to be planned last to allow incorporation of data obtained from "1002" related studies.





Fran Mauer, Tom Wilmers and "Blazo" look on as Ed Friedman carries away the "night soil." T. Doyle

### 3. Public Participation

The final environmental impact statement (FEIS) on Proposed Oil and Gas Exploration within the Coastal Plain, Arctic National Wildlife Refuge, Alaska and "Preliminary Final Regulations" were made available to the public on February 25, 1983.

An interagency review panel made up of representatives from the USFWS, BLM, and USGS and chaired by USFWS was set up and met for the first time in March. Garner, Zellhoefer (ANWR staff) and Doug Fruge (Regional Office) were the USFWS representatives on the panel, with Garner being designated Chairman by the Regional Director. The panel was established to review exploration plans submitted by industry and make approval or disapproval recommendations of the plans to the Regional Director.

Zellhoefer and Garner assisted the staff in the Regional Office in preparing a Record of Decision regarding the FEIS, and regulations for exploration on the ANWR. They also helped complete a consistency determination regarding coastal zone management as it relates to exploration on the ANWR. A Memorandum of Understanding (MOU) between USFWS, BLM and USGS regarding implementation of Sections 1002 (e) through (h) of ANILCA was drafted and signed in June. The MOU deals with the



respective agency roles in reviewing exploration plans, monitoring the seismic exploration program, and preparing a report to Congress. The final regulations governing geological and geophysical exploration of the coastal plain of the refuge were published in the Federal Register on April 19, 1983. A "pre-application" conference was held on April 26, at the Alaska Land Use Council meeting room in Anchorage to inform industry and the public about application procedures. The conference was opened by Acting Regional Director Jon Nelson. Garner chaired the remainder of the meeting.

Nineteen oil and gas exploration plans for work on the ANWR were received by the USFWS from industry on May 20, 1983, in Anchorage. The plans were published in the Anchorage Times, Fairbanks Daily News Miner, Tundra Times, and the Federal Register in June. Public hearings regarding these plans were held in Kaktovik, Fairbanks, Barrow, Anchorage and Arctic Village on June 21, 22, 23, 24, and July 8, respectively. Garner chaired the hearings and was assisted by Sharon Allender, Solicitor from Washington, Fruge and Zellhoefer. Other members of the hearing panel included Max Brewer, USGS and Jim Callahan, BLM.

Arctic Village was not included in the original schedule of hearings and subsequently requested a hearing regarding the exploration plans which was held on July 8, in Arctic Village. The meeting was conducted by Garner, Zellhoefer, and Fruge.



"Modern aviation" off loading freight on Barter Island.

R. Bartels



Of the 19 exploration plans submitted on May 20, 9 plans requested expedited review so they might conduct surface geology studies during the late summer 1983. The Regional Director approved eight of nine exploration plans and disapproved the International Technology, Ltd. plan for a helicopter supported gravity-magnetic survey and a control survey. I-Tech appealed the Regional Director's decision to the Director USFWS and the Director overturned the Regional Director's decision and approved I-Tech's exploration plans.

On September 15, 1983, Regional Director Keith Schreiner approved the exploration plan of Geophysical Service, Inc. (GSI) for conducting reflection seismic studies for oil and gas on the ANWR. Major modification to the GSI plan required first-year seismic work to be conducted on a 6X12 mile reconnaissance grid instead of the proposed 2X2 mile grid and conventional drill shot hole/explosive technique to be used instead of the Vibroseis technique proposed by GSI.



GSI immortalized by bulldozer carved initials in the tundra circa 1963.

R. Bartels

None of the other nine seismic exploration plans submitted concurrently with the GSI plan were approved. This decision was made to avoid significant adverse effects to the fish, wildlife and habitat on the ANWR coastal plain and to gather the best possible data for the Secretary to prepare the report to Congress. In addition to the seismic study, two plans for conducting surface geological studies by Alaska Research Associates, Inc. and Conoco, Inc. were approved. Helicopters will be used for the latter work.



Following R.D. Schreiner's decision GSI appealed, requesting a smaller grid size and use of the Vibroseis technique. On appeal, the request for a smaller grid size was denied. The use of the Vibroseis technique was approved for use up to four miles inland to allow GSI to tie offshore data obtained by Vibroseis to data obtained by the drilled shothole technique on land. In addition to the GSI appeal, 3 seismic exploration companies (Western Geophysical, Petty-Ray Geophysical, and CGG) appealed the Regional Director's decision to the Director USFWS. The Director eventually denied the three appeals and upheld the Regional Director's decision.

Zellhoefer began planning and organizing a program for monitoring seismic work scheduled to begin during the winter of 1983-1984. A lot of effort was initially made to hire two field monitors. Nancy Felix joined the staff in July and Dan Laplant joined the staff in September. A commitment was made by Regional Director Schreiner to have full-time monitors in the field with each of two GSI seismic parties that will be operating on the coastal plain during the winter of 1983-1984. The local hire provision of ANILCA was used to recruit four GS-9 wildlife biologists (30 month appointments) to function as monitors during the winter months and field biologists during the remainder of the year. These positions required specific firsthand knowledge of the area where work will be performed. This knowledge has been gained either through having lived in or near the ANWR or having previously worked in this area. Marsh Zellhoefer left Alaska in December to take a job in Washington D.C. Her experience and abilities will be missed. Doug Fruge from the Regional Office was detailed to the ANWR to continue where Marsh left off.



Not much snow falls on Kaktovik but what there is gets blown around alot.

R. Bartels

#### 4. Compliance With Environmental Mandates

This year marked the third year of study and work being carried out to meet the requirements of Section 1002 of the ANILCA. The "1982 Update Report Baseline Study of the Fish, Wildlife, and their Habitats" was published in January, 1983 and available to the public in February 1983.

Analysis of data from the 1983 field season and drafting of the annual update to the Baseline Report began in September. The format for the update report involves a summary of new information obtained about subjects covered in each chapter of the Initial Report. Appendices contain individual scientific reports of each study being conducted. Abstracts of results from these studies from the "1983 Baseline Report" are contained in Section D.5.

#### 5. Research and Investigations



Experimental insect traps on the Jago River. The fly paper trap in foreground worked better than the umbrella trap.

Physical facilities and support services were established via a cooperative agreement between the ANWR and the Denver Wildlife Research Center (DWRC) Caribou Project in June.

A comprehensive annotated bibliography on the Porcupine caribou herd (PCH) was updated, partially encoded into a microcomputer and programs to update, edit and search by author and subject were written. A Request for Procurement for the design and construction of satellite transmitters for



caribou was completed. Bids were rejected due to insufficient project and cooperator funds. An interagency support agreement with USGS to map the landcover of the United States portion of the PCH range and the field work on twenty-four 49 mi<sup>2</sup> training blocks to accomplish the mapping were cooperatively completed. Registered multispectral scanner scenes for the entire PCH range and digital topographic data for the United States portion were acquired. A cooperative (EROS-USFWS) study was initiated to develop the algorithms, programs and a data base management system to integrate and analyze landcover, topography, diversity and caribou attribute data. A remote image processing system was acquired via an interagency (USGS, USFWS) agreement. Research probes were initiated to evaluate techniques and quantify effort required to define 1) insect relief habitat, 2) temporal and spatial distributions of biting and parasitic dipterans, 3) pellet density and degradation, 4) shed antler density and 5) phenological differences on the coastal plain. A research work order with the Alaska Cooperative Wildlife Research Unit was initiated to identify insects occurring on the coastal plain. Project staff also assisted with the major "1002" studies on the PCH.

Note: Full reports of work accomplished on these projects are contained in the "1983 Update Report Baseline Study of the Fish, Wildlife and their Habitats" (USFWS, 1984) available from the ANWR, Fairbanks, AK in early 1984.

ANWR Progress Report No. FY84-1: Habitat use and behavior of grizzly bears in the Arctic National Wildlife Refuge.

Michael K. Phillips. U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge and Wildlife and Fisheries Program, University of Alaska-Fairbanks, Fairbanks, Alaska.



Aerial view of a bear den on a talus slope.



Abstract: Habitat use and behavior of grizzly bears (Ursus arctos) were studied from 27 June-11 August 1982 and 24 May-29 August 1983, in the Caribou Pass/Kongakut River area of the Arctic National Wildlife Refuge. Data are presented as bear-unit hours. A bear-unit was defined as one bear, a family unit, or a male bear with consort(s). Bear densities are low on the study area (1 bear/130-260 km<sup>2</sup>). Intensive searching for bears resulted in the collection of 387 bear-unit hours of behavioral information. Six categories (21 sub-categories) were used to describe behavior. Bears were most often observed feeding, foraging, or resting (114, 113, and 88 bear-unit hours, respectively). The most common food items were Hedysarum alpinum (roots), Equisetum arvense, Boykinia richardsonii (flowers and leaves), berries (Empetrum nigrum, Vaccinium vitis-idaea, and Arctostaphylos rubra), caribou (Rangifer tarandus), ground squirrels (Spermophilus parryi) and microtines. Most use of caribou by bears occurs on the coastal plain at or near the caribou calving grounds. Grizzlies shift their ranges to include areas frequented by caribou. For about 1 month (24 May-21 June) caribou (especially calves) are an important food item for grizzlies. Habitat types were described by the dominant topographic and vegetative feature. A total of 398 bear-unit hours was collected concerning habitat use. Bears were observed in 6 topographic types. Valley flats mountain slope/hillside, and cutbank/gulley/creek were the most common topographic types used (107, 90, and 89 bear-unit hours, respectively). A different vegetation classification system was used in 1982 than 1983. Results from 1982 are being converted to the 1983 system. In 1983 bears were observed in 20 vegetation types. Sedge tussock mixed-shrub tundra, sedge-willow tundra, and mixed-shrub tundra were the most common vegetation types used.

ANWR Progress Report No. FY84-2: Distribution, abundance, and productivity of fall staging lesser snow geese in coastal habitats of northeast Alaska and northwest Canada, 1983.

Michael A. Spindler, U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge, Fairbanks, Alaska.



The arrival of staging snow geese in late August herald the end of summer.

Abstract: The 1983 distribution, abundance, and productivity surveys of lesser snow geese staging in August and September in northeast Alaska and northwest Canada were conducted by the U.S. Fish and Wildlife Service, in cooperation with the Canadian Wildlife Service. The 1983 surveys emphasized changes in temporal and spatial distributions within the staging season through increased survey frequency and examined habitat use, feeding, and behavioral response to aircraft overflights through ground observations. Fall staging was later than the previous 11 years with major arrival occurring within the Canadian sections on 1 September and on ANWR sections on 8 September, a full 13 days later than 1982 and 2 days later than the long-term average. Peak numbers were detected on 12 September. A total of 393,000 snow geese were estimated to have been present: 12,828 on ANWR; 300,651 on the Yukon north slope; 54,523 on the Mackenzie River delta; and 25,000 south of the delta. In 1983, total numbers of geese estimated in ANWR and Mackenzie delta were much lower than the respective long-term averages (99,107 for ANWR and 172,826 for Mackenzie delta), but were much higher than the Yukon long-term average (106,312). Also on this date, age ratio aerial photography was obtained over the entire staging ground. Analysis of 94 usable aerial photographs of flocks representing 8500 geese indicated a weighted age ratio of  $26.8\% \pm 11.0$  (SD) young. Age ratios varied spatially with the highest percent young (45%) observed on the Mackenzie River delta and the lowest (14%) observed on the Yukon north slope. Productivity levels in 1983 were higher than 5 of the 9 previous years, and were higher than any recent year since quantitative photo counts were initiated. Major departures occurred from 21-26 September: by the latter date no geese were seen following 5 days of strong west wind and freezing temperatures. The departure was 5 days later than 1982 and a week later than the 11 year average. Total duration of staging was 4 days less in 1983 than in 1982 and 2 days less than the long-term average. On ANWR, snow goose distribution in 1983 occupied generally the same area between the Hulahula and Egaksrak Rivers as in previous years, except in 1983 the most frequently used "core" concentration area centered more coastally and eastward in the Aichilik, Egaksrak, and Kongakut River deltas. The Okerokovik River area, used more extensively in previous years, was not used as greatly in 1983. Snow cover in 1983 may have been a factor in this slightly-changed distribution. A majority of geese seen in ground behavior scans on the lower Aichilik River on 11 September 1983 were feeding. Observation of feeding geese and areas where geese had recently fed indicated extensive use of sedge rootstocks in wet sedge tundra and grass leaf blades in riparian areas. Snow geese on the ANWR coastal plain were as sensitive to aircraft overflights as geese from other studies in Yukon, with flushing distances averaging 3 km and altitudes up to 3000 m causing flushing in both areas. An intentional disturbance experiment consisting of an evening aircraft overflight on the lower Aichilik River caused all geese within a 4 km radius to take flight, 70% of which left the area immediately; total numbers the next morning were 60% of goose numbers the previous morning before disturbance. Low altitude (less than 30 m) aircraft overflights produced less disturbance than higher altitudes, perhaps due to lessened lateral dispersion of sound.

ANWR Progress Report No. FY84-3: Microtine rodents and ground squirrels of the coastal plain and foothills of the Arctic National Wildlife Refuge: distribution, densities, and general ecology.

Christopher A. Babcock. U.S. Fish & Wildlife Service, Arctic National Wildlife Refuge and Department of Biology, University of Alaska-Fairbanks, Fairbanks, Alaska.

Abstract: A microtine rodent trapping survey was done at 3 locations across an altitude/coastal influence gradient in the Arctic National Wildlife Refuge from 2 June - 18 August 1982. Each location was trapped 3 times, at monthly intervals. Microtus oeconomus decreased in density and Dicrostonyx torquatus and Lemmus sibericus increased towards the coast. Microtus miurus occurred only at the most inland site. The coastal microtines appeared to be at a low point in their cyclic fluctuation. Arctic ground squirrels (Spermophilus parryii) were also surveyed at the same locations. Density distributions of S. parryii depends primarily on suitable burrowing conditions and forage quality. Herbivory by, and predator use of microtines and ground squirrels suggests their integral importance in the Arctic ecosystem.

ANWR Progress Report No. FY84-4: Population size, composition and distribution of moose along the Canning and Kongakut Rivers, in the Arctic National Wildlife Refuge, Alaska, fall 1983.

Larry D. Martin and Gerald W. Garner, U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge, Fairbanks, Alaska.

Abstract: Aerial surveys to determine the population size, composition, and distribution of moose (Alces alces) along the Canning and Kongakut River drainages were conducted on the Arctic National Wildlife Refuge. The Canning River drainage was surveyed in mid-September and late October to determine seasonal shifts in moose distribution. Numbers of moose observed increased from 78 in September to 149 in October. Moose had evidently not yet moved into the drainage in September. Shallow snow depth and incomplete snow cover are believed to be the major factors for differences in moose numbers between the 2 surveys. Number of moose along the Canning River (149) was approximately the same as the 1980 spring survey (148). This population is evidently relatively stable. The Kongakut River survey detected 158 moose, which is 28% more than the 1980 spring survey. The increased population may be due to immigration from surrounding river valleys, which has been a factor in previous years. The population may also be increasing on its own.

ANWR Progress Report No. FY84-5: Prey utilization by wolves and a preliminary assessment of wolf and prey densities in three drainages within the Arctic National Wildlife Refuge, Alaska.

Harald Sveinson Haugen, U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge and Department of Biology, University of Alaska-Fairbanks, Fairbanks, Alaska.

Abstract: The relative utilization and availability of prey types used by wolves (Canis lupus) in the Kongakut, Hulahula and Canning River drainages was assessed by visual observation and by analysis of wolf scats. Wolves were observed in each of the 3 drainages. Visual assessment indicated that moose (Alces alces), caribou (Rangifer tarandus), and Dall sheep (Ovis dalli) were available to the wolves in the Kongakut drainage. In the Hulahula drainage, sheep seemed to be the prey species most available, while in the Canning moose were present in relatively high densities and caribou at a lower but stable density. Scat analysis indicated that the Kongakut wolves preyed on the 3



available ungulates, but focused on caribou; the Hulahula wolves also utilized all 3 species, but ate relatively more sheep; while no moose remains were found in the scats from the Canning.

ANWR Progress Report No. FY 84-6: Movement of molting oldsquaw within the Beaufort Sea coastal lagoons of the Arctic National Wildlife Refuge, Alaska, 1983.

Robert F. Bartels, Terrance J. Doyle, and Thomas J. Wilmers, U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge, Fairbanks, Alaska.



This space age oldsquaw didn't go undetected for long with this radio telemetry set-up. R. Bartels

Abstract: During August, 1983, 16 molting oldsquaw were captured in Tapkaurak Lagoon and fitted with a backpack radio transmitter. Birds were relocated each day that weather permitted until they departed the refuge. Over 75% of the oldsquaw relocation points were within lagoons or within 400 m of barrier islands in the ocean. Radioed oldsquaw were relatively sedentary with 47% of relocations in Tapkaurak - Oruktalik lagoon system where captured. Nearly 90% of the relocation points were found in water less than 5 m deep. The average movement rate for the 9 oldsquaw alive at the onset of migration ranged from 1.77 to 12.20 km/day. The average daily movement rate for males exceeded that for females, but the difference was not significant. The average date of migration initiation was 22 September, and coincided with the beginning of lagoon freeze up. The relocation data suggests oldsquaw move from lagoons to offshore and ocean areas as molt is completed and migration begins. The radio relocation data is in agreement with the distribution data obtained during the 1983 aerial surveys.



ANWR Progress Report No. FY84-7: Migratory bird use of the coastal lagoon system of the Beaufort Sea coastline within the Arctic National Wildlife Refuge, Alaska, 1983

Robert F. Bartels and Terrance J. Doyle. U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge, Fairbanks, Alaska.

Abstract: Aerial surveys were conducted on 10 selected coastal lagoons of Arctic National Wildlife Refuge during 1983 to obtain an index of relative numbers of migratory birds using the lagoon and to determine the relationship between three different survey techniques. Oldsquaw were identified as the major species using the lagoon (over 80% of the total population). The total number of oldsquaw observed in lagoons in 1983 approximated 1981 totals and exceeded 1982 numbers. Although the temporal distribution of oldsquaw observed was similar in all three years, the spatial relationships varied. As the season progressed, there appeared to be a westerly shift in oldsquaw use of lagoons. A shift from lagoon to offshore was, also, noted. Comparison of oldsquaw numbers and density observed in a 400m strip transect within the lagoon to the whole lagoon areas showed that the birds were not randomly distributed and the strip transect cannot be used as an index of oldsquaw number or density in the entire lagoon. A three strip survey was compared to the total lagoon survey, and revealed that the total lagoon survey remains the best estimate of oldsquaw numbers.

ANWR Progress Report No. FY84-8: Distribution, abundance, and productivity of tundra swans in the coastal wetlands of the Arctic National Wildlife Refuge, Alaska, 1983

Robert F. Bartels and Terrance J. Doyle, U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge, Fairbanks, Alaska.



Tundra swans on the coastal plain with the Brooks Range in the background.

P. Miller



Abstract:

Two aerial surveys of tundra swans utilizing coastal wetlands of Arctic National Wildlife Refuge were conducted in 1983. The first survey, a breeding pair/nesting survey, was conducted on 2-3 June; a second survey to determine productivity, was conducted on 21 August. These surveys are used to describe the distribution, abundance, and productivity of the tundra swan population. Survey methods were those described by Bartels et al. (1983). The nesting population was estimated to be a minimum of 105 pairs. Total swan numbers in 1983 increased 13% and 67% over 1981 and 1982, respectively. Adults in 1983 declined 2% over 1981, and increased 31% over 1982. Cygnet production in 1983 increased 70% and 316% respectively over 1981 and 1982. Swans on 1 concentration area were stable over 3 years. A second area had an increase in 1983 over 1982, with 1981 numbers comparable to 1983. The third major area in 1983 had numbers exceeding both previous years. Swans in the fourth area declined over 1981, but increased over 1982. Since air traffic and human disturbance was equally high in 1982 and 1983, the milder weather of 1983 probably contributed to greater production.

ANWR Progress Report 84-9: Terrestrial bird populations and habitat use on coastal plain tundra of the Arctic National Wildlife Refuge.

Michael A. Spindler, Pamela A. Miller and Cathryn S. Moitoret. U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge, Fairbanks, Alaska.



Stilt sandpipers brooding chicks.

M. Spindler





Censusing bird plots in the fog.

L. Martin

Abstract: Birds were censused on 41, 10 ha plots representing 7 habitat types at 3 sites on the coastal plain of the Arctic National Wildlife Refuge, Alaska, June-August 1983. Variability in bird populations due to location was primarily attributed to differences in habitat types available at coastal versus inland sites. Habitat type was found to be one of the most significant factors controlling densities of passerines, shorebirds, Lapland longspurs, red-necked phalaropes, pectoral sandpipers, and semipalmated sandpipers, as well as mean total populations and number of species. Flooded tundra, Riparian, and Moist/Wet Sedge (Mosaic) habitats showed significantly higher total densities and greater diversity of species than Moist Sedge-Shrub, Wet Sedge, Tussock Dwarf Shrub, and Moist Sedge habitats. For breeding bird populations, however, Riparian habitat was found to have significantly higher densities than any other habitat. Season (date of census) was a significant source of variability in levels of habitat use by birds. The Wet Sedge, Moist/Wet Sedge, and Moist Sedge-Shrub types showed the most constant pattern of total population density through the season; in contrast, Flooded, Tussock Dwarf Shrub, and Riparian types showed distinct peaks and troughs in density. Some inland habitats (notably Wet Sedge) showed initially high density which dropped drastically late in the season while some coastal habitats (especially Flooded, Riparian, and Wet Sedge) showed a later distinct and possibly related peak in population. Analysis of annual variability for 1978, 1982, and 1983 at Okpilak delta indicated that there were significant population changes between years but these were not consistent for each habitat. Annual variability of total breeding bird and total shorebird breeding populations was most significant in Flooded and Moist/Wet Sedge habitats. Significant annual differences were found for breeding densities of red-necked phalarope



and red phalarope in Flooded and semipalmated sandpiper in Moist/Wet Sedge which contributed to overall significant inter-year densities. Largest inter-year differences in importance were seen for breeding populations in Flooded Tundra. Moist/Wet Sedge tundra consistently had the highest breeding population density. Annual changes in habitat importance were not detected when mean total population density, rather than breeding density, was used as the variable tested, suggesting that the former variable, though more difficult to analyze statistically (due to larger, more cumbersome data sets) may be preferable because it may not be as subject to annual changes. For 3 years at Okpilak, Flooded Tundra consistently supported the highest total bird densities, followed by Moist/Wet Sedge (Mosaic), Moist Sedge-Shrub, and Wet Sedge Tundra. Although similarity was found in rank of breeding and total bird densities for habitats studied at Okpilak River delta for 3 years, repeated study of the complete array of habitats on the coastal plain of ANWR is needed.



Margaret Kerndt (in foreground) and Kathy Doyle survey bird plot boundaries near the Jago River delta.

M. Spindler



ANWR Progress Report FY84-10: Population dynamics and distribution of muskoxen in the Arctic National Wildlife Refuge, Alaska.

Patricia E. Reynolds, Larry D. Martin, Thomas J. Wilmers, and Terrance J. Doyle. U.S. Fish & Wildlife Service, Arctic National Wildlife Refuge, Fairbanks, Alaska.



The refuge muskox population has been growing rapidly and are more commonly found on the flatter coastal plain than in the mountains as this scene depicts.  
P. Reynolds

Abstract: Numbers of muskoxen in the Arctic National Wildlife Refuge in northeastern Alaska were estimated to be 257 animals prior to calving in April 1983. In November 1983, 311 muskoxen were counted. An estimated 64 calves were born between late April and late June 1983. In August 1983, 66 calves per 100 cows (3 yr+) were observed and calves comprised 22% of the population. Yearling recruitment was high in both 1982 and 1983 and mortality appeared to be low. Nine adult mortalities, including 4 adult bulls killed by hunters and 2 adult bulls killed or scavenged by a grizzly bear, were recorded between April 1982 and November 1983. Herd dynamics were similar in 1982 and 1983. Herd stability and size changed seasonally and may be related to the proximity of other herds. In 1982 and 1983 muskoxen in the Okerokovik area calved along the Niguanak River, the Sikrelurak River and the Angun River. In 1983 most muskoxen from the Sadlerochit area calved in the hills between Marsh Creek and the Katakaturuk River, about 12km west of the Carter Creek hills calving area used in 1982. Animals from the Tamayariak area which calved with Sadlerochit animals in the Carter Creek hills in 1982, calved on bluffs near forks of the Tamayariak River in 1983. Habitat use changed seasonally and could be correlated with seasonal movements in some areas. Some long range movements by radio-collared animals in 1982 and 1983 may be related to



dispersal. As the population is rapidly expanding, movement into new areas apparently is occurring. Dispersal of at least one young-aged herd into a new area on the Katakturuk River in 1982 and 1983 was documented.



Gerald Garner ear tagging an adult bull muskox.

P. Reynolds

ANWR Progress Report No. FY84-11: Ecology of brown bears inhabiting the coastal plain and adjacent foothills and mountains of the northeastern portion of the Arctic National Wildlife Refuge.

Gerald W. Garner, Harry V. Reynolds, Larry D. Martin, Thomas J. Wilmers, and Terrance J. Doyle, U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge and Alaska Department of Fish and Game, Fairbanks, Alaska.



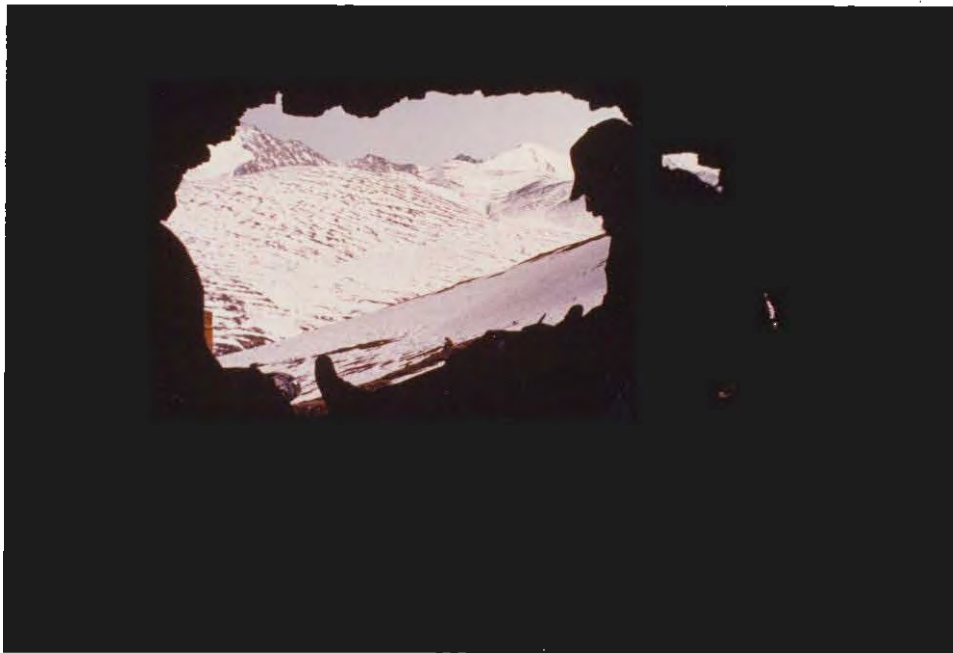


ADF&G biologist Harry Reynolds and Gerald Garner working on a tranquilized bear. L. Martin

Abstract: Fifty brown bears (*Ursus arctos*) were captured between 23 June and 3 July 1982 and an additional 30 bears were captured between 28 May and 16 June 1983 in the coastal plain and adjacent foothills and mountains of the northeastern portion of the Arctic National Wildlife Refuge (ANWR). Radio-transmitters were attached to total of 60 different bears during this time period and these bears were monitored through denning (October-November) in both years. More males were captured in age classes 5.5 years of age or less, while females were more abundant in age classes 6.5 years old and older. The sex ratio for captured bears was equal. No natural mortalities occurred in 1982 among sample bears, however in 1983, 10 apparent mortalities occurred among 17 young bears (cubs and yearlings). Reasons for this high mortality rate (58.9%) among young bears is undetermined. Brown bears were observed feeding on muskox (*Ovibos moschatus*) carcasses on 2 occasions, and were observed stalking or chasing muskox on 2 other occasions in 1983. No muskox/brown bear interaction was recorded in 1982. Brown bears were observed feeding on caribou (*Rangifer tarandus*) carcasses on 6 occasions in 1982 and 15 occasions in 1983. Bears were observed chasing caribou once in 1982, and 15 times in 1983, with 3 of the 1983 chases being successful (calf kills). Preliminary analysis of radio-relocation data indicate that brown bears appear to shift habitat use patterns to coastal areas in June to coincide with occupancy of these habitats by calving and post-calving caribou. Emergence from winter dens occurred from mid-April throughout May, with early emergence by males and non-paturient females and later emergence of females with cubs and females with young. Twenty-nine den sites were inspected in the spring and summer of 1983. Elevation of den sites averaged  $816.2 \pm 61.4$  m (SE), and



slope at den sites averaged  $53.6 \pm 3.8\%$  (SE). Den sites were predominantly located on southeast facing slopes (mean aspect  $145^\circ \pm 20^\circ$  SE). In late September, October, and early November 1983, 58 den sites of radio-collared and unmarked bears were located. Bears again moved south into the foothills and mountainous habitats to den. Three bears denned during the first half of October, 52 bears denned during the last half of October, and 3 bears denned in early November 1983. One radio-collared bear and 1 unmarked bear denned in coastal plain habitats within the 1002c study area. Preliminary estimates of population size and productivity of brown bears in and adjacent to the 1002c study area were developed from capture and movement data. A minimum of 87 brown bears occurred in the area in 1983, with a total population estimate of 108 bears (density of 1 bear/80 km<sup>2</sup> for the 8300 km<sup>2</sup> study area). Estimated average age at first reproduction was 7.4 years, with a potential reproductive life of at least 16 years. Mean litter size was 1.9 young and minimum reproductive interval was estimated at 3.6 years. Theoretically, females could produce a total of 8.4 young during their lifespan. This relatively high reproductive rate, if accurate, may be related to the seasonal accessibility by bears on ANWR to the Porcupine caribou herd as a food source.



A bears eye view of the world and Gerald Garner from inside a rock cave where its former occupant slept away the winter. L. Martin

ANWR Progress Report No. FY84-12: Calving distribution, initial productivity and neonatal mortality of the Porcupine caribou herd, 1983.

Kenneth R. Whitten, Gerald W. Garner, and Francis J. Mauer. Alaska Department of Fish and Game and U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge, Fairbanks, Alaska.



Caribou cows and calves in a post-calving aggregation on the Arctic coastal plain.

D. Ross

Abstract: A 3 year joint study by the Alaska Dept. of Fish and Game and the U.S. Fish and Wildlife Service of the Porcupine caribou herd's calving distribution, initial productivity and neonatal mortality was initiated in 1983. Frequent relocation surveys of 23 radio-collared adult female caribou as well as aerial reconnaissance surveys and transects during late spring migration and throughout the calving season identified calving distributions on the coastal plain and foothills extending from the Sadlerochit River to the Firth River. A primary area of major calving concentration occurred in the lower foothills and adjacent coastal plain along the Jago River. Another concentration of calving occurred on the coastal plain and foothills between the Kongakut River and Komakuk Beach. In 1983 the calving distribution of the Porcupine caribou herd was most similar to that observed in 1976, 1978 and 1979, and it was the eighth out of 11 years in which concentrations of caribou calved in the Jago River foothills area. Calving activity extended farther north than usual, occurring nearly to the coastline. A rapid melting of snow during 30 May - 2 June may have favorably influenced the northern extension of calving. The peak of calving occurred on 4 June and there was no discernable variation in calving chronology from west to east. Eighteen of 23 (78%) radio-collared females produced calves. Initial productivity based on aerial composition transects over calving concentrations was measured at 74 calves/100 cows. During 4-8 June 69 calves were captured at coastal plain and foothills sites in the Jago concentration area, and fitted with mortality sensing radio-transmitters. Radio frequencies of these calves were monitored at least twice daily and visual checks were made every 48 hours during 4 June - 2 July. A helicopter was used to immediately investigate all mortalities



detected. Monitoring was less intense during the remainder of July and continued on a monthly basis through 1983. Eighteen productive radio-collared adult females were monitored as a control group on 1-3 day intervals during 29 May - 2 July. During 4 June - 31 July, 16 (23%) of the study calves died. Eighty-five percent of the mortality occurred in the first 10 days of the study. Categories of mortality (% of total mortality) included: probable study-induced abandonment (37.5%); predator kills (25%); probable natural abandonment (18.75%); and undetermined (predation and/or scavenging)(18.75%). Mortality associated with natural factors was 16% for the study group. During 29 May to 2 July 5(28%) of the control calves died. Differences in geographic distribution of study and control groups may have contributed to the higher mortality of control calves. Golden eagles killed 3 study calves and were observed feeding on unmarked calves on several occasions. Grizzly bears were observed killing and/or feeding on unmarked calves on 11 occasions. Natural mortality was greatest among study calves captured on coastal plain areas (26%) versus 11% among foothills groups. A majority of mortalities (60%) occurred in foothills areas, however, as most of the study calves captured on the coastal plain moved into the foothills. The relative low initial mortality rate of study calves during 4 June - 2 July agreed with comparative herd composition data between peak of calving and early July which also indicated a high survival of calves. During 7-30 June 1982 a natural mortality rate of 45% was measured in radio-collared calves captured on the coastal plain south of Herschel Island. Factors associated with spring migration and geographical distribution of calving may have influenced calf mortality rates in 1983 and 1982. An additional 4 mortalities of undetermined causes were confirmed in the study group during the period of 1 August to 10 December 1983.



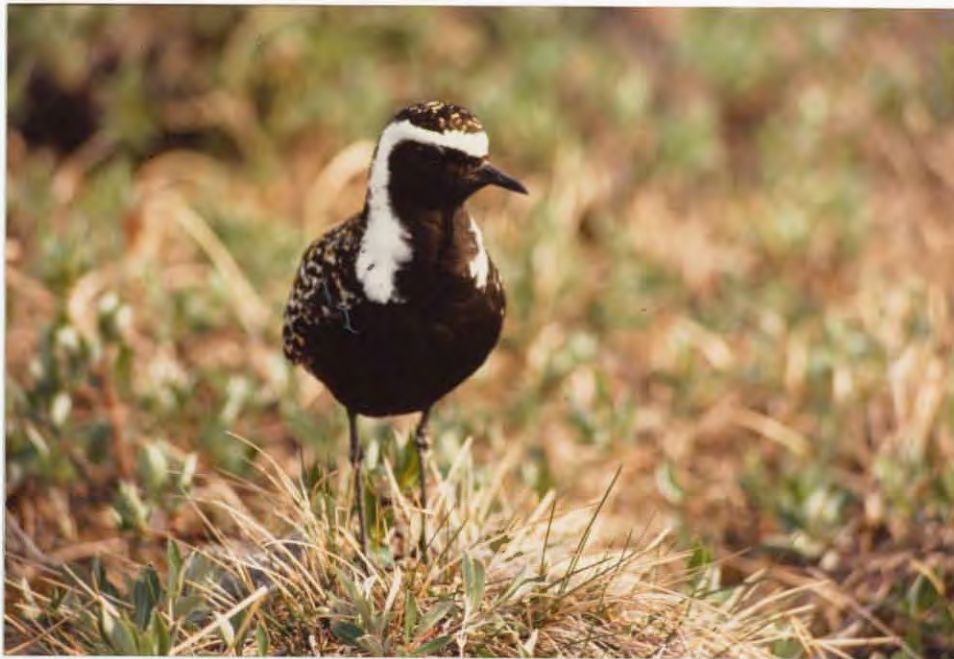
Post-calving aggregation of Porcupine herd caribou in the foothills south of the Arctic coastal plain.

D. Ross



ANWR Progress Report No. FY84-13: Species accounts of migratory birds at three study areas on the coastal plain of the Arctic National Wildlife Refuge, Alaska, 1983

No abstract available.



Lesser golden plover, a common bird on the Arctic coastal plain.



Ross' gull, a rare summer migrant, photographed at Barter Island, breeds in northeastern Siberia. T. Doyle



Fairbanks Fishery Resources Progress Report Number FY84-1: Fishery Studies on the North Slope of the Arctic National Wildlife Refuge, 1983.

David Daum, Patricia Rost, Michael W. Smith, U.S. Fish and Wildlife Service, Fisheries Resources, Fairbanks, AK.

Abstract: During 1983, the Fairbanks Fishery Resource Station conducted fisheries studies on the coastal plain of the Arctic National Wildlife Refuge. The major emphasis in 1983 was fall and winter movement and spawning areas of arctic char and general species distribution and life history in the Hulahula River. Fish distribution and life history in the Okpilak and Jago River drainages, and several smaller rivers were also studied. Char movement and overwintering was again studied on the Canning River. Physical characteristics of these drainages were examined and related to the potential overwintering habitat. During the study period, char movement into the Lower Hulahula River ranged from the beginning of August through the beginning of September. The peak movement in numbers of fish appeared to occur around the last week of August.

Fall concentrations of char on the Hulahula River were located by aerial survey in mid-September. The fish appeared to be concentrated in three sites which are consistent with the three fish holes used historically for subsistence fishing. Major spawning areas were located at the upper two fish holes. Overwintering pools appear to be limited. Hulahula River radio-tagged char showed little movement during late fall and early winter. A few tagged fish remained at the original site and the remaining fish had moved no further than 5 km downstream into a large auffs field.

Fairbanks Fishery Resources Progress Report Number FY 84-2: Abundance, Distribution and Diversity of Aquatic Macroinvertebrates on the North Slope of the Arctic National Wildlife Refuge, 1982 and 1983.

Reed S. Glesne, Steve J. Deschermeier, U.S. Fish and Wildlife Service, Fisheries Resources, Fairbanks, AK.

Abstract: Quantitative aquatic macroinvertebrate samples were collected from 46 sites in the vicinity of 1002c study area, Arctic National Wildlife Refuge, during the summers of 1982 and 1983. Density, biomass, number of taxa, diversity ( $H'$ ) and evenness ( $J'$ ) values were determined for macroinvertebrate communities from all stations. Mean values were compared for tundra, spring, and mountain stream types. Density of invertebrates ranged from 11 organisms/m<sup>2</sup> to 15,555 organisms/m<sup>2</sup>. Mean density increased by nearly an order of magnitude between mountain and tundra streams and between tundra and spring streams. Species composition was dominated by taxa of Orthoclaadiinae, Simuliidae, Oligochaeta, and Baetidae. The majority of the taxa collected were representative of the collector - gatherer functional group. The scarcity of other functional groups was reflected in the generally low diversity ( $H'$ ) values found in the study area. Highest diversity values were found in tundra streams. Low diversity values were found at spring stream sites, and were attributed to the high redundancy of chironomids in the invertebrate samples at these sites. Significant positive correlations ( $P < 0.01$ ,  $r > 0$ ) were found between density and biomass of organisms with alkalinity and conductivity values.

## E. ADMINISTRATION

### 1. Personnel

Someone apparently gave the right keys to several Federal Building inmates who took advantage of the situation to escape during the year. Outdoor Recreation Planner Judy Liedberg, left June 25, to take a job as a Natural Resource Specialist with Gates of the Arctic National Park also headquartered in Fairbanks. Refuge Manager Russell "Buzz" Robbins rode into the sunset July 9, to take a job with the Fergus Falls, Minnesota Wetlands complex. Filling in for Robbins as Acting Refuge Manager was John Martin from the Alaska Maritime NWR. John began serving his sentence on July 13, but got time off for good behavior to visit his family in Homer on weekends. John was finally paroled on September 30, with the arrival shortly thereafter of newly selected Refuge Manager Glenn Elison of the Alaska Peninsula NWR. Wildlife Biologist, Zellhoefer, left the frozen north in early December to take a job as a Fish and Wildlife Biologist with Ecological Services in Washington D.C. Nancy Felix and Dan LaPlant were issued their striped suits on July 10 and September 18 respectively, when they joined the staff as full-time monitors for the seismic exploration program. An attached graph (page 30) shows the growth of the permanent staff since the refuge was established.

### 2. Youth Programs

The only involvement with youth programs in 1983 was with a single YCC enrollee, Dennis Gramps, employed from June 13, to August 12. Dennis served as a much needed expediter for the three refuges in Fairbanks. He also did general cleanup of warehouse and hanger, painting and varnishing boat trailers, construction of a metal flammable materials building, vehicle washing and cleanup and various other duties.

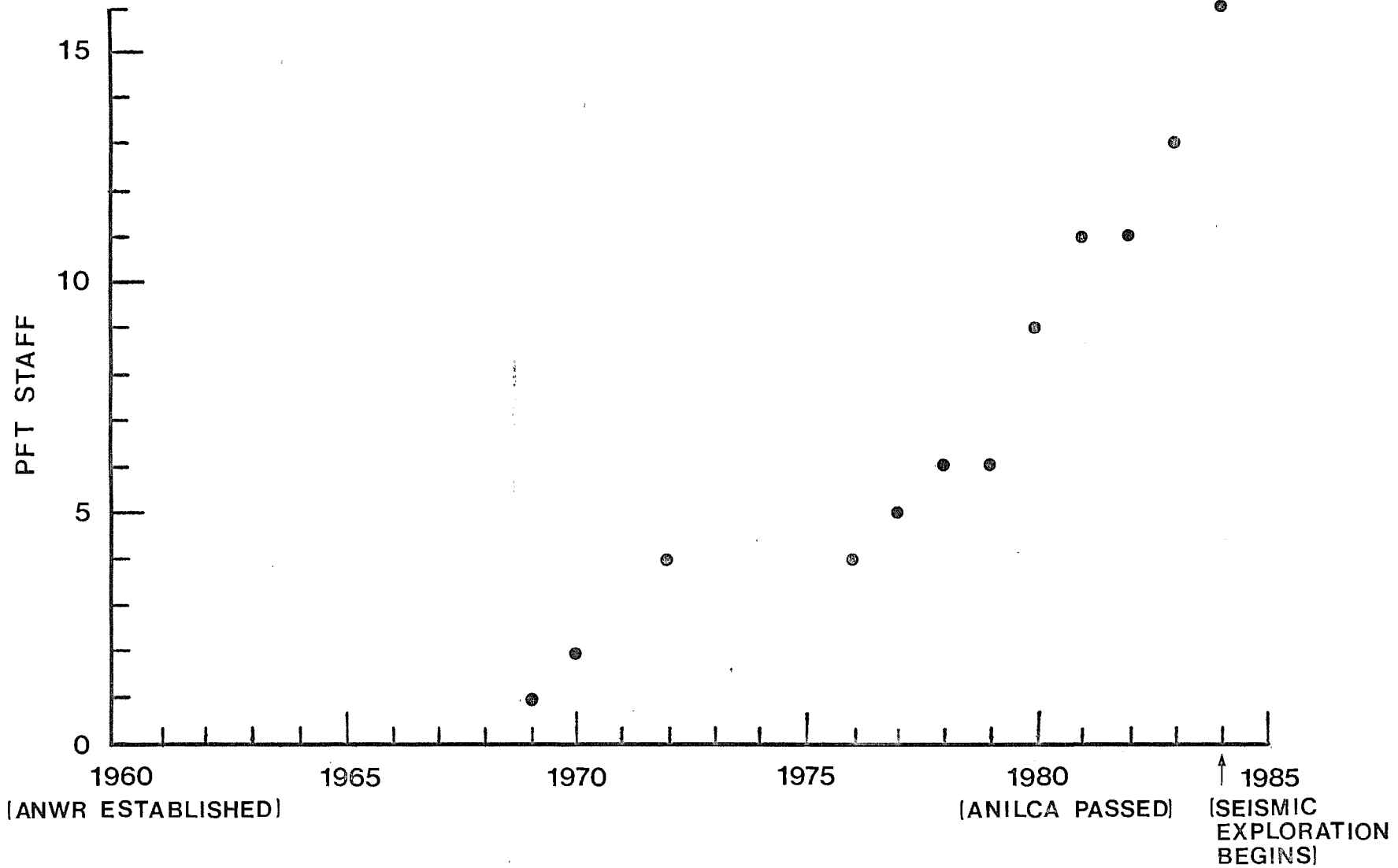
Some form of youth program is definitely needed to support our summer operations. The YCC program, however, is not the answer in our case. It worked this year because our enrollee was authorized to have a government drivers license. We understand this authorization will not be given in 1984. Being headquartered in the Fairbanks Federal Building, enrollees have to be able to drive a vehicle. With a small number of unlicensed enrollees, a staff person is required to serve as a driver much of the time. This combination is not worth our involvement in the program.

### 3. Other Manpower Programs

The Local Hire provisions of ANILCA provide for employment of individuals that have "special knowledge or expertise concerning the natural or cultural resources" of the refuge. This authority allows for appointment without regard to OPM qualification requirements or FTE constraints. At year's end, Catherine Moitoret, Larry Martin, Pamela Miller, and Greg Weiler all of whom had worked previously as temporary Biological Technicians on ANWR, were hired to fill 30 month temporary appointments as oil and gas seismic exploration monitors (Wildlife Biologist, GS 486-9). These people will be monitors for the seismic program during the winter months and field biologists during the summer. Frugé was detailed to ANWR to fill in where Zellhoefer left off with the monitoring program. The detail was made permanent with his appointment as the Principal Assistant Refuge Manager in January 1984.



# GROWTH RATE OF ANWR STAFF



4. Volunteers Program

Nineteen volunteers helped throughout the summer in various aspects of the biological program. Periods of work ranged from several days to several months with a total 10,112 hours worked - a savings to the refuge of \$88,000.

The program provided us with excellent assistance. Many of the volunteers had a BS degree in wildlife or a related field, and a number had further degrees with considerable experience.

Six biological technicians were hired from the regional summer/seasonal register at the Biological Technician GS 404-5 level. The work period extended anywhere from April 17, through December 31.

5. Funding

The trend of funding increases for the ANWR continued as it has over the past 5 years. The congressionally mandated studies on the coastal plain again received most of our attention. Even though funding trends look good, we are unable to spend sufficient time in other areas of the refuge that require work.

Summary of Funding for the Past 5 Years

	<u>FY80</u>	<u>FY81</u>	<u>FY82</u>	<u>FY83</u>
1210	88,000	88,000	350,000	420,000
1220	231,000	230,000	550,000	600,000
1240	48,000	46,000	20,000	20,000
1260	5,000	10,000	10,000	10,000
<hr/> Total	<hr/> 372,000	<hr/> 374,000	<hr/> 930,000	<hr/> 1,050,000

By year's end the refuge was gearing up to conduct a monitoring program for oil and gas seismic and exploration activities. USFWS expenses for monitoring exploration activities will be reimbursed by participating companies.

6. Safety

Two accidents occurred involving service employees during 1983. On May 12, temporary biological technician Thomas Wilmers had parked a vehicle in a parking lot. The vehicle was hit by a private vehicle backing out of an adjacent stall. Damages were minimal. On July 25, YCC enrollee Dennis Gramps was driving the same vehicle and was hit in an intersection after failing to yield. Damages amounted to approximately \$250.00.

On September 7, a Cessna 185 aircraft owned by Audi Air Inc. and piloted by one of their employees attempted a takeoff from a strip on the Kongakut River. The aircraft failed to develop full power and, as a result, did not attain flying speed before a steep bank brought a halt to further efforts to defy gravity. The aircraft ground to a stop on large rocks at the end of the gravel bar breaking a landing gear and wing among other damages. The aircraft was considered a total loss and had not been removed by the end of the year. There were no injuries and no refuge employees were involved.



Regional Safety Officer Ginny Hyatt presented CPR, First Aid and Defensive Driver training for Fairbanks employees on March 8, 9, and 10.

Tom Belleau of the Office of Aircraft Services conducted a one day "Pinch Hitter" course for non-pilots on March 28. The course is designed to provide individuals with basic flying information to get an aircraft on the ground safely in the event of pilot incapacity.

Safety meetings were held monthly and conducted by each of the USFWS offices in the Federal Building. A few of the covered topics included boating, firearms, bear safety, and, emergency signaling.

Safety materials constituted a major part of the orientation packet prepared for seasonal employees and volunteers. No lost time accidents occurred during the year.

A 10'x14' metal building was erected near our leased warehouse to store flammable materials. The building meets our short-term needs of removing flammables from the warehouse and hanger but is by no means a satisfactory long term storage facility.

During a 100 hour inspection of N67697 in August it was discovered that the 30x13, 6 ply tundra tires were in imminent danger of complete failure. The tires were purchased new and were only in their second season of use. Poor quality manufacturing was to blame. The only suitable substitute tires, (29x11, 8 ply) that were located and finally installed, are smaller and not as soft as the other tires.

Vintage "Herman Nelson" gas heaters used in the hanger for many years were discovered to have asbestos liners on the ends of the canvas heater ducts. Adaptors were fabricated and new smaller diameter high temperature ducts were attached.

## F. HABITAT MANAGEMENT

### 1. General

There are no habitat management manipulation practices utilized on the ANWR. Efforts are directed towards preserving and maintaining a natural ecosystem and in gathering baseline information on the plant communities and animals populations.

Habitat types found on the refuge are widely varied. Nowhere else in North America is the transition of biotic communities from the Arctic coastal plain to the Brooks Range so compact. The rugged chain of peaks comprising the Brooks Range curves through the refuge forming a continental divide through northern Alaska. Deep valleys reach far within the mountains to the base of glaciated peaks, the highest in the Brooks Range. Uplifted east to west, the land to the north descends in a tundra covered plain to the Arctic Ocean. This treeless coastal plain, covered with grasses, sedges, lichens and other low plants, is cut by braided streams flowing into the sea. A narrow reef of gravel protects much of the marshy shoreline from the Arctic Ocean ice pack. In the south sloping valleys of the Brooks Range, rivers wind through valley floors dotted with lakes, sloughs, and wetlands. Groves of stunted white spruce and balsam poplar stand among meadows and muskeg, and grade into dense, taller spruce forests farther south.

## 2. Wetlands

Wetland habitats are plentiful on the coastal plain and in the wide glaciated river valleys on the south slope of the Brooks Range. They provide breeding, nesting, and migration habitat for a myriad of waterfowl and shorebirds.

## 3. Forests

Spruce forests exist only in the southern regions of the ANWR. A limited amount of timber is harvested along the Porcupine River for local rural uses.

## 6. Other Habitat

Tundra habitat exists over much of the ANWR above timberline in the mountains, and north of about 68° north latitude. Tundra in northern latitudes is a generic term which describes the flat treeless terrain. Tundra contains a variety of plant communities, some of which can be considered wetlands, some grasslands (or sedgelands) and some shrublands. Readily affected by man's activities, special attention is necessary to minimize impacts from exploration activities.

## 7. Grazing

There are no grazing programs on the ANWR. Three hunting guides use pack horses or mules which utilize forage in the vicinity of their camps.

## 9. Fire Management

The Upper Yukon-Tanana fire plan was not completed in time to be implemented during the 1983 fire season. Work resumed on the plan in the fall and early winter with a draft of the plan being circulated among responsible agencies at year's end. The plan is scheduled for completion and implementation during the 1984 fire season. Most of the refuge south of the Brooks Range would be placed in the limited suppression category which means no initial attack on detected fires. There is no fire history on the ANWR north of the Brooks Range. Fires would be allowed to burn unless they threatened lands in a higher suppression category.

In 1983, three fires, all of which were caused by lightning were detected and attacked by BLM fire crews south of the Brooks Range on the ANWR. Smoke jumpers attacked a 10 acre fire, #8660, near White Snow Mtn. on the Sheenjok River on June 28. The fire was declared out on July 17, with 400 acres reported burned. Fire #8676 was discovered on June 29, near VABM KON south of the Koness River. This 20 acre fire grew to 75 acres before being put out by smoke jumpers on June 30. Fire #8902 was attacked on July 24, along the U.S./Canada border about 10 miles south of new Rampart House. This fire grew from 30 acres to 75 acres before being declared out on August 1.



## G. WILDLIFE

### 2. Endangered Species

Herman Aishanna's whaling crew struck and killed a 58 foot bowhead whale north of Jago Spit September 20, 1983. The whale sunk after being hit and was not recovered until the following morning. The meat was spoiled but the muktuk was salvaged. The whale was a pregnant female with a three foot fetus. Another whale was struck and lost late in the month using up Kaktovik's strike quota of two.



George Akootchook taking a breather from butchering a bowhead whale landed in Kaktovik. R. Bartels

In early August Dr. Henning Behmann, a biologist and visitor from the museum at the University of Kiel, West Germany, reported an observation of a probable Eskimo curlew with young. The sighting was near Kikiktat Mountain west of the Hulahula River. He obtained one poor quality photograph. He was apparently quite familiar with whimbrels due to their abundance in another area where he had studied Arctic shorebirds. The geographic location away from the west coast of Alaska where bristle-thighed curlews occur, and relative proximity to the Mackenzie River where the Eskimo curlew was last known to have bred, add credibility to this sighting.

The USFWS began banding projects in 1979 on the Yukon, Porcupine and Colville Rivers where high concentrations of peregrines are located. There have been no peregrine band recoveries from the Porcupine River in ANWR to date. In 1983, Alaska Biological Research (ABR) again received the contract for the banding and raptor survey program along the Porcupine River. The objectives of this study were:

1. To locate cliffs occupied by peregrine falcons on the Porcupine River, determine productivity, and band nestlings;
2. To collect prey items, addled eggs, and eggshell fragments from active peregrine nests; and
3. To locate other raptors and band their nestlings.

Peregrine falcons were observed at 13 cliffs on the Porcupine River in 1983. Eleven pairs and two lone adults occupied these cliffs. In addition, a pair was observed soaring over Canyon Village. Seven pairs produced at least 15 nestlings (1.36 young/observed pair, 2.14 young/successful pair). Eggshell fragments and one whole egg were found at these nest scrapes. Productivity was lower than in previous years. Thirteen scrapes were on ledges used between 1979 and 1982 while the remaining were close to traditional nest sites.

Ages of nestlings were estimated at 12 to 22 days on July 16. Nestlings on the lower Ramparts were nearly one week older than nestlings found upriver. Fifteen nestlings and two adult females were banded. The adults had not been previously banded. In addition, two male peregrines were observed wearing lock-on type bands.

Seventy-two prey items were identified from seven nest scrapes. The frequency of occurrence of major prey groups was: waterfowl (13.9%), shorebirds (41.7%), passerines and other landbirds (40.3%), and mammals (4.7%) (Ritchie, 1983).

## 6. Raptors

ABR also undertook the only systematic study of raptors in 1983 on the ANWR in conjunction with peregrine surveys along the Porcupine River. Golden eagles were the second most abundant raptor species on the Porcupine River in 1983. At least 10 pairs were observed. Of these, 8 were successful and produced 11 young (1.4 young/successful pair). Six subadult golden eagles were also observed on June surveys. Six nestlings were banded in 1983. These young ranged from 3 to 6 weeks of age on July 1. Twenty-one prey items were identified in five active eagle nests in 1983. Two species, snowshoe hare (67%) and arctic ground squirrel (29%) predominated. Remains of an unidentified diving duck were the only other prey species recorded in 1983.

Merlins have been regularly observed near the lower Ramparts and near the Salmon Trout River since 1979. Four pairs of merlins were located at nests in 1983. A total of 16 young and a single egg were observed at these nests (4.0 young/successful pair). Twelve nestlings were banded. Three nests were located in parasitic growths in spruce trees. Merlins use similar nest substrates in the northern Yukon Territory (Hayes, pers. comm.). The fourth nest was located on the ground.

Six other species of raptors were identified in 1983 along the Porcupine River. These included: a subadult bald eagle, red-tailed hawks, marsh hawks, a sharp-shinned hawk, kestrels and great horned owls (Ritchie 1983).



In a study of caribou calf mortality, confirmed golden eagle kills of three study calves, and two unmarked calves were noted (Sec. D.5.) . No systematic survey of golden eagles on the Arctic coastal plain during caribou calving was made. In 1983, at least 51 observations totaling 60 birds from May 14 to August 4, were made by various field study personnel. More adults (23) than immatures (18) were identified. In previous years a preponderance of immature eagles has been observed (D. Roseneau pers. comm.). Most golden eagle sightings were made during June (28) and were most often recorded in areas associated with caribou concentrations, although sightings may be biased towards observer effort and location.

Other raptor sightings were recorded at three tundra bird camp locations (Map page 1). In addition to golden eagle sightings at all three bird camp locations, sightings of northern harrier (1), snowy owl (1), and short-eared owl (3) were recorded at the Okpilak bird camp. Owls were more common at Okpilak in 1982 than 1983.

#### 8. Game Mammals

Caribou wintering in traditional areas on the south side of the Brooks Range in the refuge migrated northeast in April and May, crossing into Canada in the Firth River/Joe Creek area. There was no significant migration of cows down the Kongakut River in 1983. Calving distribution extended on the coastal plain and foothills of the refuge from the Sadlerochit River to the Canadian border. Concentrations of calving occurred in traditional areas of the Jago River foothills and between the Kongakut River and Komakuk Beach (Canada). Calving distributions extended farther north onto the coastal plain than in most years. This may have been due to rapid snowmelt from that area during May 30 - June 2. Initial production of calves was about average. Movement of most cows and calves after calving was generally southwards into the higher foothills and to the northern flanks of the Romanzoff Mountains.

In late June there was a mass movement of caribou away from the mountains, towards the coast. This movement continued east, proceeding into Canada where cow/calf groups mixed with bull/yearling groups. On July 3, the herd reversed direction and rapidly reentered the refuge. Very large aggregations occurred on the coastal plain (approximately 2/3 of the herd) while smaller aggregations occurred in the foothills.



Refuge Helicourier and Porcupine caribou herd on the Kogotpak River,  
Arctic coastal plain. D. Ross

Direct counts from aerial photographs taken on July 6, 1983, of the Porcupine caribou herd totaled 135,284 animals. Survival of newborn calves was good this year, indicating that the herd is continuing to increase.

Post-calving aggregations of the Porcupine caribou herd rapidly dispersed during July 8-10, and most of the herd entered Canada by July 12. Dispersal occurred with major movements eastward along the coastal plain and foothills. There was also dispersion of caribou southeastward through the mountainous region from the Aichilik River to the Canadian border. In early August portions of the herd were found in the upper Sheenjek, Coleen, and Firth River drainages of the refuge. During the rutting season portions of the Porcupine herd were found on the south side of the Brooks Range from the Canadian border to Ackerman Lake (west of the refuge boundary). Caribou occupied traditional wintering areas in the refuge and adjacent areas to the west. One radio-collared two year old female wintered north of the mountains near Schrader Lake. Other segments of the herd wintered in traditional areas in the Ogilvie Mountains and Peel River basin of the central Yukon Territory.

The caribou bag limit set by the Alaska Board of Game remained at 5 caribou during 1983. Preliminary considerations regarding an international agreement for the management of the herd arose during the year and the refuge staff provided information to the Regional Office.



9. Marine Mammals

Three male polar bears are known to have been taken by residents of Kaktovik, one in late winter and two in the fall. One was shot at the dump, one on Manning Point and one on a beached whale carcass on Barter Island. One of the bears had been captured and ear-tagged the year before.



Partially immobilized polar bear captured on the ice pack as part of ongoing population studies by Denver Wildlife Research Center.

L. Martin

11. Fishery Resources - See D.5.

16. Marking and Banding

During 1983, 21 oldsquaw were banded, 16 of which also had radio tags attached (D.5).

The following species of birds were banded as chicks in 1983 by personnel working on terrestrial bird studies (D.5.):

ruddy turnstone 1  
lesser-golden plover 13  
arctic tern 1  
stilt sandpiper 5  
pectoral sandpiper 20  
red phalarope 2  
red-necked phalarope 4  
semipalmated plover 3

semipalmated sandpiper 25  
baird's sandpiper 4  
lapland longspur 52

Fifteen nestlings and two adult female peregrine falcons were banded on the Porcupine River during July, 1983 by Alaska Biological Research personnel (See G.2.).

In March, the ADF&G put 17 radio collars on adult cow caribou in the vicinity of Arctic Village .

Mortality sensing radio collars were attached to 69 caribou calves captured on the coastal plain south of Barter Island (D.5).

A total of 45 grizzly bears were captured on the refuge in 1983. Five were marked with color-coded ear tags, 10 were bears with radio-collars from 1982 which required refurbishment and 30 additional bears were radio-collared and ear-tagged (D.5.).

Fourteen new radio-collars were placed on muskoxen during 1983. One previously radio-collared muskox was captured to replace its collar. Two muskoxen were captured to re-adjust radio-collars which had shifted position and were riding across the animal's forehead (D.5.).



Pat Reynolds and Tom Wilmers set up for watching muskox.

T. Doyle



## H. PUBLIC USE

### 1. General

The I&R program is limited almost entirely to wildlife-oriented activities. Since the entire refuge is designated Wilderness, or defacto wilderness, public use of the area is limited to those uses relating to wilderness and wildlife values. Subsistence and sport hunting, fishing, trapping, backpacking, camping, and river running are common uses. The refuge is accessible by aircraft only, and visitors are expected to be completely self-sufficient. Trails, signs and designated campsites are unnecessary and inappropriate in the wilderness of the ANWR. Opportunity for contact with visitors is limited. Unless visitors seek out our office in Fairbanks, (in the bowels of the Federal Building), or contact a staff person in Kaktovik, we will probably never have a personal contact with them.

### 8. Hunting

Sport hunting and backpacking continued to be the most popular recreation activities on the refuge. Walt Audi, owner of Audi Air Inc. operating out of Kaktovik, reported that the number of hunters this year was up over last year but was still less than in previous years. Audi Air generally provides charter air service north of the Brooks Range in ANWR. He reported flying in 109 hunters, backpackers and floaters from June 10 to Sept 5, 90 of which were non-hunters. The number of non-hunters was up over last year but also less than previous years. An undetermined but smaller number of hunters not included in the total were flown in by Audi Air from Deadhorse. The 1983 ADF&G rough estimate of the sheep harvest for those Game Management Units within ANWR was as follows: Unit 26C, 56 sheep; Units 24, 25, 26A and 26B, 24 sheep. The sport hunting sheep season runs from August 10 to September 20. The Kaktovik registration hunt runs from October 1 to April 30, with 50 permits available and a bag limit of 3 sheep. Approximately 10 sheep may have been taken from January to April in 1983.

Subsistence hunters from Kaktovik took approximately 25-30 caribou during the mid-summer open water period along the north coast of ANWR and less than 30 caribou in the foothills and mountains during the winter months. No reports are available for the caribou harvest this year by people in Arctic Village.

The refuge is divided into exclusive use guiding areas by State regulation. A guide is required for a non-resident to hunt Dall sheep or brown bear. Fourteen hunting guides were issued permits to hunt on ANWR in 1983.

### 9. Fishing

Sport fishing for grayling, arctic char, lake trout, and northern pike occurs incidental to other recreational activities. There is little or no participation in fishing as a primary recreational activity. Subsistence fishing is important to local residents. Both freshwater and saltwater fish are sought.



You can't always pick your weather for char fishing.  
R. Bartels

10. Trapping.

Trapping is allowed on the refuge without permit. People from Arctic Village and Kaktovik run village based traplines out of their communities. At least eight trappers spend part or all of the season living on their ANWR lines. Two trappers not formerly based on the refuge are now within the boundaries of the refuge as a result of land added to the refuge by Secretary Watt (C.3.).

11. Wildlife Observation

Wildlife observation is an integral part of any wilderness trip on the refuge. Most visitors express an interest in seeing caribou, brown bear, wolves and Dall sheep.

12. Other Wildlife Oriented Recreation

All recreational activities on the refuge are related to wildlife. Backpacking, camping, and river running are popular activities.

Commercial recreation guides operate river and backpack trips on the refuge. Fourteen Special Use Permits were issued to recreation guides on ANWR in 1983, about double the number issued last year. At least one of the guides obtained a permit but did not actually guide on the refuge, probably due to lack of clients.





Don Barry, Washington office solicitor takes a break from legal briefs for a float down the Canning River. J. Stroeble

#### 17. Law Enforcement

Law enforcement (LE) emphasis is primarily placed on checking compliance of hunting guides and hunters in guide camps. All LE efforts on ANWR require the use of an aircraft for transportation from Fairbanks to the refuge. The southern boundary of the refuge is a two hour flight away from Fairbanks by Supercub. This year the refuge aircraft was used almost exclusively in support of ongoing biological projects on the Arctic coastal plain to meet congressional mandates.

All of the active law enforcement work on the refuge outside the northern coastal areas was performed by Special Agent (SA) Randy Armstrong also based in Fairbanks. In 1983, Agent Armstrong flew 171 flying hours and spent many more actual hours of law enforcement work on the refuge. Without his efforts, there would have been no law enforcement presence on much of the refuge. Agent Armstrong's efforts are much appreciated. Along with refuge staff, he helped refurbish an existing cabin on the Junjik River so it could be used for winter patrols and other work on the refuge. He also repaired the cabin after a bear tore it up in the spring.

On August 9, SA Armstrong landed near Last Lake on ANWR to check a guide hunting camp operated by Dennis Mooney. During the course of the contact

SA Armstrong observed that Mooney had cut green trees for use as tent poles. Mooney admitted he had cut the trees. This was a violation of his Special Use Permit (timber in the Last Lake area is very sparse and slow growing). Mooney was issued a violation notice. A letter written by Acting Refuge Manager John Martin informed Mooney of the intent to revoke his permit. Mooney paid a \$100.00 fine but was allowed to continue guiding next season on a probationary basis.

In August 1981, SA Armstrong assisted the State in a case in which a guide, Brad Langvardt, was charged with a violation involving a client. Langvardt was found guilty on November 2, 1982 and fined \$1,000.00 with 60 days in jail and 50 days suspended, 10 days of which he served. He was ordered to not be in any game camp for one year, not fly a camouflaged plane for three years and not guide for one year.

On August 17, 1983, SA Armstrong observed an aircraft on the Hulahula River that he recognized as belonging to Brad Langvardt. The aircraft was observed at the big game guide camp of "Buster" Wassom. SA Armstrong landed in the camp and asked Langvardt what the terms of his sentence were. Langvardt replied and included the fact that he had not been in any guide camp for one year. SA Armstrong reminded him that he was in a guide camp at the time. A summons was subsequently issued but never served. It was later reissued for Langvardt to appear before Judge Stephen R. Cline to answer the petition for his probation revocation. On November 18, 1983, SA Armstrong testified before Judge Cline who sentenced Langvardt to serve his suspended 50 days in jail in the Fairbanks correctional facility.

On August 11, Bob Bartels observed that navigation aids (radar reflectors) had been erected along the barrier islands of the refuge. Further investigation by Bartels and Zellhoefer determined that the reflectors (6), belonged to Energy Analysts. They did not have a permit for the reflectors. An "after the fact" application by Energy Analysts for a refuge permit was denied by Acting Refuge Manager Martin. Martin's decision was appealed to the Regional Director. The company subsequently removed the towers from the barrier islands and placed them in the water offshore outside refuge jurisdiction. Law Enforcement issued a citation to Energy Analysts for installation of the towers on refuge lands without a Special Use Permit.

Bartels discovered another unauthorized tower/meteorological station on Jago Spit on August 18. The tower belonged to Oceanographic Services, Inc. of Goleta, California. The company was ordered to remove the tower which was done on August 27.

#### I. EQUIPMENT AND FACILITIES

##### 4. Equipment Utilization and Replacement

Two new snow machines and sleds, survival equipment and two HF radios were purchased for use by monitors to be assigned to seismic crews scheduled to work on the refuge this winter (1983-1984).

Numerous items of small equipment were purchased for the Fairbanks office, the Kaktovik field station, and various field projects.



A GSA bid sale of old outboard motors, pumps, calculators and binoculars belonging to ANWR was conducted in August. This ridded us of equipment reported as excess property 18 months ago.

5. Communications Systems

No changes were made to communications systems.

J. OTHER ITEMS

1. Cooperative Programs

The following Special Use Permits were issued in 1983:

GSI	Jan. 20 - May 1, 1983	Unmanned navigation towers for offshore seismic exploration
CGG	Feb. 23 - Apr. 30, 1983	"
Western Geophysical	May 1 - Oct. 30, 1983	"
GSI	July 1 - Oct. 30, 1983	"
Canadian Institute Of Ocean Science	July 10 - Sep. 30, 1983	"
Navigation Services Inc.	Sep. 1 - Oct. 31, 1983	"
I-Tech	Aug. 1 - Sep. 30, 1983	"
ARCO	July 1 - Aug. 9, 1983	Surface geology
BP/SOHIO	July 1 - Aug. 9, 1983	"
Chevron	July 1 - July 15, 1983	"
Gulf	July 1 - July 16, 1983	"
Placid Oil	July 1 - July 16, 1983	"
Shell Oil	July 10 - Aug. 9, 1983	"
Union Oil	July 1 - Aug 9, 1983	"
EXXON	Aug. 1 - Aug. 9, 1983	"
	Aug. 15 - Aug. 27, 1983	"
Poker Flats Rocket Research Range	Jan. 1 - Dec. 31, 1983	Retrieve rocket and debris
payloads		
RZA Inc.	Jan. 17 - Feb. 28, 1983	Gravel core sampling
North Slope Borough	Apr. 20 - Oct. 19, 1983	Gravel dredging
BIA	June 1 - Sep. 15, 1983	Historic site
inspection		
BLM	July 20 - Aug. 9, 1983	Native allotment site review
BLM	Aug. 27 - Sep. 1, 1983	Native allotment site review



A gravel dredge operated by the North Slope Borough started sucking up gravel for the first time this summer to meet construction needs in Kaktovik. All dredge components were airlifted to Kaktovik in Hercules cargo aircraft.

F. Mauer

## 2. Items of Interest

On July 18, ARM Ross and Jerry Stroeble (NAES) accompanied Jan Riffe, Bob Jantzen (Director WDC) and Don Barry (Solicitor - WDC) on a tour of the ANWR. The group overnighted at Peters Lake and made a flight over the coastal plain stopping briefly in Kaktovik before departing for a two day float trip on the Canning River.





Jan Riffe and Bob Jantzen at Peters Lake on a VIP trip of the refuge.

J. Stroeble

On August 9, staff members from the House Interior Committee made a brief visit to Kaktovik.

On August 18, Acting Refuge Manager John Martin accompanied Don Knowles, a staff person of the Senate Interior Department Appropriations Sub-Committee on a tour of the refuge, stopping at Kaktovik and Old John Lake. Larry Pank, Gerald Garner, and Bill Palmisano accompanied Richard Smith, Director of Research on a visit to the refuge from August 1 to 3. Future needs for research related to gas and oil development were discussed.

Larry Pank accompanied Paul Vohs, Director of Denver Wildlife Research Center on a visit to the refuge on July 4 and 5, stopping at Beaufort Lagoon.

### 3. Credits

As usual, the narrative was a cooperative effort by the staff. Special thanks is due Gayle Hudson and Carol Tate for suffering through numerous drafts, redrafts, and editorial changes enroute to the final copy.



Crowley Maritime barges in "hard water" on Arey Spit just west of Barter Island. The barges broke loose from moorings at Prudhoe Bay during a late summer storm and didn't get back to Prudhoe Bay until the summer of 1983.

R. Bartels

#### K. FEEDBACK

The ANWR spent much of 1983 reconciling the inherent conflicts which occur when major economic activities are mandated in a sensitive wildlife/defacto wilderness area. ANILCA provided a very strong mandate that exploration of the Coastal Plain of the ANWR would occur accompanied by an equally strong mandate that the exploration would occur in an environmentally sensitive manner.

This has been a new experience for everyone on the ANWR staff and indeed their is little precedent for such a program anywhere. The congressional mandates are strong, unique, and specific.

The "1002" program has provided unusual opportunities, challenges and inevitably problems. Probably nowhere in the NWRS has such a detailed study of a large area, with major wildlife populations been undertaken. Yet it is with frustration that we see 90% or more of the refuge budget focused on 6% of the refuge, however, the priorities dictate.

Philosophically, we wrestle with the reality of cat trains traversing the last untouched area of the arctic coastal plain. Images of the impacts that have



occurred to the west of the refuge drive home and reinforce our awareness that this seismic program must be different. Yet, the bottom line is our philosophical bent has no bearing on the issue.

Probably no single program in the NWRS enjoys/suffers such national attention and concern. There are advantages as well as liabilities to this. By 1986 when the report to Congress is made, the entire staff will have witnessed and participated in a true life experience in bio-politics.

Fortunately industry is aware that this is not business as usual. I will be benevolent and attribute their concern to altruism, but for whatever reason, from management down to the cooks and cat skimmers the people are aware that this is not an ordinary program.