LIBRARY
ARLIS/USFWS
ANCHORAGE, ALASKA
Est. 1997
Anchorage

ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Homer, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1985

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

US FISH & WILDLIFE SERVICE--ALASKA
3 4982 00020970 9

SPEC
COLL
NARR
AMNWR
1985

HOMER OFFICE

ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Homer, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1985

Merged With
ARLIS
ANCHORAGE, ALASKA
Est. 1997

Library
U.S. Fish & Wildlife Service
1011 E. Tudor Road
Anchorage, Alaska 99503

U. S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

HOMER OFFICE
ALASKA MARITIME NATIONAL WILDLIFE REFUGE
HOMER, ALASKA

ANNUAL NARRATIVE REPORT
CALENDAR YEAR 1985

Refuge Manager Date Refuge Supervisor Review Date 3/24/86

Regional Office Approval Date 7/1/86

US FISH & WILDLIFE SERVICE--ALASKA
3 4982 00020970 9

INTRODUCTION

The 3,500,000 ac. Alaska Maritime National Wildlife Refuge (AMNWR) was established in 1980 by the Alaska National Interest Lands Conservation Act (ANILCA). This act added 460,000 ac of additional lands to eleven existing refuges combining practically all coastal refuge areas under one office. There are about 3,000 headlands, islands, islets, and pinnacle rocks within the refuge. These areas are used annually by about 30 million nesting seabirds representing about 75% of Alaska's seabird population.

Each of the eleven refuges included in the AMNWR had their own establishing authority and purposes but ANILCA supersedes these stating management shall 1) conserve fish and wildlife populations and habitats in their natural diversity; 2) fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats; 3) provide the opportunity for continued subsistence uses by local residents; 4) provide a program of national and international scientific research on marine resources; and 5) ensure, to the maximum extent practicable, water quality and necessary water quantity within the refuge. ANILCA also established five distinct geographic refuge units: The Chukchi Sea Unit (CSU), The Bering Sea Unit (BSU), The Aleutian Islands Unit (AIU), The Alaska Peninsula Unit (APU), and The Gulf of Alaska Unit (GAU)(See maps).

The entire Alaska Maritime National Wildlife Refuge complex is administered from the port town of Homer, Alaska, located on the south end of the Kenai Peninsula about 220 mi by road from Anchorage. There is a sub-headquarters at Adak, on the Aleutian Islands, which administers the AIU. All other units are administered from Homer. Homer receives funds from the Regional Office. Adak receives a portion of the funds from Homer and the remainder is used to manage the other units and the Homer office. Personnel are managed in much the same way with the AIU having a separate staff and the other unmanned units operating from Homer.

The sea is common to all refuge areas, but each unit has its own unique features. Lush rain forests dominate much of the precipitous small islands in the GAU; there are mountains rising directly from the sea to over 9,000 ft on the volcanic and treeless AIU; and treeless areas of permafrost and high coastal escarpments are found in the CSU.

Overall remoteness, bad weather and accompanying rough seas, swift currents, rocky shorelines, poor anchorages, and high cost of transportation make administration of the refuge difficult. Recent interests in the oil-rich areas off Alaska's coast, increased demand for fishery stocks, increased population, and increases in efficient and more comfortable tourist transportation to remote areas are adding to management responsibilities of the refuge.

INTRODUCTION Page

TABLE OF CONTENTS i

A. HIGHLIGHTS 1

B. CLIMATIC CONDITIONS

1. Climatic.....Nothing to report

C. LAND ACQUISITION

1. Fee title.....Nothing to report
2. Easements.....Nothing to report
3. Other.....Nothing to report

D. PLANNING

1. Master Plan.....1
2. Management Plan.....Nothing to report
3. Public Participation.....Nothing to report
4. Compliance with Environmental and Cultural Resource Mandates.....Nothing to report
5. Research and Investigations.....Nothing to report
6. Other.....Nothing to report

E. ADMINISTRATION

1. Personnel.....2
2. Youth Programs.....3
3. Other Manpower Programs.....Nothing to report
4. Volunteer Program.....3
5. Funding.....4
6. Safety.....5
7. Technical Assistance.....Nothing to report
8. Other.....8

F. HABITAT MANAGEMENT

1. General.....Nothing to report
2. Wetlands.....Nothing to report
3. Forests.....Nothing to report
4. Croplands.....Nothing to report
5. Grasslands.....Nothing to report
6. Other Habitats.....Nothing to report
7. Grazing.....Nothing to report
8. Haying.....Nothing to report

9. Fire Management.....Nothing to report
10. Pest Control.....Nothing to report
11. Water Rights.....Nothing to report
12. Wilderness and Special Areas.....Nothing to report
13. WPA Easement Monitoring.....Nothing to report

G. WILDLIFE

1. Wildlife Diversity.....Nothing to report
2. Endangered and/or Threatened Species.....Nothing to report
3. Waterfowl.....Nothing to report
4. Marsh and Water Birds.....Nothing to report
5. Shorebirds, Gulls,Terns & Allied Species.Nothing to report
6. Raptors.....Nothing to report
7. Other Migratory Birds.....Nothing to report
8. Game Mammals.....Nothing to report
9. Marine Mammals.....Nothing to report
10. Other Resident Wildlife.....Nothing to report
11. Fisheries Resources.....Nothing to report
12. Wildlife Propagation and Stocking.....Nothing to report
13. Surplus Animal Disposal.....Nothing to report
14. Scientific Collections.....Nothing to report
15. Animal Control.....Nothing to report
16. Marking and Banding.....Nothing to report
17. Disease Prevention and Control.....Nothing to report

H. PUBLIC USE

1. General.....9
2. Outdoor Classrooms - Students.....Nothing to report
3. Outdoor Classrooms - Teachers.....Nothing to report
4. Interpretive Foot Trails.....Nothing to report
5. Interpretive Tour Routes.....Nothing to report
6. Interpretive Exhibits/Demonstrations.....Nothing to report
7. Other Interpretive Programs.....9
8. Hunting.....Nothing to report
9. Fishing.....Nothing to report
10. Trapping.....Nothing to report
11. Wildlife Observation.....Nothing to report
12. Other Wildlife Oriented Recreation.....Nothing to report
13. Camping.....Nothing to report
14. Picnicking.....Nothing to report
15. Off-Road Vehicling.....Nothing to report
16. Other Non-Wildlife Oriented Recreation...Nothing to report
17. Law Enforcement.....9
18. Cooperating Associations.....10
19. Concessions.....Nothing to report

I. EQUIPMENT AND FACILITIES

1. New Construction.....Nothing to report
2. Rehabilitation.....Nothing to report
3. Major Maintenance.....Nothing to report

4. Equipment Utilization and Replacement.....10
5. Communications Systems.....Nothing to report
6. Computer Systems.....10
7. Energy Conservation.....Nothing to report
8. Other.....Nothing to report

J. OTHER ITEMS

1. Cooperative Programs.....Nothing to report
2. Other Economic Uses.....Nothing to report
3. Items of Interest.....10
4. Credits.....11

K. FEEDBACK 12

A. HIGHLIGHTS

Vessel charter for the 122 day program was the best ever.

D. PLANNING

1. Master Plan

The Alaska National Interest Lands Conservation Act (ANILCA) requires all Alaskan refuges to prepare a Comprehensive Conservation Plan (CCP). These plans are to serve as the station master plan and will be initiated by a special planning team from the regional office. The primary objectives of the comprehensive plans are to (a) inventory and describe the resources and values of the refuge, (b) specify management programs for conserving fish and wildlife resources and/or values, (c) specify other compatible uses, and (d) specify opportunities for fish and wildlife oriented recreation, research, etc.

The revised AMNWR schedule is as follows:

Activity	Date
"Alternatives and Effects" draft complete	3/28/86
Finalize "Alternatives and Effects"	4/25/86
Scoping complete	5/15/86
Assess impacts and effects	10/30/86
Identify preferred alternative	11/15/86
Inhouse draft of document	12/15/86
Publish draft of document	1/15/87
Distribute document	3/30/87
Public review of document complete	6/30/87
Publish final document	10/15/87
Protest period complete	12/02/87

The schedule for the AMNWR CCP was accelerated and active involvement by the planning team and refuge staff has been initiated. In June we provided input to the team for listing all lands included on the refuge. In August, two members of the planning team, Vivian Mendenhall and Poppy Benson accompanied the charter vessel NORPAC from Adak to Homer to familiarize them with the remote and inaccessible lands typical of the refuge. In October, the biologists provided basic input to the "Affected Environment" section of the CCP. In November and December a mailing list of interested persons to be contacted during the planning process was compiled.

E. ADMINISTRATION

Homer Office Personnel

Left to right: Mike Nishimoto, Trina Fellows, Ed Bailey, Carol Hagglund, Tom Early, Vernon Byrd, John Martin

1. Personnel

Permanent Full Time

1. John L. Martin, Refuge Manager, GS-13,EOD 12-21-81
2. Tom J. Early, Assistant Refuge Manager, GS-11,EOD 8-23-81
3. Edgar P. Bailey, Refuge Biologist, GS-11, EOD 10-01 81
4. Mike Nishimoto, Refuge Biologist, GS-11, EOD 4-15-84
5. G. Vernon Byrd, Refuge Biologist, GS-11, EOD 4-29-84, Intermittent.
6. Carol M. Hagglund, Budget Assistant, GS-7, EOD 08-21-83
7. Trina B. Fellows, Clerk-Typist, GS-3, EOD 11-28-83

Temporary

1. Paul R. Sievert, 6/03/85 - 11/08/85
2. Barbara L. Slater, 6/03/85 - 10/18/85

SCA

1. Janie P. Brixey, 6/17/85 - 9/01/85
2. Lisa Climo, SCA, 3/11/85 - 6/28-85

YCC

1. Donna Jones 6/13/85 - 8/23/85

Volunteers

1. Tony Berto, 6/02/85 - 9/01/85
2. Brian Cooper, FT -7/06/85 - 7/20/85
3. Lisa Climo 6/29/85 - 9/14-85
4. Donald Dragoo, 6/02/85 - 9/09/85
5. Nina Faust, 5/28/85 - 7/02/85
6. Stewart I. Fefer, 7/02/85 - 7/20/85
7. Carolyn Fleshman, 7/06/85 - 7/18/85
8. Orcutt W. Frost, 5/02/85 - 5/13/85
9. Steven R. Kirkhorn, 7/06/85 - 7/20/85
10. Gary A. Lyon, 7/06/85 - 7/20/85
11. David McCargo, 5/02/85 - 7/02/85
12. Susan McLane, PT 7/1/85 - 7/30/85
13. Harold Smith, PT 7/1/85 - 7/30/85
14. Alan M. Springer, 7/25/85 - 7/31/85
15. Wayne Torp, 5/02/85 - 7/02/85
16. Gregory Thomson, 5/02/85 - 7/02/85
17. Michael N. Witter, 9/03/85 - 9/17/85
18. Don Williamson, 7/23/85 - 7/30/85

Breakdown of Homer office employees by fiscal year:

	Permanent			Total
	Full-Time	Part-Time	Temporary	FTE
FY 1981	1	0	0	0.14
FY 1982	3	0	0	2.75
FY 1983	3	0	2	3.80
FY 1984	6	1	0	6.50
FY 1985	7	0	2	6.50

2. Youth Programs

Donna Jones was our only YCC student this year. Donna was a Junior at Homer High School and did an very good job for us this year. She was involved in wildlife surveys in Kachemak Bay, routine administrative duties, and I&R programs aboard tour boats in the Homer area.

4. Volunteer Program

A total of 19 volunteers were employed through the Homer office during the year. Several were on full-time status while others contributed only several hours per day, depending on the assignment. The volunteer program provided a positive aspect to our refuge operations as well as a positive image by the local people of the refuge. All volunteers except Susan McLane and Harold Smith were full-time employees during their tenure. Most worked almost exclusively in the field following some initial work preparing for the field season at Homer.

Lisa Climo was a Student Conservation Association (SCA) volunteer this year. Following her SCA commitment, she remained on as a refuge volunteer. Lisa worked for the first half of her tenure in the Homer office assisting with

ordering field supplies, packing for field crews, running miscellaneous errands, and typing. The remainder of the time was spent on several field projects in the Bering Sea and Gulf of Alaska Units. Lisa was employed by National Marine Fisheries Service as a Foreign Fisheries observer after her departure.

Patricia "Janie" Brixey, also a SCA volunteer, worked primarily in the office during her tenure. Janie assisted with wildlife surveys of Kachemak Bay, typing, filing, and cleaning field gear. She left in early September to pursue her M.S. degree at Auburn University.

Tony Berto and Don Dragoo spent June thru August assisting with seabird plot work on the Pribilofs after initial training and work in Homer. Stewart Fefer was on loan to us from Hawaiian Island NWR assisting with the establishment of plots on the Pribilofs. Brian Cooper, Carolyn Fleshman, Steve Kirkhorn, Gary Lyon, and Mike Witter worked in the BSU at either the Pribilofs or St. Matthew Island. Professor Orcutt "Jack" Frost volunteered from Alaska Pacific University in Anchorage to assist us with setting up camp on the Shumagins (APU) and surveying these islands in context with historical notes on Georg Steller's expedition in the area. Nina Faust, David McCargo, Wayne Torp, and Greg Thomson all worked on the fox eradication effort in the APU. Susan McLane, Harold Smith, and Don Williamson all worked in the GAU and Alan Springer assisted with the Cape Lisburne survey in the CSU.

5. Funding

Funding for the Alaska Maritime National Wildlife Refuge (AMNWR) is through the Homer headquarters. The funds are then internally distributed between Homer and the Aleutians Islands Unit (AIU) at Adak. The funding for AIU is discussed in that unit's section. All other unit funds are distributed from the Homer office. Following is a summary of the total refuge funding:

	1260 Wildlife Resources	1480 Endangered Species	1520 Youth Program Corps	Total
FY-82	346,000	75,000	0	421,000
FY-83	730,000	250,000	0	980,000
FY-84	1,124,000	245,000	0	1,369,000
FY-85	1,110,000	239,000	3,010	1,352,010
FY-86	969,000	246,000	4,410	1,219,410

Rental receipts for quarters maintenance (8610), previously subactivity (1994), were not included since there has been considerable latitude in where those funds were used. In FY82 and FY83, the funds collected were used at the station where collected. In FY84 the funds were retained in the

regional office for distribution on a "need" basis. Beginning in January of FY85, 90% of the funds collected were to be used at the station where collected, and would remain available until expended.

In FY82 the vessel charter costs came out of the regional office budget. Since then, all charter costs have come from the refuge budget.

Accelerated Refuge Maintenance Management (ARMM) projects accounted for $580,000 of FY84; and $543,000 of FY85; and $349,600 of the FY86 funding advance.

A comparison of FY82 to FY86 Homer funding is as follows:

	1260 Wildlife Resources	1480 Endangered Species	1520 Youth Program Corps	Total
FY82	230,000	31,000	0	261,000
FY83	462,200	155,400	0	617,600
FY84	502,500	140,000	0	642,500
FY85	615,000	140,000	2800	757,800
FY86	501,640	141,195	3010	645,845

The Alaska Maritime National Wildlife Refuge is headquartered in the Ross Duncan building located on Pioneer Avenue in downtown Homer. A total of $59,400 (which includes utilities, snow and refuse removal) was paid for approximately 4,032 sq ft of leased office/storage space in FY85.

6. Safety

No lost time accidents were reported for the year. Assistant Manager Early is the Station Safety Officer. Monthly safety meetings are scheduled the first Monday of each month with permanent staff members attending.

The following is a list of the monthly meetings:

Month	Subject
January	Winter Walking Safety
February	Hand tool/Appliance Safety
March	Cold Weather Safety
April	Boating/Survival/Comprehensive First Aid & CPR
May	Back Country Skiing/Hiking Safety
June	Office Safety
July	Home Safety
August	Lifting Moving Safety
September	Gun/Hunting Safety
October	Fire Prevention
November	Winter Driving Safety
December	Winter Recreation Safety

The session in April involved several field volunteers as well as the permanent staff. We used the local high school swimming pool and practiced donning survival suits in the water, being in the water with hip boots, using floatation coveralls and being in the water with field gear on. Another similar session was held in early June for personnel going to the Pribilofs. All personnel are required to put a survival suit on and use it in the water prior to being on a refuge boat. This exercise is very effective in familiarizing people with a survival suit, as well as giving them confidence in their use. Incidentally, we did find that several of the suits leaked slightly and they were sent in immediately for repair.

The video and workbook series entitled "Sea Survival", "Shore Survival", "Hypothermia", and "Cold Water Near Drowning" is available and used. These are made by the University of Alaska, Cooperative Extension Service, the U.S. Coast Guard, and the Kodiak Community College.

We are attempting to purchase a VHF radio and depth recorder to improve the Safety features of a 25-foot Whaler used in Kachemak Bay and Cook Inlet. WB Nishimoto attended the regional dive board meeting in Sitka where he participated in a mock sea rescue with the U.S. Coast Guard helicopter. The staff also completed first aid and CPR training given by personnel from the local fire department. The entire safety training was one of the best we have seen. Instruction by practicing professionals added an invaluable dimension to the training exercise.

8. Other

On April 1 the Regional Wildlife Resources Program Evaluation team reviewed the AMNWR-Homer station. Lynn Fisher (Team Leader, Program Coordinator), Joe Mazzoni (DARD,WR), Larry Calvert (Refuge Supervisor, South) and Mike Boylan (ORP, Kenai NWR) made up the review team. Primary purposes of the evaluation were to foster communication among various organizational levels, to improve the efficiency and effectiveness of service activities, and to provide the opportunity for the RD, ARD, and their staff to gain insight and understanding of issues and concerns of the AMNWR. Several of the points addressed and actions indicated are listed below:

Coordination and Cooperation

1. Lack of regional office responsiveness.
2. Excellent working relations of AMNWR staff with other federal agencies.
3. Coordination and Cooperation by AMNWR staff with State of Alaska is very good but needs to be expanded where possible.

4. AMNWR should plan to visit more villages each year to foster understanding and acceptance of FWS programs and policies.
5. Region 7 needs a wilderness management policy
6. Interim grazing policy needed for refuge lands subject to disposal.
7. Determine authority and responsibility for management of refuge owned offshore water and bottom areas.
8. Need for refuge to document 810 determinations completed prior to issuing a SUP

Program Execution

9. Guidance needed by RO on use of Regional Resource Plan
10. Compliment Refuge Manager for working with the Program Coordinator development of the Wildlife Resources budget analysis outline.
11. Additional staff required to properly manage the AMNWR with priority order being ORP, Clerk/Typist, Supervisory Wildlife Biologist, Animal Damage and Control Specialist, Wildlife Biologist for CSU, Refuge Manager Trainee, and Vessel Captain.

Program Administration

12. Follow through on Administrative facilities on Pribilofs as identified in ANILCA.
13. Need bunkhouse for Homer volunteers and temporary personnel.
14. Need vessel operating funds beginning in FY87.
15. Need ANILCA Sec.14(h)1 selection reports prepared by the Regional Archaeologist sent to refuge manager.

Biological Program

16. Compliment on seabird management program direction by refuge staff.
17. Need to improve coordination and communication in Alaska seabird management between refuge staff and other service and outside personnel.
18. Input from WA is needed to complete 1982 field report in Aleutians.
19. Develop strategy for addressing seabird nesting colony failures.
20. Complete the Regional Seabird Management Plan.
21. Improve efficiency and effectiveness of seabird field activities conducted by refuge, WA, and RE.
22. Need clearance for use of toxicants to eradicate introduced arctic fox.
23. Fishery resource information needed.

Public Use Program

24. Need AMNWR Public Use Management Plan.
25. Need visitor facility in Homer.

The Homer office funds a charter vessel for use by the entire complex. The vessel was also shared by BIA, Denver Wildlife Research Center - Anchorage Field Station, Wildlife Assistance, University of Alaska Cooperative Wildlife Research Unit, Minerals Management Service, Animal Damage Control, and the Alaska Maritime Refuge Planning Team. This year's vessel and crew were set up for chartering and had experience doing so in the past. The attitude of the crew was more accommodating than previous charters due to, in large part, the past charter experiences. The vessel, the NORPAC, was 85' LOA and a converted shrimp boat.

The NORPAC was chartered for a 122 day period from May 2 to August 31 and provided most of the logistical support for the field projects on this far-flung and remote refuge during the nesting season. The cost of the charter was $213,500 with an additional amount of $23,252.10 spent for fuel. Total cost per use-day was $1,940.59. The costs for chartering, including fuel, for the past four years is presented below.

Charter Year	Vessel Name	Charter Days	Total Cost	Cost/Day
1982	Sea Spray	103	$231,773.59	$2,250.23*
1983	Western Pacific	109	$192,872.97	$1,769.48*
1984	Vestfjord	122	$220,223.00	$1,805.11*
1985	Norpac	122	$236,752.10	$1,940.59

A brief schedule of vessel activities follows:

Date	Activities
5/2	Leave Homer.
5/5-10	Work in APU setting up fox trapping operation on Big Koniuji and reconnaissance of Bird Island.
5/11-25	Work in eastern Aleutians, check for fox sign on Uliaga, Adugak, Amukta, and Kasatochi islands.
5/26-6/5	Work in central Aleutians checking Amchitka for Aleutian Canada geese and Rat Island for fox sign. Transport BIA personnel to Amchitka. Set up field camp for fox evaluation work on Kiska.
6/6-10	Set up goose survey team on Agattu Island and return to Adak.
6/11-18	Assist in logistical support and camp set up for Pribilof seabird survey crew.
6/19-30	Support BIA work at Amchitka, pick up Kiska and Agattu operations and return to Adak.

7/1-24 Support BSU work at St. Paul, St. George, and St. Matthew Islands.

7/25-8/20 Support goose transplant work in western Aleutians between Buldir and Amchitka islands.

8/21-31 Survey islands in eastern Aleutians and APU for fox sign. Orientation to above areas for planning team. Deliver jet fuel to islands in support of cattle eradication efforts. Pick up research personnel on the Semidi Islands. Return to Homer and offload vessel.

H. Public Use

1. General

The present location of the Homer office affords an ideal opportunity for the refuge to establish a viable interpretive and information center. Visitor use in the Homer office is slightly ahead of last year but still at fairly low numbers. A crediting plan was submitted to the regional office of establishment of an Outdoor Recreation Planner (ORP) position at Homer but due to both budget and FTE constraints no action has been taken. Until such a position is created the I&R program has little chance to expand to the potential in the Homer area.

A brochure for the Alaska Maritime Refuge was made up through the PUI office. We initiated the order in January, had input through the summer, and received the order in November. In general, the leaflet is fairly good but the land status map is inaccurate.

7. Other Interpretive Programs

Several programs were conducted in the Homer area throughout the year by various staff members and volunteers. We were active in two seabird programs with the Homer Society of Natural History, with the local schools during the annual "Sea Week" in May and with the Boy Scout Troop.

Input was provided late in the year for a refuge display on an interpretive outdoor Kiosk in Seward adjacent to the Kenai Fjords National Park headquarters. This may be combined with an indoor exhibit in the park headquarters.

17. Law Enforcement

ARM Early and WB Byrd have law enforcement authority on the Homer staff. All incidents were off-refuge and turned over to the FWS agent in Soldotna. We do respond directly to

animal pick-up with species under our jurisdiction. Logistical support and minor assistance was given to agent Soroka to the south side of Kachemak Bay to check waterfowl hunters in December.

18. Cooperating Associations

During the first year of operation in 1984, gross sales at the Homer outlet were $52. In 1985, gross sales totaled $120.15. The outlet had hoped for a better year with improved signing to direct visitors to the main entrance of the visitor area which is located at the rear of the building. Refuge plans to employ a Bio-Tech/Volunteer for interpretive work using the street side office space in the building did not occur as these people were needed for other refuge duties.

The Homer outlet presently carries 15 sales items with the Guide to Wildlife Viewing in Alaska added this year.

Our plans are to keep the outlet open another year with hopes of increasing the level of income and filling the position of an outdoor recreation planner, and/or volunteers for interpretive work.

I. EQUIPMENT AND SUPPLIES

4. Equipment Utilization and Replacement

The 1981 Chevrolet Suburban was repaired for a broken cam in Soldotna in November. Immediate repair of the problem resulted in less than major repairs at a later date.

6. Computer Systems

A Data General 10SP microcomputer with Dbase II is being used to analyze seabird monitoring data. The problem plagued computer has worked surprisingly well with this software. Our experience with a Wordstar program is somewhat different. The computer does not want to exit Wordstar without locking the keyboard. In December our disk was sent to the regional office to resolve the problem. After its return the computer was used for about a day before it dumped all Wordstar files. We discovered that it now will not print with both our CEO wordprocessing program and Wordstar. The computer possibly has a few bugs.

J. OTHER ITEMS

3. Items of Interest

RM Martin is a member of the Kachemak Bay Rotary Club, the Homer Yacht Club, the Kachemak Bay Conservation Society, The

Coast Guard Auxiliary, Rescue 21, the Kachemak Gun Club, and on the Board of Directors for the Kachemak Bay Ski Club. ARM Early is also a member of the Kachemak Bay Rotary Club, the Homer Winter Carnival Committee, and on the Board for the Homer Society of Natural History (Pratt Museum). WB Bailey is on the Board for the Kachemak Bay Conservation Society, member of the Kachemak Bay State Parks Advisory Committee, and serves on the city's Hazardous Wastes Task Force. WB Nishimoto and BA Hagglund are members of the Homer Society of Natural History, Kachemak Bay Conservation Society, and the Alaska National History Association. Clerk/Typist Fellows is on the Board of Directors for the Kachemak Bay Lioness Club, a Foster Mother and a member of the Homer Winter Carnival Committee, the Homer Society of Natural History, and the Alaska Natural History Association.

4. Credits

Sections E.1 and 5 and H.18 were written by BA Hagglund. Section I.6 was written by WB Nishimoto. All other sections were written by ARM Early. The entire report was edited by most of the staff. Typing and final assembly were accomplished by C/T Fellows.

K. FEEDBACK

We have had a number of problems with our Data General Computer. Most have related to the way the system handles the programs we want to use under the MSDOS operating system, but we have also had problems getting printers to work with the AOS system.

Overall it has been a very frustrating process to try to get an operational system of data processing in place. We had an onsite review of our computer needs in February 1985 and were told it would take some time to get the report back with recommendations on software for us to buy to accomplish our major projects. As of the end of the year we had not received the report or any communication about its progress.

In the year since we have had the machine, it has never worked properly, and we have had two major breakdowns that required sending the hard disk to Anchorage. Attempts to correct problems over the telephone have sometimes worked, but it is very cumbersome and often problems can not be resolved in this way.

These problems have been particularly frustrating since we have had no problems with our IBM PC during the period, and it has been the machine we have used the most. If things could be done over we would have been much better off with 4-5 IBM's, the number we could have bought for the price of the DG, but things being as they are we recommend the following:

A team of two people, one "field" biologist and one computer person with detailed knowledge of the 10SP and the MSDOS option, should go to every station with a desk-top DG and spend the time to solve their problems (i.e. assess needs, recommend software, debug existing macros). It may take several years to complete the process, but the alternative has already taken several years and not even started the process. We know what we want to do with the computer, but are having a difficult time trying to get it done with only emergency support from IRM.
It is admirable to try to standardize things region-wide before getting anyone operational, but it is taking too long and it probably will not solve most of the specific biological needs of data processing unique to most areas.

ALASKA PENINSULA UNIT

ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Homer, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1985

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

ALASKA PENINSULA UNIT
ALASKA MARITIME NATIONAL WILDLIFE REFUGE
HOMER, ALASKA

ANNUAL NARRATIVE REPORT
CALENDAR YEAR 1985

Refuge Manager Date Refuge Supervisor Review Date 3/26/86

Regional Office Approval Date

INTRODUCTION

Next to the Aleutian Islands the Alaska Peninsula Unit (APU) encompasses the largest amount of land of any unit of the Alaska Maritime National Wildlife Refuge (AMNWR). This unit includes all federally owned islands, islets, and rocks off the south side of the Alaska Peninsula between Katmai National Park and the tip of the Alaska Peninsula, excluding the Sanak Islands. Over 800 islands totaling roughly 600,000 ac comprise this unit, which incorporates two refuges established before designation of the AMNWR by the Alaska National Interest Lands Conservation Act (ANILCA) in 1980. The Semidi Islands, designated a refuge in 1932, and Simeonof Island, a refuge since 1958, also are the only areas in the APU which extend beyond mean high tide. Seal Cape, a small area south of the village of Chignik, is the only portion of the Unit located on the Alaska Peninsula itself, all other areas being offshore islands. Most of the islands are exceedingly rugged with mountains reaching nearly 2000 ft; a few islands such as Simeonof and Sutwik have numerous lakes and extensive marsh habitat.

Except for the Aleutians, the greatest diversity of breeding seabirds is found along the south side of the Alaska Peninsula. Over 6,000,000 seabirds comprised of at least 25 species nest in this region. Murres, numbering over a million individuals, are among the most common diurnal birds. Although little data are available on breeding numbers of storm-petrels because they are nocturnal and often nest in talus, these birds probably greatly outnumber murres. In some areas, such as in the Sandman Reefs, storm-petrels, Cassin's auklets, and ancient murrelets outnumber all diurnal species combined. The largest aggregation of seabirds along the south side of the Alaska Peninsula is in the Semidi Islands, where approximately 2,400,000 birds representing at least 19 species breed. About one-quarter of the resident seabirds along Alaska's coastline from British Columbia to the tip of the Alaska Peninsula nest in the Semidi Islands. The Semidis are the easternmost breeding site for least auklets, and the easternmost colonies of crested auklets occur in the Shumagins; the rhinoceros auklet reaches the western limit of its range in the Sandman Reefs. Both Cassin's auklets and ancient murrelets appear more numerous off the Alaska Peninsula than elsewhere in the state.

Both harbor seals and Steller's sea lions number in excess of 35,000 animals in the APU region; six sea lion rookeries and many haulouts are present. At least 15,000 sea otters, more than in any other part of the state except the Aleutians, also inhabit this region. Sea otters are particularly abundant in the Sandman Reefs and the Shumagin Islands.

Tundra swans migrate along the Alaska Peninsula, and several pairs nest on a few islands. Thousands of geese, primarily

brant and emperor geese, migrate through the region, and many winter in the Sandman, Shumagin, and Sanak islands. Also, thousands of ducks, predominantly scoters, harlequins, scaup, oldsquaws, mergansers, and eiders, winter there. Common eiders, mallards, teal, and scoters are among the more common nesters. A unique race of Canada geese, a relic population of endangered Aleutian Canada geese, nest on one tiny island in the Semidis. Besides waterfowl a myriad of shorebirds migrate along the Alaska Peninsula, and several species like rock sandpipers also nest locally. Rock sandpipers are probably the most abundant resident species. Red-throated loons nest on some of the islands, and three other species of loons winter in this region.

More than 1500 bald eagles occur along the south side of the Alaska Peninsula; 110 eyries have been recorded on islands. A few golden eagles also inhabit refuge islands, and peregrine falcons nest on several islands, especially near large alcid concentrations. Gyrfalcons, rough-legged hawks, and short-eared owls also occasionally nest in the region.

Surprisingly few of the islands remain truly pristine due to past introductions of foxes, rodents, and ungulates. Foxes were released on 60 islands on the south side of the Alaska Peninsula. They have disappeared or were removed from all but 19 islands. Of these, seven have red foxes, while the others have arctic foxes. Foxes destroyed fossorial and surface-nesting seabird colonies on numerous islands and left only remnant populations on others. More damaging than foxes on some islands are the ground squirrels and voles which were released with them as an added food source besides nesting birds. Irruptions of these rodents on some islands have resulted in severe overuse of vegetation and subsequent erosion. Eradication of rodents is all but impossible on larger islands.

Starting before 1900, cattle, sheep, and goats were introduced to several islands. Cattle remain on seven islands where they continue to locally overgraze and accelerate erosion. Caribou occasionally swim to islands but cause no problems since their use is intermittent. Sutwik is the only sizeable island off the Alaska Peninsula which has escaped introductions of exotic mammals. Brown bears regularly swim to islands and raid seabird colonies, mainly gulls and puffins. The interaction between bears and humans has markedly influenced the distribution and abundance of seabirds on islands. River otters abound on most islands and locally prey on some bird colonies.

Few people visit refuge islands except in the vicinity of villages, primarily Sand Point, Squaw Harbor, and King Cove; six other villages are located in the region. Occasionally local people go ashore on islands to hunt ptarmigan, marine mammals, or waterfowl. Egging and hunting of seabirds is generally negligible in this region where most residents

derive their livelihoods from commercial fishing. Aleuts once lived on most of the larger islands, many of which have rich archaeological resources. In fact, the first contact between Russians and Alaska Natives occurred in 1741 in the Shumagin Islands. The islands thus far have been little affected by offshore oil exploration and development, but exploration has begun in Shelikof Strait to the north and soon will start elsewhere off the Peninsula. Human competition for fish relied upon by marine birds and mammals probably poses their greatest potential threat.

INTRODUCTION Page

TABLE OF CONTENTS i

A. HIGHLIGHTS 1

B. CLIMATIC CONDITIONS 1

C. LAND ACQUISITION

1. Fee Title.....Nothing to report
2. Easements.....Nothing to report
3. Other.....Nothing to report

D. PLANNING

1. Master Plan.....3
2. Management Plan.....3
3. Public Participation.....Nothing to report
4. Compliance with Environmental and Cultural resource Mandates.....Nothing to report
5. Research and Investigations.....4
6. Other.....Nothing to report

E. ADMINISTRATION

1. Personnel.....5
2. Youth Programs.....Nothing to report
3. Other Manpower Programs.....Nothing to report
4. Volunteer Program.....5
5. Funding.....7
6. Safety.....8
7. Technical Assistance.....Nothing to report
8. Other 9

F. HABITAT MANAGEMENT

1. General.....Nothing to report
2. Wetlands.....Nothing to report
3. Forests.....Nothing to report
4. Croplands.....Nothing to report
5. Grasslands.....Nothing to report
6. Other Habitats.....Nothing to report
7. Grazing.....9
8. Haying.....Nothing to report
9. Fire Management.....Nothing to report
10. Pest Control.....Nothing to report

11. Water Rights.....Nothing to report
12. Wilderness and Special Areas.....Nothing to report
13. WPA Easement Monitoring.....Nothing to report

G. WILDLIFE

1. Wildlife Diversity.....Nothing to report
2. Endangered and/or Threatened Species.....13
3. Waterfowl.....13
4. Marsh and Water Birds.....Nothing to report
5. Shorebirds, Gulls, Terns and Allied Species.....14
6. Raptors.....24
7. Other Migratory Birds.....24
8. Game Mammals.....Nothing to report
9. Marine Mammals.....24
10. Other Resident Wildlife.....26
11. Fisheries Resources.....Nothing to report
12. Wildlife Propagation and Stocking.....Nothing to report
13. Surplus Animal Disposal.....Nothing to report
14. Scientific Collections.....Nothing to report
15. Animal Control.....26
16. Marking and Banding.....Nothing to report
17. Disease Prevention and Control.....Nothing to report

H. PUBLIC USE

1. General.....31
2. Outdoor Classrooms-Students.....Nothing to report
3. Outdoor Classrooms-Teachers.....Nothing to report
4. Interpretive Foot Trails.....Nothing to report
5. Interpretive Tour Routes.....Nothing to report
6. Interpretive Exhibits/Demonstrations.....Nothing to report
7. Other Interpretive Programs.....Nothing to report
8. Hunting.....Nothing to report
9. Fishing.....Nothing to report
10. Trapping.....Nothing to report
11. Wildlife Observation.....Nothing to report
12. Other Wildlife Oriented Recreation.....Nothing to report
13. Camping.....Nothing to report
14. Picnicking.....Nothing to report
15. Off-Road Vehicling.....Nothing to report
16. Other Non-Wildlife Oriented Recreation...Nothing to report
17. Law Enforcement.....Nothing to report
18. Cooperating Associations.....Nothing to report
19. Concessions.....Nothing to report

I. EQUIPMENT AND FACILITIES

1. New Construction.....Nothing to report
2. Rehabilitation.....Nothing to report
3. Major Maintenance.....Nothing to report
4. Equipment Utilization and Replacement....Nothing to report

5. Communications Systems.....Nothing to report
6. Computer Systems.....Nothing to report
7. Energy Conservation.....Nothing to report
8. Other.....Nothing to report

J. OTHER ITEMS

1. Cooperative Programs.....Nothing to report
2. Other Economic Uses.....Nothing to report
3. Items of Interest.....31
4. Credits.....32

K. FEEDBACK.....Nothing to report

A. HIGHLIGHTS

Cattle on Simeonof, Chernabura, and Caton islands were finally removed!

Widespread reproductive failure of several species of seabirds noted in the Shumagin and Semidi islands was probably associated with an unusually cold spring.

Visits to Bird Island in the Shumagins tentatively confirmed that all arctic foxes were eliminated the previous year. Nearly all red foxes were eradicated on Big Koniuji Island, but without the authority to use poison in conjunction with traps complete success on large islands is unlikely.

B. CLIMATIC CONDITIONS

Cold Bay provides the only long term weather records available for the south side of the Alaska Peninsula. Intermittent records are available from Sand Point in the Shumagin Islands and from Chignik, which lies 100 mi to the northeast. Sand Point's annual mean temperature is 37.9 F, and it averages 60.3 inches (4-year record) of precipitation. Chignik, one of the wettest stations in the state, averages 127 inches of precipitation and has an annual mean temperature of 38.5 F, based on 8 years of data. Overall the islands south of the Alaska Peninsula experienced a warmer and much wetter year than usual. Temperatures at Cold Bay were below normal only during 4 months; precipitation was below average only during 3 months (see table). Cold Bay witnessed the second wettest year on record. The Shumagin Islands, however, experienced an exceptionally cold spring, which evidently depressed reproductive success of seabirds in general.

While we were stationed on Big Koniuji Island during May and June chiefly to remove introduced fox, snow frequently fell and sometimes persisted on the ground at sea level for up to a day. Snow was recorded as late as 17 June and temperatures to near 20 F were noted, which is most unusual so late in the spring.

Climatological data for Cold Bay, Alaska - 1985.

	Temperature (F)						Precipitation (in.)			Wind (mph)
Month	Ave. Max.	Extreme	Ave. Min.	Extreme	Monthly mean	Departure from mean (40 yrs.)	Water Equivalent	Snow	Departure from mean	Mean speed
Jan.	39.8	45	32.4	19	36.1	+7.8	3.29	4.2	+0.59	19.5
Feb.	33.1	45	22.6	-2	27.9	+0.4	2.42	8.2	0.15	18.1
Mar.	34.6	44	25.6	12	30.1	+1.5	2.85	28.6	+0.54	20.7
Apr.	32.3	40	21.2	05	26.8	-6.2	1.01	8.8	-0.94	18.9
May	43.2	52	33.3	24	38.3	-1.2	2.45	1.5	-0.02	19.4
June	47.6	68	37.3	32	42.5	-2.9	2.19	0.4	+0.03	18.1
July	55.0	65	46.2	42	50.6	+0.3	2.27	0	-0.23	14.7
Aug.	55.4	63	46.1	40	50.8	-0.4	5.47	0	+1.77	19.0
Sept.	54.9	76	44.1	34	49.5	+2.0	7.17	0	+3.37	18.0
Oct.	44.0	58	35.1	27	39.6	+0.1	6.59	2.8	+2.30	19.2
Nov.	42.3	49	35.5	24	38.9	+4.6	7.72	1.1	+3.68	21.3
Dec.	39.2	44	31.9	17	35.6	+6.1	4.95	12.0	+2.10	17.2
Total	43.3	78	34.3	-2	38.8	+0.8	48.35	65.0	12.76	18.7

D. PLANNING

1. Master Plan

The Alaska National Interest Lands Conservation Act (ANILCA) requires all Alaskan refuges to prepare a Comprehensive Conservation Plan (CCP). These plans are to serve as the station master plan and will be initiated by a special planning team from the regional office. The primary objectives of the comprehensive plans are to (a) inventory and describe the resources and values of the refuge, (b) specify management programs for conserving fish and wildlife resources and /or values, (c) specify other compatible uses, and (d) specify opportunities for fish and wildlife oriented recreation, research, etc.

The revised AMNWR schedule is as follows:

Activity	Date
"Alternatives and Effects" draft complete	3/28/86
Finalize "Alternatives and Effects"	4/25/86
Scoping complete	5/15/86
Assess impacts and effects	10/30/86
Identify preferred alternative	11/15/86
Inhouse draft of document	12/15/86
Publish draft of document	1/15/87
Distribute document	3/30/87
Public review of document complete	6/30/87
Publish final document	10/15/87
Protest period complete	12/02/87

The schedule for the AMNWR CCP was accelerated and active involvement by the planning team and refuge staff has been initiated. In June we provided input to the team for listing all lands included on the refuge. In August , two members of the planning team, Vivian Mendenhall and Poppy Benson accompanied the charter vessel NORPAC from Adak to Homer to familiarize them with the remote and inaccessible lands typical of the refuge. In October, the biologists provided basic input to the "Affected Environment" section of the CCP. In November and December a mailing list of interested persons to be contracted during the planning process was compiled.

2. Management Plan

Final reversions on the wildlife inventory plans are awaiting completion of the seabird censusing techniques manual being written by the Research staff in Anchorage and are awaiting the delineation of census plots in the Shumagins.

5. Research & Investigations

AMNWR NR85-Ecology and Reproductive Success of seabirds in the Semidi Islands (FWS-Research)(74500-APU-27).

Personnel from the Alaska Fish and Wildlife Office of Research (biologists Scott Hatch, Gerry Sanger, and two volunteers) visited the Semidi Islands during the latter half of August. Transportation to the islands was provided by USCGC SEDGE on 12-13 August; return was by way of the refuge charter vessel NORPAC on 28-29 August. The primary objectives of the field work were: (1) to estimate annual productivity of black-legged kittiwakes, tufted and horned puffins, northern fulmars, and Leach's and fork-tailed storm-petrels, (2) to band up to 5000 nestling fulmars, (3) to collect samples of foods fed to nestlings of selected species, (4) to install artificial nest boxes for tufted and horned puffins on Suklik Island, and (5) to census Canada geese on Kiliktagik Island.

All objectives were accomplished except the fulmar banding, which was dropped from the agenda due to the poor productivity of fulmars in 1985. A check of permanent study plots on Chowiet Island indicated that fulmars had only about 7% breeding success (through the mid-chick stage), compared with 70% in the best year previously observed and 50% average annual production. This was the lowest production observed in 8 years since 1976, and meant that too few young were in nest sites to warrant an intensive banding effort. Similarly, black-legged kittiwakes experienced total breeding failure this year at the Semidis. By contrast, 71% of 100 horned puffin burrows contained chicks on 16 August, as did 68% of 50 tufted puffin burrows. Both values indicate a relatively high level of breeding success in puffins.

The results for storm-petrels were mixed. Both species nest in abundance on Suklik Island, but it is generally not possible to identify burrows to species from external signs. Observations in other years, however, have indicated the species ratio on Suklik is approximately 50:50. We opened 100 burrows on 22 August and found 43 Leach's storm-petrel chicks, 5 fork-tailed storm-petrel chicks, 35 empty burrows, and small numbers of dead chicks and live or addled eggs. This suggested that Leach's storm-petrels had good to excellent breeding success in 1985, whereas fork-tailed storm-petrels had very poor success. The reasons for this difference are not clear, but the finding agrees with observations of these two species on St. Lazaria Island by J. L. Trapp and others in July.

Time available from not banding fulmars was used mainly to collect food samples from tufted and horned puffins on Suklik Island. Thus, 323 samples were obtained, the largest collection of its kind yet obtained for puffins in Alaska.

The analysis of this material is just now (January) being completed in the lab.

Ten nest boxes were installed on Suklik Island, five designed for horned puffins and five for tufted puffins. Observations in 1986 and beyond will indicate whether this technique has potential for facilitating research and management of these species.

Kiliktagik Island was first visited on 21 August to count Canada geese. Four persons walking over the island flushed 44 adult-plumaged birds and located a family group containing three flightless young. On 25 August, Anowik Island was surveyed by foot, and it was a surprise to find 52 adult-plumaged birds in one flock in the low, central portion of the island. Therefore we returned the same day to Kiliktagik and recounted the geese there, finding only 11. Apparently, most of the flight-capable geese had moved to Anowik since our 21 August visit to Kiliktagik, probably to forage on the abundant crowberry available on Anowik. That pattern of habitat use had not been noted previously at the Semidis, but may occur late in the season each year as the birds prepare for the fall migration.

E. Administration

1. Personnel

Permanent Full Time

1. John L. Martin, Refuge Manager, GS-13, EOD 12-21-81
2. Tom J. Early, Assistant Refuge Manager, GS-11, EOD 08-23-81.
3. Edgar P. Bailey, Refuge Biologist, GS-11, EOD 10-01-81.
4. Mike Nishimoto, Refuge Biologist, GS-11, EOD 4-15-84
5. G. Vern Byrd, Refuge Biologist, GS-11, EOD 4-29-84

Intermittent

6. Carol M. Hagglund, Budget Assistant, GS-7, EOD 08-21-83
7. Trina B. Fellows, Clerk-Typist, GS-3, EOD 11-28-83

Volunteers:

8. Nina Faust, 5/28/85 - 7/02/85
9. Dave McCargo, 5-02-85 - 7-02-85
10. Orcutt W. Frost, 5/02/85 - 5/13/85
11. Wayne Torp, 5/02/85 - 7/02/85
12. Gregory Thomson, 5/28/85 - 7/02/85

4. Volunteer Program

For the fourth successive summer David McCargo ably assisted our fox trapping and seabird surveying activities. Wayne Torp, Nina Faust, and Greg Thomson also aided in the removal

"Steller Lake," the site where Steller suggested procuring water rather than from the brackish pond which was used. Bering's crew left a wrecked yawl on this beach after being forced ashore after returning from Turner Island.
5/85 E.P.B.

The "St. Peter" anchored between Near Island in the background and Nagai in August 1741. Dr. Jack Frost, a scholar on Bering's voyage to Alaska was thrilled to actually be able to visit the still remote isles Steller went ashore on.
5/85 E.P.B.

of foxes from Big Koniuji Island and in collecting information on seabird reproductive success.

5. Funding

Funding for the Alaska Maritime National Wildlife Refuge (AMNWR) is through the Homer headquarters. The funds are then internally distributed between Homer and the Aleutians Islands Unit (AIU) at Adak. The funding for AIU is discussed in that unit's section. All other unit funds are distributed from the Homer office. Following is a summary of the total refuge funding:

	1260 Wildlife Resources	1480 Endangered Species	1520 Youth Program Corps	Total
FY82	346,000	75,000	0	421,000
FY83	730,000	250,000	0	980,000
FY84	1,124,000	245,000	0	1,369,000
FY85	1,105,000	245,000	3,010	1,352,010
FY86	969,000	246,000	4,410	1,219,410

Rental receipts for quarters maintenance (8610), previously subactivity (1994), were not included since there has been considerable latitude in where those funds were used. In FY82 and FY83, the funds collected were used at the station where collected. In FY84 the funds were retained in the regional office for distribution on a "need" basis. Beginning in January of FY85, 90% of the funds collected were to be used at the station where collected, and would remain available until expended.

In FY82 the vessel charter costs came out of the regional office budget. Since then, all charter costs have come from the refuge budget.

Accelerated Refuge Maintenance Management (ARMM) projects accounted for $580,000 of FY84: and $543,000 of FY85: and $349,600 of the FY86 funding advance.

A comparison of FY82 to FY85 Homer funding is as follows:

	1260 Wildlife Resources	1480 Endangered Species	1520 Youth Program Corps	Total
FY82	230,000	31,000	0	261,000
FY83	462,200	155,400	0	617,600
FY84	502,500	140,000	0	642,500
FY85	615,000	140,000	2800	757,800
FY86	501,640	141,195	3010	645,845

The Alaska Maritime National Wildlife Refuge is headquartered in the Ross Duncan building located on Pioneer Avenue in

downtown Homer. A total of $59,400 (which includes utilities, snow and refuse removal) was paid for approximately 4,032 sq ft of leased office/storage space in FY85.

6. Safety

No lost time accidents were reported for the year. Assistant Manager Early is the Station Safety Officer. Monthly safety meetings are scheduled the first monday of each month with most permanent staff members attending.

The following is a list of the monthly meetings:

Month	Subject
January	Winter Walking Safety
February	Hand Tool/Appliance Safety
March	Cold Weather Safety
April	Boating/Survival/Comprehensive First Aid & CPR
May	Back Country Skiing/Hiking Safety
June	Office Safety
July	Home Safety
August	Lifting/Moving Safety
September	Gun/Hunting Safety
October	Fire Prevention
November	Winter Driving Safety
December	Winter Recreation Safety

The session in April involved several field volunteers as well as the permanent staff. We used the local high school swimming pool to practice donning survival suits in the water, being in the water with hip boots, using floatation coveralls and being on the water with field gear on. Another similar session was held in early June for personnel going to the Pribilofs. All personnel are required to put a survival suit on and use it in the water prior to being on a refuge boat. This exercise is very effective in familiarizing people with a survival suit, as well as giving them confidence in their use in the cold ocean waters. Incidentally, we did find that several of the suits leaked and they were sent in immediately for repair.

The video and workbook series entitled "Sea Survival", "Shore Survival", "Hypothermia", and "Cold Water Near Drowning" is available and used. These are made by the University of Alaska, Cooperative Extension Service, the U.S. Coast Guard, and the Kodiak Community College.

We are attempting to purchase a VHF radio and depth recorder to improve the Safety features of a 25-foot Whaler used in Kachemak Bay and Cook Inlet. WB Nishimoto attended the regional dive board meeting in Sitka where he participated in a mock sea rescue with the U.S. Coast Guard helicopter. The staff also completed first aid and CPR training given by personnel from the local fire department. The entire safety training was one of the best we have seen. Instruction by

practicing professionals added an invaluable dimension to the training exercise.

8. Other

Three Special Use Permits (SUP) were issued to the U. S. Geological Survey for the APU. Two were to conduct studies through the Alaska Mineral Resource Assessment Program, Section 1010 ANILCA, in the Pavlof and Shumagin Island Groups. Another SUP was issued to the office of Earthquakes, Volcanoes, and Engineering to place strain gauges in the Shumagin Islands.

A SUP was issued to ARCO-Alaska to conduct surficial geological surveys in the Shumagin and Pavlof islands.

A commercial fishing setnet site SUP was issued to an individual for Guillemot Island, near Cold Bay.

A SUP was issued to the U.S. Army Corps of Engineers to survey and inventory Caton Island World War II debris in accordance with the Defense Environmental Restoration Account (DERA) project.

A SUP was issued to Columbia University's Lamont-Doherty Geological Observatory to maintain seismic stations on Big Koniuji, Chernabura, Deer and Najai Islands.

The 17th U.S. Coast Guard District was issued a SUP to construct and maintain navigational aids on Korovin and Deer islands.

F. Habitat Management

7. Grazing

The year began with ten islands being grazed by cattle and only one of these was under a Special Use Permit. Caton, Chernabura, and Simeonof islands have not been under a permit for several years and the cattle were declared excess property after being abandoned by the grazing permittees. In 1982, GSA put the cattle from these areas up for public sale. After several awards were issued only a small percentage of the cattle were ever removed. Finally in July 1984, the areas were opened to free public take of cattle. This resulted in an estimated 50 animals taken on all three areas. The Shumagin Native Corporation has been interested in transplanting up to 100 animals to Unga Island from Simeonof Island. Unga is adjacent to the village of Sand Point and about 50 miles closer to their village than Simeonof.

In late February the Corporation, upon request, sent us a plan for removal of cattle from Simeonof Island. They

requested to be allowed until September to complete removal of cattle due to problems in lining up barge support and the fact that most people will be fishing during the summer months.

On March 18 to 21 Early and Tom Hutchison (ADC-Casper, WY) went to Simeonof via a chartered Bell 206 helicopter and culled 110 animals, mainly old herd bulls and a few older cows. This was done for several reasons: to reduce range damage to the island, to make the remaining animals easier to herd, and to begin the process of cattle eradication. Fifteen animals were salvaged by two boats that were in the area.

During the winter and spring about six unsolicited requests for government support to private individuals or companies to remove the cattle were received. All were either too expensive, incomplete, or required too long a time frame for completion.

In August the FWS made a commitment to the Shumagin Corporation to provide helicopter support, the use of one FWS person, and up to $7,500 to cover barge costs for the herding and transplant of cattle from Simeonof to Unga Island. On September 16 Early and a chartered helicopter with pilot went to Simeonof to assist in the herding operation and eradicate remaining cattle on Simeonof Island. It was evident after an initial roundup and breakout of these wild animals on Simeonof that the larger animals could not be held by the available fencing and corral facilities. It was mutually decided to shoot the estimated 110 adult animals and try to herd only the young ones. After this was accomplished however, only ten of the nearly thirty calves were actually corralled and transported. Ten escaped just as they were entering the corral when the helicopter's tail roter struck the ground and crash landed near the corral. A total of 139 cattle were shot on Simeonof with 40 of those salvaged by the Natives.

In a split two day operation on September 24 and 25, 140 head were shot on adjacent Chernabura Island by use of a helicopter. This operation went very smoothly and no one was interested in salvaging any animals.

On September 16 and 19 personnel from Izembek NWR shot 72 animals on smaller Caton Island. They used a Supercub and two personnel on the ground doing the shooting.

A grand total of 351 cattle were eradicated from the three islands. About $15,720 was spent on Simeonof and Chernabura islands excluding FWS personnel time. Simeonof accounted for most of the costs as about four days were spent herding cattle for the Native Corporation. Exact costs for Caton Island were much less as FWS personnel and equipment were used. Attempts to remove the cattle have lasted over five

years and went through three Regional Directors. Perseverance finally did pay off. The grazing policy on Alaskan refuges is virtually non-existent. We have been charging $2.40 per AUM for several years and when it was revised as per Refuge Manual guidelines in 1985 at $1.87 (after about two years of negotiations) it was shortly determined by the Regional Office that it was too high. So presently the fee schedule is unknown. The grazing permittee on Wosnesenski Island currently owes the Government $3,641.75 in bills dating back to 1983. He presently is grazing only 55 head on the island although it has been over 90 head for several years. We have been billing him through several (and different) bills. We plan to pursue the case through civil court in 1986.

A total of 53 cattle were salvaged from Simeonof Island by members of the Shumagin Corporation during the March and September shooting operations. Animals were slung by helicopter to a beach site and loaded onto boats.
3/85 T.J.E.

Cattle were dressed out on the beach by the Natives and transported to offshore fishing boats in Simeonof Harbor.
9/85 T.J.E.

A forced landing was made after the tail rotor struck the ground during cattle herding operations on Simeonof Island in September. Parts were flown in several days later and the helicopter flew out under its own power.
9/85 T.J.E.

The Aleut archaeological site on the north end of Chernabura Island is being lost to the ocean. The site has been selected by the Aleut Corporation. (Note: the barrels are not part of the archaeological remains).
9/85 T.J.E.

G. Wildlife

2. Endangered and/or Threatened Species

Cytological studies at the University of California revealed that the Canada geese nesting on Buldir and Chagulak are genetically similar to those nesting on Kiliktagik Island in the Semidis. Hence, the Semidi population apparently represents a relic of a former continuum of "Aleutian" Canada geese which once probably extended as far east as the Geese Islands off Kodiak. Insular nesting of Aleutian Canada geese apparently became separated and eventually genetically distinct from Taverner's and other mainland races after the last ice age. Eradication of fox from islands off the Alaska Peninsula therefore should be regarded as potentially restoring former habitat for recolonization by nesting geese.

3. Waterfowl

Waterfowl surveys along the south side of the Alaska Peninsula were flown by Migratory Bird Management (Fairbanks) and Izembek NWR personnel in the spring, but they did not include offshore islands. Emperor goose numbers along the

Peninsula were 17% lower than in 1984. Most emperor geese were seen between Beaver and Kuiukta bays. During two months spent on Big Koniuji Island in the Shumagins common mergansers and tundra swans were noted for the first time on this island.

5. Shorebirds, Gulls, Terns, and Allied Species

The only seabird related activities by refuge personnel in the Alaska Peninsula Unit were associated with fox eradication in the Shumagins in May and June. Upon our arrival in the Shumagins on 4 May no seabirds had begun nesting. The breeding activities of all species appeared later than usual because of the cold spring. Although we visited four islands in the Shumagins, nearly all observations were at Big Koniuji Island (Figure 1).

We had intended to establish 20 10m X 10m census plots in talus above Yukon Harbor (Figure 2), site of the largest colony on Big Koniuji Island, but due to the cold spring little activity was noted in this colony during evening hours when activity is usually most pronounced. Hence, only five plots were established, but no birds were observed flying into the talus or standing about, as is customary. No cliff plots were designated for black-legged kittiwakes because relatively few birds had completed nests by the end of June. Gulls also experienced reproductive failure. More detailed accounts of individual species of seabirds follow:

Crested Auklet. The primary reason for attempting to eradicate fox on Big Koniuji Island was to stop the evident decline of crested auklets, horned puffins, and probably other nesting birds. The seabird distribution and abundance in the Shumagins originally undoubtedly was much different than now because of fox introductions to most of the larger islands which did not have indigenous red fox.

In around 1911, 5 years before the introduction of foxes to Big Koniuji, Charles Townsend visited the crested auklet colony at Yukon Harbor and stated that they were more numerous here than were the least auklets at St. George Island in the Pribilofs, where they currently are believed to number roughly 250,000. In June 1973 when I first visited Big Koniuji Island, we estimated over 60,000 crested auklets in Yukon Harbor and adjoining Koniuji Strait, which separates

Figure 1.

SHUMAGIN ISLANDS, ALASKA

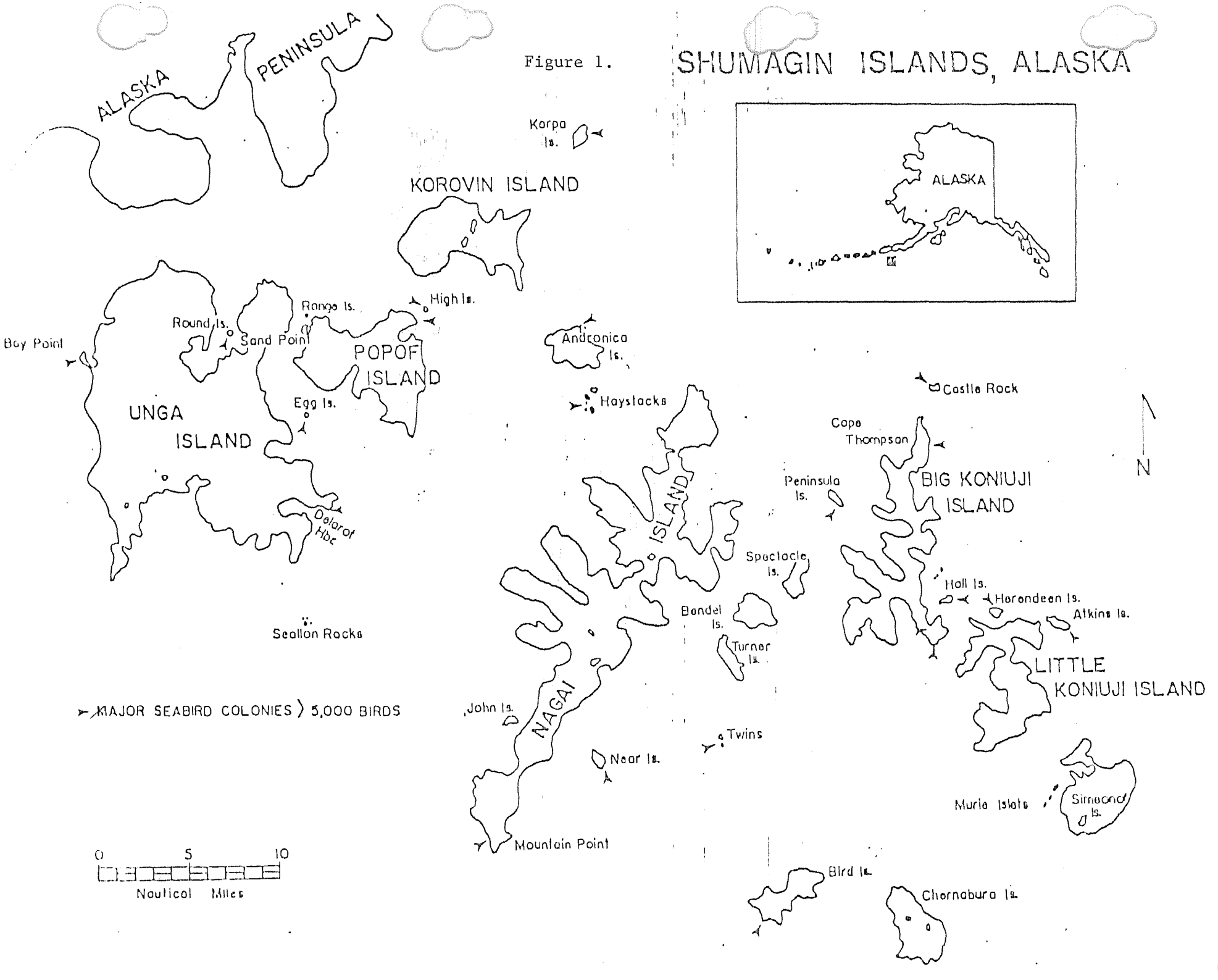
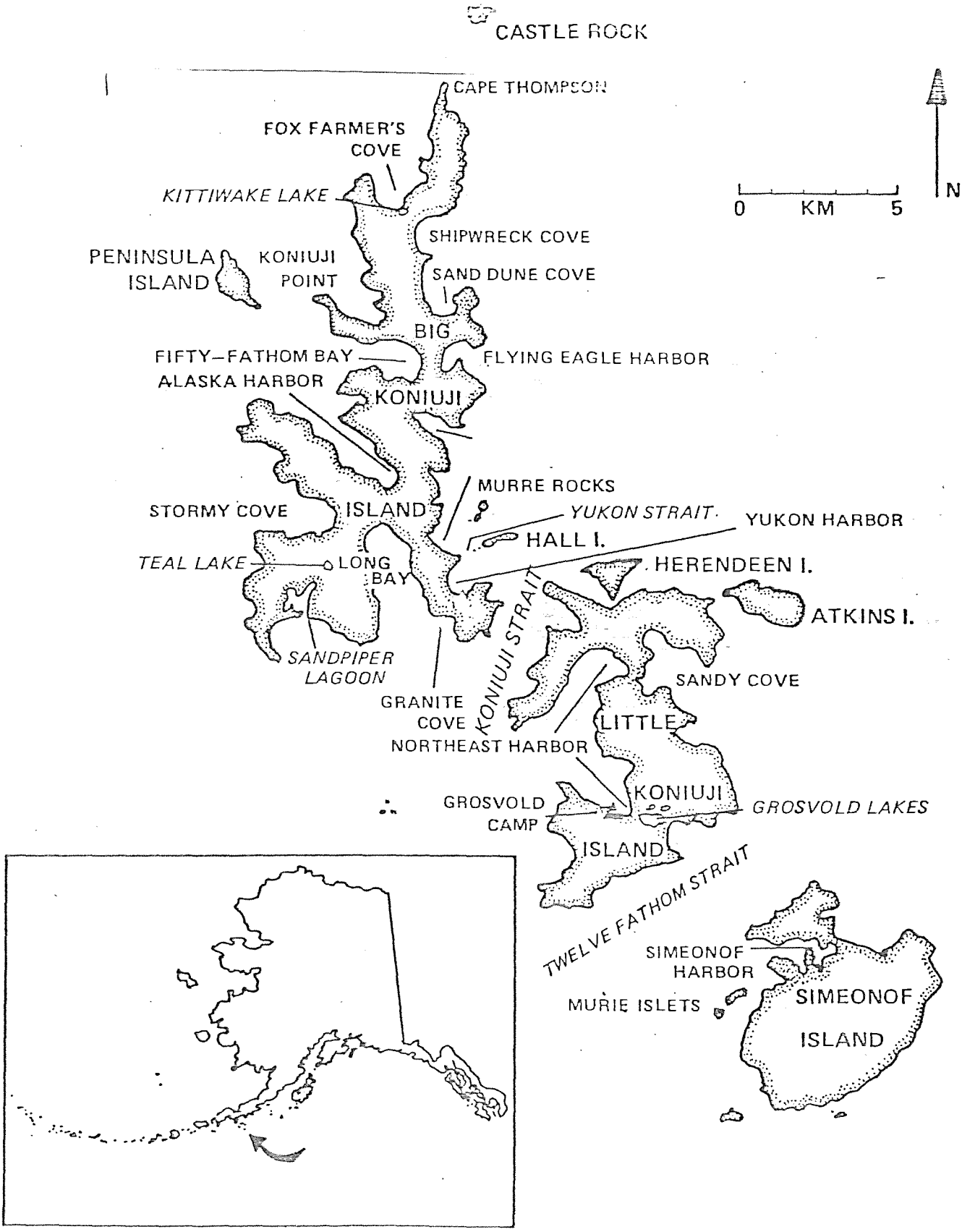


Figure 2. Big Koniuji Island.



Big Koniuji Island has several sparkling white sand beaches.
6/85 N.H.F.

Our base camp on Big Koniuji was at Flying Eagle Harbor. This scene reflects the unusually cold spring experienced in 1985.
5/85 E.P.B.

Big and Little Koniuji islands. After spending the summer of 1976 in Yukon Harbor, Moe and Day estimated a breeding population of 30,000 auklets there. However, in June 1984 when I revisited Yukon Harbor for the fourth time in 11 years, I was amazed at how few crested auklets there were compared to previous visits. On the evening of 8 June we saw only about 7000 auklets, and while spending May and June of 1985 on Big Koniuji, we never observed more than about this number despite frequent visits to Yukon Harbor from our base camp 6 mi to the north. Even if Townsend grossly exaggerated the numbers at this colony about 75 years ago, there is no doubt that the auklet population has drastically declined. Though not quantified, the apparent decline has been quite noticeable just since 1973.

When we arrived in early May auklets congregated on the water during evening hours, but none were noted flying to the colony in the talus above. Believing that the extraordinarily late spring was delaying nesting, we waited until 14 June before establishing five 10 X 10 m plots, but to our surprise, still no birds were noted perched on rocks in the colony as in past years. I recall hundreds of auklets sitting on rocks with several foxes prowling about during afternoon stays there in 1976 and 1977. We did hear a few auklets beneath the rocks at the highest parts (1410 ft) of the colony, and occasionally a bird would fly out of the rocks to join small flocks on the water. Futhermore, rather than flying up to the colony before dark, the auklets in Yukon Harbor went back out to sea. During the evenings birds began arriving in the harbor in late afternoon and reached a peak of only about 3000 at approximately 2200 hr; numbers then decreased. It definitely appeared that practically all the auklets had aborted nesting in 1985, probably in response to abnormally cold air and water temperatures. Because of the cold presumably too little food was available to successfully rear young. Auklets reportedly did engage in aerial displays over the talus one morning in late June. Normally auklets are more active during evening hours.

In 1985 it also was significant that no auklets were heard calling beneath rocks less than approximately 853 ft in elevation. Townsend remarked that auklets nested under boulders along the beach. This colony was mapped in 1976 at between approximately 600 ft to the base of the cliffs located at over 1100 ft. Though the majority of the auklets were concentrated above 820 ft in 1976, some did nest at lower elevations. Albeit a few birds were in the talus in 1985, it appears that the colony has shrunk in area as well as size.

One can only speculate why the crested auklet population on Big Koniuji Island has evidently sharply declined. Day believes that vegetation probably has covered the colluvium near sea level since Townsend's visit, and auklets generally avoid vegetated areas. Although some vegetative succession

Yukon Harbor on Big Koniuji Island, site of the easternmost colony of crested auklets in North America.
6/85 N.H.F.

Census plots denoted by orange stakes were established but no counts were made because few auklets were observed in the talus this year.
6/85 N.H.F.

would be expected on the inactive lower parts of talus, it seems difficult to imagine that this colluvium has changed so much in only 75 years. Moreover, while some nesting habitat would be expected to be lost to vegetative cover at the stable, bottom of the slopes, new talus habitat should have formed from rock falls from eroding cliff faces above. Barring changes in local oceanographic conditions and concomitant reduced food supplies, it seems too much of a coincidence that a few years after Townsend reported huge numbers of auklets foxes were introduced to the island, and now the auklet population is only a small fraction of what it once was. In 1976 Moe estimated that 13 foxes (six adults and seven pups) consumed a minimum of nearly 800 crested auklets plus many other birds. In 1976 Day also believed there were only 25-30 foxes on all of Big Koniuji. Although Moe (1977) thought that foxes were taking only about 4% of the breeding auklets, the actual impact over the past seven decades may have been much greater than imagined, especially since we found up to 80 foxes on the island prior to denning. With this many adults on the island, well over a 100 pups a year would be expected to be produced. Moreover, many years ago when more birds were present the island may have even supported a larger fox population than is now present. I firmly believe that introduced fox are the chief reason for the decline of auklets, horned puffins, ptarmigan and other birds. If this is true, we probably have eradicated foxes none to soon because if auklets, puffins, or other species continue to decline at the rates suspected, they would be all but gone in the future.

After removal of all foxes from the island, bird numbers should begin to rise, notwithstanding detrimental climatic or other factors. Fox predation in the past may have been especially significant in cold years like 1985 when virtually no young are produced. In good years with a surplus of chicks and good winter survival, fox predation may not have been significant, but when combined with a series of years with low productivity and /or high natural mortality, added pressure from introduced fox may be very deleterious. The Shumagins also represent the easternmost colonies in north America for crested auklets; so on the edge of their range their population may be more precarious than those in the center of abundance, such as in the Bering Sea, where they have evolved with arctic fox predation. After fox removal is completed, careful long-term monitoring will be necessary to document an anticipated recovery of bird populations on Big Koniuji Island. Small colonies of crested auklets also are found southwest of Yukon Harbor in Granite Cove and south of Cape Thompson.

Horned Puffin. On 13 June 1973 the numbers of horned puffins nesting on Big Koniuji Island were even more awesome than those of crested auklets. We estimated 140,000 horned puffins in Koniuji Strait and perched on boulder slopes above the summit. Moe and Day estimated only 60,000 horned

puffins breeding on these slopes in 1976. Our 1973 estimates may have been exaggerated, or perhaps the additional estimated 60,000 horned puffins nesting on Castle Rock, 10 mi to the north, may have mingled with the birds from Big Koniuji.

In 1985 repeated trips through Koniuji Strait while checking trap lines revealed no more than 500 puffins at any time. Likewise, few were noted on or flying above the talus slopes which rise to over 1000 ft. Whether the paucity of birds in late June this year is attributable to the unusually cold spring, as is presumably the case with the lack of appreciable breeding by auklets, or whether this colony, like the crested auklet colony in nearby Yukon Harbor, is experiencing a pronounced reduction, is unknown. What appears certain to anyone who has repeatedly been to Big Koniuji since 1973, however, is that the decline in puffin numbers seems even much more dramatic than for auklets.

Curiously, Townsend does not mention huge numbers of puffins at Big Koniuji. In 1985 we actually encountered more horned puffins (~2000) below the cliffs on the east side of Cape Thompson. Perhaps puffins manifest cyclic population changes.

Though foxes also prey on puffins, Moe indicated foxes took far fewer puffins than auklets. Probably puffin numbers also have been declining since foxes were released on the island, but it is difficult to fathom foxes' being responsible for as pronounced a drop as the previous population estimations suggest. Obviously this colony bears more careful scrutiny in 1986, which hopefully will be a more average year climatically. Unfortunately this horned puffin colony is at a rather inaccessible locale and thus is not suitable for regular monitoring. Moreover, accurate census techniques for this species, which generally nests in colluvium and manifests erratic colony attendance patterns, have not yet been devised.

Kittiwakes. Black-legged kittiwakes are the third most common species of nesting seabirds on Big Koniuji. Moe and Day estimated 8000 pairs nesting on cliffs south of Cape Thompson in 1976. On 9 June 1984 approximately 7800 nests were counted, but on 12 June 1985 only 20 partially completed nests were observed among the some 12,000 adults on or near the cliffs! We counted 50 and 650 nests on these cliffs on 19 and 27 June 1985, and most were incomplete. Obviously like the auklets and probably horned puffins, kittiwakes evidently experienced reproductive failure in 1985, most likely because of a lack of food associated with the cold spring. Kittiwake nesting failure was widespread in much of Alaska this year, as success was negligible at the Semidi and Barren Islands, Middleton Island, islets around Kodiak, and at Bluff in Norton Sound. Production in the Pribilofs was late but success was fair; kittiwakes produced many chicks in the Chiswell Islands and at Gull Island.

The north end of Big Koniuji is long and narrow with few possible landing sites.
6/85 N.H.F.

Approximately 16,000 kittiwakes normally nest on the cliffs on the east side of the south of Cape Thompson, the northern tip of Big Koniuji.
6/85 E.P.B.

Because of the reproductive failure on Big Koniuji we did not establish census plots for replicate counts in future years. It would be best to determine the locations for plots in a year with successful nesting activity.

In early May 1985 while we were briefly on Bird Island no kittiwakes were noted; during the same period in 1984 thousands were on or near the cliffs, though nest building began later in the month; thus, the late phenology also was reflected here, and it is likely that reproductive failure occurred on this island too.

Cormorants. Pelagic, red-faced, and double-crested cormorants nest on Big Koniuji, but they too did not seem to fare well in 1985. We counted only 40 nests in June, mainly red-faced cormorants, on the cliffs near Cape Thompson, compared to 140 in the same area the previous year. Only forty nests were recorded at Cape Thompson in 1976 along with small numbers at Flying Eagle Harbor and about 100 nests in stormy Cove on the west side of the island. We found none at the latter sites, but we recorded 80 nests at a new colony in Granite Cove. Since cormorants are not philopatric, it is difficult to assess long term population changes at any particular location.

Gulls. Both mew and glaucous-winged gulls occur on Big Koniuji and surrounding islands. Though common at the large lagoon at the south end of Big Koniuji, no mew gulls nest on the island; the only sizeable colony in the Shumagins is on Bendle Island, lying just to the west. Because of foxes only about 10 pairs of glaucous-winged gulls nest on Big Koniuji, and all of these are on inaccessible ledges or on offshore stacks near Cape Thompson.

The nearest large glaucous-winged gull colony is at Hall Island, lying 2 km northeast of Yukon Harbor, where 775 pairs were estimated in 1976. Though we did not take the time to count gull nests on the entire island in 1985, we did cover the western third on 25 June and counted only 39 nests and about 300 adults. Twenty nests were empty, 13 had one egg, and three nests each had two and three eggs. Sixteen days earlier we briefly visited Karpa Island, the largest gull colony in the Shumagins, by helicopter with the USGS; none of the 60 nests examined near the 1200 ft summit contained eggs. Thus, it seems that productivity of glaucous-winged gulls like most other seabird species was poor in the Shumagins.

Other seabirds. No attempts were made to determine numbers or reproductive success of other seabirds breeding on Big Koniuji and nearby islands. Nevertheless, subjectively, it appears that pigeon guillemots were unusually scarce in 1985. Few nest at Big Koniuji, but less than 30 were detected around tiny Hall Island, where 600 were reported in 1976. Parakeet auklets seemed as numerous as in past years. Moe and Day estimated roughly 1000 pairs breeding on Big Koniuji,

primarily in the Cape Thompson area in 1976. We saw up to 800 birds at any given time in this area but also found hundreds in Alaska Harbor on the west side of the island where not previously reported. Two Kittlitz's murrelets spotted represent the first records for this alcid at Big Koniuji.

6. Raptors

In 1976 at least 10 bald eagle eyries were located on Big Koniuji and surrounding isles, and 11 others were suspected. We found only six nests and suspected another. Five nests were active (Cape Thompson, Stormy Cove, Yukon Harbor, Long Bay, and Koniuji Point). Nesting phenology appeared very late in 1985, for eagles were still carrying sticks at the Yukon Harbor eyrie on 27 May, and no eggs were present. In 1976 the egg-laying period was between 20 April and 5 May. The nest at Yukon Harbor was the only one of five on the southern end of Big Koniuji in 1976 that was still present 9 years later. The seemingly lower eagle population probably reflects the reduced numbers of seabirds nesting on the island. Two golden eagles were sighted on Big Koniuji; we found them nesting on Bird Island in 1984, and a pair was present near this eyrie in early May of 1985 at the time of our brief visit.

A probable peregrine falcon eyrie is located near Cape Thompson, as a pair was regularly seen driving eagles away. Another peregrine was heard at Sandpiper Lagoon. In 1976 an eyrie was recorded in Yukon Harbor below the crested auklet colony, but it was gone in 1985.

A gyrfalcon which was encountered in late May represents the first observation of this species in the Big Koniuji area.

7. Other migratory Birds

The following passerine birds are the first records for Big Koniuji Island: orange-crowned warbler, Lapland longspur, and pine grosbeak. Surprisingly grosbeaks appeared to breed in Flying Eagle Harbor.

9. Marine Mammals

Harbor seals are common around Big Koniuji. Up to 50 seals often were seen in Sandpiper Lagoon. River otters and sea otters also were especially common in this lagoon, which has a very narrow opening to the ocean. Much of the lagoon is quite deep and water fluctuates little in the upper reaches because of the shallow entrance. Sea lions were never seen in the lagoon, and they were uncommon elsewhere around the island. A large rookery exists on Atkins Island. Based on frequent travels along the shores of Big Koniuji, the island's summer population of sea otters was only about 100. Deep water around most of the rugged island limits the sea

A large lagoon frequented by seals, sea otters, and river otters is located at the south end of Big Koniuji.
6/85 N.H.F.

Hall Island, lying east of Yukon Harbor, has the largest gull colony near Big Koniuji.
6/85 N.H.F.

otter population. In 1976 nearly 300 sea otters were reported around this island. Aerial surveys in 1957 and 1962 revealed approximately 220.

Minke whales were sighted close to shore in Yukon Harbor, and killer whales occasionally appeared near shore and once in Flying Eagle Harbor.

10. Other resident wildlife

Voles, primarily tundra voles, and ground squirrels occur on many islands off the Alaska Peninsula. Vole populations on some islands are amazingly high, amounting to several burrows per square meter. On some islands rodents consume nearly all of the standing dead plant material, causing localized erosion. Voles and ground squirrels probably were introduced to most of these islands to augment birds as a food supply for foxes. Ground squirrel densities are generally low on Big Koniuji Island because of the rocky terrain.

15. Animal Control

Prior to trapping fox on Big Koniuji Island in the Shumagins nearly all of Bird Island (4300 ac) was covered on foot on 9 and 10 May to ascertain whether our month of trapping the previous spring had succeeded in eradicating the island's arctic fox population. All but 20 of the 71 traps left set around the island a year earlier were removed. We were unable to relocate all of the traps, and several were not checked in one locale because of insufficient time. Of the 50 traps recovered all were sprung except 10; only four of these were still operable. Some of the traps were so rusty that they were beyond restoration.

The value of leaving unattended traps on the island was manifested by discovery of a fox skeleton in a trap. When we left the island in June 1984 after trapping 12 foxes, we believed that none were left. Leaving traps also conveys additional risk to non-target species, as the talon of an eagle and the foot of a gull were found in two different traps. However, with no M-44's or other backup means to remove foxes missed while trapping, leaving set traps for possible remaining foxes is the only way to try to ensure that none survive. Since we found no tracks, fresh scat, or other recent sign, we believe that no foxes remain on Bird Island. Moreover a brief visit to the island in August revealed no fox tracks on the longest beach on the east side.

We spent 55 days between 6 May and 28 June trapping red foxes on Big Koniuji Island. A total of 69 foxes was killed on this extremely rugged island. Three additional foxes were trapped but escaped by chewing off a foot; one of these was recaptured. At least four other foxes escaped by pulling out the trap stake or nails affixing the trap chain to a log. The number of foxes on this island formerly fluctuated

Big Koniuji is extremely irregularly shaped and is a steep island with elevations reaching nearly 2000 feet, making fox trapping very arduous.
6/85 N.H.F.

Big Koniuji is mainly composed of granite rubble and has a perimeter of 70 miles.
6/85 N.H.F.

greatly primarily due to trapping efforts. In the winter of 1935 three trappers caught only eight foxes in 4 months on the south end, but about 100 were taken in some earlier winters according to an interview with Raymond Rogers, one of the trappers there 50 year ago. He related that foxes were mainly eating clams and thus had badly worn teeth.

By early June approximately 250 traps were deployed around the island, which has a perimeter of 70 mi and an area of 23,000 ac. Since our base camp was in Flying Eagle Harbor (see map), more or less centrally located on the east side of the island, trap lines were established on the eastern side first. Starting from the base camp, traps were deployed further and further away between Shipwreck Cove, the northernmost landing beach on the east side, to Yukon Harbor, the southernmost.

With the unusually cold and stormy weather experienced this year, it was especially difficult to frequently check traps which were beyond reach by foot from base camp. Further complicating trapping in May, was the inability to set traps at higher elevations because of frozen soil. Fortunately the base camp was located on the side of the island with better beach habitat for fox and better landing sites. Hence, a majority of the foxes and traps were on the eastern side of Big Koniuji. Also, since the island is only 1 mi wide in places, foxes from the west side regularly travel across isthmuses or mountain passes from one side to the other. Hence, by the time we finally were able to set traps on the west side of the island, presumably many foxes using this side had already been caught in traps on the other side. Accordingly, only 21 (10 males, 10 females, and 1 sex unknown) of the 69 foxes killed were taken on the west side. However, some of the difference probably can be also attributed to the seemingly better beaches and the presence of nearly all of the seabird colonies on the eastern side of the island. The attraction of the crested auklet colony at Yukon Harbor to foxes probably is not great in May before the birds begin using the talus. This was apparently even more so in 1985 because of the extraordinarily late spring and the consequent abandonment of nesting by most auklets.

Thirty, nearly half of the foxes trapped, were taken in three areas: Yukon Harbor, Sandpiper Lagoon on the southwest peninsula, and the isthmus south of Cape Thompson (Kittiwake Lake area). Flying Eagle Harbor and Sand Dune Cove also were heavily used areas, with eight and seven foxes, respectively, trapped. No bays on the island's west side accounted for more than four foxes, except for the isthmus at the north end. Undoubtedly, if we had deployed traps on the west side of the island first, the total there would have been higher.

All foxes killed were trapped, save one which was shot. Despite using three different commercial predator calls, no foxes were attracted by them, but none of us were experienced

using calls. Over half the foxes (34) were caught on or adjacent to beaches. Cobble or gravel beaches were the best sites, particularly where trails descended to the beach or paralleled them along low bluffs. Although numerous tracks often were present on sandy beaches, few foxes were trapped there because traps usually were soon deeply buried by drifting sand. Seventeen foxes were trapped in mountain passes connecting bays on different sides of the island, and the remaining foxes were caught on trails, generally along ridges. Traps which caught foxes were simply reset in the field without cleaning. This did not appear to deter the capture of additional ones in the same traps. Several traps repeatedly caught foxes; one beach-set amidst driftwood caught five in succession!

Most of the 39 females trapped were lactating, and by mid-June several females obviously were being suckled. No pups were noted, however, and it is unlikely that any litters survived. We found no dens, but they are more easily detected later in the summer when pups are outside.

During the last few days on the island it was apparent that a few wary foxes still survived despite nearly two months of intensive trapping. Hence, we believe a maximum of 10 foxes remained on Big Koniuji when we left at the end of June. Thus, with a former population of roughly 80 adult foxes on the island, the density was about 0.45 fox/mi. Arctic fox achieve higher densities on many islands in the Aleutians.

Since more females were caught than males and since females tended to be trapped earlier, it seems possible that the last few foxes could have all been males.

It is likely that females outnumber males on most islands. Fifty-eight percent of the foxes killed on both Big Koniuji and Bird were females. In 1984, 57% of 163 adult foxes killed on Rat Island in the Aleutians were females. The sex ratio of the 64 and 49 arctic foxes killed on Kasatochi and Amukta islands was 62% and 54% females, respectively. Adult red foxes are territorial, at least during the breeding season, and breeding pairs are monogamous. There is no apparent reason for the disparate sex ratio.

River otters seriously complicated trapping on Big Koniuji. Otter densities appear higher on this island than on any other of the Shumagins; they were observed almost daily. Otters now are undoubtedly much more numerous than during the fox trapping era prior to World War II because they formerly were heavily trapped along with introduced foxes. Otters often use the same trails as foxes, particularly those traversing the island through passes. We avoided setting traps on several major trails alongside streams and ponds since they appeared more heavily used by otters. Fourteen otters were caught; eight were released alive and six were found dead. Otters in traps usually were vicious, and the

only way we managed to release most of them was to strike them in head with a trap stake or heavy stick. After being stunned and released from a trap, usually less than a minute ensued before they recovered and ran off.

We originally believed that traps set at high elevations and away from water would be no risk to otters. However, most of the otters accidentally caught were in high passes, often exceeding 1000 ft elevation, which connected bays on different parts of the island. Only one fox-set on a beach caught an otter. Otters also were trapped on isthmuses. The only locations where no otters were captured were on lateral trails running along the tops of high ridges. After catching several otters, we began to place all traps in passes or their approaches slightly off trails. Otters then usually shuffled by on the adjacent trail and did not seem interested in the lures or scents used to attract foxes. Traps also were regularly sprung by otters, as evidenced by tracks and scat nearby, and in several cases otters managed to finally pull out of the jaws of the 1 3/4 size traps. Size no. 3 traps generally are recommended for otters, which are larger and stronger than foxes. Most of the dozen traps that disappeared were probably attributable to otters which are more apt to pull out trap stakes or nails from logs than are foxes. Unfortunately we probably killed 12-15 otters on the island, but this would have little effect on Big Koniuji's large population.

Besides river otters ground squirrels also frequently sprung traps, but since the densities of these rodents on Big Koniuji are not excessive, much less difficulty with their getting into traps was experienced than on Bird Island the previous year. Ground squirrel densities on Big Koniuji are highly variable; some areas have very few, a marked contrast from Bird Island, where they were superabundant nearly everywhere. The offset jaw version of the "Northwoods" brand traps were a problem because they allowed squirrels that sprung traps to always escape by pulling their feet through the gap between the jaws. Those animals subsequently would spring traps repeatedly without being removed. With the older models and with the Blake and Lamb traps squirrels rarely escaped, and therefore, eventually they were removed from the immediate vicinity, and traps remained set. On islands having ground squirrels, traps with offset jaws definitely should not be used. The only other non-target species caught in 1985 were a song sparrow and several black-billed magpies. Magpies seem to smell the lures, as more were caught than can be ascribed to chance.

Since we failed to totally eliminate the fox population on Big Koniuji, it is imperative to return in the spring of 1986 to finish the job. The remaining few foxes could conceivably be all males, or the number left may be so low that the population would not survive anyway because inbreeding depression would reduce the fitness of progeny. Moreover,

with over 200 traps left set on fox trails and beaches, it is possible that even the wary survivors may eventually stumble into traps long after our departure from the island. Most traps, however, probably will be tripped by ground squirrels, especially in July when their young disperse. Also, some traps likely will be inactivated by river otters, magpies, and other non-target species. A few wary foxes still may again elude traps in 1986. Therefore, cyanide projectiles (M-44) definitely should be available. A backup eradication means is vital to totally eradicate fox populations on large, rugged islands. Now that we know where river otters do not occur on this island, we can safely utilize M-44 devices with virtually no risk to otters. Ground squirrels could possibly trigger a few M-44s or chew baits off, but this would be of no consequence. Permission must be secured to use cyanide on some islands besides in the Aleutians if we are to succeed in extirpating foxes on certain large islands off the Alaska Peninsula. Otherwise we should not even attempt to remove them from such islands, as a great deal of effort and funds may be wasted. Hopefully M-44's, which are currently registered only for protection of livestock and poultry, will be available by May 1986.

H. Public Use

1. General

An adventuresome kayaker was encountered in the Shumagins. As far as is known this is the first such visitor use in the Alaska Peninsula Unit. Such activity surely will increase as more people seek new challenges in areas rarely visited because of remoteness and adverse weather.

J. Other Items

3. Items of Interest

Dr. "Jack" Frost, a retired historian from Alaska Pacific University, accompanied us to the Shumagin Islands to visit the landing sites of Vitus Bering's expedition in 1741. Dr. Frost has been translating Georg Steller's, the expedition's physician and minerologist, diary on the momentous voyage of the "St. Peter". Upon discovery of the northwest coast of America, landings to procure water were made in two areas - Kayak Island near Cordova and the Shumagin Islands. Afterwards the "St. Peter" was wrecked and Bering perished on Bering Island, largest of the Commander Islands, on the return voyage to Kamchatka.

Bering's crew landed on Nagai, Turner, and Bird islands in the Shumagins, and Steller made the first biological observations in Alaska. It was on Nagai that Nikita Shumagin, the first member of the crew to die from scurvy,

was buried. Most important, however, was the first contact with Aleuts on Bird Island. Based on Steller's description of the islands we visited the pond on Nagai where the crew filled barrels of water, where sick seamen were taken ashore, and where Shumagin apparently was buried. Dr. Frost also examined the beach on Bird Island where the first contact between Caucasians and Aleuts occurred, and it was highly rewarding for him to be able to actually relate to the very spots mentioned in Steller's diary. He is continuing his writing on Steller, and we are assisting in trying to interpret some of the birds and mammals he described in the Shumagins nearly 250 years ago. It is through Steller, for instance, that we know that red fox were once indigenous on Nagai Island, though they later were annihilated apparently by trappers using strychnine.

Dr. Frost suggests that the refuge nominate Bering's landing sites on Nagai and Bird islands, which mark the beginning of recorded history in Alaska, for acceptance in the National Register of Historic Places. The site on Nagai is refuge-owned, but the landing site at Bird Island currently is part of a fox farm patented in 1908. The latter locale, however, is included as part of a proposed land exchange with the Natives and is expected to be added to the refuge.

4. Credits

This report was written and edited by Edgar Bailey, except for the sections on grazing, permits, and law enforcement which were written by Tom Early. Carol Hagglund wrote the administrative portion. Trina Fellows typed the report.

10/15

JR ...

I met with Mr. Bunn of the WTB (Where's The Beef) Cattle Company last week, and we reached a settlement. He's agreed ~~ag~~ to drop his complaint for a two months supply of Big Macs (with cheese). I assume you won't mind if we charge them against your account.

Joe

Joe - Lets switch him to Burger King and charge it to Jan Kipp. He should have seen to it that this mess was cleaned up while he was here. JR

IN THE DISTRICT COURT FOR THE STATE OF ALASKA

AT Anchorage

WTB Cattle Company

Plaintiff(s),

vs.

Tommy J. Early

Defendant(s)

CASE NO. 85-1099-2 SC

COMPLAINT

Plaintiff [XX] is a corporation that has paid its taxes due the state and filed its required reports.

[ ] is not a corporation.

Defendant is indebted to the plaintiff in the amount of $ 20,000

plus court costs and interest as a result of malicious, sadistic slaughter and gross wanton waste of approximately 100 head of prime cattle on Chernabura Island. Cattle were left writhing on the blood-stained tundra and bawling calves were brutalized before the very eyes of their frantic mothers.

which occurred at or near Chernabura Island, Alaska, on or about September 23, 1985.

Plaintiff has demanded relief from the defendant, but defendant has failed to comply.

Plaintiff requests the small claims procedure, gives up his right to a jury trial and formal procedure in this case, and waives all of this claim which exceeds $2,000. If the court enters an order applying the formal Rules of Civil Procedure rather than the Small Claims Rules to this action, this waiver shall be null and void

ALEUTIAN ISLANDS UNIT
ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Adak, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1985

U. S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

ALEUTIAN ISLANDS UNIT
ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Adak, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1985

C. Fred Zeillemaker	3/12/86
Refuge Manager, Adak	Date
J. L. Martin	
Refuge Manager, Homer	Date
[illegible]	3/26/86
Refuge Supervisor Review	Date
Regional Office Approval	Date

INTRODUCTION

The Aleutian Islands Unit
Alaska Maritime National Wildlife Refuge

The Aleutian Islands National Wildlife Refuge was established in 1913 by Executive Order of President Taft. Today the refuge is called the Aleutian Islands Unit (AIU) of the Alaska Maritime National Wildlife Refuge (AMNWR). The AIU includes nearly 200 islands stretching over 1,100 mi from Amak Island to Attu totalling approximately 2.7 million acres. Most of the islands are designated wilderness. Exceptions are military reservation lands or islands, former military sites, and lands or islands selected by Native Corporations under the Alaska Native Claims Settlement Act. Unimak and Amak islands, adjacent to the Alaska Peninsula, are managed by the Izembek NWR at Cold Bay. The Sanak Islands, south of the Alaska Peninsula, are managed by the AMNWR main headquarters at Homer.

The Aleutian Island Chain is divided into six island groups. From east to west the groups are the Fox Islands, the Islands of the Four Mountains, the Andreanof Islands, the Delarof Islands, the Rat Islands and the Near Islands.

The AIU and AMNWR staffs have completed an island-by-island survey of the biological, botanical and physical features of the Aleutians. Present refuge management objectives call for maintaining the islands in as near a natural condition as possible. Specific management goals include the eventual elimination of introduced arctic fox from most islands, the restoration of the endangered Aleutian Canada goose to additional islands within its former breeding range, periodic wildlife inventories on each island, studies of various wildlife populations and control of human access to and activities on currently uninhabited islands.

The Aleutians are the emergent peaks of a submarine mountain range believed to have appeared as islands about 8,000 years ago when the surrounding seas rose at the end of the last ice age. Most of the islands are mountainous. The larger islands are dotted with lakes and cut by streams. Irregular shorelines include boulder or sand beaches, rocky cliffs, and numerous offshore islets, spires and reefs.

The maritime climate of the Aleutian Islands is characterized by persistent fog or overcast skies; frequent, often violent, cyclonic storms; and high winds. Weather is very local and fog, low ceilings, precipitation, and clear weather can all occur within a distance of a few miles or even within a span of a few minutes at one location.

The Aleutians are treeless except for a few spruce introduced to some of the islands by the Russians in 1805 and by Americans during World War II. The islands support a dwarfed flora of

willow and alder, alpine heaths and meadows of forbes and grasses. Shorelines are bordered with stands of beach wildrye. The shallow near shore waters support dense beds of kelp.

The Aleutian Islands are rich in wildlife. A total of 255 species of birds have been recorded on the AIU and adjacent waters west of Unimak Island. At least 21 species of mammals, mostly cetaceans, occur regularly. New species of birds, primarily Asiatic migrants, are added to the AIU list almost annually. Bird species composition and density vary significantly from island to island, depending on the island's size, the presence of introduced predators, and the island's location within the Chain. One of the most interesting features of the Aleutian Islands is the unique combination of plant and animal species from both the North American and the Asian continents. Olaus J. Murie aptly described the Aleutians as a "melting pot for faunal elements from two continents not yet reaching an equilibrium."

The sea otter is very much at home in the Chain, reaching its greatest population density from Adak to Kiska. Once highly valued for its fur, the otter was almost exterminated by overhunting. Now under strict protection, its population in the Aleutian Islands has increased to over 100,000. Other common sea mammals are the northern (or Steller's) sea lion and the harbor seal. Caribou have been introduced to Adak. Atka supports a thriving herd of feral reindeer. Fourteen species of cetaceans have been recorded in Aleutian waters.

The arctic fox is native to Rootok Island in the far eastern Aleutians. The species was also found on Attu by the earliest explorers, but it was most likely introduced there. The red fox is native to several islands from Umnak eastward. Beginning in the 19th century, but increasing in the 1920's, arctic fox were introduced to most islands in the Chain. The introductions were necessary to allow development of a commercial fur farming enterprise wherein the fox utilized the abundant island wildlife for food. The Aleutian fur farming industry collapsed during World War II. Fox pelts continue to have little commercial value and complete removal of the introduced animal is necessary if native bird life is to be restored to former dense levels. The introduction of Norway rats occurred chiefly during World War II and both the fox and rats have seriously affected nesting birds. Arctic ground squirrels and Greenland collared lemmings, introduced to a few islands, complete the list of nonnative mammalian species.

Huge numbers of sea birds are the most striking feature of many islands. Millions of fulmars, storm-petrels, cormorants, kittiwakes, gulls, guillemots, murres, murrelets, auklets, and puffins congregate in vast nesting colonies. Great numbers of waterfowl winter in the Aleutians and ducks nest throughout the chain. The endangered Aleutian Canada goose, currently increasing to a population in excess of 4,400 birds, nests in

numbers only on tiny Buldir and Chagulak islands, with a small breeding population becoming established on once again fox free Agattu Island. Bald eagles, peregrine falcons, gyrfalcons, and other raptors are also found, along with numerous resident and migrant shorebirds and passerine species. Winter wrens, rosy finches, song sparrows, snow buntings, and lapland longspurs are among the most common of the small passerines. All but the latter are permanent residents in the chain.

Adjacent waters contain large fish populations which are harvested primarily by the fishing fleets of Japan, Russia and South Korea. Island streams support several species of salmon and the Dolly Varden trout.

The Aleutians were once home to about 10,000 Aleuts. Their numbers were severely decimated following Russian discovery of the islands in 1741. Today, only four small native villages exist in the Aleutian Chain west of Unimak Island. The communities are Atka, Nikolski (on Umnak Island), Unalaska and Akutan. They are inhabited by a few hundred people each.

A civilian fishing community exists at Dutch Harbor on Amaknak Island adjacent to Unalaska Village. A U.S. Navy complex is located at Adak (site of the AIU headquarters), U.S. Air Force personnel occupy Shemya Island, and a small U.S. Coast Guard staff mans a navigational station near the east end of Attu Island.

Perhaps the greatest benefit the Aleutian Islands Unit offers our nation is its potential as an outdoor laboratory for scientists conducting maritime ecosystem studies under natural, near pristine conditions. Outdoor writer Michael Frome issued a challenge to our generation when he referred to the Aleutians as "a great oceanic crossroads, a natural treasure which this nation must now properly acknowledge and safeguard for the future."

INTRODUCTION

PAGE

TABLE OF CONTENTS i

A. HIGHLIGHTS 1

B. CLIMATIC CONDITIONS 2

C. LAND ACQUISITION

1. Fee Title .....Nothing to report
2. Easements ..... Nothing to report
3. Other 6

D. PLANNING

1. Master Plan ..... Nothing to report
2. Management Plan ..... Nothing to report
3. Public Participation .....Nothing to report
4. Compliance with Environmental Mandates 6
5. Research and Investigations 9
6. Other 10

E. ADMINISTRATION

1. Personnel 10
2. Youth Programs 12
3. Other Manpower Programs .....Nothing to report
4. Volunteer Programs 13
5. Funding 13
6. Safety 13
7. Technical Assistance ..... Nothing to report
8. Other .....Nothing to report

F. HABITAT MANAGEMENT

1. General 15
2. Wetlands 15
3. Forests ..... Nothing to report
4. Croplands ..... Nothing to report
5. Grasslands ..... Nothing to report
6. Other Habitats ..... Nothing to report
7. Grazing 15
8. Haying ..... Nothing to report
9. Fire Management 17
10. Pest Control ..... Nothing to report

11. Water Rights ..... Nothing to report
12. Wilderness and Special Areas 17
13. WPA Easement Monitoring ..... Nothing to report

G. WILDLIFE

1. Wildlife Diversity 18
2. Endangered and/or Threatened Species 20
3. Waterfowl 30
4. Marsh and Water Birds 31
5. Shorebirds, Gulls, Terns and Allied Species 31
6. Raptors 40
7. Other Migratory Birds 42
8. Game Mammals 45
9. Marine Mammals 47
10. Other Resident Wildlife 49
11. Fishery Resources 49
12. Wildlife Propagation and Stocking ..... Nothing to report
13. Surplus Animal Disposal ..... Nothing to report
14. Scientific Collections 50
15. Animal Control 50
16. Marking and Banding 68
17. Disease Prevention and Control .....Nothing to report

H. PUBLIC USE

1. General 68
2. Outdoor Classrooms - Students 69
3. Outdoor Classrooms - Teachers 70
4. Interpretive Foot Trails ..... Nothing to report
5. Interpretive Tour Routes ..... Nothing to report
6. Interpretive Exhibits/Demonstrations 70
7. Other Interpretive Programs 73
8. Hunting 76
9. Fishing 77
10. Trapping 77
11. Wildlife Observation 77
12. Other Wildlife Oriented Recreation ..... Nothing to report
13. Camping 77
14. Picnicking ..... Nothing to report
15. Off-Road Vehicling ..... Nothing to report
16. Other Non-Wildlife Oriented Recreation 78
17. Law Enforcement 78
18. Cooperating Associations 79
19. Concessions ..... Nothing to report

I. EQUIPMENT AND FACILITIES

1. New Construction 80
2. Rehabilitation 80
3. Major Maintenance 81

4. Equipment Utilization and Replacement 82
5. Communications Systems 82
6. Computer Systems 83
7. Energy Conservation 83
8. Other ..... Nothing to report

J. OTHER ITEMS

1. Cooperative Programs 83
2. Other Economic Uses .....Nothing to report
3. Items of Interest 84
4. Credits 84

K. FEEDBACK 85

L. INFORMATION PACKET

A. HIGHLIGHTS

Adak winds unofficially exceeded 130 mph in November (Section B).

Refuge unit grazing programs, inherited in 1980 from the Bureau of Land Management were finally straightened out (Section F.7).

Eight bird species were found for the first time using refuge lands in 1985. All were Asiatic in origin and represented the first North American records for each species (Section G.1, G.5 and G.7).

June surveys of Agattu Island resulted in sightings of numerous returning transplanted Aleutian Canada geese and eleven nests (Section G.2).

The summer Aleutian Canada goose transplant effort resulted in 124 birds being released on Amchitka Island (Section G.2).

The Regional Botanist surveyed Rat and Kiska islands for Aleutian wormwood and Adak Island for Aleutian shieldfern (Section G.2).

Many Adak eagles were electrocuted during the last four months of the year, but corrective action was initiated in December (Section G.6).

Northern sea lions in the eastern and central Aleutians continue long term population declines (Section G.9).

The Environmental Protection Agency issued an Experimental Use Permit allowing the testing of Compound 1080 for introduced predator control at Kiska Island (Section G.15).

Initial pre-Compound 1080 treatment wildlife surveys were conducted at Kiska Island in June (Section G.15).

World War II crashed aircraft remains caused considerable activity within and without the Fish and Wildlife Service during the year (Section H.17).

An ARMM project was initiated to design upgraded visitor center displays late in the year (Section H.6).

The Adak Alaska Natural History Association sales exceeded $13,000 during the year (Section H.18).

B. CLIMATIC CONDITIONS

There is no "normal" weather pattern in the Aleutian Islands. Conditions, temperatures, and resulting precipitation, whether it be rain or snow, vary widely from year to year and island to island. Weather data for 1985 were no exception. Four widely scattered reporting stations are maintained in the Aleutians. From west to east they are the U. S. Coast Guard LORAN Station at Attu, the U.S. Air Force Base at Shemya, the U.S. Naval Air Station (NAS) at Adak and the Reeve Aleutian Airways office at Dutch Harbor.

Comparisons for those few months at Attu Island where 1984-1985 data are available indicate that January, February and October were warmer in 1985 than in 1984 (Table 1). Since the weather at Shemya Island, only 35 mi to the east show similar comparisons (Table 2), such may have been the case at Attu for temperatures throughout the year. A comparison of reported total precipitation (rain plus melted snow) for January through May and October, however, indicates that Attu received considerably more precipitation (32.95 in) than Shemya did (14.23 in), but Attu is a mountainous island while Shemya is mainly flat. Many clouds pass freely over Shemya without dropping moisture due to the absence of intercepting mountains. Attu recorded the warmest temperature for the entire state of Alaska for October when 61 degrees was reached on the 9th.

Shemya weather was near normal early in the year, but was cooler than normal during the summer months. By the end of October total precipitation was near normal (24.93 in vs 24.69 in) and only three percent drier than that recorded during 1984 (25.71 in). Except for March, Shemya temperatures were near normal throughout the year. Attu, Shemya, Adak and Dutch Harbor all recorded considerably cooler than normal temperatures in March.

Adak weather data for 1985 indicates the central Aleutians had a generally drier than normal year (Table 3). The year began warm with less snow than usual, but March was nasty with nearly 42 inches of snow being recorded. Conditions remained near normal from April through August, but the last third of the year was considerably warmer than average. Adak had the distinction of being the warmest place in Alaska on 22 and 23 August when 61 and 64 degrees were recorded. Adakians experienced a soggy October. Late blooming wildflowers persisted well into November. A "killing" frost did not occur at Adak until 4 December. Adak experienced considerably less wind in 1985 than is normally expected, with gusts never exceeding 60 mph until a 3 November storm when unofficial gusts reached 111 mph. Then on 25 November several unofficial gusts exceeded 100 mph, once reaching 133 mph, throwing gravel on windows, sandblasting vehicles and alarming the refuge staff enough that they closed shutters on one of the residences to prevent window glass failure. Adak's annual average temper-

Table 1. 1985 Attu, Alaska, weather summary with comparisons to 1984 data

	Inches of precipitation		Inches of snow		Days of measurable precip.		Degrees fahrenheit					
							Maximum		Minimum		Average	
	1985	1984	1985	1984	1985	1984	1985	1984	1985	1984	1985	1984
JAN	5.34	9.32	10.5	28.1	19	17	39	37	15	12	30.5	27.7
FEB	4.53	5.19*	16.1	15.3	16	14	43	40	17	14	31.1*	28.5
MAR	4.92*	5.30	6.0	M	21*	M	42	M	-5	M	26.2	31.0*
APR	5.33	2.31	1.0*	M	21	M	52	M	17	M	33.4	M
MAY	3.16	2.64	0.1	M	13	M	52	M	22	M	38.6	M
JUN	3.57	M	T	M	12	M	57	M	19	M	42.4	M
JUL	3.52	9.29	0	0	9	10	72	M	24	M	46.3	M
AUG	4.73	M	0	0	12	M	62	M	35	M	49.0	M
SEP	9.86	M	0	0	14	M	62	M	29	M	43.7	M
OCT	9.67	8.30	T	0	18	17	61	55	30	32	42.2	41.8
NOV	8.88	7.41	1.0	21.4	22	12	49	47	23	28	37.3	34.2*
DEC	5.31	8.11	32.6	22.5*	24	14*	44	37	15	22	30.7	29.2
Totals:	68.82*	57.87+*	67.3	87.3+*	201*	84+*						
Extremes:							72	55+	-5	12*		
Average:											37.6	32.1+

* Incomplete data
** Missing data (M)

Table 2. 1985 Shemya, Alaska, weather summary with comparisons to 1984 and normal data

	Inches of precipitation			Inches of snow		Days of measurable precip.		Degrees fahrenheit						
								Maximum		Minimum		Average		
	1985	1984	NORM	1985	1984	1985	1984	1985	1984	1985	1984	1985	1984	NORM
JAN	2.77	1.80	2.31	17.6	14.7	28	21	36	38	20	18	31.5	30.0	31.3
FEB	1.89	1.44	1.85	9.5	13.6	24	20	39	36	23	14	31.5	29.9	30.2
MAR	2.68	1.39	1.82	20.3	10.1	24	24	39	41	19	22	29.2	32.6	31.7
APR	1.96	0.96	1.82	9.8	4.9	21	15	42	41	22	27	34.5	35.8	34.6
MAY	0.90	1.63	1.73	2.6	T	17	21	45	45	24	35	36.9	39.7	38.3
JUN	1.96	2.19	1.65	0	0	16	18	49	47	37	38	41.8	42.3	42.2
JUL	1.38	5.21	2.68	0	0	16	19	57	54	41	40	45.4	47.5	46.6
AUG	3.72	4.78	3.64	0	0	12	21	53	58	44	40	47.8	49.2	48.9
SEP	3.69	2.79	3.16	0	0	22	17	56	54	38	36	47.8	48.1	47.5
OCT	2.68	3.52	4.03	0	T	23	19	50	54	37	36	45.2	42.1	41.3
NOV	3.94	4.49	3.96	2.3	14.3	26	26	47	46	32	24	39.0	34.7	35.3
DEC	2.70	3.31	2.87	12.9	19.5	26	29	38	41	26	23	33.0	32.1	32.4
Totals:	30.27	33.51	31.52	7.50	77.1	255	250							
Extremes:								57	58	19	14			
Average:												38.6	38.7	38.4

Table 3. 1985 Adak, Alaska, weather summary with comparisons to 1984 and normal* data

	Inches of precipitation			Inches of snow			Days of measurable precip.		Degrees fahrenheit						
									Maximum		Minimum		Average		
	1985	1984	NORM	1985	1984	NORM	1985	1984	1985	1984	1985	1984	1985	1984	NORM
JAN	3.43	4.97	6.20	6.4	29.1	19.5	24	27	47	44	19	15	35.5	33.1	33.2
FEB	2.96	4.27	4.67	13.5	35.6	18.3	19	24	46	41	22	11	34.5	30.0	32.9
MAR	4.77	6.71	6.01	41.6	26.2	20.6	24	27	46	47	12	20	31.3	36.4	34.6
APR	3.66	4.55	4.66	11.0	13.1	8.5	26	23	48	47	30	26	37.1	37.3	37.3
MAY	3.86	2.74	4.28	0.3	1.2	1.5	21	21	52	54	32	34	41.6	42.4	40.8
JUN	3.37	1.67	3.17	0	0	T	22	19	61	57	29	42	45.4	47.6	44.9
JUL	1.34	1.76	2.98	0	0	0	14	15	68	69	41	40	50.0	51.8	49.1
AUG	7.32	3.01	4.13	0	0	0	20	19	66	70	38	41	50.8	54.0	51.2
SEP	4.66	5.15	5.37	0	0	.01	21	22	63	71	33	41	48.8	51.7	48.0
OCT	11.20	4.49	6.86	0	T	1.9	25	24	60	55	30	30	46.0	45.2	42.5
NOV	8.01	9.58	8.03	0.1	19.8	12.0	23	29	55	50	32	25	42.0	39.0	37.1
DEC	5.87	6.79	7.50	12.7	19.7	22.1	27	31	43	50	18	25	37.1	38.1	33.9
Totals:	60.45	55.69	63.86	85.6	144.7	104.4	266	281							
Extremes:									68	71	12	11			
Average:													41.7	42.2	40.5

* Average of data from the past ten years

ature was 1.2 degrees above normal due primarily to a warmer than usual October, November and December. Conditions at Adak were good for wildlife food and habitat throughout the 1985 breeding and postbreeding seasons. For the second consecutive year wintering birds that normally arrive at Adak during the fall either arrived quite late or hadn't arrived at all by year's end.

Dutch Harbor weather data, representing conditions in the eastern Aleutians, are so incomplete as to render comparison with 1984 difficult (Table 4). January was very mild and rainy with only one inch of snow being recorded. Dutch Harbor recorded the warmest temperature for Alaska in March when the thermometer reached 61 on the 6th. Summer temperatures averaged cooler than during 1984, although the annual high temperature was only one degree lower than that recorded the previous year. Dutch Harbor weather data for November and December were not available for inclusion in this report.

C. LAND ACQUISITION

3. Other

Negotiations on the proposed land exchange between the U.S. Fish and Wildlife Service (FWS) and the Ounalashka Corporation of Unalaska Island to convey the subsurface rights to 195 acres on Amaknak Island to the Corporation continued during the year. The Ounalashka Corporation already owns the surface rights to the Amaknak land. The Service will give up the subsurface rights to this parcel in exchange for approximately 380 acres of offshore islands and islets. The exchange was very close to completion as the year ended. The islands being acquired by the Service have high numbers of seabirds.

D. PLANNING

4. Compliance with Environmental and Cultural Resource Mandates

In passing the Alaska Native Claims Settlement Act (ANSCA, Public Law 92-203), the U. S. Congress enacted a large scale settlement of Native American land claims. Section 14(h)(1) of ANCSA allows each of the 12 regional Native corporations to select cemetery/village sites and historical places on unreserved and unappropriated land, including existing national wildlife refuge lands. The Secretary of the Interior has charged the Bureau of Indian Affairs (BIA) with the responsiblilty of certifying the claims. There are approximately 380 claims within the Aleutian Islands Unit (AIU). If valid, the Secretary of the Interior has authority to convey fee title of the sites to the appropriate regional corporation.

During the 1985 summer field season, BIA personnel investigated 78 sites on Amchitka Island. With only a few exceptions, all

Table 4. 1985 Dutch Harbor/Unalaska, Alaska, weather summary with comparison to 1984 data

	Inches of Precipitation		Inches of Snow		Days of Measurable Precip.		Degrees Fahrenheit					
							Maximum		Minimum		Average	
	1985	1984	1985	1984	1985	1984	1985	1984	1985	1984	1985	1984
JAN	10.76*	9.04	1.0*	14.0*	9*	25	46	42	20	19	36.7	31.6*
FEB	M**	5.88	M	43.2	M	28	M	39	M	7	M	23.2*
MAR	3.63	6.90	M	2.5	12	21	61	45	13	2	29.6*	33.1
APR	M	3.47	M	10.0*	M	14*	M	46	M	10	M	M
MAY	0.93	2.18	0	T	18	19	51	55	32	15	40.4	39.3*
JUN	3.28	2.19	0	0	12	19	73	63	34	34	45.4	47.9
JUL	2.19	0.82	0	0	18	11	73	72	38	41	50.3	52.3
AUG	5.39	0.34	0	0	21	9	74	75	35	47	50.0*	56.5
SEP	5.43	7.76	0	0	15	19	74	58	25	34	50.2*	50.6*
OCT	7.46	7.72	0	T	25*	16	58	53	25	27	40.8*	42.3*
NOV	M	8.86	M	0.5	M	23	M	48	M	15	M	37.4*
DEC	M	6.49	M	2.5	M	18	M	55	M	28	M	39.6
Totals:	M	61.65	M	72.7	M	222+						
Extremes:							74	75	13	2		
Average:											42.92*	41.25*

* Incomplete data
** Missing data (M)

of the 43 sites investigated during 1983 and 1984 at Adak and Unalaska have been determined to be valid native sites. The final review of the sites on Amchitka Island were not completed by the end of 1985. Due to their isolation, however, the sites may remain under the protection of the AIU. It is expected that the corporations would rather select lands not as well protected or those having higher economic values.

During the period 26 May to 28 June, Assistant Manager Klett was involved in checking for arctic fox on Rat Island and conducting Aleutian Canada goose population/nesting surveys on Agattu Island. While accomplishing those projects, Van located and photographed six Aleut village sites that are not listed in the Aleutian Island Wilderness Report, the Cultural Resources of the Aleutian Region Vol.II, or shown as Aleut village/cemetary sites under ANSCA Section 14(h)(1) selections on recent FWS land status maps. One site is on Rat Island and the others are on Agattu Island.

One of five Aleut village sites located on Agattu Island. Lush green vegetation aids in locating the sites in the otherwise brown tundra in early spring. 6/9/85, #R0832, EVK

The lush vegetation is the result of nutrient enriched soil caused by decaying bird, fish, shellfish and marine mammal remains at each house pit. 6/9/85, #R0825, EVK

5. Research and Investigations

Investigation of the sea-air exchange (SEAREX) of chemical substances

University of Rhode Island, SEAREX Executive Committee, Dr. Robert A. Duce. This was the third year of a study in the Aleutian Islands that is part of a world wide evaluation of atmospheric concentrations and fluxes over the ocean for a variety of organic and inorganic substances. An air particle monitoring system was established on Shemya Island in 1984.

Census of northern fur seals and northern sea lions in the eastern Aleutians

National Marine Fisheries Service, Marine Mammal Laboratory, Seattle, Washington, Dr. Thomas Loughlin. A census of northern fur seals was conducted in the eastern Aleutians on Bogoslof Island. A total of 112 animals were counted with 25 also being tagged. The following studies were conducted on the northern sea lion: population study on Ugamak Island, population survey throughout the central and eastern Aleutians, and assessment of net entanglement mortality throughout the Aleutians.

Revegetation of distributed tundra

University of Tennessee, Department of Botany, Dr. Clif

Amundsen. Work was completed on a study to determine which introduced species are suitable for vegetation establishment on areas disturbed by military activities. A final report was received.

Aleutian Canada goose investigations
U. S. Fish and Wildlife Service AIU-Alaska Maritime National Wildlife Refuge (AMNWR). The Aleutian Canada goose (ACG) project continued, consisting of a spring population and nest survey on Agattu Island; arctic fox eradication follow up on Amukta, Rat, Kasatochi, Adugak, and Uliaga islands; pre-Compound 1080 treatment study on Kiska Island; and transplanting of geese from Buldir to Amchitka Islands. Detailed discussions of these efforts are contained in Section G. 2. and Section G. 15.

Avian migratory system in the Near Islands
George F. Wagner. This three year study designed to catalog the migratory birds of the Near Islands, estimate mean migration dates for some species, examine annual fluctuations in populations, study the pre- and postbreeding movements of regularly breeding species, catalog incidentals and determine how the migratory system works in the Near Islands, was completed this year. A final report is due by 1 March 1986.

The breeding avifauna of Attu Island
George F. Wagner. A three year study to catalog and census the breeding birds of Attu Island, including mapping of suitable breeding areas/habitat on the island and a determination of causes for annual flucuations in breeding species populations. The study was completed this year. A final report is due on 1 March 1986.

6. Other

RM Zeillemaker is the leader of the ACG Recovery Team. The team did not meet in 1985.

E. ADMINISTRATION

Personnel

1. C. Fred Zeillemaker, Refuge Manager, GS-12, PFT
2. Evan V. Klett, Assistant Refuge Manager, GS-11, PFT
3. Fredric G. Deines, Wildlife Biologist, GS-11, PFT
4. Thomas R. Edgerton, Outdoor Recreation Planner, GS-7, PFT

5a. Janice M. Meindl, Clerk-Typist, GS-4, PFT (EOD 7/01/85)
5b. Karen R. Shaw, Clerk-Typist, GS-4, PFT (resigned 7/28/85)
6a. Susan C. Beard, Clerk-Typist, GS-3, PFT (EOD 12/16/85)
6b. MaryAnn Griffiths, Clerk-Typist, GS-3, PFT (resigned 12/20/85)

7. Robert P. Schulmeister, Maintenance Worker, WG-8, PFT
8. Mark E. Wilkins, Laborer, WG-2, INT (resigned 11/08/85)

1, 2, 3, 5a, 4, 6a, 7 and 9a
12/85, #018501, CFZ

9a. Greg T. McClellan, Biological Technician, GS-5, TFT (EOD 12/08/85, SCA aide and volunteer 4/18/85 - 12/07/85)
9b. Chris Ambroz, Biological Technician, GS-5, TFT (resigned 8/22/85)
10. Ellen Kord, Biological Technician, GS-5, TFT (5/30/85 - 8/29/85)
11. Susan Cantor, Biological Technician, GS-5, TFT (4/18/85 - 8/23/85)
12. Elizabeth Sharpe, Biological Technician, GS-5, TFT (5/2/85 - 9/30/85, Volunteer 10/1/85 - 11/22/85)
13. Duane Lawson, SCA aide, (6/3/85 - 9/20/85)
14. Ann Hubbard, SCA aide, (5/14/85 - 8/20/85)
15. Laurel Kagan-Wiley, SCA aide, (5/14/85 - 8/2/85)
16. Karen Janik, YCC (6/10/85 - 8/2/85)
17. Cathy Edgerton, Volunteer (June 1985)
18. Ellen Deines, Volunteer (7/24/85 - 8/20/85)
19. Tracy Knutton, Volunteer (9/24/84 -1/31/85)
20. Pat Davis, Volunteer (10/24/84 - 2/28/85)
21. Roger Jurack, Volunteer (10/28/84 - 2/28/85)
22. Davey Adams, Volunteer (August 1985)
23. Becky Benge, Volunteer (8/85 to present)
24. Rodney Weems, Volunteer (8/85 to present)
25. Leslie Slater, Volunteer (8/11/85 - 12/31/85)
26. Melly Zeillemaker, Volunteer (7/24/85 - 7/28/85)

16, 9a, 11, 12, 14, 13, 15 and 10
7/85, #R1401, EVK

The AIU staff remained at seven permanent full time personnel in 1985 (Table 5).

Table 5. AIU staffing, FY 80 to FY 86

Year	Permanent full time	Permanent part time	Temporary all categories	Total FTE's	Voluteers SCA	Voluteers Other
FY-86	7	0	2*	7.14	4	3
FY-85	7	0	5**	10.8	4	3
FY-84	7	0	7**	10.5	3	5
FY-83	6	2	5**	11.0	4	5
FY-82	5	1	1	7.0	0	0
FY-81	7	1	1	9.0	0	0
FY-80	7	5	11	--	0	0

* 1 local hire, 1 intermittant.
** 1 local hire, 1 intermittant, 3-5 seasonal biotechs.

2. Youth Programs

The AIU participated in the Youth Conservation Corps (YCC) program for the first time in 1985. A talented and responsible

15 year old girl worked full time for almost two months organizing the library, assisting with supervision of youngsters participating in the outdoor education program, cataloguing photographs and assisting with a number of administrative and maintenance duties. We plan to continue the YCC program.

4. Volunteer Programs

Eleven volunteers worked on the AIU during the 1985 field season. Four were selected through an agreement with the Student Conservation Association (SCA), of Vashon, Washington. The summer field season could not have been successfully completed without the dedicated efforts of volunteers. SCA aides contributed many hours to the Kiska field study, Agattu goose surveys, eastern Aleutian wildlife surveys, Adak wildlife surveys, Buldir/Amchitka goose transplant operations, a variety of environmental education programs, Adak visitor center operation, and a number of other refuge programs.

5. Funding

Funding for the AIU is included in the AMNWR budget. AIU funding was received from wildlife resources (1260), endangered species (1480), YCC (1520) and Accelerated Refuge Maintenance Management (ARMM) (Table 6). Funding in 1985 was adequate due to the expeditious use of volunteers and SCA aides. A one-time $237,000 endangered species add on for fox work at Kiska Island will carry us through FY-1986. Beyond that, the future looks bleak.

Table 6. AIU funding, FY - 1981 to FY - 1986 (in thousands of dollars)

Year	Discretnry MB (1260+)	Discretnry SE (1480)	Discre. ARMM	Discre. total	Contr. ARMM	Grand total
FY-86	177.4	219	0	396.4	205	601.4
FY-85	435	105	95	635	54	689
FY-84	326.5	105	200	631.5	176	807.5
FY-83	384.1	89.6	N/A	473.7	N/A	473.7
FY-82	346	75	N/A	421	N/A	421
FY-81	225	140	N/A	365	N/A	365

6. Safety

Refuge Biologist Deines served as station safety officer from 1 January through 30 September. Outdoor Recreation Planner Tom Edgerton assumed the duties on 1 October.

Safety meetings were held monthly except for December, with nine movies being shown. Meeting topics included winter hazards, hypothermia, survival, noise, hearing problems, seat-

belts, safe driving techniques, value of your eyes, back problems, lifting techniques, and how accidents can be avoided. No meeting was held in December since a majority of the staff was away from the office on business or leave.

Fire safety inspections were completed once a month in the AIU headquarters building by the NAS Fire Department. The Navy Fire Department also conducted an annual housing fire inspection in all eight Adak FWS housing units.

A variety of safety training was received by refuge personnel during the year. Sixteen permanent, seasonal and volunteer employees were certified for CPR. A week long spring training session for field personnel included viewing of U.S. Coast Guard cold weather/cold water training films, use of personal floatation devices and survival suits, the care and use of outboard motors and small boats, radio operation and communication procedures, the operation and maintenance of the "Kittiwake", a 25 ft Boston Whaler used around Adak, and weather forecasting (provided by the Navy forecaster).

Safety related purchases included four outbound motors, two 13 ft inflatable boats, two portable emergency locator transmitters, two portable High Frequency (HF) Single Side Band field radios and four vehicle mount HF radios. Wooden shutters were installed on the two Quarter's 2 picture windows. They were used during a November storm with 133 mph wind gusts. Exterior lights were installed on porches at Quarters 4A, 4B, 5A and 5B. Double switches were installed for exterior lights on all quarters. All houses had screening placed around their foundations to rat proof the crawl spaces.

A neon walkway light system was installed at refuge headquarters so personnel could walk through the shop instead of using the sodium vapor lights which require long waits while they warm up. Photoelectric cell controlled exterior lights were installed around the headquarters building for safety and security reasons.

In April Manager Zeillemaker prepared a list of Alaska FWS permanent and temporary radio stations, their frequencies and radio check times for most refuges and other field divisions for the 1985 field season. Copies were provided to all refuges and field stations in the state. This was the first time such information was gathered. It helped in providing information to field camps for reference during possible unforeseen emergencies. The listing will be updated anually and hopefully expanded to include all stations. A multifrequency antenna and HF radio were installed in Biologist Deines' quarters allowing for 24 hour emergency monitoring of AIU field camps or other camps in Alaska. Two radios were taken to all AIU field camps in 1985. One served as the primary communication unit and the other served as a backup in the event of failure by the primary unit. Newly purchased multifrequency whip antennas (5907.5,

3215.0, 4125.0 and 2182.4) also were used in all field camps this year. They performed very well, and eliminated use of cumbersome inverted V "hotstick" antennas.

One accident occured during the 1985 field season. While carrying a backpack load of geese on Buldir, Biologist Deines injured his knees after stepping into a hole hidden by vegetation. The injury to his right knee was serious enough to require arthroscopic surgery in December. His knee recovered well from the operation and was almost back to full performance by the end of the year.

F. HABITAT MANAGEMENT

1. General

The AIU of the AMNWR contains nearly 200 named islands totalling 2.7 million acres. These islands stretch over 1,100 mi from the tip of the Alaska Peninsula to within 500 mi of the Soviet Union's Kamchatka Peninsula. Commonly referred to as "The Chain", all but portions of the seven larger eastern islands are included in the refuge unit. Due to their close proximity to the Alaska Peninsula, Unimak (1.0 million ac) and Amak islands are administered by the Izembek National Wildlife Refuge, headquartered at Cold Bay, Alaska. The Sanak Islands south of the Alaska Peninsula are managed from the AMNWR headquarters at Homer, Alaska. Except for the Aleut village at Atka, the Navy bases at Adak, the U. S. Air Force base at Shemya and the U. S. Coast Guard LORAN Station at Attu, the only signs of recent human activity on the refuge unit are the unhealed scars and debris remaining from World War II.

2. Wetlands

Many of the islands have freshwater "potholes", some areas even superficially resemble the prairie pothole country of the Midwest. A few areas at lower elevations produce aquatic growth and support modest waterfowl populations. This is especially true of Amchitka, Kanaga and Agattu islands. Current management efforts include orienting military development away from wetlands and lagoons. The AIU staff monitors most construction projects on all military installations and provides recommendations on proposed activities by Native corporations as well as the military. The military, especially at Adak, was quite cooperative and sensitive to our suggestions throughout the year. A proposed Adak landfill project was stopped in June due to protests by Manager Zeillemaker.

7. Grazing

Even though some semblance of order was made last year with the grazing leases the AIU inherited from the Bureau of Land Man-

agement (BLM) in 1980, our problems were not solved. A synopsis of 1985 activities follows:

Special Use Permit (SUP) AI-84-016, Unalaska Island. The SUP and a bill of collection covering 370 head of cattle, 401 sheep and six saddle horses were issued in May 1984. The 150 wild horses that were reported on the lease were not included. We received partial payment in June 1984 and a statement of appeal over the high grazing fee. Ownership of the wild horses was also claimed, so an amended bill of collection was prepared to include them. A meeting was held in the Anchorage Regional Office (RO) to discuss the appeal with the permittee's attorney. The meeting was followed by many phone calls and letters. An aerial count in September 1984 showed that the sheep and saddle horses were being kept on lands conveyed to a Native corporation and that there were over 300 wild horses. The sheep were consequently eliminated from the SUP and the increase in horse numbers was added. A final payment for 1984 grazing was received in April 1985.

Part of the 300+ wild horses claimed by one grazing permittee on Unalaska Island. 11/6/85 #R1835, EVK

SUP AI-84-032, Umnak Island. The SUP and a bill of collection covering 150 head of cattle were issued in September 1984. The SUP was appealed and, again, many phone calls and letters

followed. Through misunderstandings, the appeal did not reach the RO until October 1985.

SUP AI-85-004, Akun Island. The SUP and a bill of collection covering 292 head of cattle were issued in September 1984. After several follow up letters, the permittee was contacted by telephone and stated that he would sign the SUP and send payment promptly. Several letters and attempted telephone calls (telephone had been disconnected) produced no results. The permittee was finally contacted through the Unalaska Police Department and threatened with a summons into federal court. Payment was received in November 1985.

After negotiating for over a year, the 1985 grazing fee was received from the RO in November. The fee was set at $1.87 per animal unit month (AUM). SUP's were prepared for all three 1985 grazing operations. The three permits were under appeal as the year ended. The permittee on Umnak is now claiming it (a Native corporation) does not own the cattle, claiming instead that the cattle still belong to a former BLM leasee.

9. Fire Management

A tundra fire occurred on the NAS Adak rifle range in early June. The local Marine Corps detachment was conducting gunnery practice at the time and a mortar round ignited the dry vegetation. Through advise from Manager Zeillemaker, the fire was allowed to burn itself out due to the presence of unexploded ordance in the area and blocking streams and snow patches. Approximately 275 acres were burned, but due to the location within a rifle range, no significant impact occurred to any wildlife species. The area fully greened up by September. Fire is an unusual event in the Aleutians, as our normally perpetually wet tundra usually will not burn.

12. Wilderness and Special Areas

The Alaska Natural Interest Land Conservation Act (ANILCA) designated approximately 1.3 million ac of the Aleutian Islands Unit as Wilderness. Notable areas of the Unit excluded from the designation include 127,870 ac on Shemya, Attu, Adak, Amchitka and Ugamak islands for military and lighthouse purposes or World War II debris and approximately 200,000 ac selected by Native corporations under ANCSA.

Other special designations which occur on the AIU are as follows:

AREA	DESIGNATION
Aleutian Islands Unit	Biosphere Reserve
Agattu Island	Research Natural Area
Buldir Island	Research Natural Area
Kiska Island Occupation Site	National Register of Historic Landmarks

AREA	DESIGNATIONS
Attu Island Battlefield	National Register of Historic Landmarks
P-38 G Lightning Aircraft, Attu Island	National Register of Historic Places
B-24 D Liberator Bomber Aircraft, Atka Island	National Register of Historic Places

Dormant volcanic craters add their own type of beauty to the wilderness scene. 7/26/85, #018502, CFZ

G. WILDLIFE

1. Wildlife Diversity

Birdlife of the central and western Aleutian Islands has been adversly impacted through the introduction of arctic and red

foxes beginning in 1836 and continuing through the 1920's for fur farming purposes. The once abundant Aleutian Canada goose was dangerously close to extinction during the 1960's due to fox predation and hunting on its California wintering grounds. As a result of fox eradication success, the ACG is slowly being reintroduced to islands near two remaining traditional nesting grounds at Buldir and Chagulak islands. Continuing fox removal efforts are leading toward restoration of the endangered goose and benefiting numerous other tundra and burrow nesting bird species. Several nesting seabirds have already begun to increase on Agattu, Alaid, Nizki, Amchitka and Amukta islands which are once again free of foxes. The other endangered species frequenting the Aleutian Islands area is the short-tailed albatross. This migrant from Japan has suffered from human impacts and introduced rats on its nesting island near Japan, but is now being recorded in Aleutian waters once again with regularity.

In separating the North Pacific Ocean from the Bering Sea and bridging North America to Asia, the Aleutian Islands offer refuge to an international variety of birds. Migrants converge from all points of the compass. Nearly 80 Asiatic species have been observed in the Aleutians, particularly from Adak to Attu. Several have been reported nowhere else in North America and observations of new species occur almost annually. Asiatics include whooper swan, bean goose, the Asian form of green-winged teal, common pochard, tufted duck, smew, white-tailed eagle, common greenshank, wood sandpiper, Far Eastern curlew, common sandpiper, long-toed stint, eye-browed thrush, olive tree-pipit and rustic bunting. A large variety of seabirds nest on island cliffs, talus slopes and tundra covered slopes in dense, noisy colonies. Their rookeries vary in size and composition, but some of the more numerous species include northern fulmars, fork-tailed and Leach's storm-petrels, red-faced and pelagic cormorants, glaucous-winged gulls, black-legged kittiwakes, thick-billed and common murres, pigeon guillemots, ancient murrelets, least and crested auklets and horned and tufted puffins.

Eight new bird species were observed this year in the Aleutians causing the list of avifauna to grow to 255 species. Species diversity knowledge has increased considerably in recent years due to increased field investigations by nonrefuge as well as refuge personnel. Attour, Inc., continued spring surveys at Attu for the ninth year. A private researcher conducted spring through fall surveys at Attu for the final year of his three year agreement. Dr. Dave Sonneborn, a private birder from Anchorage, once again conducted spring surveys at Shemya while conducting medical clinics there for the Air Force. Refuge and other FWS personnel conducted surveys at Attu, Agattu, Shemya, Buldir, Kiska, Adak, Kasatochi, Baby Islands, Egg and other islands during the year. New species added to the North American list in 1985 were the Oriental pratincole, great spotted woodpecker, Mugimaki flycatcher, Pallas' grass-

hopper-warbler, pale-legged willow warbler, Asian brown fly-catcher, Siberian blue-robin and pine bunting. The Siberiean rubythroat was added to the Kiska Island list. Details are in sections G.5 and G.7.

No native terrestrial mammals occur in the Aleutians west of Umnak Island, except possibly the arctic fox population on Attu Island. The arctic fox is native to Rootok Island and the red fox and tundra vole occur west to Umnak Island. Including the Norway rat, arctic ground squirrel, Greenland collared lemming and the caribou/reindeer a total of five terrestrial mammal species have been introduced to the Aleutians. Eighteen species of marine mammals ply Aleutian waters.

The Siberian rubythroat was observed at Kiska Island for the first time. 6/13/85, #038501, FGD

2. Endangered and/or Threatened Species

Endangered species work within the AIU this year centered on the Aleutian Canada goose, covering a wide variety of projects. These projects included surveying the returning geese and nests on Agattu, a Buldir to Amchitka goose transplant, verifying fox free status at Amukta and Rat islands, and several prefox eradication surveys on Kiska Island. In addition to the goose

The M/V Norpac, and its crew, provided very able assistance during the 1985 field season. 6/85, #038509, FGD

work, surveys were conducted for two potentially threatened or endangered plant species on Adak, Rat and Kiska islands. Detailed information on all fox control projects to benefit the ACG Section G. 15 ("Animal Control").

During June a crew of six biologists was stationed on Agattu to observe returning ACG and search for goose nests in hopes of estimating the Agattu breeding population. The crew was split into two groups from 6 to 12 June. Two biologists stayed in the old cabin at Aga Cove while four biologists stayed in two Weatherport tents at Camp Cove about one mi south of Aga Cove.

After 12 June all personnel stayed at the base camp in Camp Cove. From 6 to 16 June, the crew concentrated on observation of banded and unbanded geese. After 16 June the crew concentrated on nest searches.

The weather was unusually nice on Agattu. The only bad weather appeared on 24 June and delayed departure from the island to 26 June.

The crew documented the presence of 52 individual geese (34 in Cape Sabak area, 18 in Aga Cove area). It is estimated that there may have been up to 84 geese on Agattu in 1985. A sighting counted as an observation if there was a definite

spatial or temperal separation between individual geese or flocks. Of the 234 sightings, observers were able to discern whether or not 120 (51%) of the geese were banded. Of those, 46 (38%) were banded and 74 (62%) were unbanded. Thirty-three of the 46 sighted bands were read. A total of 12 bands were read (Table 7).

Picturesque Camp Cove at Agattu Island, a nice place to call "home" after a long day in the field. 6/85, #048501, TRE

Banded geese were observed in similar locations to those recorded in 1983 and 1984. Of the 12 identifiable banded geese, seven (58%) were found from Aga Cove north to McDonald Cove and five (42%) were found from Camp Cove to Cape Sabak. Four of the seven geese found in Aga Cove and two of the five

Table 7. ACG Bands Read on Agattu Island, June 1985

Colored Band #	Release Site	Release Date	Sex & Age @ Banding	Source
Blue C26	Aga Cove	8/82	AHY - F	Buldir
Blue E45	Aga Cove	8/83	L - M	Buldir
Blue E46	Aga Cove	8/84	L - F	Buldir
Blue E53	Aga Cove	7/84	L - M	Buldir
Blue E62	Aga Cove	8/84	L - M	Buldir
Blue E96	Aga Cove	8/84	L - F	Buldir
Blue X20	Aga Cove	8/82	L - M	Buldir
Blue X61	Aga Cove	8/84	L - F	Buldir
Blue X62	Aga Cove	8/84	L - M	Buldir
Blue 932	Aga Cove	8/82	L - M	Buldir
Blue 605*	Aga Cove	8/82	-----	------
Red J05	Crescent City, CA	3/85	ASY - M	Crescent City, CA
Yellow 14	Crescent City, CA	4/83	ASY - F	Crescent City, CA

* - only leg with blue band found

---

geese found in Cape Sabak were 1984 goslings. Of the 12 banded geese, two were banded as adults in California and the other ten were transplanted from Buldir. Except for one bird (C26), all were goslings when banded and released. As with previous goose surveys, the majority of the banded birds were recorded at Aga Cove and were from the release of the previous year. This fixation with Aga Cove is to be expected for nonbreeding birds following the year of release, as they tend to return to the site of their first flight. As the birds mature they become more secretive and disperse while involved with breeding activity and selecting preferred nesting habitat.

The geese observed during the 1985 survey that were found at Agattu in previous years were C26 and 932 which were sighted in 1983 and E45 which was sighted in 1984. The high number of recorded unbanded geese is possibly due to the following factors: 1) geese from other islands pairing with geese released on Agattu while both were on the wintering grounds and returning to Agattu, 2) immature geese from the wintering grounds following other geese to Agattu for the summer, 3) natural dispersal from established breeding populations at Chagulak and/or Buldir which may be at or near saturated population densities, and 4) geese produced on Agattu by wing clipped birds released in 1974 and several releases of transplanted geese made on Agattu over the years since 1974.

The first nesting by wild transplanted birds on Agattu was documented in 1984 with the discovery of two nests and a brood.

A total of 11 ACG nests and one pair were found between McDonald Cove and Anemone Falls in 1985. The areas were selected for nest searches on the basis of goose observations in early June. The Thomas Lake and Cape Sabak areas received the heaviest use by geese at that time. At least seven geese and two nests were found by Thomas Lake and 15 geese and three nests were found on Cape Sabak, with two other nests in the general cape area. In addition, at least 18 birds and two nests were found in the Aga Cove area. The final two nests were found near Camp Cove and Newt Pond. Nine of the 11 nests were found by flushing an incubating bird off the nest. Females remained on nests until observers were very close. The average flushing distance was 13.7 ft, with the minimum being 5 ft. When flushed, the adults tended to remain in the vicinity and vocalize considerably.

The average clutch size of the 11 nests was 5.73, which compares favorably with clutch sizes found at Buldir and Chagulak islands (5.5 and 5.8 respectively). Eggs measured from the Agattu Island nests were slightly larger than eggs measured at Buldir or Chagulak islands. Nest sites chosen on Agattu Island varied considerably from those found on other islands. (Table 8).

Table 8. Site characteristics of eleven Aleutian Canada goose nests found on Agattu Island, 1985

Date Located	Number of Eggs	Site Vegetation	Aspect	Degree of Slope	Elevation in Feet
8 June	6	*Elymus mollis*	S	15	225
8 June	6	*Elymus-umbel*	W	5	200
9 June	4	*Elymus mollis-Angelica lucida*	S	15	250
10 June	6	Upland tundra	E	15	235
11 June	6	*Elymus-umbel*	NE	10-15	240
13 June	6	*Elymus mollis*	E	5	50
14 June	6	*Elymus mollis*	W	8	225
16 June	6	*Elymus mollis-Angelica lucida Conioselinum chinese*	W	5	240
16 June	5	*Elymus mollis-Ligustreum scoticum-Conioselinum chinese Epilobium-angustifolium*	E	50	150
17 June	5	*Elymus mollis-Angelica lucida*	SE	20	300
17 June	7	*Elymus mollis-Angelica lucida*	WSW	5	250

Ten of the eleven nests found on Agattu Island in 1985 were on level slopes. Seventy-two percent (72%) of all Buldir Island nests have been on slopes on greater than a 20 percent gradient, however, nesting success there has been highest for nests in level areas. The predominance of level nest sites found on Agattu Island may indicate that that habitat is favored where it is widely available. The rugged terrain of Buldir and Chagulak isalnds does not offer an abundance of level nesting habitat. One of the Agattu nests was found in upland tundra. The only nest ever previously discovered in upland tundra also occurred in the Aga Cove area of Agattu in 1974 when Patuxent reared geese were involved.

The average distance between nests on Agattu Island was 3,036 ft. In contrast, 54 percent of nests examined on Buldir were found within 165 ft of another active nest. This indicates the nesting density observed at Agattu Island is far from its maximum potential. Historical reports confirm this conclusion.

Including the five nests on Cape Sabak, the two nests at nearby Thomas Lake, and the 34 birds observed, the Cape Sabak area is believed to prove high quality goose nesting habitat. This feature was first evident in 1984 when the three nests and brood found that year were in the Cape Sabak area. The utilization of the southern portion of Agattu corresponds with the

The second known occurrence of an Aleutian Canada goose nest in an upland tundra habitat at Agattu Island. 6/85, #048502, TRE

nesting preference found at Buldir. A member of the crew collected vegetative samples from Agattu to assist in assembling baseline data for Aleutian Canada goose habitat sites. The material was passed to the Regional Botanist in Anchorage for identification.

In late May, while enroute to Kiska and Agattu islands via the M/V Norpac, a visit was made to Amchitka Island to check for geese and locate a release site for the planned Buldir-Amchitka goose transplant in August. A three person crew using an inflatable boat surveyed part of the south side of the island for geese. Due to rough weather, extensive kelp beds, and minor outboard motor problems, continuation of the survey was cancelled. The next day, three possible release sites were checked. The sites included Buoy Point and Bluff Point on the south side of the island, and Midden Point on the north side. The final selection of Buoy Point was made at Adak using field information and topographic maps.

In late July, while enroute to Buldir for the goose transplant, an additional stop was made at Amchitka Island to set up a goose holding pen. After two days of hiding from weather in Constatine Harbor, a long overland trek was mounted to set up the holding pen at Buoy Point. In spite of dense fog, the crew was able to locate Buoy Point Valley from the road, and, after

Constructing a goose holding pen at Buoy Point, Amchitka Island. 8/3/85, #038502 FGD

about a two mile hike down to the beach, the pen was set up in tall Elymus dominated vegetation about 60 ft from a creek and 300 ft from the beach.

The 22 by 49.5 ft holding pen was constructed of metal fence posts and poultry wire. Burlap was attached to the sides of the enclosure to provide a visual barrier for the birds.

The 1985 Aleutian Canada goose capture, banding and transplant operation was conducted from 8 to 17 August. The M/V Norpac arrived off Buldir on 4 August, but due to heavy seas and rough weather had to seek shelter in Kiska Harbor. The vessel returned to Buldir when the weather subsided only to have the field crew find the cook tent frame completely blown away by winter storms and part of the 12 x 16 ft cabin roof missing. Repairs required two days, resulting in a completely rebuilt cook tent frame on one end of the cabin and a reroofed cabin.

Based on previous experience, Buldir goose search and capture efforts were conducted by having all personnel walk 33 to 99 ft abreast through the upper edge of the lowland tall plant association. When a bird was sighted, everyone converged on that area as additional geese are normally found in the same area. Geese were then captured using large, long handled dip nets. After capture, each goose was placed in a small burlap bag which had one corner clipped to allow the bird's head and neck to extend outside the bag. The bags were precut to snugly fit geese and prevent injuries. The open and of the bag was tied with a short piece of twine to limit the bird's movement and prevent escape. The bagged geese were then placed in a burlap lined, welded wire backpack cage for transport to main camp. Three cages were attached to each backpack frame. Each cage could hold three to five adult geese or four to six goslings. Unnecessary walking with birds in the pack was avoided. If one particular area was worked for a time, loaded packs were set down so that crew members could chase other geese and the packed geese would not be subjected to considerable jostling. Hiking back to camp was completed without unnecessary delays or rough treatment of the birds.

Upon return to the main camp at North Marsh, the geese were removed from the backpack cages and burlap bags and placed in wooden crates to await processing. Banding materials, tubing supplies (for forced feeding) and other equipment necessary to process the birds were then gathered. Processing of the geese began with each person being responsible for one specific task in an assembly line type operation. The age and sex of each bird were determined first, the metal FWS band was applied next, and a yellow colored leg band was applied last. The colored band was placed on the right leg of males and left leg of females. All information, including the capture date and location, was recorded in a field log. All geese were then tube fed with a 15cc protein mixture. The tube feeding continued once daily thereafter, including the day of transplant. The

birds were also tube fed just prior to release on Amchitka. The tube feeding helps reduce the shock of handling and increases the chances of survival and success of the transplant.

After processing, the birds were released into a 16.5 x 49.5 ft enclosure constructed of metal fence posts and poultry wire, including a poultry wire roof. Burlap was again attached to the sides of the enclosure to provide a visual barrier for the birds. Burlap sacks were placed over one end of the pen to afford the birds some protection from rain. The area within the enclosure provided natural food and cover, but water and commercial goose feed were also provided. The band numbers of any birds which appeared to be suffering from paralytic shock syndrome were recorded at that time and at each subsequent tube feeding. Those birds were attended to more closely to allow constant monitoring of their recovery.

Bean Goose Lake, Extra Plateau, Glissade Valley, Dip Camp, Dry Lake and the Kittiwake Lake areas were all searched for geese. Fourteen geese were captured in Glissade Valley while enroute to Extra Plateau. This was the first time that geese have been caught in that valley. Kittiwake Lake again proved to be a very sumptous, but fleeting, capture site. Over 300 geese were observed on the slope above the east shore of the lake, but when approached they all flew away. No geese were captured on the lake, but six were captured at nearby Kittiwake Lake Plateau. Dip Camp and Dry Lake were bountiful, with over 40 geese captured at each site. A new record capture of 47 geese was established at Dry Lake.

Just prior to transport to Amchitka, the birds were removed from the holding pen and tube fed. They were then placed in wooden crates covered with burlap and lined with Elymus mollis. Adults and goslings were put into separate crates to eliminate potential trampling mortality. The number of birds placed into the wooden crates was limited to four to six adults or six to eight goslings. Once the geese were placed in the crates, they were taken to the vessel via inflatable boat. The goose crates were then securely tied to the deck of the 98 ft M/V Norpac and covered with a heavy canvas. All efforts were made throughout handling of the geese to provide maximum protection from the elements. Three transplants were completed in 1985. The first two went smoothly, but the final transplant was full of excitement. Due to a gale warning, the last load of geese, all personnel, and all camp equipment were taken from Buldir during a midnight exodus. Although it was hoped to offload the birds the following evening, heavy fog and rough seas at Amchitka delayed the operation until the next morning. Even then, fog and five to eight ft swells slamming onto the beach made the release exciting. All geese were tube fed aboard the vessel prior to being taken ashore to the release site by inflatable boats. They were then released in Buoy Point Valley without further processing, except for placement into the holding pen. The birds were held in the pen for two hours during the first

two releases in order to allow them to settle down and reestablish old or establish new family ties. However, on the final transplant the birds were given only about one half hour to allow the transplant crew to return to the support vessel expeditiously. The hasty departure was necessitated by concern for the safety of the release team under adverse sea conditions.

A total of 136 Aleutian Canada geese were captured on Buldir Island. Eleven birds died during the transplant. Of the eleven, one bird died during banding operations on Buldir, seven died during transport to Amchitka, and three died after release on Amchitka. The three goslings that died on Amchitka included two killed by eagles and one found dead near a creek. Ten of the eleven birds that died were goslings (five females, and five males). The remaining bird was an adult female. The birds that died represented an eight percent mortality rate for all birds captured. In addition, one adult female escaped on Buldir prior to transplant.

A total of 124 Aleutian Canada geese (96 goslings and 28 adults) were successfully transplanted to and released on Amchitka Island. The birds included 48 male goslings, 48 female goslings, 11 male adults and 17 female adults. The average age of the goslings was 33.7 days. Two of the transplanted birds were recaptures. One was an adult female banded on the wintering grounds at the Lofton Ranch pasture in California on 21 March 1984 as a second year female. The second recaptured bird was an adult male banded as a second year male on 24 March 1984 at the same location.

Although every effort was made to minimize the impact of capture and handling, some geese still exhibited signs of paralytic shock syndrome when released into the holding pens at Buldir or Amchitka. In most cases, however, the affected birds seemed to recover within 24 hours, but 31 geese exhibited some degree of partial paralysis at the time of release on Amchitka. All 31 were mobile, but each had some impairment of movement. Each was expected to recover. As was the case in 1984, goslings and males had the greatest tendency to suffer from parlysis due to the stress of being handled and confined. Seventy-three percent (23) of the birds exhibiting some paralysis were goslings and 61 percent (14) were males. A few birds sustained minor abrasion injuries during handling and transport. Those injuries were treated with spray antiseptic.

A botanist from the Regional Office accompanied the summer field crew to Rat and Kiska Island. Aleutian wormwood (Artemesia aleutica) was thought to be a possible candidate for listing as a threatened or endangered plant species in the Aleutians. At Kiska and Rat islands, however, numerous specimens were found, indicating that the plant is neither threatened nor endangered. The botanist was also on Adak in August to continue the search for the Aleutian shield fern

(Polystichum aleuticum). That plant is also considered a potential threatened or endangered species in the Aleutians. The fern has been observed previously on Adak and Atka islands. Unfortunately, the 1985 Adak search was unsuccessful, as had been the 1984 searches on Adak and Atka.

A summary of fox eradication work in the AIU to benefit the Aleutian Canada goose is contained in Section G-15.

3. Waterfowl

The whooper swan, six species of geese and 32 species of ducks have been recorded in the Aleutian Islands. Of those, the swan, one goose and ten duck species are Asiatic in origin. The following information is provided for unusual North American and Asiatic species observed in the Aleutians this year.

Whooper Swan - Six were observed in a cove along the southeast shore of Kanaga Island and another six were on Figure Eight Lake at Tanaga Island on 5 April. Seven were observed and photographed at Shemya Island 26 April-4 May. Six were reported to be at Shemya on 3 November. Three were at Lake DeMarie, Adak, 10-19 November. Up to ten were at Lake Elwood, Attu, 1-13 December.

Greater White-fronted Goose - One was at Adak 26-31 May. Two immature birds were carefully scrutinized at close range on Kuluk Bay, Adak, on 27 September.

Emperor Goose - Numbers appeared at Adak by mid-October, which is considered earlier than normal. This event may have been related to mild weather in the Aleutians and cold weather on mainland Alaska this fall. Emperors arrived at Shemya in mid-October also.

Brant - One was reported observed at Dutch Harbor/Unalaska on about 20 February.

Canada Goose - Two birds, believed to be leucopareia, were reported to be at Little Thumb Bay, Adak, on 10 February. The observation was not confirmed.

Falcated Teal - A pair was at Attu 12 May.

Eurasian Wigeon - Two appeared at Adak on 28 April. By 9 May, 12 could be found and by 11 May, 18 were present. Three remained as late as 28 May. Up to 11 were at Attu 14-31 May. Up to eight were at Shemya 22-28 May. Five were were found at Adak 9 October, 12 were counted on 23 October and five were recorded on 6 November.

Common Pochard - Two drakes were at Murder Point, Attu, on 12 May. A male was on Cosco Cove and at Murder Point 30-31 May. Up to four were at Shemya 22-28 May.

Canvasback - None appeared at Adak for the first fall in four years.

Tufted Duck - Six were at Smew Ponds, Adak, on 12 February. One was at Adak 21 March, four were there by 10 April, six were present 27 April-9 May, and two remained as late as 27 May. Up to 16 were at Attu 14-31 May. Up to 22 were at Shemya 22-28 May. Four were rediscovered near Andrew

Lake, Adak, on 30 June and four drakes and a hen were in the same area on 1 July. Two drakes in partial eclipse plumage were on a pond adjacent to Andrew Lake, Adak, on 9 August. These occurrences add to local speculation that this species possibly breeds in the Aleutians.

King Eider - A high plumaged drake was at Navy Cove, Attu, 25-27 May.

Steller's Eider - The drake that has apparently wintered at Adak with harlequin ducks since the winter of 1982-1983 was observed 19 April and had returned again by 28 December.

Barrow's Goldeneye - An immature male was at Shemya 22-28 May.

Smew - Up to five females were at Murder Point, Attu, 12-24 May.

4. Marsh and Water Birds

Five species of loons, three species of grebes, three species of albatrosses, nine species of smaller tube-noses, three species of cormorants, an egret, a night-heron, and the sandhill crane have been recorded in the Aleutian Islands. Of those, the short-tailed albatross and the egret are from Asia. The Asiatic short-tailed albatross is an endangered species. The Chinese egret, also an endangered species, has occurred only once (in 1974). Several of the tube-noses are from the southern hemisphere. The following list includes information only for unusual species or sightings.

Pacific Loon - Up to 15 could be found through April and even as late as 4 May. Two lingered until 28 May. The species was not known to have previously wintered at Adak in such numbers. Single birds, which may have been the similar Asiatic arctic loon, were at Attu 21-25 May.

Yellow-billed Loon - Records in 1985 indicate the lowest number of winter-spring observations since January 1982. One was identified off Murder Point, Attu, on 27 May.

Northern Fulmar - A small breeding colony of about 20 nests was discovered on sea stacks near Cape Wrangell, Attu, in late July and early August. The species had not been known to breed west of Buldir Island.

Sandhill Crane - A single bird was at Attu 22-25 May.

5. Shorebirds, Gulls, Terns and Allied Species

Seven species of plovers, 44 species of sandpipers, three species of jaegers, a skua, 13 species of gulls, four species of terns and 15 species of alcids have been recorded in the Aleutian Islands. Of those, five species of plovers, 22 species of sandpipers, five species of gulls and two species of terns are Asiatic in origin. The Oriental (or Eastern) pratincole, representing a new family as well as species for the North American bird list, was added to the Aleutian Islands avifauna in May 1985. The rock sandpiper and the glaucous-winged gull are year-round residents. The following listing includes occurrence information for all unusual North American and Asiatic species.

The Oriental Pratincole at Attu 19-20 May 1985 was new to the North American bird list. 5/20/85, #018503, CFZ

Oriental Pratincole - A high plumage bird was on the north shore of Murder Point, Attu, 19-20 May. It was photographed on 20 May and collected. The specimen was deposited at the University of Alaska Museum in Fairbanks. The species and family had not been previously recorded in North America.

Black-bellied Plover - One appeared at Clam Lagoon, Adak, on 24 May.

Lesser Golden Plover - Five migrants were on the lower slopes of Mt. Moffett, Adak, on 12 August. Others were recorded through 13 October.

Mongolian Plover - Up to six were on the southwestern shores of Attu 20-27 May.

Lesser Yellowlegs - One was on Kuluk Beach, Adak, on 10 September. Previous Adak records are 18 June 1972 and 30 August 1984.

Wood Sandpiper - Up to 11 were at the southeastern portion of Attu 19-31 May. At least two males continued courtship displays into June. Only one or two were at Shemya 22-24 May.

Gray-tailed Tattler - Single birds were at Attu 20 and 30 May. One was at Shemya 23 May. One was at Rat Island on 30 May.

Common Sandpiper - Single birds were on the southeastern shores of Attu 21, 22 and 25 May with two being found on 23 May. Single birds were at Shemya 22, 23, 28 and 29 May.

Terek Sandpiper - One was at Shemya on 22 May.

Whimbrel - Single birds of the Asiatic subspecies were on the southeastern shores of Attu 20 and 25 May with two being found on 27 May.

Bristle-thighed Curlew - One was observed at Adokt Island in the Baby Islands on 15 May.

Far Eastern Curlew - One or two were at Shemya 22-28 May.

Black-tailed Godwit - A single bird was at Barbara Point/Pyramid Cove, Attu, 22-29 May.

Bar-tailed Godwit - Fourteen appeared at Adak 25 May. Three arrived at Attu on 26 May. Fifteen were there by 30 May. One was at Rat Island on 30 May. Five were at Clam Lagoon, Adak, on 2 June.

Rufous-necked Stint - None were recorded in the Aleutians during the spring migration. It has been several years since the species has not been recorded in the Chain.

Long-toed Stint - Up to three birds were on the southeastern portions of Attu 19-25 May. Two were at Shemya 24 May and one was there 25 May.

Sharp-tailed Sandpiper - One was near Lake Jean, Adak, on 23 September.

Rock Sandpiper - A flock of 200 to 250, the largest known for Adak in winter, was at Clam Lagoon, Adak, from 27 December 1984 to 31 March 1985.

Dunlin - Three birds spent the winter at Clam Lagoon, Adak, in the company of 25 sanderlings. To our knowledge this is the first over winter Adak occurrence since 1974-1975. Five appeared at Attu 20 May, single birds were there 26 and 28 May and three were observed on 29 May. Up to three were at Shemya 22-28 May.

Ruff - A black ruffed male was at Attu 24 May.

Long-tailed Jaeger - One was reported from Clam Lagoon, Adak, on 4 July.

Common Black-headed Gull - A single bird was at Attu 22 May. Another was at Shemya 23, 24 and 26 May. A nonbreeding plumaged bird arrived at Adak 24 May and remained through 26 May. An adult appeared 27-28 May. One was at Clam Lagoon, Adak, on 2 June and remained for one week. Another was at Kiska 13-14 June. The species was still present at Attu in late June.

Mew Gull - Up to five were at Dutch Harbor and Unalaska in January and two were at Clam Lagoon, Adak, on February 24.

Slaty-backed Gull - A single first year bird was at Attu 21 May. One was on Agattu 9 June. The species was still present at Attu at least through late June.

Aleutian Tern - A colony of nearly 200 birds was established on the flats adjacent to Clam Lagoon at Adak. Adults were observed carrying fish to nestlings on 29 June. The first fledgling was observed on 28 July. Adults were still feeding fledged young near the colony on 21 August. The

last sighting there of five birds was on August 29.

Marbled Murrelet - One of two adults on Kuluk Bay, Adak, 21 August was carrying fish in its beak as if preparing to feed young somewhere nearby.

Whiskered Auklet - A small breeding colony may be established near Cape Wrangell, Attu. Several breeding plumaged birds were sighted there in late July and early August. The species is not known to breed west of Buldir Island.

A female red-necked phalarope on a shallow freshwater pond at Agattu. 6/8/85, #R0733, EVK

Seabird colony surveys were conducted from Egg Island in the eastern Aleutians to Agattu in the west in 1985. Islands which were surveyed or checked included the Baby islands, Bogoslof, Chagulak, Atka, Salt, Kasatochi, Koniuji, Kagamil, Herbert, Chuginadak, and Carlisle. In addition, pelagic surveys for seabirds were conducted whenever the weather and sea conditions permitted.

In May, the Baby islands and Egg Island were circumnavigated via inflatable boats to determine their potential as monitoring sites for the Aleutian Wildlife Inventory Plans (WIP). The bird and mammal species observed during the circumnavigations are shown in Table 9. A stop was made at Egg Island to check a possible camp site. The area looked good with an adequate water

Table 9. Bird and marine mammal observations during circumnavigation of Egg Island and the Baby Islands, May 1985.

BIRD SPECIES	Island Name and Number Observed						
	Egg Island	Tangagm Island	Auklet Island	Excelsior Island	Koschekt Island	Adokt Island	Total
Red-faced Cormorant	15	2	1	97	--	--	115
Double-crested Cormorant	13	--	4	49	--	10	76
Pelagic Cormorant	3	--	--	2	--	5	10
Common Eider	--	2	49	170	61	58	340
Harlequin Duck	9	103	45	88	61	41	347
Black Oystercatcher	5	26	--	2	3	10	46
Glaucous-winged Gull	201	70	25	38	17	54	405
Common Murre	--	--	--	--	--	1	1
Murre, species	1085	2000	--	--	--	--	3085
Pigeon Guillemot	343	70	--	63	2	3	481
Parakeet Auklet	5	--	--	3	--	--	8
Whiskered Auklet	25	--	--	--	--	--	25
Tufted Puffin	55	200	12	1302	--	--	1569
Bald Eagle, Ad	1	2	--	1	1	3	8
Bald Eagle, Im	2	4	--	1	--	1	8
Peregrine Falcon	--	--	--	--	--	3	3
Common Raven	3	--	1	--	--	--	4
Winter Wren	6	--	--	--	--	--	6
Song Sparrow	--	50	--	--	--	--	50
Total Birds	1771	2529	137	1816	145	189	6587
MAMMAL SPECIES							
Northern Sea Lion	80	5	--	2	--	--	87
Harbor Seal	39	65	2	4	18	21	149
Sea Otter, Ad	--	10	--	2	5	3	20
Sea Otter, Im	--	--	--	--	--	1	1
Total Mammals	119	80	2	8	23	25	257

supply. A crew also landed on Tangagm in the Baby islands to check a possible camp site. The island has an excellent camp site, but, unfortunately, no fresh water as is the case with the other Baby islands. Two beaches on nearby Unalga Island were checked for possible camp sites. Two sites appeared promising, being within easy working distance of the Baby islands. One of the beaches had several large bones from a large whale. Several of the bones were transported to Adak for an exhibit in the visitor center.

A project was initiated this summer to form data books for selected islands. Each book will contain all the resource information on a particular island, including photographs of the entire island shoreline. In conjunction with this effort, photographs of several islands were taken during the 1985 field season. The complete shorelines of Egg Island and each of the Baby islands were photographed in May. While enroute from the Baby Islands to Amukta, shoreline pictures were taken of the south end of Kagamil Island, the north side of Chuginadak Island, the south end of Carlisle Island and the north side of Herbert Island. An old fox trapper cabin was found still standing on Herbert Island in July, but is in poor condition. The cabin on Carlisle has crumbled. While enroute to Kiska and Agattu islands from Adak in May, shoreline pictures were taken of the south shoreline of Semisopochnoi Island. An attempt was also made to locate a cabin on Semisopochnoi and a ranch site on Kanaga Island, but both efforts were unsuccessful. Photographs were taken of the entire shoreline of Kiska in June.

In June, during the Aleutian Canada goose population and nest surveys on Agattu Island, a seabird survey was also completed. The survey was accomplished via inflatable boat and encompassed the southeast portion of Agattu. Black-legged kittiwakes and murres were the most numerous species observed with populations similiar to or increasing from previous surveys. Population numbers of murres in Aga Cove have shown a steady increase since 1975. Cormorants and puffins were more numerous this year than in previous surveys. Ground and cliff nesting species are increasing at Agattu due to the absence of fox since 1979. The results of this survey help justify continued removal of introduced arctic foxes from other islands within the Aleutians and elsewhere in the AMNWR for the benefit of breeding populations of seabirds, waterbirds, shorebirds and songbirds.

Three beach surveys were also completed during the ACG population and nest survey on Agattu Island. Two were conducted at Aga Cove and one at Karab Cove. Noteworthy observations included four white-winged scoters, one arctic warbler and three endangered Aleutian Canada geese flying overhead.

Eighteen beach surveys, 15 vehicle surveys and four nearshore boat surveys were conducted at Adak throughout 1985 according to standards set in the AIU WIP's. Noteworthy sightings during the year included:

Species	No. Observed	Dates Observed
Red-necked Grebe	13	1/15,16,29;12/10
Whooper Swan	2	12/10
Tufted Duck	5	1/15
King Eider	2	2/12
Steller's Eider	2	4/19;12/30
White-winged Scoter	6	1/16;3/26
Lesser Golden-Plover	1	10/13
Bar-tailed Godwit	13	5/28
Lesser Yellowlegs	1	9/10
Northern Sea Lion	15	4/8;12/11
Harbor Porpoise	11	4/8
Minke Whale	1	9/10
Killer Whale	10	4/28;10/2

In late July four Adak staff members along with Keith Bayha, Deputy Assistant Regional Director, and Leslie Kerr, AMNWR Planning Team Leader, of the Regional Office staff made a brief orientation trip through the eastern and central Aleutians. The trip started in Dutch Harbor and proceeded west making stops at Bogoslof, Chagulak, Herbert, Atka, Salt, and Kasatochi islands enroute to Adak. Bogoslof Island was circumnavigated via inflatable boat to determine its potential as a permanent wildlife monitoring site. Except for a lack of fresh water, Bogoslof is an excellent WIP island due to its small size, workability and large numbers and variety of wildlife. While circumnavigating the island, photographs were taken of the shorelines of Bogoslof and Fire islands.

The cliff face on the east side of Bogoslof island was surveyed in detail for murres, tufted puffins and northern sea lions. The east shore murre nesting cliff was divided into eight sections to facilitate counting of the numerous birds. Photographs were taken of each section with a Polaroid camera prior to being surveyed. Each of five observers then helped delineate specific census boundaries and the photos were marked accordingly. The photographs of each section will be used for reference during future counts. After the counts for each section were completed, the highest and lowest counts for the five observers were discarded. The remaining three counts were averaged together to develop an estimate for each section. A total of 5,144 murres (predominantly thick-billed) 401 tufted puffins, ten pelagic cormorants and three black-legged kittiwakes were estimated for the east Bogoslof Island cliff. The majority of the common murres nesting on Bogoslof Island were on the flat upper plateau of the island. No other detailed bird counts were made on Bogoslof due to limited time. Red-legged kittiwake numbers, however, appeared to have increased some since the last survey in 1973. A landing was made on Bogoslof to determine if there was a suitable compsite. A good campsite was located on the north end of the island between Kenyon Cove and north edge of the upper plateau, but it lacks water.

One of the many thick-billed murres observed on Bogoslof. 7/25/85, #018504, CFZ

The next day a stop was made at Herbert Island to check the cabin and an attempt was made to land on Chagulak Island to look for Aleutian Canada geese. Heavy fog prevented a landing at Chagulak, so the island was bypassed and the M/V Norpac steamed toward Atka Island. The vessel arrived at Korovin Bay off Korovin Lagoon, Atka Island, after an all night run. Korovin Lagoon was surveyed by five observers in two inflatable boats. The results of the survey are displayed in Table 10.

The charter vessel then proceeded to Salt Island off the northwest shore of Atka. The island was circumnavigated following WIP procedures with the results shown in Table 11. A total of 1,918 individuals of thirteen different bird species and 279 individuals of four different mammal species and were observed on the 444 ac island. The most interesting observations at Salt Island were the large numbers of horned puffins,

tufted puffins, and parakeet auklets. The survey was conducted late in the afternoon, so the numbers are considered to be minimum figures.

Table 10. Results of 27 July 1985 Korovin Lagoon survey, Atka Island.

Bird Species*	Number Observed	Bird Species*	Number Observed
Pelagic Cormorant	20	Bald Eagle, im	6
Green-winged Teal	36	Common Raven	3
Harlequin Duck	77	Winter Wren	1
Red-breasted Merganser	11	Song Sparrow	3
Glaucous-winged Gull, ad	456	Lapland Longspur	1
Glaucous-winged Gull, im	3		
Black-legged Kittiwake	12	Mammal Species*	
Pigeon Guillemot	4	Harbor Seal	9
Horned Puffin	8	Sea Otter	12
Bald Eagle, ad	8	Arctic Fox	4

* Several ancient murrelets, unidentified murres and one minke whale were observed outside the lagoon entrance.

Table 11. Results of 27 July 1985 circumnavigation of Salt Island.

	Location and Number Observed			
Species Observed	North Shore	South Shore	South Reef	Total Number Observed
Pelagic Cormorant	--	2	1	3
Cormorant, species	14	--	--	14
Common Eider	--	5	--	5
Harlequin Duck	2	--	5	7
Black Oystercatcher	4	--	--	4
Glaucous-winged Gull	279	115	15	409
Pigeon Guillemot	33	8	8	49
Parakeet Auklet	21	69	--	90
Horned Puffin	346	448	--	794
Tufted Puffin	157	376	--	533
Bald Eagle, ad	4	4	1	9
Peregrine Falcon	--	1	--	1
Common Raven	1	2	--	3
			Total	1,918
Harbor Seal	--	32	--	32
Sea Otter	36	17	88	141
Northern Sea Lion	--	--	105	105
Killer Whale	--	--	1	1
			Total	279

Due to limited time, the survey crew was unable to go ashore to search for Aleutian Canada geese. Glaucous-winged gull colonies were concentrated on the upper slopes of the western end of the island, so any future goose searches should start on the edge of those areas.

The charter vessel then proceeded to Koniuji Island in hopes of obtaining detailed shoreline photographes. Upon approach, the island was totally enshrouded in fog, so the vessel steamed on to Kasatochi Island. The survey crew was able to go ashore briefly on Kasatochi Island in the late afternoon and early evening to witness the auklet swarms before heading for Adak. The objectives of familarizing visiting Regional Office staff with unique conditions in the Aleutions and conducting some censuses were adequately accomplished during the short four day trip.

Nearly 12 hours (11.45) of pelagic bird transects were conducted aboard the charter vessel during the 1985 summer field season. Transects were conducted between Kasatochi and Adak islands, Rat and Adak islands, and off Buldir Island. A summary of the results of the transects is contained in Table 12.

Table 12. Summary of 1985 AIU Pelagic Bird Transects.

Species	No.	Species	No.
Black-footed Albatross	1	Ancient Murrelet	103
Laysan Albatross	22	Parakeet Auklet	266
Northern Fulmar	383	Crested Auklet	34
Sooty Shearwater	6	Least Auklet	185
Shearwater, species	93	Auklet, species	11
Fork-tailed Storm-Petrel	111	Horned Puffin	7
Pelagic Cormorant	1	Tufted Puffin	172
Red-faced Cormorant	2	Unidentified Small Alcid	665
Cormorant, species	5		
Pomarine Jaeger	1	Total bird observations	2327
Parasitic Jaeger	2		
Glaucous-winged Gull	102	Dall Porpoise	26
Black-legged Kittiwake	45	Harbor Porpoise	2
Common Murre	5	Sea Otter	6
Thick-billed Murre	3	Whale, species	1
Murre, species	45		
Pigeon Guillemot	2	Total mammal observations	35

6. Raptors

The osprey, four eagle species, ten hawk species and three owl species have been recorded in the Aleutian Islands. Two of the eagle species, three of the hawk species and one of the owl species are Asiatic in origin. The following information covers unusual North American and all Asiatic species recorded.

Osprey - One was fishing over Casco Cove, Attu, 14 May. The bird was observed again in early June at Lake Nicholas.

White-tailed Eagle - An adult bird was found at the former Temmac Valley, Attu, nest site on 23 May and an immature (estimated to be three years old) was observed in Siddens Valley, Attu, on 26 May.

The year of 1985 was a rough year for Adak bald eagles. A total of 33 eagle carcasses were retrieved during the year. Twenty three were electrocuted and 18 of those were retrieved from the immediate vicinity of the NAS Baler Building. Garbage is collected and baled in the building in preparation for transportation to the garbage dump. The Baler Building has been condemned by the Navy, but the necessary replacement funds are not available. Eagles and ravens scavenge the bales for food. All of the power poles in the immediate vicinity of the building have been equipped with raised perches. In October the AIU staff and NAS Public Works personnel worked out a plan to cut off the food source from the birds. The main doors of the building are not operable, so it was proposed that split fire hoses be hung in the doorways to allow trucks in and out, but exclude most ravens and eagles. The project was attempted in November, however, the walls around the doorways began to cave in, so work had to be halted. The Navy then cancelled the project because it was determined that the building could not support the extra weight. The AIU staff then submitted a work request to the Navy to provide enlarged perches on the power poles. The Navy further proposed to cover the power lines with PVC pipe. At present perches are to be lengthened to the same length as the cross beams on the power poles. That effort would allow more than one eagle at a time to comfortably perch on each pole and, hopefully, reduce aggressive fighting for perch sites. The PVC pipe would protect birds from electrocution in the vicinity of the perches. All unnecessary power lines in the area will also be removed. The problem of eagles flying into wires while chasing others or fighting over food will not be solved until all power lines around the Baler Building are placed underground. That work is scheduled by the Navy for the summer of 1986. Part of the work was initiated in December. All unnecessary wires were removed from three poles near the Aleutian Constructors office just north of the Baler Building. The poles and perches were left to provide eagle perch sites. The two poles between the Baler Building and the Aleutian Constructors office were provided with new perches that are the same length as the power pole crossbeams. Four poles west of the Baler Building and two poles south of the building still required the longer perches as the year ended. No power lines had been covered with PVC pipe by year's end.

Three injured bald eagles were also retrieved this year. All three were immature birds. One died during rehabilition and the other two were successfully rehabilitated and released.

7. Other Migratory Birds

The only true nonmigratory bird in the Aleutian Islands is the rock ptarmigan. However, several of the so-called "migratory" species don't migrate out of the Aleutians. Excluding those species covered in other sections of this report, species not leaving their individual breeding islands include the common raven, winter wren, song sparrow, snow bunting and rosy finch. That leaves 83 "other" migratory species including eight species added to the North American list in 1985, for this section. Many of those species have been recorded passing through the Aleutians between wintering grounds (in North America, Asia, Hawaii, Japan or elsewhere in the Pacific) and breeding grounds (in mainland Alaska or eastern Russia). The apparent exceptions are American dipper, water pipit, savannah sparrow and lapland longspur, which remain to nest in the islands. Nobody seems to know what Aleutian redpolls do, as they have sporadically been recorded during all months of the year and have at least occassionally nested on some of the islands. Of those species covered in this section, at least 42 are Asiatic in origin. The information that follows covers unusual North American and all Asiatic species recorded during the year.

Common Cuckoo - A probable common cockoo was at Shemya 22-28 May. Another was between Alexai Point and McCloud Head, Attu, on 31 May. One was at Kiska on 10 June. Up to eight birds remained at Attu until 5 July.

White-throated Needletail - A single bird was at the Shemya barrel dump 25 and 26 May.

Great Spotted Woodpecker - This normally "sedentary" species was photographed at Attu in October. The species had not been previously recorded in North America.

Eurasian Skylark - An apparent male bird was displaying at Shemya 23-28 May. At least three were still there on 3 June.

American Dipper - A single bird was reported from Unalaska in late December 1984.

Middendorf's Grasshopper-Warbler - This species was present at Attu in late June.

Lanceolated Grasshopper-Warbler - This species was also present at Attu in late June. Some males were observed on territory, but no nests were found, although adults appeared to be collecting food over a 6 day period near Cape Wrangell in late July.

Pallas' Grasshopper-Warbler - A bird, reported to be at Attu in late June may be this species, which has not been previously recorded in North America. Poor quality photographs were obtained, but analysis had not been completed.

Dusky Warbler - A single bird was found along the north shore of Attu in late May.

Arctic Warbler - Two were at Agattu 21 June. Up to 14 were at Attu in late June.

Pale-legged Willow Warbler - Possibly observed at Attu in late June, poor quality photographs were still being analyzed at year end. The species has not been previously recorded in North America. The record is apparently applicable to the hypothetical/unsubstantiated list.

Gray-spotted Flycatcher - Two birds were at Attu on 23 May. One was at Shemya 24-25 May.

Asian Brown Flycatcher - A single bird was discovered near the base of Alexai Point, Attu, on 25 May. The specimen was deposited in the University of Alaska Museum collection at Fairbanks. The species had not been previously recorded in North America.

Mugimaki Flycatcher - One was photographed at Shemya 25 May. The species had not been previously reported in North America, but, due to poor quality photographs, it has been relegated to the Alaska hypothetical/unsubstantiated list.

Siberian Rubythroat - Up to four frequented the southwestern portions of Attu 22-28 May. One was at Shemya on 23 May. One was observed regularly and photographed at Kiska 13-16 June. Several singing males were at Attu through most of June, but most had departed by the end of the month. An adult was observed feeding bob-tailed young later in the summer, indicating breeding occurred at Attu for the first time.

Bluethroat - One was at Attu on 8 November, for the second Aleutian record.

Siberian Blue-Robin - A female plumaged individual was found in a stream ravine near "South Midden" at the base of Murder Point, Attu, on 21 May. The specimen was placed in the University of Alaska Museum at Fairbanks. The species had not been previously reported in North America.

Eye-browed Thrush - Up to 11 were on the southwestern portions of Attu 19-29 May. Up to 12 were at Shemya 22-29 May.

Dusky Thrush - A single bird was in West Massacre Valley, Attu, 22 May.

Yellow Wagtail - Up to 14 frequented the southeastern portions of Attu 20-29 May. One was at Shemya 22-25 and 28 May. One was at Agattu 8 June. An adult with four chicks was found at Attu in June. This observation is believed to provide the first known record of nesting for the Asiatic form of this species in North America.

Gray Wagtail - One to two frequented rocky shoreline areas from Murder Point to the Alexai Point Road, Attu, 21-29 May. One was at Shemya 24-26 May.

Black-backed Wagtail - One appeared at Sweeper Cove, Adak, on 24 May and remained the next day.

Olive Tree-Pipit - Single birds were at Attu 22 and 27 May with four being found on 25 May. Three were at Shemya 22 May and two were there 23 May.

Northern Shrike - One was reported to be in the Dutch Harbor-Unalaska area in February. One was discovered in the small "Adak Forest" during the Christmas Bird Count 28 December.

Savannah Sparrow - A single bird was reported by an Attour participant at Attu on 22 May. Verification by others was not accomplished. The species nests in the Aleutians as far west as Chagulak Island.

Rustic Bunting - Up to 37 frequented the southwestern portions of Attu 21-29 May. Up to six were at Shemya 23-29 May.

Pine Bunting - One was photographed at Attu in November. The species has not been previously reported in North America.

Brambling - Up to ten were found on the southeastern portions of Attu 14-29 May. One was at Shemya 22, 24, and 27 May. One was at Kiska 2-3 June.

Rosy Finch - A bird considerably smaller than the Aleutian form visited Manager Zeillemaker's feeder from 23 February to late March. The black forehead/crown did not contrast with the gray head color as typical Aleutian subspecies head markings do. It was speculated that a mainland bird spent the winter at Adak.

Common Rosefinch - One was at Attu in late June.

Oriental Greenfinch - One was at Attu in late June.

Hawfinch - Single birds were observed briefly at Attu on 22, 23 and 26 May. One was on Kiska 4, 5, 10 and 18 June. One was at Alexai Point, Attu, for nearly one full day in late June. Having a hawfinch stay anywhere on Attu for more than a few seconds is noteworthy! The bird at Kiska must have been tired!

The hawfinch, an Asiatic migrant, was recorded at Kiska Island for the first time. 6/4/85, #038503, FGD

Occasionally, refuge staff members are called upon by various facilities on the Naval Air Station to pick up wildlife. Commonly these calls concern birds that have flown into warehouses (ravens, rosy finches and snow buntings) and must be removed for sanitation purposes. Others have been injured by cars, blown into buildings by strong winds (gulls, kittiwakes, ravens, snow buntings), or have become disoriented as a result of storms and strong winds (storm-petrels). If injuries are minor, the birds are treated and released. If the injuries are major, the birds are euthanized. Several opportunities to "serve" the community in handling these types of problems occurred in 1985.

The third annual Adak Breeding Bird Survey was conducted on 20 June in conjunction with the Nongame Wildlife Program of the Alaska Department of Fish and Game and the Patuxent Wildlife Research Station, Laurel, Maryland. The census follows a prescribed 25 mi route with specific survey points every one-half mi. A total of 654 birds of 24 species were recorded. (Table 13).

The 18th annual Adak Christmas Bird Count was conducted on 28 December, the finest winter day of 1985. A total of 35 species and 3,429 individual birds were recorded (Table 14). A record number of song sparrows were observed. Assistant Manager Klett and his team observed a northern shrike in the small "Adak National Forest". It was only the fourth recorded observation for this species in the Aleutian Islands.

8. Game Mammals

Caribou were introduced to Adak in 1958 and 1959. The herd grew rapidly due to normally mild winters, lush vegetation, and lack of predators and biting insects. Within ten years many islanders were hunting caribou and the world's record bull weighing over 700 lbs was taken at Adak in 1968. The management goal, set by a cooperative agreement between the Service, the Alaska Department of Fish and Game and the U.S. Navy, is a postseason population of 150-250 animals. The danger of overpopulation is very real and a major concern to the AIU staff, since no natural predators or disease exist on the island. Population control is accomplished through sport hunting. Continued U.S. Navy support in the form of tug boat transportation for hunters and refuge monitors is essential to proper management of the Adak caribou herd.

Due to limited personnel availability and higher priority work, only one caribou management effort was conducted in 1985. An aerial survey was accomplished on 22 August from a Piper PA31 Navajo at an average speed of 120 kts and an average altitude of 500 ft above ground level. The weather conditions were satisfactory with mostly clear skies and a light wind. The census covered the whole island, but was concentrated over primary caribou habitat on the south half of the island. The

Table 13. Adak Breeding Bird Survey, 20 June 1985, with comparisons to the 21 June 1984 BBS.

	1985		1984	
Species	Number	No. of stops	Number	No. of stops
Pelagic Cormorant	6	4	1	1
Green-winged (Com.) Teal	76	11	69	11
Mallard	12	8	9	6
Northern Pintail	5	2	11	2
Tufted Duck			1	1
Greater Scaup*	26	6	24	2
Harlequin Duck**	9	4	30	1
Red-breasted Merganser	14	6	5	2
Bald Eagle	18***	14	21***	10
Rock Ptarmigan	20	12	19	11
Black Oystercatcher	3	1		
Red-necked Phalarope	10	4	7	3
Parasitic Jaeger	13	5	12	8
Glaucous-winged Gull	90	20	50	13
Black-legged Kittiwake	2	1	6	2
Arctic Tern	12	2	6	1
Aleutian Tern	29	6	54	9
Marbled Murrelet	2	2	4	1
Tufted Puffin	10	1		
Horned Puffin	29	1	1	1
Common Raven	6	5	3	3
Winter Wren			1	1
Song Sparrow	13	8	19	13
Lapland Longspur	230	48	283	48
Snow Bunting	6	5	4	3
Rosy Finch	13	9	5	4

* Flocks including both sexes not considered breeding birds.
** Not known to breed in the Aleutian Islands.
*** 15 adults, 3 immatures (1985), 7 adults, 14 immatures (1984).

results from the census were good and pointed toward a successful season. A total of 313 caribou were observed. Due to the speed of the fixed wing aircraft, rugged island topography, turbulence in the mountain passes and the blending of caribou with the terrain, it was estimated that only 75% of the entire island population was observed on the survey. The island's population was estimated, therefore, to total approximately 420 animals. The largest observed herd was 45 animals, with the remainder observed in small scattered groups of five to 20 animals at higher elevations.

One hundred and sixteen caribou had been harvested from 1 September 1985 to the end of the year, compared to 119 caribou harvested in a comparable period last year. Last season's

Table 14. Adak Christmas bird count, 28 December 1985

Species	No.	Species	No.
Arctic Loon	6	Bufflehead	42
Common Loon	1	Red-breasted Merganser	231
Loon, species	1	Merganser, species	1
Horned Grebe	13	Black Oystercatcher	2
Red-necked Grebe	4	Rock Sandpiper	46
Pelagic Cormorant	100	Sanderling	31
Cormorant, species	117	Glaucous-winged Gull	153
Emperor Goose	8	Pigeon Guillemot	38
Mallard	110	Marbled Murrelet	9
Green-winged (Com.) Teal	160	Alcid, species	7
Eurasian Wigeon	4	Bald Eagle (144a, 101i)	245
Northern Pintail	29	Rock Ptarmigan	27
Greater Scaup	89	Common Raven	281
Common Eider	94	Winter Wren	1
Steller's Eider	1	Northern Shrike	1
Black Scoter	62	Song Sparrow	33
White-winged Scoter	23	Snow Bunting	108
Harlequin Duck	801	Common Redpoll	10
Oldsquaw	107	Rosy Finch	187
Common Goldeneye	246		
		Total 35 sp, 3429 birds	

final harvest (ending 31 March 1985) totaled 143 animals. This year's goal is a harvest of 170 to 270 animals, which would allow achievement of the management objective.

9. Marine Mammals

During the Aleutian Canada goose (ACG) population and nesting survey on Agattu Island, a marine mammal survey was completed. The survey encompassed the southeast portion of Agattu only. Two different methods were used: a sea survey by inflatable boat and land survey by looking down at the beaches from the cliffs above. Northern sea lions accounted for 98% of the species observed. Similar results were obtained from both the sea and land surveys with population counts of 3,100 and 3,400 respectively.

The National Marine Fisheries Service conducted three separate field studies on the northern sea lion this year. On Ugamak Island, in the eastern Fox Islands, they documented an 80 percent population decline since 1969 (from 10,995 to 2,068 adult and subadult sea lions). On a population survey from Ugamak Island to Kiska Island, they counted only 36,561 sea lions which was very disappointing and far from what they expected. A study was also conducted to assess the problem of net entanglement of northern sea lions. Of 15,957 sea lions observed, only 11 (0.07%) showed evidence of present or prior net entanglement.

Harbor seals pup on several refuge islands, including Agattu. 6/21/85, #R1130, EVK

In July, AIU personnel were able to visit Bogoslof Island and observe the only northern fur seal population in the Aleutian Islands. The field crew was able to locate the rookery, but due to time constraints and fear of disturbance, only a partial count of 25 animals was accomplished. Before landing on the island, a count of the northern sea lions was conducted from the charter vessel. The island was divided into eight sections. The counts, of several observers, for each section were averaged and then combined for a total figure. One thousand seven hundred and seventy-two sea lions were counted, including 1,181 adults and 591 pups.

A group of scientists from the National Marine Fisheries Service (NMFS), led by Dr. Thomas Loughlin, conducted a census of northern fur seals at Bogoslof Island in August. They counted 112 fur seals, which is a tremendous increase from the 76 counted by NMFS in 1983. The scientists also tagged a total of 25 fur seals (16 females and 9 subadult males). Five previously tagged fur seals were observed. Four (3 females and 1 male) were originally tagged on 11 August 1983 at Bogoslof Island, while the other female was originally tagged on Medney Island, USSR, as a pup in 1976 and also at Bogoslof Island in 1983.

A large northern fur seal bull standing his ground in the Bogoslof Island colony. 7/25/85, #038504, FGD

10. Other Resident Wildlife

Rock ptarmigan are the only resident game bird present in the Aleutian Islands. Permanent ptarmigan transects were established at Adak in 1981, but were not monitored this year due to other obligations. Judging from the number of ptarmigan bagged by hunters, however, it appears that the birds had another productive year.

11. Fisheries Resources

Pink salmon are the most heavily harvested of the three anadromous fish species that utilize streams on Adak. Dolly Varden and kokenee are harvested to a lesser extent, while halibut is available to "salty dogs". Good red and pink salmon runs occur

on Adak, although the numbers are always less in odd years than in even years. No specific salmon spawning counts were completed this year.

The fish highlight of 1985 was a beached 4 foot Longnose Lancetfish (Alepisaurus ferox) found at Kuluk Beach, Adak, in July by two children.

14. Scientific Collections

Eleven Aleutian Canada geese died during the Buldir to Amchitka transplant operations. The carcasses were retained and were at the Homer office as the year ended. A total of 36 dead bald eagles were retrieved on Adak in 1985 (mostly due to electrocution). All carcasses were measured and necropsied. The tail and wing feathers were saved for shipment to Law Enforcement personnel in Anchorage and subsequent processing for native Americans. No other scientific collections were made on the unit, except for the salvage of occasional dead specimens reported to refuge staff.

15. Animal Control

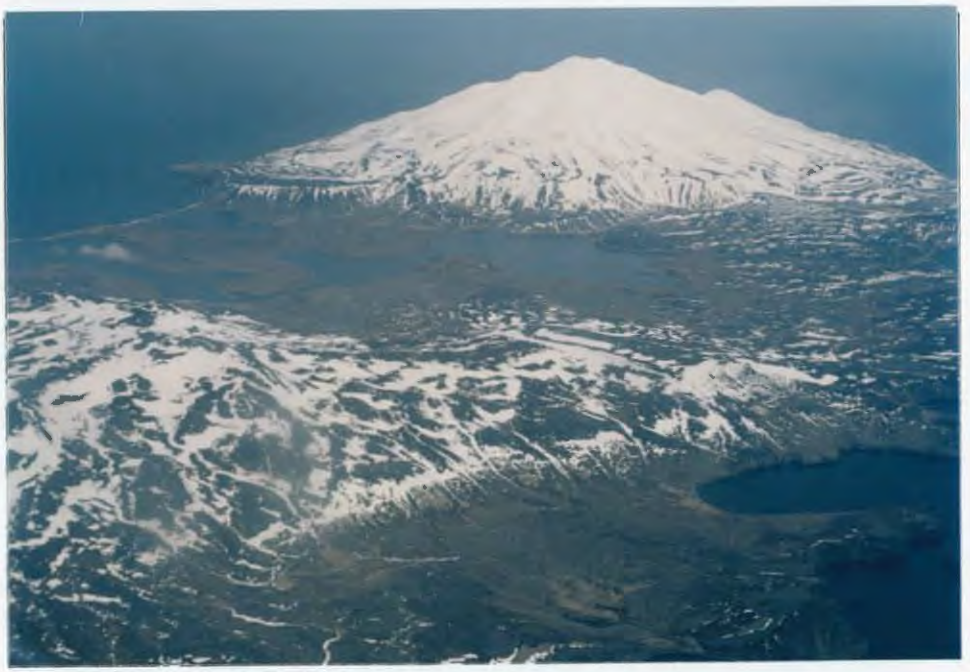
Animal control work was conducted on Amukta, Rat, Kiska, Kasatochi, Adugak and Uliaga islands. Stops at Amukta and Rat islands were scheduled to allow verification of the presence or absence of fox. A prefox eradication study was conducted on Kiska Island as part of a Compound 1080 experimental use permit issued by the Environmental Protection Agency (EPA). Fox eradication continued on Kasatochi this year. Adugak and Uliaga islands were checked as part of the experimental red fox program. All the fox projects, with the exception of Kasatochi Island, were to primarily benefit the endangered Aleutian Canada goose. Kasatochi fox eradication was initiated primarily to benefit other migratory birds with the goose as a secondary benefactor.

An Experimental Use Permit (EUP) was granted in November by the EPA to benefit the endangered Aleutian Canada goose. The permit will allow the Service, AIU staff and RO staff to evaluate the effectiveness of Compound 1080 for eliminating introduced arctic fox from Kiska Island. The ultimate goal is registration of the Compound for use elsewhere in the Aleutians. Specifically, the EUP allows for the use of up to 50,000 baits per year to be distributed on the island by air for two years. The end result is expected to be the complete eradication of fox from Kiska. Eradication of fox from Kiska cannot be accomplished through the use of conventional mechanical means (traps, snares, guns, etc.). The island is so large (69,598 ac) as to require years of effort by numbers of personnel using conventional means to even approach success. The island also has an excellent food source for the fox in the form of the

largest known crested and least auklet colony in the world (1.4 million birds), along with extensive high quality scavenging beaches. If the eradication effort on Kiska is successful, authorization for the use of Compound 1080 on other large islands in the Aleutians to benefit the endangered Aleutian Canada goose and other migratory birds may be sought.

As part of the EUP, a pre- and postfox eradication inventory of wildlife populations at Kiska Island are required. The surveys will evaluate the effect of the treatment on the target species (arctic fox), monitor the impact of the treatment on nontarget wildlife species (in particular raptors and avian scavengers), and evaluate and document the recolonization and population trends of other avian species whose populations have been suppressed by the foxes.

Kiska Island is located in the Rat Island Group of the Aleutian Islands (Figure 1). The Rat Islands extend from Amchitka Pass westward nearly 180 mi to Buldir Island. Included are Semisopochnoi, Amchitka, Rat, Little Sitkin, Segula, Kiska, Buldir, and several smaller named and unnamed islands. The group is mountainous except for the eastern portion of Amchitka which is



The north portion of picturesque Kiska Island, site of a major experimental effort to benefit Aleutian Canada geese and over a million nesting seabirds. 5/15/85, #018504, CFZ

relatively flat. Kiska is the second largest island in the Rat Island group.

Amchitka is the only Rat Island larger than Kiska. Kiska Island is irregularly shaped with many large coves and bays and is oriented predominantly in a northeasterly to southwesterly direction. The island measures about 22 mi in length and varies in width from about 1.5 to 6 mi. It is very rugged and mountainous, with the northern end of the island dominated by active Kiska Volcano. The crater of this volcano has two summits, the higher and most westerly being 4,004 ft high. Immediately south of the volcano is a low valley about 2 mi wide which contains several lakes. This valley extends nearly across the island from east to west. Flattopped, boulder-strewn ridges rising to over 1,000 ft occur between the lake area and Kiska Harbor. A low, narrow pass cuts across the island from the southwest corner of Kiska Harbor to a small bight on the west shore. South of this pass, the southern portion of Kiska Island consists of sharp, rugged ridges 1,500 to 1,700 ft high and extending to the southwestern corner of the island. Ridges are quite precipitous on the western side, but the eastern portions slope gradually to the shoreline of Vega Bay. The valleys and lower slopes of the island are covered with vegetation while the higher elevations are generally bare and strewn with boulders. The shores of Kiska are mostly rocky and steep, bordered in many places by small islets and rocks. There is a kelp fringe around most of the island. Kiska has an excellent protected harbor located on the east side about in the middle of the island. Located in the Kiska Harbor area are two large lagoons (Salmon Lagoon and Trout Lagoon).

Surveying Kiska Island for selected bird and mammal species in June was more difficult than initially envisioned. The difficulties began with establishing the base camp in the harbor area where a large metal World War II quonset hut was thought to be acceptable as the main camp structure. Upon arrival at Kiska it became apparent that the building had deteriorted considerably in the two years since it was previously used and that it would require major repairs before providing the necessary shelter. Repairs required major reconstruction which consumed two days. The weather encountered throughout the survey work proved to be the second major obstacle. Even the usually bad Aleutian weather was worse then normal. The end result was that it further eroded the already limited time schedule and severly impacted the number and quality of surveys accomplished.

The first phase (pre-eradication portion) of the Kiska Compound 1080 project was initiated in June. Five biologists worked on or around the island from 1 through 29 June. On 1 June the island was completely circumnavigated using the charter vessel. That survey was conducted to allow survey crew familiarization with the island and to allow surveys of raptors and other

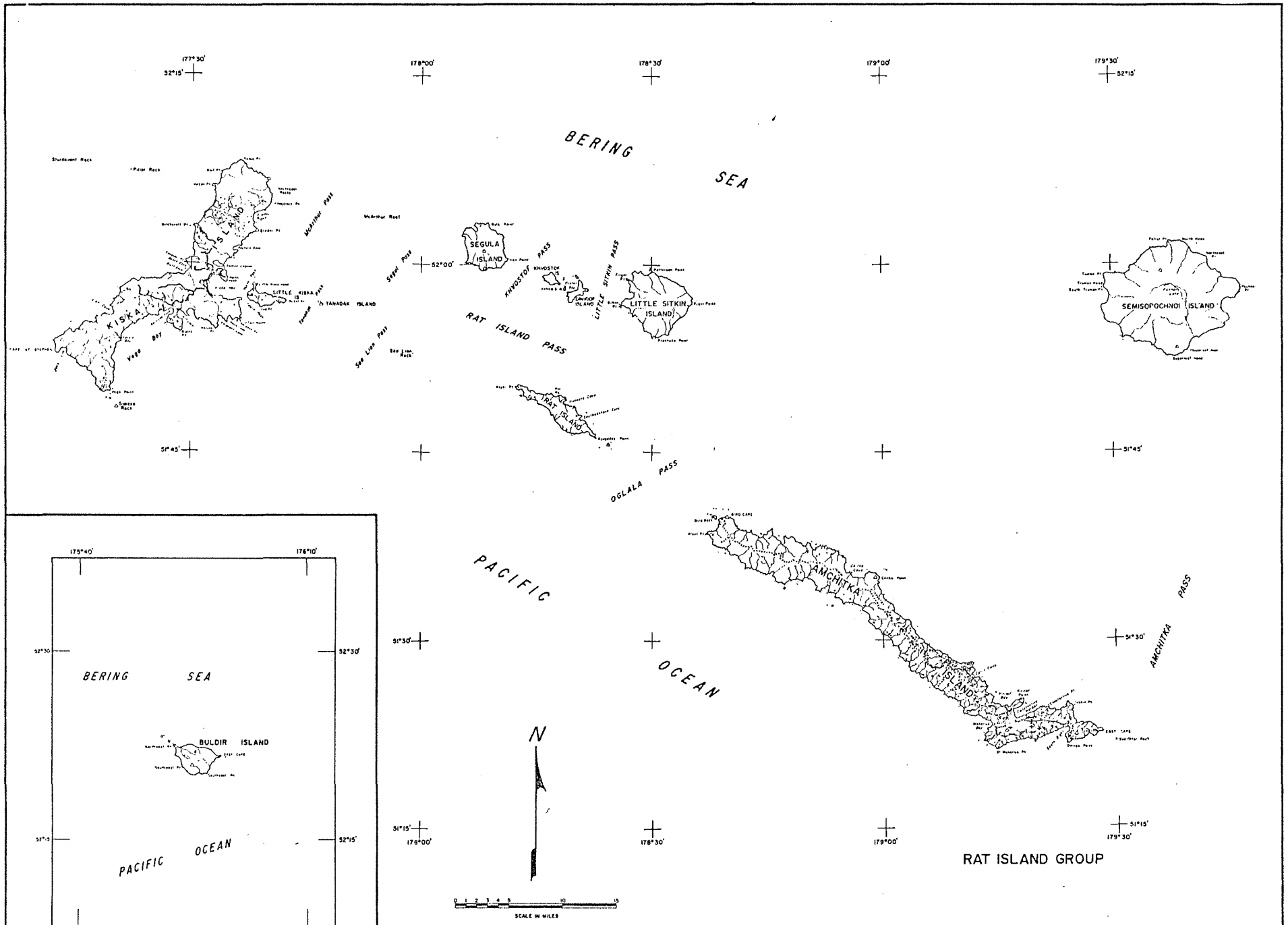


Figure 1. The Rat Island Group, Aleutian Islands Unit. ALASKA

shorline wildlife. Observations of defensive adult eagles near land were considered indicative of potential nest or aerie locations. A total of sixteen bald eagle aeries were located during the circumnavigation survey. The count compares favorably with the seventeen nests located during a 1978 Kiska survey. Half (8) of the nests found in 1985 were at the same locations as nests found in 1978. During the circumnavigation survey a total of 34 adult and 8 immature bald eagles were observed. The low number of immature bald eagle observations is possibly due to the difficulty of locating dark birds against dark tundra and cliffs from a distance of 1/4 to 1/2 mi offshore where the vessel could safely operate. In addition to the raptors, 1,284 individuals of 22 bird species were observed. The most noteworthy observation was of three red-legged kittiwakes. The nearest nesting colony is at Buldir Island about 120 mi to the west.

To supplement the island circumnavigation survey and provide more detailed information about wildlife along the shoreline, four partial circumnavigation surveys and four beach walk transects were also conducted. Both survey techniques were conducted following procedures specified in the AIU Wildlife Inventory Plans. The partial circumnavigation surveys of Kiska were conducted simultaneously in both directions from Kiska Harbor utilizing two crews and inflatable boats. The partial circumnavigation surveys were conducted on 5 and 14 June as far north and south as could be accomplished in a single day of safe travel and allow return to the main camp at Kiska Harbor before dark. The north transect ran from the harbor to Northeast Rocks. The south transect ran from the harbor to near Bukhti Point. The south transect was divided into four segments. The segments were determined by headlands and allow scrutiny of four distinct areas within the transect. The north transect was not subdivided. Although the surveys were only conducted twice each, the results obtained on some of the indicator species appears comparable between the surveys. Examples include 16 and 17 arctic fox observed on the south surveys while nine and seven were observed on the north route, 501 and 514 glaucous-winged gulls on the south route while 172 and 151 were observed on the north route, and 10 and 12 bald eagles recorded on the south survey and 10 on both runs of the north route. The weather did not allow additional partial circumnavigation surveys.

Beach surveys were conducted on 6 and 11 June. Weather again was a limiting factor, allowing only two days of beach survey work to be accomplished. The south transect ran from the stream on the east side of the harbor along the beach west and south including Trout Lagoon on to a bald eagle nest on a sea stack on the southwest side of the harbor. The north transect ran from the sandy beach north of North Head including Salmon Lagoon to about two-fifth's of a mile east of a lake outlet stream at map coordinates 40.4/61.8. Both transects were divided into segments (five segments for the north route, four

Arctic fox scavenging beach on Kiska Island in search of food. 6/6/85, #038505, FGD

segments for the south route). Unlike the partial circumnavigation surveys, the beach transect results indicated some variability in the numbers of wildlife observed. The three species of special interest are good examples of this variability. Thirty-eight and 75 glaucous-winged gulls were observed on the north transect while 209 and 24 were observed on the south transect. Seven bald eagles were observed during the first north transect while none were seen during the second. Two bald eagles were observed on both runs of the south transect. Twelve and four arctic fox were counted on the two north transect runs, while one and four were seen on the south transect runs. A possible explanation for the differences is that although all surveys were accomplished during low tide, the second surveys were conducted later in the day with less desirable observation conditions in occassionally heavy rain and 20 knot winds. An additional two beach surveys were conducted on 6 August while the Aleutian Canada goose transplant team was weathered off Buldir Island. The surveys followed techniques established in July. The three species of special interest observed on the north and south transects respectively were glaucous-winged gull, 36 and 39; bald eagle, two and eight; and arctic fox, zero and four.

Six passerine transects were established in the Kiska Harbor area based on methods developed by Emlen. The length of a transect was determined by the availability of homoaeneous

habitat. Habitat types consisted of disturbed areas and undisturbed lowland, upland, and alpine areas. Transects were 825 ft wide with subdivisions of 0-50, 51-99, 100-198, and 199-413 ft strips on either side of the center line. Although 413 ft visibility from the center line was sometimes obscured by terrain or weather, counts were made by song as well as by observation. Lateral distance from the center line, species, number of birds, and sex were recorded for each bird. Time of day and weather conditions at the beginning and ending of the count were also recorded. The undisturbed lowland transect near Trout Lagoon was conducted four times. The only bird species observed on this transect was the lapland longspur. The highest number recorded was 15. There were two transects established in the undisturbed uplands near Trout and Salmon lagoons. The most abundant species again was the lapland longspur and the highest number recorded was eight. Other species observed on the upland transects were the rock ptarmigan, rock sandpiper, winter wren, snow bunting and rosy finch. The second most abundant species on the undisturbed upland transect was the rosy finch. Two transects were also established in the disturbed upland areas around Kiska Harbor. The most abundant species on one transect again was the lapland longspur with seven being the highest number recorded. On the other transect the snow bunting was the most abundant species with five being recorded on several occasions. The final passerine transect was located in the rocky alpine area. Four species of birds were observed on this transect, all in low numbers. The most abundant species on the alpine transect was the snow bunting. While working in the Kiska Harbor area, five asiatic bird species were also observed.

Several incidental surveys for arctic fox were conducted on Kiska. Again, fox sightings or vocalizations were recorded on all surveys. Den locations were also noted. One section of sandy beach approximately 30 ft wide from low tide to the high storm bank was raked and checked daily in the Kiska Harbor. Arctic foxes scavenge the beaches in the Aleutians repeatedly in search of food. All fox tracks in the raked area were tallied each time the area was checked. Two dens were located in the harbor area. One den site was under a bridge about 600 ft from camp. The other was located under a collapsed building near the Trout Lagoon outlet stream. Several den sites were also found in the Sirius Point auklet colony, but it is impossible to pin down den locations there due to the large area of jumbled, nondescript boulder strewn slopes the colony occupies. The raked beach in the harbor produced eight sets of tracks on ten occasions.

The auklet colony at Sirius Point was difficult to census. Initially it was hoped that the road system was good enough to allow the crew to approach within a reasonable distance of the colony by ORV and backpack a short additional distance. Once the crew was on island, however, it became apparent that road conditions were poor outside the immediate Kiska Harbor area.

The trip to Sirius Point had to be accomplished by water using either the charter vessel or inflatable boats. One attempt was made using inflatable boats and two with the charter vessel. The survey crew finally reached Sirius Point on the second charter vessel attempt. Once at Sirius Point, several trips with inflatable boats were necessary to off-load all of the necessary camp gear. A small cove just east of the auklet colony offered a good protected landing spot for the inflatable boats. The site had a large cobblestone beach which would have been impossible to land on had there been any surf. Once ashore, all of the gear was hauled up by rope over a 110 ft cliff to a plateau suitable for use as a campsite. It was possible to climb the cliff area on the east side of the cove, but only if unencumbered. The campsite was set up at about 165 ft elevation in a slight depression which offered some wind protection near a stream. Omnipotent tents were used as sleeping quarters for the crew and a dome tent was used for gear storage and cooking. It took almost a full day to establish camp and set up the radio system. The next challenge was to relocate the permanent plot markers placed in 1978. No detailed map showing plot locations was available. Only an elevation, transect line bearing and distance from the top or bottom of the colony were available. In the jumbled, boulder strewn nondescript lava flow, some type of a marked transect line from the edge of the colony to one or more of the plots would have been helpful. In addition, winds and earthquakes had knocked some of the poles down among the rocks so that only a couple inches of the poles remained exposed to view. The surface plots were finally relocated and reestablished by marking in such a manner that they should be easily relocated during future visits by walking up the drainage next to the lava flow to a bearing rock and then following a compass bearing across the old lava flow past four white poles on ridgelines to the upper group of plots. Relocating the remaining plots should then be accomplished by following a compass bearing of 12 degrees true north.

Population censuses for crested and least auklets are difficult because of the great number of birds generally involved. The Sirius Point colony on Kiska is especially difficult because it is one of the largest known auklet colonies in the world with an estimated population of 1.4 million birds. Because of the limited time available, no total auklet population estimate was attempted in 1985.

Surface counts of auklets within specific plots were attempted to allow calculation of population indexes only. Surface counts of auklets were made in 30 ft square plots using techniques developed by Bedard and modified by Byrd. Four of the plots established in 1978 were utilized for three consecutive counts. Seven additional plots were established after the first day and censused the following two days. Counts were made continuously throughout the morning/afternoon observation period at fifteen minute intervals. The number of birds sit-

ting on rocks within the plot surface were tallied during each effort. A juvenile/adult ratio was obtained in a standard area each hour. Observers were positioned at least 60 ft from the plots and partially hidden within the rocks to minimize disturbance to birds during a survey.

The northeast corners of each plot were marked with a five foot by one inch galvanized pipe which was painted orange and flagged to allow relocation. The other corners of the plots were either marked by painting a rock, vegetation, or using a small painted galvenized pipe. The plots were surveyed on 27, 28 and 29 June. The first auklet surface count effort concentrated on the four previously established plots. Time also allowed the documentation of bird activity patterns and suitable areas for additional plots. Unfortunately, plot number one was mis-

Crested and least auklet swarm over old lava flow at Sirius Point colony, Kiska Island. 6/27/85, #038506, FGD

counted the first day because a large auklet landing rock was thought to be inside the plot that was later determined to be outside of that plot. From 0800 to 1000 there was a constant outmigration of both species of auklets from the colony. From 1000 to 1100 there were still constant flights of auklets, but in both directions. The earliest recorded auklet landing within a plot was at 1115 (27 June). The peak of activity for least auklets generally ranged from 1300 to 1615. The peak activity range for the crested auklets was more compressed and occured slightly later from about 1445 to 1545. The number range for the five highest counts taken each day for least auklets had a low of 0-5 on plot number 11 on 29 June and a high of 55-83 on plot number 4 on 28 June. Crested auklet numbers spread for the five highest counts taken each day was considerably lower with a low of 0-1 on several plots and a high of 3-10 on plot number five on 29 June. The average surface count index for least and crested auklets for the three days of census on all of the plots is shown in Table 15.

The numbers obtained will serve as population indices for both auklet species when attempting to compare pre- and postfox eradication efforts from 1985 to 1987. The low numbers of crested auklets in the old lava flow was unexpected. The 1978 survey indicated crested auklets outnumbered least auklets in the old lava flow. The later timing of the 1978 survey may explain the difference since least auklets fledge slightly earlier than crested auklets. Additionally, a lack of

Table 15. Average surface count index for least and crested auklets on all surface plots in old lava flow at Sirius Point Colony, Kiska, 27-29 June 1985.

	Average surface count index for three days census	
Plot #	Least Auklet	Crested Auklet
1	45.5	0.0
2	48.1	.9
3	44.0	.4
4	26.0	0.06
5	23.3	0.0
6	39.8	0.5
7	30.1	3.7
8	59.5	3.3
9	2.2	0.0
10	19.8	0.3
11	17.2	1.3

appropriate large sized "landing rocks" within the plots may also limit crested auklet use. The population estimate of 1.4 million least and crested auklets may be significantly low.

Two other activities noted during the auklet surveys were the presence of natural avian predators (glaucous-winged gulls,

bald eagles and peregrine falcons) and the presence of introduced arctic fox. The presence of any or all predators in or near a plot can dramatically affect the number of birds counted. A simple fly over by any of the three avian predators cause all auklets within the general area to depart. The foxes have numerous dens throughout the boulders of the auklet colony and, unlike the avian predators, they do not eat all the birds they capture immediately, but cache them for later consumption. The birds of the Aleutian Islands evolved without land predators, so they show little or no fear or defense against such animals except to attempt flying away.

Predators were observed in or over the surface of the auklet plots on 65 different occasions during the three days of survey (Table 16).

Table 16. Summary of predator disturbance to auklets in surface plots at Sirius Point, Kiska Island, 26-28 June 1985.

	Predators				
Plot #	glaucous-winged gull	peregrine falcon	bald eagle	arctic fox	unknown distur.
1,2,3	3	0	0	6	3
4,5	9	0	3	11	1
6,7,8	10	0	2	6	2
9,10,11	8	0	0	1	0
Total	30	0	5	24	6

The two most common disturbances were glaucous-winged gulls and arctic fox. They accounted for 30 and 24 disturbances each, respectively. Predator disturbances within the plots always caused the auklets to fly. Glaucous-winged gulls were observed taking least auklets on three occasions, and an adult bald eagle was observed taking one least auklet. Arctic fox were not observed taking any auklets during the surveys, due to visibility restrictions. If the immediate area outside of the plots were also considered, an additional 51 arctic fox observations, would elevate the number of fox observations during the count period to 75. The fox were, therefore, the most prevalent predator observed in and around the colony during the auklet surface counts.

The ratio of juvenile to adult least auklets was determined by observing moults and feather generations. A count of the number of juvenile and adult birds within the plots was attempted at least once each hour. The task was not accomplished on all plots because observation conditions were not adequate or the observer did not have enough experience to be comfortable aging the birds. Although it was hoped the crew could age the crested auklets in a similar manner, it was not accomplished due to the low number of crested auklets within the

The "bumble bee of the sea" least auklet at old lava flow Sirius Point auklet colony, Kiska Island. 6/28/85, #038507, FGD

plots. The proportion of juvenile least auklets in the surface plots ranged from a about three to 36 percent. The averages for all of the plots censused during each of the three days were 12.9%, 09.4% and 14.2% juvenile least auklets. The average for all three days was 12.2%.

Net movement counts were also attempted during the evening activity period on some of the surface plots but that task was not successful due to darkness and crew safety reasons. The evening activity period did not begin until about 2330 and didn't end until 0030. Walking over the boulder strewn auklet colony during the day was difficult enough, and night time activity would have been unhealthful. A "temporary" net movement plot was set up on the edge of the lava flow immediately above camp in an effort to document some of the evening activity and to allow consideration for such plots next year when additional time will hopefully be available for the work. The plot was surveyed for three evenings from 26 to 28 June. Unfortunately, heavy rain and high winds forced cancellation halfway through the count on 27 June.

The results from the net movement counts are interesting (Table 17). Two things to be noted from the results are the extremely late (and short) evening activity period (2245 to 2400) and the presence of arctic fox in the plot.

Other auklet colonies within the Aleutians (ie. those at Buldir) have an earlier (2100 to 2330) and more prolonged period. The Kiska colony differs from other colonies in Alaska (such as those on St. Matthew Island) due to the availability and distance to feeding areas. During the circumnavigation of Kiska, large rafts of feeding auklets were seen in tide rips off the coast of the island. Food resources that close to the colony may explain the extremely short evening activity period at Kiska. Two fox observations were recorded in the plot the first night and three on the third night. None were seen on the second night (when the survey was weathered out).

Table 17. Results of three net movement counts for auklets during the evening activity period in the old lava flow at Sirius Point colony, Kiska, 26-28, June 1985.

		Dates											
		6/26				6/27				6/28			
Time	Species	#st	arv.	dep.	#end	#st	arv.	dep.	#end	#st	arv.	dep.	#end
2230	LEAU	--	--	--	--	--	--	--	--	--	--	--	--
	CRAU	--	--	--	--	--	--	--	--	--	--	--	--
2245	LEAU	--	--	--	--	--	--	--	--	--	--	--	--
	CRAU	--	--	--	--	--	1	1	--	--	--	--	--
2300	LEAU	--	--	--	--	--	56	22	11	3	19	18	1
	CRAU	--	--	--	--					--	--	--	--
2315	LEAU	--	81	55	10					1	58	35	13
	CRAU	--	--	--	--		WEATHERED			--	--	--	--
2330	LEAU	10	50	31	6					13	46	62	3
	CRAU	--	1	--	--					--	--	--	--
2345	LEAU	6	16	14	2					3	32	26	5
	CRAU	--	1	1	--			OUT		--	--	--	--
2400	LEAU	2	3	3	--					5	--	4	--
	CRAU	--	--	--	--					--	--	--	--
0015	LEAU	--	--	--	--					--	--	--	--
0030	CRAU	--	--	--	--					--	--	--	--
2400-2405		1	fox in plot					2244-2250		2	fox in plot		
2410		1	fox walked through plot					2310-2313		1	fox in plot		

Time lapse cameras were also ulitized to supplement the census of auklets in the Kiska old lava flow colony. Two 8 mm movie cameras with intervelometers set at one frame per two minutes and a solar pack were initially set up on the afternoon of 24 June and operated until 29 June. Two problems were encountered with the time lapse cameras. The clock for the camera on plot number one was knocked down (presumably by a fox). That event combined with the fact that the camera also had a switch to turn it off at night (which the other camera didn't have) made the results unusable. The camera in plot number two did pro-

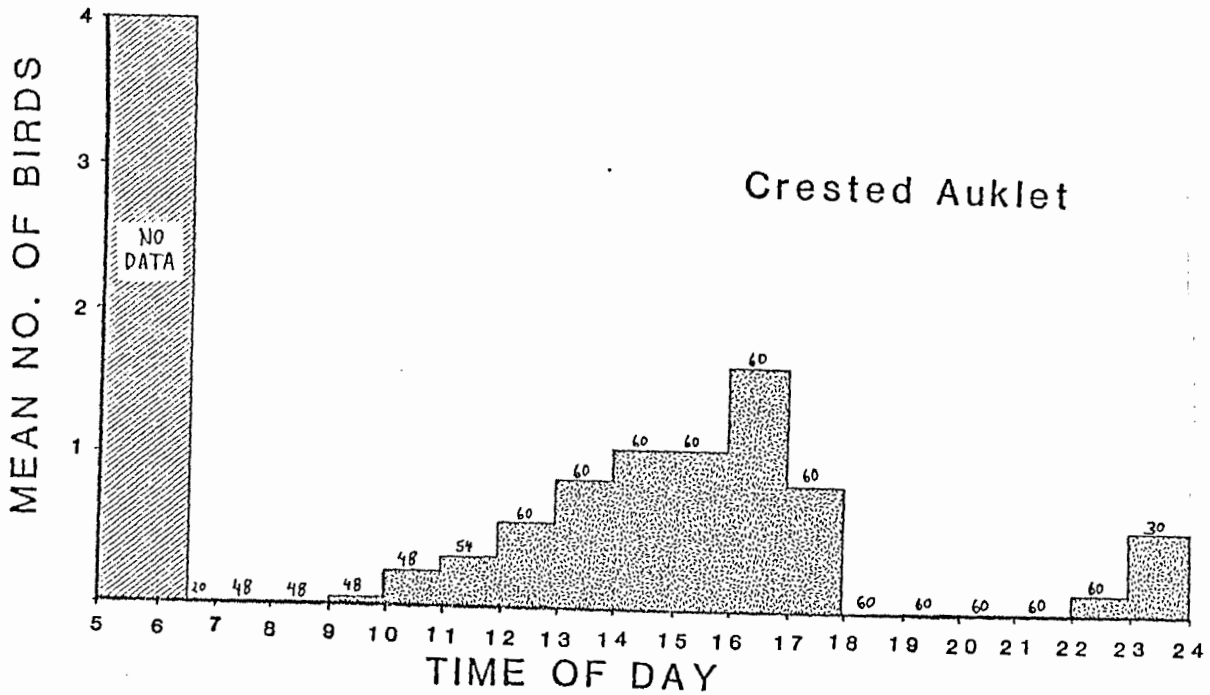


Figure 2. Daily attendence pattern of birds at Kiska Island from time-lapse photography, June 24 29, 1985. Number of counts per hour is indicated above each bar.

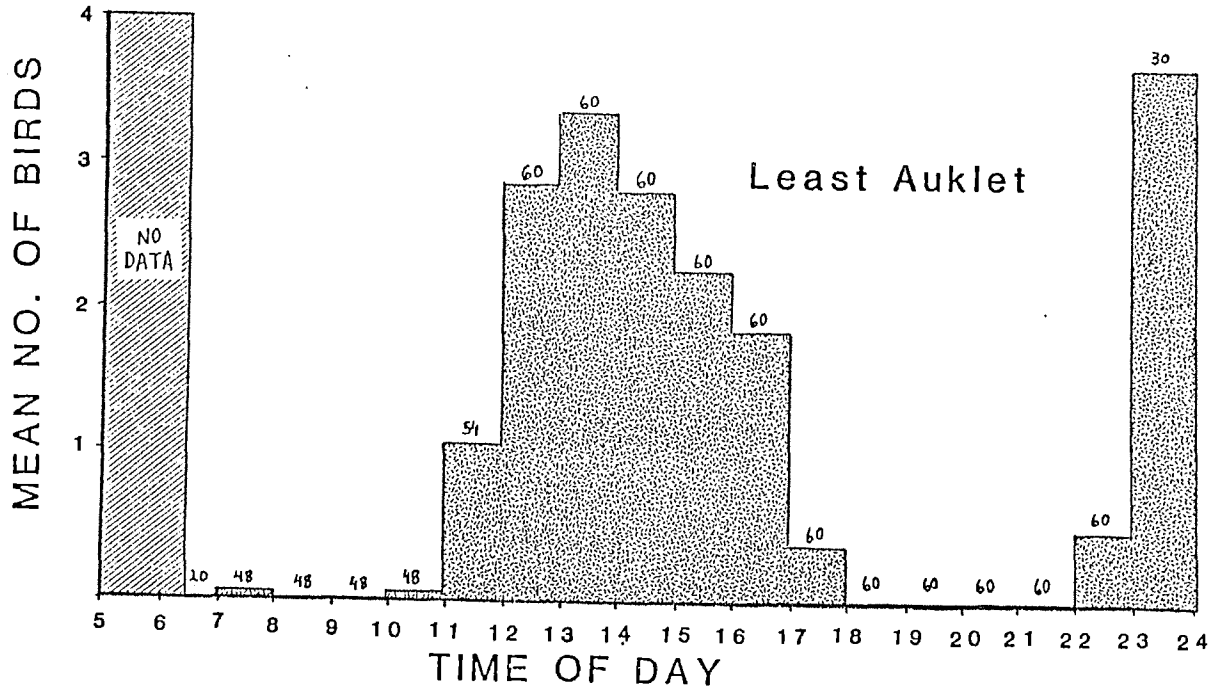
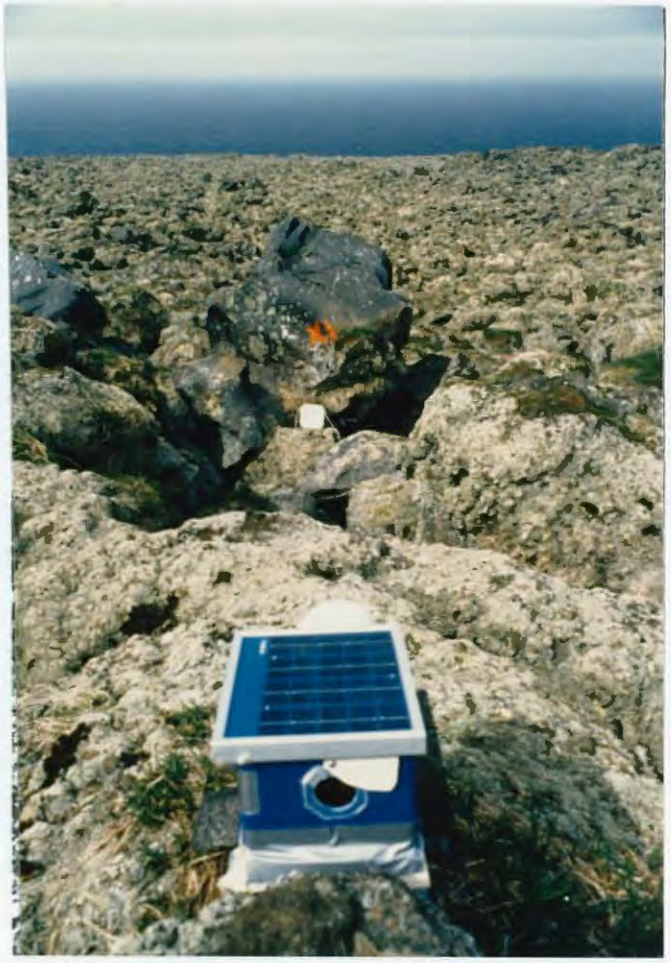


Figure 3. Daily attendence pattern of birds at Kiska Island from time-lapse photography, June 24 29, 1985. Number of counts per hour is indicated above each bar.

vide excellent results (see figures 2 and 3). Fox were observed within camera range at plot number two on four occasions during the survey.

One additional type of survey was conducted in the Kiska auklet colony. One member of the field crew kept a record of all incidental individaul fox observations within the colony. Although counting duplications were possible, separations in time and/or distance were used to identify individuals. The results of these incidental arctic fox observations for each of the three census days were 21, 17, and 15. Temperatures were noticeably cooler on the last day.



Time lapse camera setup used in old lava flow at Sirius Point auklet colony, Kiska. 6/27/85, #038508, FGD

Two major goals of the 1985 field season were to declare Amukta and Rat islands fox free. Forty-nine fox were eliminated on Amukta in 1983 and no fox or fox sign were found during an exhaustive eradication effort in 1984. Two FWS personnel from Animal Damage Control eliminated 175 fox from Rat Island in 1984. Both islands were searched this year in hopes of verifying their fox free status. During a trip through the eastern Aleutians in late May, Amukta Island was visited. The effort was concentrated at Trader's Cove which has a sandy beach (high quality fox habitat and former concentration area) and at the old camp/fresh water site on the southeast end of the island. Both areas were searched for any fox sign, including former trails, den sites, mounds and water sources. One member of the crew was very adapt at fox calls and made numerous attempts to call foxes without success. No fresh fox sign was found. All former fox trails were overgrown with vegetation and no scat was seen on the mounds or promontories along the former fox trails. None of the den sites were active and the den site at Trader's Cove was completely overgrown with vegetation. No response to the fox calling was received. A couple of old M-44's were found in the Trader's Cove area. There was no fox sign around them. At the fresh water holes near the old main camp, several recent goose droppings were found. Along the ridge above the water holes some old storm-petrel and/or puffin burrows were found to have recent diggings. After three year's work on Amukta Island, Amukta Island was declared fox free in 1985.

During a trip through the Western Aleutians in June, the entire south shore of Rat Island was searched for fox or sign. No fox or fresh fox sign were found. Considerable rat activity, however, was noted. Because of bad weather and rough seas, the north side of the island was not searched. A two person crew was able to land briefly at Gunner's Cove on the north side of the island, however, and they searched the immediate beach, but found no fox or fox sign. They did find the old fox trapper's cabin rolled completely over twice by severe winter storms. After completion of the Buldir-Amchitka goose transplant, a crew returned to Rat Island and after several hours the cabin was turned right side up and secured to the ground.

A declaration of fox free status for Rat Island will not be issued until the north side of the island can be completely surveyed.

Efforts continued in 1985 toward fox eradication at Kasatochi Island to benefit nesting auklets. Work at Kasatochi was conducted from 20 to 24 May from the M/V Norpac. Again, weather became a major obstacle. The crew was unable to land on Kasatochi one day due to heavy seas. Then the crew spent a very wet, windy and unproductive afternoon on Kasatochi on a second occasion. The entire effort was not very productive with only three fox definitely killed and possibly two additional animals eluding removal efforts. Continued eradication

effort is scheduled for 1986.

During August five personnel visited Uliaga and Adugak islands to check the progress of experimental introductions of sterilized red fox on the two islands. The project is part of an attempt to determine whether or not the more aggressive red fox will eliminate arctic fox. Results have been inconclusive to date. No foxes were observed on Uliaga and only one red fox was observed on Adugak. It was determined that better surveys of red/arctic fox populations are more likely in May during the breeding season (when foxes are easier to call). The vegetation would also be considerably shorter in the spring, making fox observation easier.

The biological staff conducted a concentration effect bio-assay test for Compound 1080 on arctic foxes at Adak in August and September. The testing was conducted in accordance with the EUP for the Kiska project. Compound 1080 is a canid specific poison at low concentrations, primarily affecting their central nervous system. The experiment was conducted to determine the proper arctic fox dosage for a single lethal dose bait. Nine foxes were captured using live traps. Six were trapped on Kagalaska Island and three were caught on Adak. Doses were administered at the two, three, four, and five mg levels. Eight of the nine foxes died after consuming the bait, while one male survived a three mg dose (Table 18). Thirty-two hours after consuming the bait the surviving fox was euthanized. After each fox died, a hind quarter was removed, frozen, and sent to the Denver Wildlife Research Center (DWRC) for analysis.

Table 18. Effectiveness of various Compound 1080 dose levels on arctic fox.

Number fox tested	1080 bait dosage	Average time to death	Average time to death after convulsions start
2	2 mg	4.75 hr	1.90
2*	3 mg	4.40 hr	1.60
3	4 mg	2.70 hr	1.00
1	5 mg	3.25 hr	0.25

* Does not include fox which survived the 3 mg bait.

According to the Predator Section at the DWRC, fox should die within three hours after consumption for a bait to be considered effective. If a fox died within three to five hours after consumption, the bait would be considered to be marginally effective. The four mg dose level fell under the three hour time limit while the other three dosage levels exceeded it. One fox survived the three mg dosage level. The fox that received a five mg dose required 3.25 hours to die, but it also had the shortest duration of convulsions. It was

also the largest fox tested, weighing 2.75 pounds more then the next heaviest animal. The four mg dose level also resulted in a short time duration from the start of convulsions to death (averaging only one hour). The four mg dose was recommended to the EPA as the most efficient single lethal dose bait for the planned Kiska project. The three mg dose level was considered to have a marginal effectiveness. The five mg dose level may have been too strong and present a greater potential danger to non-target species. The EPA approved the four mg dose level for baits to be used under the Kiska Island EUP.

A permit is issued annually for gull control along the Shemya Air Force Base runway. It was not necessary to shoot any birds there in 1985 for depredation control.

16. Marking and Banding

AIU 1985 banding efforts resulted in the marking of 123 Aleutian Canada geese. All but one also received a yellow plastic numbered band. That goose escaped on Buldir prior to being color banded.

H. PUBLIC USE

1. General

Most of the people living in the Aleutian Islands are active duty military personnel and their dependents. A Naval Air Station and other Navy commands are located on Adak Island where approximately 5,000 people reside. The average tour of duty for Adak military personnel is one and a half to two years, providing the refuge staff a unique opportunity to contact a continually changing population with interpretive, educational and informational resources. Shemya Air Force Base and a Coast Guard LORAN Station on Attu Island add 1,000 military personnel to the population of the Chain. Four Native villages on Unalaska, Umnak (Nikolski), Akutan and Atka Islands account for about another 500 individuals. The AIU staff tries to visit Shemya, Attu and each of the native villages at least once annually, although weather and logistical problems often prevent some trips. These visits give us the opportunity to discuss refuge programs and objectives with the people, present films and/or slide shows to interested residents, and provide environmental education activities for students. Attu, Shemya, Atka and Unalaska were visited during 1985.

During the year 3,610 people spent time in the Adak visitor center and refuge personnel handled almost 1,300 public inquiries. Public use surveys on Adak recorded an estimated 15,348 recreational visits. Consumptive use totalled 25,166 activity hours, down from 63,269 activity hours in 1984. This was due primarily to reduced fishing caused by poor salmon runs and a change in the way caribou hunting use was calculated. Nonconsumptive use was estimated at 9,753 activity hours.

Until April, nature films were shown every Sunday at 2, 3 and 4 p.m. in the refuge visitor center. Poor attendance caused the schedule to be revised to only one showing on Sunday evenings at 7 p.m. That schedule held through the end of the year. Films are obtained from the Alaska State Film Library, the National Park Service, the FWS Public Affairs Office in Anchorage and the AIU film library. The films are presented to give Adak residents an opportunity to learn more about Alaska and its natural resources. This year, 44 different films were shown to a total of 699 people.

Manager Zeillemaker and Assistant Manager Klett attended 45 Navy command staff meetings on Adak during the year. These meetings help keep island commands and organizations informed of refuge operations and programs, as well as to keep refuge staff abreast of Adak Navy activities.

Approximately 40 news items were published in the Adak "Eagle's Call" (weekly NAS newsletter), the "Tundra Times" (monthly NSGA newsletter), "Rec on the Rock" (monthly RSD newsletter) and various Navy "Plans of the Day". The AIU staff also contributed to the production of numerous radio and television spots through the Adak Armed Forces Radio and Television Service detachment, the local Navy broadcasting service. News releases covered a variety of topics including refuge programs and activities, public use regulations, information on wildlife species, and outdoor recreation opportunities. Although the Adak newspapers, television and radio are used whenever possible to disseminate refuge news, the turnover of Navy personnel and changing command directives for the news media often prevent the refuge staff from having a consistent and stable public relations program through the military.

2. Outdoor Classrooms - Students

The refuge's summer environmental education program took off in 1985 as never before. Plans were made to conduct programs for the Adak Youth Center, Child Care Center, and Boy and Girl Scout groups. A nine week "Junior Naturalist Explorer" program was organized in June for children in grades K-6. Wildflowers, acclimitization, birds, food webs, habitats, intertidal animals adaptations, outdoor survival and salmon were some of the topics covered by the summer's programs. A total of 27 Junior Naturalist sessions, 10 special nature hikes and four visitor center programs were conducted for a total of 340 children. A special trip was also made to Atka Village to conduct educational activities for 21 children there. With assistance and guidance from refuge staff, three elementary school classes and one Girl/Brownie Scout group with a total of 92 students conducted afternoon environmental education activities at the visitor center using refuge displays and audiovisual resources.

3. Outdoor Classrooms - Teachers

Refuge staff supplied teachers on Adak with National Wildlife Week and Alaska Wildlife Week packets for use in their classrooms. Teachers were also invited to an environmental education (EE) meeting held in late April. The purpose of the meeting was to explain EE mandates of the FWS, provide support materials and information, identify teacher needs, and outline future EE plans and activities of the refuge. Seven enthusiastic teachers attended the three hour meeting. An environmental education resource/lending library was also established for staff and teacher use. In addition, films were loaned and resource information was distributed to teachers intermittently throughout the year. Finally, in August 15 new teachers were presented an orientation session on the FWS and the AIU.

6. Interpretive Exhibits/Demonstrations

Accelerated Refuge Maintenance Management (ARMM) funds were available this year to hire a contractor to design a display package for the complete rehabilitation of the Adak refuge visitor center. Inside/Outside of Austin, Texas, was hired as the design contractor. In October, Inside/Outside met with refuge staff on Adak to gather data and begin the planning process. Refuge personnel spent a significant amount of time from October through December gathering information, selecting photos, refining plans, reviewing resource information, and reviewing preliminary drawings for the project ORP Edgerton also, surveyed the community. Adak Navy commanding officers were interviewed and all 40 Adak teachers were surveyed to obtain their views on the FWS and what services they would like to see us provide (Table 19). One hundred survey forms were distributed to island residents through the different military commands (less than an ideal random sample) to obtain ideas and thoughts from the public (Table 20). Miraculously, 85 of the surveys were returned. The design phase of the project will be completed in February 1986. If all goes as planned, the new displays should be nearing completion through additional ARMM funds by the end of 1986. Completion of this project is greatly anticipated because it will do wonders for our interpretation, recreation, environmental education and law enforcement programs. In the meantime, we have continued to replace and improve old and outdated displays.

The AIU staff worked hard to complete the live mounts, artificial rock slide, identification key and interpretive writeup for the visitor center seabird diorama. The diorama will become one of the components of the new display package. We also constructed and completed a six sided display stand for mounted Aleutian Canada geese, mounted pictures with captions along the 18 ft Aleutian wall map display, and completed a display stand for a three-ring photo album that is used in conjunction with the Aleutian map. In June a new display was constructed entitled "A Calendar of Natural Events on Adak".

U.S. Fish and Wildlife Service
Alaska Maritime National Wildlife Refuge -- Aleutian Islands Unit

Table 19. TEACHERS SURVEY

1. Have you visited the Fish and Wildlife Service headquarters on Adak?
34 (81%) yes 8 (19%) no

2. What do you believe is the main purpose of Fish and Wildlife Service on the island?
7 (17%) provide outdoor recreation activities
27 (64%) conduct wildlife research
20 (47%) enforce Fish and Wildlife Service regulations
17 (40%) provide information about fish and wildlife
16 (38%) provide educational programs and services

3. Do you currently utilize Fish and Wildlife programs or services for your students?
15 (36%) yes 27 (64%) no

Which services or programs do you use?
6 (14%) printed material
6 (14%) films
4 (9%) visitor center
4 (9%) programs
4 (9%) field trips

4. What services or activities would you like Fish and Wildlife Service to provide for your students on Adak?
1) printed material - 10 (24%)
2) films - 4 (9%)
3) programs - 11 (26%)

5. Would you prefer:
16 (38%) visit to refuge headquarters center
28 (66%) outdoor experience
18 (43%) classroom experience

6. What do you miss the most while you are on Adak?
1) trees - 14 (33%)
2) weather - 6 (14%)
3) restaurants - 5 (12%)

7. When do you have free time?

	Morning	Afternoon
_____Monday	3 (7%)	3 (7%)
_____Tuesday	3 (7%)	4 (9%)
_____Wednesday	3 (7%)	5 (12%)
_____Thursday	3 (7%)	3 (7%)
_____Friday	3 (7%)	2 (5%)
_____Saturday	13 (31%)	21 (50%)
_____Sunday	12 (28%)	23 (55%)

8. Would you like to volunteer some of your free time to the Fish and Wildlife Service?

9. What volunteer activities would be fun for you?
13 (31%) help with wildlife research
11 (26%) help lead outdoor activities
6 (14%) build exhibits
7 (16%) photograph Fish and Wildlife activities
7 (16%) help with the Fish and Wildlife library
4 (9%) produce videos for Fish and Wildlife
1 (2%) other _____

10. What would you like to take with you from Adak?
appreciation/knowledge - 10 (24%)
memories - 8 (19%)
photos - 8 (19%)

11. What name do you like for the new Fish and Wildlife Center?
0 (0%) Outdoor Center
2 (5%) Outdoor Recreation Center
5 (12%) Nature Center
7 (16%) Wildlife Center
4 (9%) Visitor Center
26 (62%) Fish and Wildlife Center
2 (5%) other _____

12. What could Fish and Wildlife do to help you and your students discover and explore outdoor Adak?
12 (28%) field trips
7 (16%) programs
4 (9%) resource information

13. What new outdoor skills and activities would you like to participate in while on Adak?
10 (24%) hiking
6 (14%) skiing
5 (12%) field identification

14. Would you be willing to pay a small fee for outdoor recreation services or programs offered by the Fish and Wildlife Service?
35 (83%) yes 5 (12%) no

15. Your age is: under 25: 1 (2%); 25-40: 31 (74%); over 40: 10 (24%); average age: 34

16. Your sex is: 12 (28%) male 5 (12%) female

17. Your subject and grade level are:
K-6: 6 (14%)
7-12: 14 (33%)

Science: 3 (7%)
Math: 2 (5%)
English: 5 (12%)
Social Studies: 2 (5%)
Music Art: 4 (9%)
Other 8 (19%)

U.S. Fish and Wildlife Service
Alaska Maritime National Wildlife Refuge -- Aleutian Islands Unit

Table 20. ADAK OUTDOOR RECREATION SURVEY

1. Have you visited the Fish and Wildlife Service headquarters on Adak?
   42 (49%) yes 44 (51%) no

2. What do you believe is the main purpose of Fish and Wildlife Service on the island?
   18 (21%) provide outdoor recreation activities
   41 (48%) conduct wildlife research
   48 (56%) enforce Fish and Wildlife Service regulations
   43 (50%) provide information about fish and wildlife

3. Please rank -- 1 (high) to 6 (low) -- your favorite activities:

	1	2	3	4	5	6
TV, video, movies	8	13	23	15	11	10
Reading	8	15	12	17	9	17
Indoor recreation	11	16	12	20	16	3
Clubs, groups, church	9	9	12	9	15	24
Outdoor recreation	38	14	9	6	9	4
Eating, drinking, shopping	8	10	12	12	16	19

(actual figures, not percent)

4. What services or activities would you like Fish and Wildlife Service to provide on Adak?
   1) fishing related - 14 (16%)
   2) hiking information - 12 (14%)
   3) boating - 9 (10%)

5. What do you miss the most while you are on Adak?
   1) weather - 24 (28%)
   2) family - 18 (21%)
   3) trees - 14 (16%)
   4) shopping - 12 (14%)
   5) outdoor recreation - 11 (13%)

6. If you had $50 to spend in one day, how would you spend it?
   45 (52%) dining
   18 (21%) drinking
   44 (51%) outdoor recreation
   16 (19%) indoor recreation
   20 (12%) theatre, video
   50 (58%) shopping

7. When do you have free time?

	Morning	Afternoon
Monday	1 (1%)	15 (17%)
Tuesday	1 (1%)	13 (15%)
Wednesday	1 (1%)	14 (16%)
Thursday	2 (2%)	14 (16%)
Friday	2 (2%)	16 (19%)
Saturday	28 (33%)	46 (53%)

8. Would you like to volunteer some of your free time to the Fish and Wildlife Service?
   37 (43%) yes 44 (51%) no

9. What volunteer activities would be fun for you?
   39 (45%) help with wildlife research
   19 (22%) help lead outdoor activities
   12 (14%) build exhibits
   30 (35%) photograph Fish and Wildlife activities
   19 (22%) help with the Fish and Wildlife library
   13 (15%) produce videos for Fish and Wildlife
   9 (10%) other build hatchery, archery range, duck blinds, zoo, enforcement

10. What would you like to take with you from Adak?
    memories - 25 (29%)
    photos/videos - 23 (27%)
    mounted game - 11 (13%)

11. What name do you like for the new Fish and Wildlife Center?
    1 (1%) Outdoor Center
    6 (7%) Outdoor Recreation Center
    11 (13%) Nature Center
    14 (16%) Wildlife Center
    1 (1%) Visitor Center
    51 (59%) Fish and Wildlife Center
    6 (7%) other

12. What could Fish and Wildlife do to help you discover and explore outdoor Adak?
    hikes - 16 (18%)
    boat - 7 (8%)
    tours - 6(7%)

13. What new outdoor skills and activities would you like to participate in while on Adak?
    skiing - 18 (21%)
    hunting - 14 (16%)
    fishing - 10 (12%)

14. Would you be willing to pay a small fee for outdoor recreation services or programs offered by the Fish and Wildlife Service?
    63 (73%) yes 16 (18%) no

15. Your age is: < 25: 32 (37%); 25-40: 40 (48%); > 40: 12 (14%); average age: 30

16. Your sex is: 65 (76%) male 20 (23%) female

17. Your rank or occupation: _____

Three erasable wall panels were provided for Adak residents to announce noteworthy natural occurences including wildlife observations, wildflower observations, and fish runs. The upgrading of our visitor center is increasing visitor interest. Over the past two years the center has provided considerably more resources for environmental education activities at Adak.

The AIU sign plan was completed this year and requested signs were either on hand or were being constructed at the Kenai Refuge sign shop by year's end. We hope to have the Adak direction signs for Adak completed and installed by late spring 1986. Once the signs are in place, our visitor center visitation should increase dramatically.

7. Other Interpretive Programs

Manager Zeillemaker presented a slide program on refuge projects to 70 members of the "Attour" birding group which visited Attu during the spring migration (May and June). He also gave the same program and then showed the film "Chain of Life" to the 25 U.S. Coast Guard personnel stationed on the island. Copies of the "Chain of Life" were then presented to the commanding officers at Attu and Shemya for inclusion in their base film libraries. Finally in June, Manager Zeillemaker showed the film "Chain of Life" and gave a 45-minute slide presentation on the AIU to 12 employees of the NMFS traveling through Adak enroute to observe Japanese fishery activities on the high seas south of the Aleutians.

A half-hour slide program on the refuge and Adak's wildlife-oriented recreational opportunities was given five times to a total of 838 island residents. This program introduced the FWS and the AIU to military and civilian personnel new to Adak. The Adak staff also gave enforcement briefings to NAS Adak and Naval Security Group Activity Adak security personnel on public use regulations, especially those relating to hunting and fishing, during the year. Three slide shows on the AIU, refuge management, and Aleutian flora and fauna were also presented to a total of 74 people. The AIU sponsored an open house at the refuge visitor center in observance of National Wildlife Week in March. Activities included continuous film showings, conducted tours of the headquarters complex and interpretive exhibits, a coloring area for kids with prizes to all participants, a special sale on all Alaska Natural History Association (ANHA) items, door prizes and refreshments. The activities occurred from 1 p.m. to 5 p.m. on 17 March. Eighty-two people participated, many of them actively involved for up to two hours.

ORP Edgerton was the guest speaker for a one hour audio conference through the Learn Alaska network on 10 April. The telephone conference was held with seven people from Unalaska and Atka villages enrolled in a class entitled "Natural History of Alaska". Topics discussed included Aleutian flora and fauna,

volcanism, characteristics of the islands, differences between the eastern and western Aleutians, endangered species and predator control work of the FWS in the Aleutians. Discussions were fruitful and interesting for all participants. The audio conference provided us with a very valuable means of communicating with other residents of the Aleutian chain.

Refuge staff conducted six "Discovery Hikes" for 68 enthusiastic Adakians during the summer. Hikes were geared toward teenagers and adults. Topics covered were nature photography, sea shore and intertidal ecology, geology, wildflowers, habitats and lake ecology. A five hour bird identification workshop was held in June to help give island residents the necessary information and tools to enjoy birdwatching

Attour participants in search of just one more rare bird. This "average" day included a rough 15 mi bike ride followed by a 10 mi hike. 5/29/85, #018505, CFZ

on Adak. Nineteen people attended the workshop which consisted of a presentation and slide show followed by a field trip to the birding "hotspots" of Adak. This is an annual activity planned to coincide with Adak's spring bird migration. A poorly attended waterfowl identification workshop was also conducted in October.

The AIU sponsored a slide show given by Steve Swartz, a marine mammal biologist with NMFS in late June. Steve's program covered gray whales and was attended by 30 people.

ORP Edgerton spent 6-19 August as staff tourguide and naturalist aboard the cruise ship World Discoverer for Society Expeditions. Tom boarded the ship in Japan to tour the North Pacific and the Aleutians. Although the tour was plagued by bad weather, programs were presented to 112 people and crew. Activities conducted by Edgerton included five slide and movie programs; hikes on Attu, Semisopochnoi and Atka; and miscellaneous formal and informal talks. Tom also presented two films for the residents of Atka before returning to Adak.

Passengers aboard the World Discoverer enjoy the rugged beauty of Attu Island. 8/17/85, #048503, TRE

Refuge personnel and the Adak elementary and high school teachers sponsored the Navy Officer's November "Hail and Farewell" dinner and program at the NAS Adak Officers Club to acknowledge those persons new to Adak and to say goodbye to those departing. The theme for the event was "Polyester Prom" and a good time was had by all.

In late December, refuge staff organized and conducted the annual Audubon Christmas bird count. Eighteen people divided into five groups participated in the event (see section G. 7).

8. Hunting

In addition to being a National Wildlife Refuge, the AIU is also a State Game Refuge and subject to regulations of the Alaska Department of Fish and Game. The entire refuge is closed to hunting except for Umnak, Atka, Unalaska, Akun, Akutan, Sanak, Tigalda, Shemya, Attu, Great Sitkin and Adak islands. Table 21 provides a breakdown of hunting and fishing visits and activity hours for Adak. Only waterfowl and ptarmigan hunting are authorized on Shemya, Attu and Great Sitkin. The command at Shemya does not allow any hunting and the command at Attu allows only waterfowl hunting. On Adak those species and the caribou may be harvested.

Table 21. Adak consumptive use

	Visits		Activity hours	
	1984	1985	1984	1985
Hunting				
Caribou	556	1,110	41,232	14,336
Ptarmigan	721	764	2,274	2,768
Waterfowl	194	221	666	800
Total	1,471	2,095	44,172	17,904
Fishing	7,243	3,500	19,097	7,262
Total	8,714	5,595	63,269	25,166

Waterfowl season on Adak opened on 8 October, but, as is usually the case, significant hunting pressure occurred only the first two weekends. As the only upland game bird on the island, ptarmigan received fairly heavy pressure throughout the open season. Caribou hunting season ended on 31 March with a total 1984-85 harvest of 144 animals, far short of the preseason goal of 200. The season began again on 1 September and 347 hunters had received permits from the refuge office by the end of the year. The registration system was streamlined this year so that fewer hours were spent issuing and renewing permits. The Navy provides tug service to the public use cabins on the south half of Adak for active duty military personnel. This service is provided during the caribou hunting season except for December and January. Approximately two-thirds of the entire caribou harvest is in conjunction with tug support. Caribou hunting is considered to be quite good on Adak and is extremely popular.

In September the AIU staff completed a new handout on Adak hunting and fishing information. Complete regulations are now available to all sportsmen on Adak.

9. Fishing

Fishing continues to be the most popular consumptive use on the Unit (Table 21). Saltwater enthusiasts angle for halibut and set crab pots in nearby waters. Stream and lake fishermen concentrate on pink, red and silver salmon, and Dolly Varden. The 1985 pink salmon run was a poor one. Nevertheless, popular areas like Finger Bay and NAVFAC Creek received moderate use. Finger Bay Stream has been designated "fly fishing" only by Naval directive to reduce fishing pressure in that popular spot. High quality wilderness fishing is also available for those interested in hiking.

The Recreation Services Division of NSGA command on Adak has a recreational vessel named the Kuluk Clipper which takes up to six fishermen daily to the halibut "hotspots". Demand has been so high that the command instituted a reservation by lottery system to try to give everyone an equal chance at taking a trip on the vessel. In April, the NSGA commander closed indefinitely all NSGA property (including Clam Lagoon) to shell fishing due to the ever present uncertainty of the existence of red tide in Adak waters and the possibility of PSP poisoning.

10. Trapping

Trapping for arctic fox is allowed year-round on Adak Island. Free permits were issued to 36 trappers during the season. Much of the trapping is limited to sites near cabins on the north (Navy) portion of the island. Few animals were taken.

11. Wildlife Observation

Landscape, wildflower and wildlife observers and photographers marvel at the opportunities available on Adak. Bald eagles and sea otters are common and are favorite subjects. Caribou, although a bit more difficult to see, are also highly sought with the camera or binoculars (Table 22).

Table 22. Adak selected nonconsumptive uses

	Visits		Activity hours	
Wildlife observations	1984	1985	1984	1985
Hiking	3,362	3,258	11,144	9,411
Land Vehicle	5,970	4,881	5,970	4,881
Photography	2,070	1,614	2,070	1,614
TOTAL	11,402	9,753	19,184	9,753

13. Camping

The entire AIU is open to camping. Most use, however, occurs on Adak where five FWS backcountry cabins are available on a

first come, first serve, reservation basis. The cabins received moderate to heavy use by backpackers, fishermen and caribou hunters during 1985.

16. Other Non-Wildlife Oriented Recreation

Cross-country skiing, sledding, tubing and snowshoeing have become extremely popular winter activites on Adak. Hiking and beachcombing are popular activities throughout the year and berrypicking is done by many during the fall.

17. Law Enforcement

Assistant Manager Klett and ORP Edgerton attended the 40 hour Refuge Law Enforcement Agent refresher training session in Anchorage in February. Both also requalified with their Service sidearms in September.

At the present time, most enforcement work occurs on Adak Island. The lack of logistical support makes enforcement on other islands virtually impossible at this time. It is station policy that all violations involving military personnel on the Adak Naval reservation are turned over to the appropiate Navy command for prosecution. Military personnel who violate regulations off the Naval reservation and all civilians are issued FWS citations.

Persons often report fishing violations (i.e. snagging salmon in fresh water, keeping too many fish, or taking fish with illegal gear) to us. We respond to many of these calls. More often than not, however, we find no evidence of violation or can not locate the alleged violator. Several undercover investigations were conducted with negative results. Our small staff does not have as much time as is necessary to do extensive routine patrols and help keep Adak's 1,000 or so "sportsmen" in compliance.

Patrol of the Finger Bay/Lake Betty region was conducted on the opening day of the caribou season. Thirty hunters were seen and 23 were checked. All had the proper licenses and permits. One party was checked as they were breaking camp. Of five individuals only two said they were interested in hunting but did not have caribou hunt permits. The entire party seemed more interested in plinking than hunting, as other hunters reported they had heard over 50 shots from their camp area (mostly .22 or larger caliber pistol). Salmon fishermen in the Traffic Circle and Finger Bay areas were also checked.

The wreckage of several World War II aircraft in the AIU created several headaches this year, and resulted in two citations being issued to one individual. The scheduled U.S. Army Corps of Engineers cleanup of World War II facilities/debris on Amchitka Island prompted a request from a World War II Aviation-Artifact Museum in Anchorage to visit the island in

September. Museum personnel wished to search for dump sites and to inventory and photograph airplane wrecks and parts. A Special Use Permit (SUP) was prepared for the visit. The inspection team was to pick up the SUP on their way to Amchitka. They did not arrive on the appointed day and we received no word regarding a change in plans for the visit. We found out two weeks later that they did make the trip. A citation was issued for unauthorized trespass on a National Wildlife Refuge without approved authorization (a signed SUP). In October we received a letter from the same museum requesting a SUP to visit Unalaska Island to remove wreckage of four P-40 fighter aircraft. We requested a map showing the location of the airplanes so we could determine if they were on refuge lands or not. The information was never received. We found out later that parts from five airplanes were removed. Assistant Manager Klett inspected the sites in early November and photographed the stockpiled parts. Two of the wreckage sites were on refuge lands. The party chief, the same man who led the group to Amchitka, was cited for landing a helicopter in a Wilderness area and the parts were impounded. At year's end the airplane parts were still stacked at the storage sites awaiting a decision on their disposition. Needless to say, these two instances have caused the RO and the Solicitors to take an indepth look at FWS policy on ownership and disposition of the World War II planes.

On 19 January, we received a telephone call regarding a dead bald eagle in the vicinity of Lake Demarie, in an area used as an unofficial firearm shooting range. When the eagle was picked up, it was noted that it was lying on bloody snow. It was then noted that a blood trail approximately 200 feet long extended away from the recovery site. The eagle was checked and we found that it had been shot through one leg with the bullet opening the lower abdomen, then exiting through the other leg. The eagle apparently flew when shot with the abdomen opening later and starting the blood trail. Loss of blood weakened the eagle and it fell to the ground and bled to death. Investigations, including three interviews, failed to provide any leads or clues to the shooting.

18. <u>Cooperating Associations</u>

Our ANHA outlet had a record year in 1985. Income totalled $13,027.51 which was an increase of 68% over 1984 sales. One hundred and thirty-two memberships were also sold. The Adak outlet had the highest FWS sales total in Region 7 and sold over one-fifth of all 1985 memberships in the state. Our sales increase was especially notable because the Adak visitor center actually saw fewer people than in 1984. A FWS/ANHA sales booth was set up at the Adak "Spring Fling" in May and the "Fall Festival" in November helped turn the trick. These one-day events are similar to arts and crafts fairs and are open to everyone on the island. The fairs drew large crowds and many people stopped at the FWS booth to ask questions, obtain refuge

brochures and purchase natural history items. The events will continue to be a regular part of the AIU public use program.

Twenty-six different items were available for sale through the ANHA outlet this year. They included wildlife posters; notecards; maps; postcards; books on the Aleutian Islands; World War II; native history; and field guides for mammals; birds and plants. Over the past two years, the AIU staff has developed a "feeling" for the sales potential that exists in our outlet. We are confident that we are only experiencing the tip of the iceberg. We will not begin to reach our full potential until our outlet can offer more books and other items specific to Adak and Aleutian resources. To date, adequate titles have been nonexistent or extremely difficult to find. When we locate more or generate enough funds to produce some of our own, income levels should begin to rise dramatically. Association aid to our outlet this year included funds for photographic enlargements, a variety of graphic supplies, binoculars and a waterfowl identification film entitled "Ducks on the Wing".

The future continues to look bright for the Adak ANHA outlet even though our interpretive center currently continues to suffer from a lack of awareness by island residents. We conduct business regularly throughout the year and do not have to rely on summer trade as much as most other outlets. We have a strong membership base, an adequate restocking budget, more money to fund needed resources, plans to install new refuge signs and plans to complete new interpretive displays in the visitor center during 1986. In addition, the regular turnover of island residents ensures a steady flow of new blood and interest in ANHA activities and resources. Our sales outlet continues to play a very important part in the educational/interpretive program of the AIU.

I. EQUIPMENT AND FACILITIES

1. New Construction

The exterior shells for three replacement 10 x 14 ft arctic entrances were completed on Quarters 4A, 4B, and 5A late in the year. All three are to be wired, insulated and sheetrocked in 1986. A similar entrance will be added to Quarters 5B when scheduling allows. The original 4 x 6 ft entryways were removed prior to installation of the larger entries. The replacements will provide badly needed additional storage space for quarters residents.

2. Rehabilitation

One of the major rehabilitation projects for the year was the replacement of all carpet and linoleum in the three older housing units (Quarters 1, 2, and 3). Refuge maintenance per-

sonnel moved all household goods out of each building (into a borrowed moving van) and removed all old carpeting. A contract vendor installed the new carpet and linoleum. AIU maintenance personnel spent many hours in a short period to meet time constraints of the installer. The completed project looks very professional and the new and thicker carpet and padding should help improve insulation of the floors.

Numerous electrical projects were completed in 1985. Three phase electrical lines to provide a receptacle for the large shop grinder and a new IBM copy machine were installed. The photoelectric exterior lighting system for the shop/office complex was modified and repaired. The interior shop lighting systems include sodium vapor lights. Due to the long warm up period required for those lights, passage through the shop spaces to other parts of the building required an annoying waiting period before enough light to illuminate passage ways was available. In the meantime, a considerable amount of energy was used and time was wasted. To eliminate those problems, a three way switch flourescent/incadescent light system was installed to light all shop passageways. Three way porch light switches were also installed in the three older houses (Quarters 1, 2, and 3) for safer lighting when exiting and entering the units. Numerous 110 volt receptacles in the three older houses were never wired when the houses were constructed in 1975. All unwired receptacles in Quarters 1 were wired in 1985.

Considerable storage shelving was installed in the headquarters library, paint room and shop areas. Before the library shelving could be completed, one of the walls was repaired to eliminate former roof leak damage. Roof repairs had been completed late in 1984. Additional floor supports were placed under the duplex housing units (Quarters 4A, 4B, 5A, and 5B) to prevent further floor sag. Contract work completed in 1984 called for a change in furnace support. The furnaces were moved off cement pads and hung from floor joists. The added weight on the floor joists caused kitchen floors to sag and counter tops and cabinets to pull away from the walls.

Other 1985 projects included the building of exhibit stands for the visitor center, the re-roofing of a housing area storage shed, the painting of interior walls and ceilings in Quarters 4A, and the erection of a cyclone fence around the concrete shop storage pad that was poured in 1984. In addition to AIU building work, repairs were made to the refuge mooring slip at the Navy Small Boat Basin for our 25 ft Boston Whaler.

3. Major Maintenance

All heating units in refuge housing and the headquarters building were serviced and cleaned. The oil fired heating unit for quarters 5B had to be rebuilt. New metal asbestos stove pipe and a wind vane were added to the headquarters boiler heat

system to extend the exhaust above the roof line and help prevent wind from blowing out the boiler fire.

New main water and power lines were run to the refuge housing complex by contract workers for the Navy during the summer. This work was part of a new Navy housing project. In the process, a lot of sand and dirt entered the refuge housing water lines a lot of time was spent cleaning and repairing water valves, faucets, washing machine control valves, and water closet valves. Along with the new power lines came brown outs and power failures over a two week period until the Navy corrected problems in the fuse and transformer system. All was well as the year ended.

4. Equipment Utilization and Replacement

Standard preventative maintenance, scheduled tune ups and lubrication were accomplished on all vehicles, boats and boat motors in 1985. Extra time was put into maintenance and repair of the Erickson front end loader during snow removal periods. A new engine and clutch were installed into one of our Chevrolet Suburbans early in the year. The engine was transferred to the refuge from the U. S. Department of Energy (DOE) in 1984. Refuge maintenance personnel removed the engine from a nearly new DOE pickup truck at Amchitka that U.S. Army personnel had wrecked in 1982. A replacement vehicle (Chevy S-10 Blazer) for the oldest refuge pickup was ordered in 1983. We were notified on 28 December 1984 that the vehicle would arrive in 1985. In May only two years after ordering, the new vehicle finally arrived. The old pickup was transferred to DOE for their use on Amchitka (in return for the new engine the refuge received from them in 1984).

Two 30 hp and two 15 hp Johnson outboard motors were purchased during the year for use on refuge inflatable boats. Some of the older Evinrude 25 hp motors will be surveyed. A new fuel/oil injection pump was installed on one of the Johnson 115 hp motors on the refuge 25 ft Boston Whaler. The engine and pump gave less than 50 hours of operation. A Raytheon 1260 radar unit was installed on the Whaler and proved very useful on foggy days during refuge surveys and fox trapping work.

We replaced our IBM Executive Model Copier with an IBM Model 20 photocopier in October. The new copier has greatly decreased copy time requirements and has greatly increased the efficiency of our photocopy operations with reduction and duplexing capabilities. If we could convince the Washington Office to allow us to have the collator we originally requested, our efficiency would really increase.

5. Communication Systems

Three portable HF SSB radios, three vehicle mount HF SSB radios and two multifrequency antennaes were purchased this year.

Those items were obtained for the summer field camps and Adak vehicles for safety reasons.

6. Computer Systems

During the year a Data General computer was purchased. Since its installation, it has been unused due to bugs in the system and a lack of programs. The computer was intended to aid our biological staff with data collection, reporting, etc., but to date it simply serves as an expensive door stop. This report (and all our reports) are prepared on our IBM PC computer.

7. Energy Conservation

Framing around several windows in the headquarters office area was removed and insulation was installed to slow or eliminate air leaks. The framing was caulked and reinstalled to help further reduce drafts. As mentioned earlier, electrical lighting additions and switch changes were made to help reduce electrical usage. Also mentioned earlier was the new carpeting with a more insulative type padding to help retain heat in the older housing units.

J. OTHER ITEMS

1. Cooperative Programs

During the last weeks of January, a film crew consisting of seven individuals, conducted a four day reconnaissance trip to Kiska Island. Their objective was to obtain sufficient underwater footage of World War II wreckage in Kiska Harbor, as well as the necessary land footage to promote a documentary of World War II activities/occupation on Kiska. During their stay they located three sunken transports, a submarine and two patrol boats. The vessels were in various stages of decomposition and most were encrusted with colorful sponges, hydroids and soft corals. This trip resulted in a short Dan Rather Report on CBS-TV. Two ten person filming crews returned to Kiska Island in July for two weeks of diving and on site photography needed to complete the project. The final results should result in a network news documentary or a National Geographic special.

Another film crew from the Tokyo Broadcasting System spent 15 days on Amchitka Island in April. Their purpose for visiting the island was to obtain footage to produce a special program to commemorate the 30th Anniversary of their TV station. The title of the film was to be "Odyssey of Great Siberia" and was to be a modern travelogue based on the adventures of a group of Japanese, led by a fisherman named Kodayu, who washed ashore on Amchitka Island from a sunken fishing boat long ago. Seven died during that historic event, but survivors somehow made their way to the Kamchatka Peninsula, in Russia, and crossed Siberia to reach the then capital of Imperial Russia (Petersburg) where they met with Catherine II. Only three individuals

eventually made it back to Japan. During that time, Japan had a policy of isolation from the rest of the world and Kodayu and his group were the first members of the general public to be shipwrecked overseas and then return to Japan.

3. Items of Interest

The investigation into the "missing" .50 caliber ammunition from Tanaga Island reported in last years Narrative Report was nearing completion at year's end. The Adak Naval Investigative Service initiated the investigation and eventually contacted the Federal Bureau of Investigation; Bureau of Alcohol, Tobacco and Firearms; and then the FWS Law Enforcement Division in Anchorage after the other two agencies declined involvement. Several months were spent tracking down leads and interviewing suspects. The big break finally came in November when a subject involved in a felony case at Sitka, Alaska, attempted to bargain with the Sitka Police in exchange for information relating to the theft of ammunition in the Aleutians and implicating the major suspect. Personnel in the FWS Law Enforcement Division are awaiting reports from the Sitka Police Department before proceeding with prosecution.

On Friday, 27 September, our office was contacted by the U.S. Navy regarding a Search and Rescue (SAR) operation that was being initiated for three young people that were missing aboard a rubber raft in Kuluk Bay. The refuge boat Kittiwake was loaded with additional first aid supplies, blankets and hot liquids and joined the search efforts. Apparently five young people, aged 13 to 15, were riding the waves on Kuluk Beach late Thursday night or early Friday morning when strong winds pushed their two small rubber rafts outside the surf line. Two boys managed to maneuver their raft to an offshore rock where they spent the night and returned to Adak after sunrise the next morning. It was several hours later before the three other young people were reported to be still missing. Friday's search resulted in the location of the missing raft and two paddles. One body was finally located on Saturday, 7-1/2 nautical miles off Kuluk Beach. The SAR mission continued until 13 October, but the other two bodies were never found.

3. Credits

Report sections were authored by the following:

Introduction - Van Klett and Fred Zeillemaker
A. Highlights - Fred Zeillemaker
B. Climatic Conditions - Fred Zeillemaker
C. Land Acquisition - Fred Zeillemaker
D. Planning - 4 Fred Zeillemaker, 5 Fred Deines, 6 Fred Zeillemaker
E. Administration - 1 Janice Meindl, 2 and 3 Van Klett 4 Fred Deines/Tom Edgerton, 5 Fred Zeillemaker, 6 Fred Deines

F. Habitat Management - Van Klett
G. Wildlife - 1 & 5 Fred Zeillemaker/Fred Deines/Greg McClellan; 2 & 15 Fred Deines/Greg McClellan; 3, 4 & 7 Fred Zeillemaker; 6 Fred Zeillemaker/Greg McClellan; 8, 9, 14, & 16 Greg McClellan and 10 & 11 Fred Deines
H. Public Use - Tom Edgerton/Van Klett
I. Equipment & Facilities - Bob Schulmeister
J. Other Items - Van Klett
K. Feedback - Fred Zeillemaker
L. Bird and Mammal Lists - Fred Zeillemaker

Tables and charts were prepared by Fred Zeillemaker. Word processing, computer entry, photo placement and collection were accomplished by Janice Meindl and Susan Beard. Final editing was provided by Fred Zeillemaker.

Among the benefits of working and living in the Aleutians are occasional colorful sunrises and sunsets. 8/13/85, #038509 FGD

K. FEEDBACK

Once again the AIU was forced to actively recruit volunteers to allow completion of assigned tasks. We really appreciate those who do volunteer for us, whether it be for a week or for six

months, but last minute recruiting and selection processes occassionally result in inadequately prepared and/or poorly trained personnel being assigned arduous and sometimes hazardous tasks at remote field locations. We have had good fortune over the past four field seasons, but we keep wondering what it will be like if some major accident occurs involving a volunteer employee. We continue to need additonal FTE's to allow professional high quality completion of the many tasks we are assigned annually through our Annual Work Plan Advices, Performance Standards, the telephone and through the mail. Paid employees tend to look at things more seriously than volunteers do. You get what you pay for!

Birds of the Aleutian Islands Unit
Alaska Maritime National Wildlife Refuge

The Aleutian Islands Unit of the Alaska Maritime National Wildlife Refuge contains over 160 named islands, islets and rocks totalling more than two million acres and stretching over 1770 kilometers (1100 miles) from the tip of the Alaska Peninsula on the east to within 805 kilometers (500 miles) of the Soviet Union's Kamchatka Peninsula on the west. Commonly referred to as "The Chain", the Aleutian Islands are the emergent peaks of a submarine mountain range called the Aleutian Ridge. All but portions of seven of the larger eastern Aleutian islands are included in the refuge. Due to their close proximity to the Alaska Peninsula, Unimak and Amak islands are administered by the Izembek National Wildlife Refuge headquarters at Cold Bay, Alaska. The Sanak Islands south of the Alaska Peninsula are managed from the Alaska Maritime National Wildlife Refuge headquarters at Homer, Alaska. Except for the Aleut village of Atka, the U. S. Navy station at Adak, the U. S. Air Force base at Shemya, and the U. S. Coast Guard LORAN station at Attu, the only signs of recent human activities on the refuge unit are the unhealed scars and debris remaining from World War II activities throughout the chain. Public access to the Aleutians is generally limited to Dutch Harbor and Unalaska in the eastern Aleutian islands. The communities are on private lands on Amaknak and Unalaska islands, respectively. Dutch Harbor is served daily by commercial airlines out of Anchorage, Alaska. Both communities have a motel. Retaurants and vehicle rentals are also available.

Birdlife on the central and western Aleutian islands has been adversely impacted through the introduction of arctic and red foxes from 1836 through the 1920's for fur farming purposes. The once abundant Aleutian Canada goose was dangerously close to extinction during the 1960's due to fox predation. Through fox removal efforts, the goose is slowly being reintroduced to islands near the remaining traditional nesting grounds on Buldir and Chagulak islands. Continuing fox removal efforts are allowing restoration of the endangered goose and benefiting numerous other tundra- and burrow-nesting bird species. Several nesting seabirds have already begun to increase on Agattu, Alaid, Nizki, Amchitka, and Amukta which are once again free of foxes. A second endangered bird species frequenting the Aleutian Islands area is the short-tailed albatross. This offshore migrant from the western Pacific has suffered from human impacts and introduced rats on its nesting island south of Japan.

In separating the North Pacific Ocean from the Bering Sea and bridging North America to Asia, the Aleutian Islands offer refuge to an international variety of birds. Migrants converge from all points of the compass. Over 90 Asiatic species have been found in the Aleutians, particularly from Adak west. Several have been reported nowhere else in North America and some, including whooper swan, bean goose, an Asian form of green-winged teal, common pochard, tufted duck, smew, white-tailed eagle, common greenshank,

BIRDS OF THE ALEUTIAN ISLANDS, ALASKA

	S	s	F	W
Red-throated Loon MEW 1-12 *	u	u	u	r
Arctic Loon MEW 5/9	o		o	
Pacific Loon MEW 9-5	u		r	u
Common Loon MEW 1-12 *	u	u	u	u
Yellow-billed Loon MEW 2-6/7-11	r	o	o	r
Horned Grebe MEW 9-7	u	o	r	u
Red-necked Grebe 8-7	u	x	u	u
Western Grebe ME 12 (1980)				x
Short-tailed Albatross M 5-10	o	o	o	
Black-footed Albatross M 5-11	o	u	c	
Laysan Albatross M 2-11	u	u	u	u
Northern Fulmar M 4-11 *	c	c	c	
Mottled Petrel M 5-10	o	r	r	
Cook's Petrel M 6/8 (1933,75)		x	x	
Pink-footed Shearwater M 5-6/9	x	x	x	
Flesh-footed Shearwater M 5/7-9	x	x	o	
Sooty Shearwater M 4-10	r	a	a	
Short-tailed Shearwater M 4-10	u	a	a	
Fork-tailed Storm-Petrel M4-11 *	a	a	a	
Leach's Strom-Petrel M 5-11 *	c	c	c	
Double-crested Cormorant MEW 4-12 *	u	u	u	o
Pelagic Cormorant M 1-12 *	c	c	c	c
Red-faced Cormorant M 1-12 *	a	a	a	u
Chinese Egret W 6 (1974)		x		
Black-crowned Night-Heron W 4	x			
Whooper Swan MEW 10-5	r		r	u
Bean Goose MEW 5-6/10	r	o	x	
Grtr. White-fronted Goose EWT 5/9-2	x		o	x
Snow Goose MEWT 5/7-10	o	x	x	
Emperor Goose MEW 9-7	u	x	c	a
Brant ME 9-7	r	x	r	o
Canada Goose MEWT 4-11 *	u	u	u	
Green-winged Teal EWT 1-12 *	a	a	a	a
[Baikal Teal ME 6 (1971,83)]		x		
Falcated Teal WT 5-6/10-2	o	x	x	x
Mallard EWT 1-12 *	c	c	c	c
Spot-billed Duck EW 1-12	o	x	o	x
Northern Pintail EWT 1-12 *	u	u	u	c
Garganey WT 5-7/8-11	r	o	r	
Blue-winged Teal EW 7/10 (1968,79)		x	x	
Northern Shoveler EWT 1-12	u	o	u	o
Gadwall MEW 10-6	u	o	r	r
Eurasian Wigeon EWT 8-7	u	o	u	r
American Wigeon EWT 9-6	r	o		r
Common Pochard EW 4-6/10-12	u	x	x	
Canvasback MEW 10-7	o	o	o	r
Ring-necked Duck EW 4 (1977,85)	x			
Tufted Duck EW 1-12	u	o	u	r
Greater Scaup MEW 1-12 *	c	r	u	c
Common Eider ME 1-12 *	a	a	a	a
King Eider MEWT 11-6	o		x	o
Steller's Eider ME 10-6	r	x	r	r
Harlequin Duck ME 1-12	a	u	c	a
Oldsquaw MEWT 8-7	a	o	c	a
Black Scoter ME 9-7	c	r	c	c
Surf Scoter MEW 1-12	r		o	o
White-winged Scoter MEW 1-12	c	r	u	c

	S	s	F	W
Temminck's Stint E 5-6/7-9	r	o	o	
Long-toed Stint EW 5-6/7-9	u	o	r	
Least Sandpiper EWT 4-8 *	r	r		
Baird's Sandpiper MEW 4-5/8-10	o	o	r	
Pectoral Sandpiper EW 5-6/7-11	o	o	r	
Sharp-tailed Sandpiper EW 5/9-11	x		r	
Rock Sandpiper MET 1-12 *	c	c	c	c
Dunlin MEWT 8-6	o	x	o	o
Curlew Sandpiper E 5/9 (1977,82)	x	x	x	
Spoonbill Sandpiper E 6 (1977)		x		
Broad-billed Sandpiper E 8-9 (77,78)		x	x	
Buff-breasted Sandpiper E 9			o	
Ruff E 5-6/8-10	r	o	r	
Long-billed Dowitcher MEW 6/9	x		o	
[Jack Snipe W 5 (1981)]	x			
Common Snipe EW 5-10 *	u	r	r	
Pin-tailed Snipe W 5 (1984)	x			
Red-necked Phalarope MEW 5-10 *	c	c	c	
Red Phalarope MEW 5-6/7-10	r	c	r	
Pomarine Jaeger M 5-9	o	u	x	
Parasitic Jaeger MEWT 4-9 *	u	u	u	
Long-tailed Jaeger ME 5-6/8-9	o	o	o	
South Polar Skua MTA 7 (1969)		x		
Common Black-headed Gull ME 4-10	r	o	r	
Bonaparte's Gull MEWT 5/8-10	x	o	x	
Black-tailed Gull ME 5-6 (1980,83)	x	x		
Mew Gull MEWT 8-5	r	x	r	r
Ring-billed Gull E 6 (1982)		x		
Herring Gull MEWT 2-6/9-11	o	o	o	o
Slaty-backed Gull ME 2-6/8-10	r	o	o	
Glaucous-winged Gull MEWT 1-12 *	a	a	a	a
Glaucous Gull MEWT 11-6	r	o	o	r
Black-legged Kittiwake MEW 1-12 *	c	c	c	o
Red-legged Kittiwake M 5-10 *	u	u	u	
Ross' Gull M 5 (1983)	x			
Sabine's Gull MEWT 5/7-10	x	x	o	
Common Tern ME 5-6/7-8	o	o		
Arctic Tern MEWT 5-10 *	c	c	o	
Aleutian Tern MEWT 5-8	u	u		
White-winged Tern E 7 (1976)		x		
Dovekie M 7 (1980)		x		
Common Murre M 1-12 *	a	a	u	o
Thick-billed Murre M 1-12 *	a	a	u	c
Pigeon Guillemot M 1-12 *	c	c	u	u
Marbled Murrelet MET 1-12 *	u	c	u	u
Kittlitz's Murrelet MET 1-12 *	u	c	u	o
Ancient Murrelet MT 1-12 *	c	c	u	o
Cassin's Auklet M 1-12 *	u	u	u	u
Parakeet Auklet M 1-11 *	u	c	u	u
Least Auklet M 3-12 *	u	a	a	o
Whiskered Auklet M 2-11 *	u	u	r	o
Crested Auklet M 1-12 *	c	a	r	r
Rhinoceros Auklet M 6-10 *		r	r	
Tufted Puffin MT 1-12 *	a	a	a	o
Horned Puffin M 1-12 *	c	c	u	o
Common Cuckoo T 5-7	o	x		
Oriental Cuckoo T 6 (1937)		x		

	S	s	F	W
Fox Sparrow T 6/9 (1894,1944,84)		x	x	
Song Sparrow EWT 1-12 *	c	c	c	c
Golden-crowned Sparrow T 3/9-11	x		o	
White-crowned Sparrow T 9 (1984)			x	
Dark-eyed Junco T 1-4/11	x		x	o
Lapland Longspur EWT 4-12 *	a	a	a	o
Pine Bunting T 11 (1985)			x	
Little Bunting T 5 (1977,83,84)	x		x	
Rustic Bunting T 5-6/9-10	r	r	r	
Gray Bunting T 5 (1977,80)	x			
[Pallas' Reed-Bunting T 5 (1980)]	x			
Common Reed-Bunting T 5-6	o	x		
Snow Bunting EWTA 1-12 *	c	c	c	c
McKay's Bunting T 1-3 (1889,1975)	x			x
Brambling T 5 5-6/9-10	r	o	r	
Rosy Finch ET 1-12 *	a	a	a	a
Pine Grosbeak T 5 (1983)	x			
Common Rosefinch WT 5-6/8-9	o	o	x	
Red Crossbill T 10 (1899)			x	
White-winged Crossbill T 7 (1983)		x		
Common Redpoll T 1-12 *	r	r	o	r
Hoary Redpoll T 4-7/9-1 *	o	o	o	o
[Eurasian Siskin T 6 (1978)]		x		
Pine Siskin T 3 (1977)	x			
Oriental Greenfinch T 5-6/8-9	o	o	o	
Eurasian Bullfinch T 5/9 (1977,78)	x		x	
Hawfinch T 5-6	o	o		

23 September 1984, revised 31 December 1985

C.F.Zeillemaker, Box 5251 NAS Adak, FPO Seattle, WA 98791

YF-1 AIBIRDS.1

Birds of Fourteen Locations on Attu Island
Aleutian Islands Unit, Alaska Maritime National Wildlife Refuge

NOTE: Authorizaion from the U. S. Coast Guard, Juneau, Alaska, is required for access to Attu by aircraft. The only runway is on the Attu LORAN Station. Those persons leading commercial tours and planning to visit portions of Attu outside the 1800 acre U. S. Coast Guard station and those persons desiring to use the Casco Cove buildings are required to obtain a use permit from the refuge manager at Adak, Alaska. There is no civilian community on Attu Island.

Attu is the westermost of the Aleutian Islands. It lays along the axis formed by the Alaska Peninsula, Aleutian Islands and Commander Islands, and hosts a mixture of avifauna from North America, Asia, and islands of the Pacific Ocean. Due to the island's location just a few hundred miles east of the USSR's Kamchatka Peninsula and Commander Islands, Attu hosts an avifauna very rich in Asiatic species, particularly during the spring (May and June) and fall (September to November) migrations. The island has been the only known North American nesting site for the white-tailed eagle, common sandpiper and black-backed wagtail. About 48% of the species recorded at Attu breed or occur regularly in both North America and Asia, 39% breed in Asia only, 11% breed in North America only and 2% breed on Pacific islands (ie. Hawaii and Australasia).

Only the southeastern one-tenth of Attu is accessible by road or short hike. The unmaintained roads, are used in part by U. S. Coast Guard and U. S. Air Force personnel for access to facilities near Massacre Bay and Engineer Hill. Bird species and abundance vary by season and year, but a single matrix can be used to depict the normal variety which the observer can expect in specific areas. The checklist indicates normal abundance, periods of occurrence, and breeding status of Adak birds as follow:

a - abundant (very numerous species)
c - common (certain to be seen in suitable habitat)
u - uncommon (present, but obsevation not certain)
r - rare (seasonal in very low numbers)
o - occasional (seen few times over 2-5 year period)
x - accidental (very few observations, irregular)

Asterisks (*) indicate species that breed or have bred at Attu. Numerals (1 to 12) indicate months of occurrence and slashes (/) separate seasons or periods of occurrence.

2 January 1985, revised 31 December 1985

C.F.Zeillemaker, Box 5251 NAS Adak, FPO Seattle, WA 98791

YF-1 ATUBIRDS.1

Birds of Fourteen Locations on Attu Island,
Aleutian Islands Unit, Alaska Maritime National Wildlife Refuge

YF-1 ATUBIRDS.1

Species	Months	Massacre Bay	Massacre Bay/Grey Bluff	Massacre Bay/Sea Lion Rock	Chichagof Bay	Chichagof Bay/Rabbit Island	Chichagof Bay/Sea Lion Rock	Chichagof Bay/Sea Lion Rock/Pt. Wilson	Chichagof Bay/Sea Lion Rock/Pt. Wilson/Vulcan	Chichagof Bay/Sea Lion Rock/Pt. Wilson/Vulcan/Alt	Chichagof Bay/Sea Lion Rock/Pt. Wilson/Vulcan/Alt/Hill	Chichagof Bay/Sea Lion Rock/Pt. Wilson/Vulcan/Alt/Hill/Vulcan	Chichagof Bay/Sea Lion Rock/Pt. Wilson/Vulcan/Alt/Hill/Vulcan/Alt	Chichagof Bay/Sea Lion Rock/Pt. Wilson/Vulcan/Alt/Hill/Vulcan/Alt/Alt	Chichagof Bay/Sea Lion Rock/Pt. Wilson/Vulcan/Alt/Hill/Vulcan/Alt/Alt/Alt
Red-throated Loon *	2-10	u	u	u		u		u		u	u	u	u	u	u
Pacific Loon	2-6	r													u
Common Loon *	5-10	u	u			u	u	u		u	u		u	u	
Yellow-billed Loon	5-6/7-9	r	r			r	r								
Horned Grebe	9-5	u	u			o		u						u	
Red-necked Grebe	9-6	u	u			o		u						u	
Short-tailed Albatross (1962)	8														x
Laysan Albatross	6-9		o												u
Northern Fulmar *	5-9		o				o								c
Pink-footed Shearwater (1983)	9														x
Sooty Shearwater	9														u
Short-tailed Shearwater	5-10		o				o				u		u		a
Fork-tailed Storm-Petrel (1973)	4-10		x												c
Leach's Storm-Petrel	5-10														u
Pelagic Cormorant *	2-11	c	c			c	c	c		c	c	c	c		
Red-faced Cormorant *	2-11	c	c			c	c	c		c	c		c	c	
Whooper Swan	5/12			r	r										
Bean Goose	5		r				u	o							
Greater White-fronted Goose	5/9						o								
Snow Goose	5		o												
Emperor Goose	9-5	c	c		c	c	c	c			u	c			
Brant (1981)	5	x				x									
Canada Goose (Aleutian)	5-6/9		o												
Green-winged Teal (Aleutian) *	3-11	u	c	u	c	c	c	u			u	c	c	u	
[Baikal Teal (1983)]	10-11			x											
Falcated Teal	5-6	r	r		r		r								
Mallard *	2-11		c	c	c	c	c	c		u	u	u	c	c	
Northern Pintail *	5-10	u	c	u	u	c	c	u			u	u	c		
Garganey	5/9-11				o										
Northern Shoveler	4-6/9-10	u	u	u	u	u	u								
Eurasian Wigeon	5-6/9-10	c	c	c	c	c	u			r	u	u	u		
American Wigeon	6			o			o								
Common Pochard	5-6	o			r	o	u								
Canvasback (1980)	5			x											
Tufted Duck	5-6/8-11		u	u	u	u	u	u							
Greater Scaup	7-6	u	u			c	u						u		
Common Eider *	2-11	a	a		c	c	c	c	c	a	a	u	c	u	
King Eider	5-6	r				o									
Steller's Eider	5	o													
Harlequin Duck	2-11	c	c		c	c	c	c		c	c	c	c		
Oldsquaw	7-6	c				u	r	u							

		Mass B	Alex	Mass V	USCG	Casc	Murd	Temm	Abra	Earl	Stel	Holt	Chic	Sara	Offs
Black Scoter	2-10	u	u			r	u	u			u				
White-winged Scoter	3-10	u	u			r	u				u			u	
Common Goldeneye	9-6	u	u		u	u	u						u		
Bufflehead	11-5	o				o	u								
Smew	5-6/11			u	u		u								
Hooded Merganser (1974)	3-5						x								
Common Merganser (Asiatic) *	5-6	u		u	r	r	r			r	u				
Red-breasted Merganser *	2-10	c	c	c	c	c	u	c	c	u	c	c	c	u	
Osprey (1978,1985)	5-6				x	x								x	
White-tailed Eagle *	5-10			o	o		o	u	o		o			o	
Steller's Sea-Eagle (1980)	5				x										
Northern Harrier	5-6/9			o			o								
[Eurasian Sparrow Hawk (1983)]	8						x								
Rough-legged Hawk	5-6			r	r		r								
Eurasian Kestrel	5-6/10				o										
Merlin (1983)	5/9			x											
Northern Hobby (1983, 1984)	5				x	x									x
Peregrine Falcon *	1-12	u	u	u	u		u	o	u	u	u	u	u		
Gyrfalcon	5/10			o	o										
Rock Ptarmigan *	1-12			c	c		c			c	c	c		u	
Sandhill Crane	5/7-10			o	o										
Eastern Pratincole (1985)	5						x								
Black-bellied Plover	9			o			o								
Lesser Golden Plover (Pacific)	5-6/8-10		c	c	c		c	c				c	c		
Mongolian Plover	5-7/8-9		o	o	o	o		o					o		
Common Ringed Plover	5/9						o								
Eurasian Dotterel (1983)	9			x											
Common Greenshank	5-6				r										
Greater Yellowlegs (1983)	9			x											
Green Sandpiper	5-6/8		o	o				o							
Spotted Redshank	5/9		r												
Wood Sandpiper *	5-9		u	u	u		u	u		u	u		u		
Wandering Tattler	5-6/8-9		u		u	u	u	u	u	u			u		
Gray-tailed Tattler	5-6/8-10		u		u	u	u	u				r			
Common Sandpiper *	5-7		u		u	u	u		u						
Terek Sandpiper	5-6		r				o								
Whimbrel (Asiatic)	5-6/9		r		r		u					r			
Bristle-thighed Curlew (1984)	5	x													
Far Eastern Curlew	5-6			r	o	o									
Black-tailed Godwit	5-6		r		r										
Bar-tailed Godwit	5-6		r	r	r	r									
Ruddy Turnstone	5-6/7-10	o	c	o	u		c			u		c			
Red Knot (1979)	5			x											
Sanderling	5/9				o										
Semipalmated Sandpiper (1980)	5	x													
Western Sandpiper	5-6/8-9		o			o	o	o							
Rufous-necked Stint	5-6/8-9		u	u	u	u									
Little Stint (1983)	9		x									x			
Temminck's Stint	5/8-9		o			o		o							
Long-toed Stint	5-6		r	r	r	r	r	r		r	r				
Baird's Sandpiper	6/8-9		o		o	o									
Pectoral Sandpiper	9-10		u	u	u	u	u					u	u		
Sharp-tailed Sandpiper	5/9-10		u	u	u	u	u					u	r		

		Mas B	Alex	Mas V	USCG	Casc	Murd	Temn	Abra	Earl	Stel	Holt	Chic	Sara	Offs
Rock Sandpiper *	1-12	c	c	c	c	c	c	u	u	c	c	c	c	c	
Dunlin	5-6/8-10		u		r		r				r	u			
Curlew Sandpiper (1977,1982)	5				x										
Buff-breasted Sandpiper (1979)	9				x										
Ruff	5-6/8-10		r		r		r	o							
Long-billed Dowitcher (1983)	9			x											
[Jack Snipe (1981)]	5								x						
Common Snipe (Asiatic) *	4-6/9-10		u	r	r		u			r	r	u	u		
[Pin-tailed Snipe (1984)]	5				x	x									
Red-necked Phalarope *	5-9		r	r	r		r	r							
Red Phalarope	5/7-9				o			o		o					r
Pomarine Jaeger	5-6/8-9						r								r
Parasitic Jaeger	5-9				o		o							o	
Long-tailed Jaeger	5-6/7-9		o		o		o								
Common Black-headed Gull	5-6	o				o				o					
Black-tailed Gull (1980,1983)	5						x								
Mew Gull (Asiatic)	5-6				r										
Herring Gull	2-6/10				r	o	r								
Slaty-backed Gull	5-6/9-10	u	u	u	u	u	u	u				u	u		
Glaucous-winged Gull *	1-12	a	c	c	a	c	c	c	c	c	c	c	c	c	c
Glaucous Gull	9-6	r	r		r	r				r					
Black-legged Kittiwake *	2-10	u	c		u	u	u	u		c	c	c	c	c	c
Red-legged Kittiwake	5-6		o				o	o							r
Sabine's Gull (1979,1985)	5-6						x								x
Common Tern (Asiatic)	5-6	o	o		o										
Arctic Tern *	5-10	r			r	r									
Aleutian Tern *	5-8	u	u		c	u									
Common Murre	2-9	u	r			o	u	u			c				c
Thick-billed Murre	5-6	u					r	r							u
Pigeon Guillemot *	5-9	u	u				u	c							
Marbled Murrelet *	5-9	u				u					r		u		
Kittlitz's Murrelet *	5-9	u				r	r								
Ancient Murrelet	2-9	u	r			r									
Least Auklet (1985)	5						x								
Whiskered Auklet	3-8						o								
Crested Auklet (1982,1985)	6					x	x								
Tufted Puffin *	4-9	c	c			u	u	a	c	u	u	c	c		
Horned Puffin *	5-9	r					r	u					u		
Common Cuckoo	5-7		x				o								
Snowy Owl *	5-10		r	r	r			r				r	r		
Short-eared Owl	5-6/9-10			r	r										
White-throated Needletail	5				o			o							
[Great Spotted Woodpecker(1985)]	10														
Eurasian Skylark	4-6/9-10		r		r		r				r		r		
Bank Swallow	6/8-9		o												
Barn Swallow (1978,1979)	5/9	x		x											
Common Raven *	1-12	o	u	u	u	u	u	u	u	u	u	u	u		
Winter Wren *	1-12		u					u	u	u	u	u	u		
Middendorf Grasshopper Warbler	6/9			x	x										
Lanceolated Warbler (1984)	6			x	x		x								
[Pallas' Willow Warbler (1985)]	6														
Dusky Warbler (1978,1983,1985)	5/9					x							x		
Arctic Warbler (Asiatic)	6/9			o			o								
[Pale-legged Willow Warbler(85)]	6														

		MasB	Alex	MasV	USCG	Casc	Murd	Term	Abra	Earl	Stel	Holt	Chic	Sara	Offs
Red-breasted Flycatcher	5-6		o				o	o							
Gray-spotted Flycatcher	5-6		r	r	r		r						r		
Asian Brown Flycatcher (1985)	5		x												
Siberian Rubythroat *	5-9			r	r		r							r	
Bluethroat (1984,1985)	9-11			x											
Siberian Blue Robin (1985)	5								x						
Red-flanked Bluetail (1982)	6				x			x							
Northern Wheatear (1983)	9						x								
Gray-cheeked Thrush (1978,1983)	9				x										
[Stonechat (1982)]	6		x												
Eye-browed Thrush	5-6			u	u		u			u	r			u	
Dusky Thrush	5-6				o		o			o					
American Robin (1977)	5			x											
Yellow Wagtail (Asiatic) *	5-6/8-10		u	u	u		u	u		u	u	u			
Gray Wagtail	5-6		o	o	o		o					o	o	o	
Black-backed Wagtail *	5-9				r		r			o		o			
Olive Tree-Pipit	5-6				o		o		o			o	o	o	
Pechora Pipit	5-6				o										
Red-throated Pipit	5-6/8-9		r	r	r		o	r		r	r	r	r	r	
Water Pipit	5-6/9-10		r	r	r		r	r		r	r		r	r	
Bohemian Waxwing (1983,1984)	5-6			x				x							
Brown Shrike (1984)	6			x											
Yellow Warbler (1984)	9			x											
Yellow-rumped Warbler (1980,84)	5/10			x											
Savannah Sparrow (1983,1985)	5/9			x	x										
Song Sparrow *	1-12		c	u	c		c	u		c	c	c	c	u	
Golden-crowned Sparrow	9			o									o	o	
Lapland Longspur *	5-10		a	a	a		a	a	a	c	a	a	a	a	
[Pine Bunting (1985)]	11														
[Little Bunting (1981)]	5/9		x												
Rustic Bunting	5-6/9		u	u	u		u	u		u	u	r		u	
Gray Bunting (1980)	5						x								
[Pallas' Reed-Bunting (1980)]	5			x											
Common Reed-Bunting (1977,1980)	5		x	x											
Snow Bunting *	1-12		c	u	c		c	a	c	u	u	c	u	c	
Brambling	5-6		u	u	u		u	u		r	r	r	u	u	
Rosy Finch (Aleutian) *	1-12		c	c	u		u	c	c	u	u	u	u	c	
Common Rosefinch	5-6			o			o								
White-winged Crossbill (1983)	7									x					
Common Redpoll	2-10		u		u		u	u	u	u	u	u	u	u	
Hoary Redpoll	5-6			u											
Oriental Greenfinch	5-6			o	o		o					o			
[Eurasian Siskin (1978)]	6			x											
Pine Grosbeak (1983)	5			x			x								
Eurasian Bullfinch (1978)	5			x											
Hawfinch	5-6		o	o	o		o								

This list of 194 species provided by Attour (Larry Balch, Al Driscol, Pete Isleib, Noble Proctor, Gerald Rosenband, Terry Savaloja, Mack Smith, Thede Tobish and others) and USFWS personnel (Dave Sonneborn, Paul Sykes, George Wagner and the author). Those species marked with brackets ([]) are cosidered hypothetical by some.

2 January 1985, revised 31 December 1985

C.F.Zeillemaker, Box 5251 NAS Adak, FPO Seattle, WA 98791

Birds of Fourteen Locations on Amaknak Island (Dutch Harbor) and Unalakaska Island, Aleutian Islands, Alaska

Species	Months	Amaknak/Dutch Harbor	Unalaska Island	Unalaska Island	Unalaska Island	Unalaska Island	Sumisu	Lake Michele	Cape Cheerie	Shipwreck Cove	Natiesse Bay	Rainbow Bay	Bitter Creek	Bitter Creek	Mud Bay	Unalaska Bay
Common Loon	10-6	u														u
Horned Grebe	10-2	u														u
Red-necked Grebe	8	u														u
Northern Fulmar	5-8															c
Sooty Shearwater	9															r
Short-tailed Shearwater	5-10	o														a
Fork-tailed Storm-Petrel	8															c
Double-crested Cormorant	10	o														
Pelagic Cormorant *	1-11	c				c										c
Red-faced Cormorant *	2-11	u														c
Greater White-fronted Goose	9	o														
Emperor Goose	10-1	c														
Canada Goose (Aleutian)	10								o							
Green-winged Teal	12-8	u				u										
Mallard *	4-6	u														
Northern Pintail	4	u														
Eurasian Wigeon	3		x													
Ring-necked Duck (1985)	2		x	x												
Tufted Duck	3		x													
Greater Scaup	12-7	u		u												
King Eider	12-4	u														
Steller's Eider	4/12	u														
Harlequin Duck	9-4	c														
Oldsquaw	8-4	c														
Black Scoter	12-1	u														
White-winged Scoter	12-4	u														
Common Goldeneye	12	u														
Barrow's Goldeneye	7			x												
Bufflehead	12	u														
Common Merganser	12	x														
Red-breasted Merganser *	1-12	u														
Bald Eagle *	1-12	c			u											u
Rough-legged Hawk	9	o														
Peregrine Falcon *	1-12	u														
Gyrfalcon	11	r														
Wandering Tattler	8-10	u														
Bar-tailed Godwit	5	o														
Ruddy Turnstone	8		u													
Least Sandpiper	8		u													
Rock Sandpiper	9/12	u														

		Amak	UnVi	UnaL	UnVa	Iliu	Summ	LkCx	Capt	Shai	Nate	Ruth	Broa	Maku	UnaB
Red Phalarope	8														c
Red-necked Phalarope	10														c
Mew Gull	10	u													
Ring-billed Gull (1982)	6		x												
Herring Gull	10					o									
Glaucous-winged Gull *	1-12	c	c	c	c	c	c	c	c	c	c	c	c	c	c
Glaucous Gull	10														o
Black-legged Kittiwake	6-9/12	c													
Red-legged Kittiwake	8-9														r
Arctic Tern	8														o
Common Murre	12-6	u				u									c
Thick-billed Murre	8-5	u				u									u
Pigeon Guillemot *	12-8	c				c									u
Marbled Murrelet	5-9/2	u													u
Kittlitz's Murrelet	7	o													
Ancient Murrelet	5														u
Cassin's Auklet	5														r
Parakeet Auklet	5														r
Whiskered Auklet	5														r
Crested Auklet	5														r
Tufted Puffin *	6-7	c													c
Horned Puffin *	6-7	u													u
Bank Swallow *	7	u		u	u										
Common Raven *	1-12	c													
Winter Wren *	1-12	u													
American Dipper *	1-12	r	r	u											
Water Pipit *	5-7	c	c												
Northern Shrike	12	x													
Savannah Sparrow *	5-7	a	a												
Song Sparrow *	1-12	u													
Dark-eyed Junco	12	x													
Lapland Longspur *	6-7	a			u										
Rosy Finch (Aleutian) *	1-12	c	c												
Common Redpoll	12	o													

74 species

Data for this list provided by Vernon Byrd (U.S.Fish and Wildlife Service), Dan Gibson (Univ. of Alaksa), Jim Low (Alaska Dept. Safety Fish and Wildlife Protection), Richard MacIntosh (National Marine Fisheries Service) and the author (USFWS).

Abundance symbols:

- a - abundant (very numerous species)
- c - common (certain to be seen in suitable habitat)
- u - uncommon (present, but observation not certain)
- r - rare (seasonal in very low numbers)
- o - occasional (few seen over 2-5 year period)
- x - accidental (very few observations, irregular)

Asterisks (*) indicate the species breeds or has bred at Amaknak or eastern Unalaska islands. Numerals (1-12) indicate months of occurrence and slashes (/) separate seasons or periods of occurrence.

19 April 1985, revised 4 August 1985

C. F. Zeillemaker, USFWS, Box 5251 NAS Adak, FPO Seattle, WA 98791

Mammal Distribution of the Aleutian Islands Unit,
Alaska Maritime Nation Wildlife Refuge

Species	Range
Arctic Ground Squirrel	Inroduced to Amaknak, Unalaska, Umnak and Kavalga
Tundra Vole	Fox Island Group (west to Umnak)
Greenland Collared Lemming	Introduced to Unalaska and Umnak
Norway Rat	Introduced to Akutan, Amaknak, Unalaska, Umnak, Atka, Kagalaska, Adak, Amchitka (incl. Makarius, Bat, Chapel Cove, Bird Rock), Rat, Kiska, Shemya and Attu
Killer Whale (Orca)	All salt water areas
Northern Harbor Porpoise	All salt water areas
Dall Porpoise	All offshore salt water
Sperm Whale	Offshore salt water areas
Baird's Beaked (Giant Bottle-nosed) Whale	Offshore salt water areas
Goosebeaked (Cuvier's Beaked) Whale	Offshore salt water areas
Pacific (Stejneger's) Beaked Whale	Offshore salt water areas
Gray Whale	Migrant through eastern island passes as far west as Unalaska
Minke Whale	All salt water areas
Sei Whale	Salt water between Akutan and Delarof Island Group
Fin Whale	Offshore salt water areas
Blue Whale	Salt water between Akutan and Buldir
Humpback Whale	Offshore salt water areas
Right Whale	Offshore salt water areas
Red Fox	Fox Island Group (west to Umnak), introduced to Chuginadak
Arctic Fox	Indigenous to Tigalda and Rootok. Introduced to Ugamak, Uliaga, Kagamil, Carlisle, Herbert, Yunaska, Seguam, Amlia, Atka, Kasatochi, Tagalak, Chugul, Igitkin, Great Sitkin, Tagadak, Umak, Little Tanaga, Kagalaska, Adak and islets, Kanaga, Bobrof, Tanaga, Gareloi, Ulak(W), Amatignak, Semisopochnoi, Rat, Little Sitkin, Segula, Kiska, Shemya and Attu. Died off of Aiktak, Kaligagan, Sagchudak, Salt, Kanu, Tanaklak, Asuksak, Aziak, Ilak, Kavalga, Unalga and Little Kiska. Removed from Amukta, Tag, Skagul, Ogliuga, Amchitka, Nizki, Alaid and Agattu
Sea Otter	Salt water and shores around most islands
Northern (Steller's) Sea Lion	All salt water areas, haul out sites throughout islands
Northern Fur Seal	Bogoslof islands, migrant through eastern island passes west to Islands of Four Mountains
Walrus	Unalaska (once, 1985)
Harbor (Common) Seal	All salt water areas, haul out sites throughout islands
Northern Elephant Seal	Ugamak(twice,1977-78) and Unalaska(once,1977)
Caribou/Reindeer	Introduced to Umnak, Atka and Adak

31 Dec 1984, rev. 12 Sep 1985, C.F.Zeillemaker

Mammals of the Aleutian Islands Unit, Alaska Maritime National Wildlife Refuge

Arctic Ground (Parka) Squirrel [intro]	Spermophilus parryii
Tundra Vole (Meadow Mouse)	Microtus oeconomus
Greenland Collared Lemming [introduced]	Lemnus groenlandicus
Norway Rat [introduced]	Rattus norvegicus
Killer Whale (Orca)	Orcinus orca
Northern Harbor (Common) Porpoise	Phocoena phocoena
Dall Porpoise	Phocoenoides dalli
Sperm Whale	Physeter catadon
Baird Beaked (Giant Bottlenosed) Whale	Berardius bairdii
Goosebeaked (Cuvier Beaked) Whale	Ziphius cavirostris
Pacific (Stejneger) Beaked Whale	Mesoplodon stejnegeri
Gray Whale	Eschrichtius robustus
Minke Whale	Balaenoptera acutorostrata
Sei Whale	Balaenoptera borealis
Fin Whale	Balaenoptera physalis
Blue Whale	Balaenoptera musculus
Humpback Whale	Megaptera novaeangliae
Right Whale	Balaena glacialis
Red Fox	Vulpes vulpes
Arctic Fox	Alopex lagopus
Sea Otter	Enhydra lutris
Northern (Steller) Sea Lion	Eumetopias jubatus
Northern Fur Seal	Callorhinus ursinus
Walrus	Odobenus rosmarus
Harbor (Common) Seal	Phoca vitulina
Northern Elephant Seal	Mirounga angustirostris
Caribou (Reindeer) [introduced]	Rangifer tarandus

22 September 1984, revised 12 September 1985

C.F.Zeillemaker, USFWS, Box 5251 NAS Adak, FPO Seattle, WA 98791

BERING SEA UNIT

ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Homer, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1985

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

BERING SEA UNIT
ALASKA MARITIME NATIONAL WILDLIFE REFUGE
Homer, Alaska

ANNUAL NARRATIVE REPORT
Calendar Year 1985

Refuge Manager _____ Date _____ Refuge Supervisor Review _____ Date 3/24/86

Regional Office Approval _____ Date _____

INTRODUCTION

The Alaska Maritime National Wildlife Refuge (AMNWR) was created by the Alaska National Interest Lands Conservation Act in 1980. It was established to conserve fish and wildlife populations and habitats in their natural diversity, fulfill international fish and wildlife treaty obligations, provide opportunities for continued subsistence uses by local residents, provide a program of national and international scientific research on marine resources and ensure water quality and necessary water quantity within the refuge. This Act consolidated management of eleven existing refuges with 460,000 additional acres resulting in a 35,000,000 acre refuge. Although relatively small in land mass, its lands are scattered through most of coastal Alaska and extends from Forrester Island in Southeast Alaska along the Gulf of Alaska to the Aleutian Islands and northward until near Barrow in northwest Alaska. There are over 2,500 islands, islets, and pinnacle rocks within the refuge which are used annually by millions of seabirds of at least 30 species. The AMNWR has five units with all former refuges designated subunits.

The Bering Sea Unit includes far-flung islands and headlands between the Aleutian Islands and the Bering Strait (Fig. 1). Although the topography varies from small sandy islands, like the Sand Islands off the Yukon Delta, to large volcanic islands, like St. Matthew, the areas all provide habitat for nesting seabirds. Marine mammals also occupy many of the sites.

Some of the most serious potential threats to the seabirds and marine mammals in the Pribilofs and elsewhere in the Bering Sea Unit are related to oil development in the outer continental shelf. Not only can oil spills cause decimation of the birds and their food chain, but increased activities from airplanes, boats, and people in these relatively undisturbed areas may adversely affect marine animals.

Long-term refuge objectives include establishing a seabird monitoring scheme that involves all the major species and which is of sufficient intensity to detect population changes of 20% or greater with 90% confidence, and also to measure annual changes in reproductive success. In addition, we should be able to identify the major causes of change. This will require a cooperative effort with other divisions in the Service, other federal, state, and local government agencies, and private organizations. In 1985 monitoring was conducted at three sites; the Pribilof Islands (refuge personnel), St. Matthew Islands (Univ. of Alaska personnel under contract to Minerals Management Service), and Bluff (Univ. of Alaska personnel under contract to the refuge).

There are significant opportunities for interpretive programs in the unit, particularly in the Pribilof Islands where several thousands of natural-history oriented tourists visit

each summer. Also, environmental education opportunities exist at schools in the Pribilof Islands, and at some of the villages in Norton Sound which occur near refuge seabird colonies.

INTRODUCTION Page

TABLE OF CONTENTS i

A. HIGHLIGHTS 1

B. CLIMATIC CONDITIONS 1

C. LAND ACQUISITION 3

1. Fee Title....3
2. Easements....Nothing to report
3. Other....Nothing to report

D. PLANNING

1. Master Plan....3
2. Management Plan....7
3. Public Participation....Nothing to report
4. Compliance with Environmental and Cultural Resources Mandates....Nothing to report
5. Research and Investigations....7
6. Other....Nothing to report

E. ADMINISTRATION

1. Personnel....14
2. Youth Programs....Nothing to report
3. Other Manpower Programs....Nothing to report
4. Volunteer Program....14
5. Funding....16
6 Safety....17
7 Technical Assistance....18
8. Other ....Nothing to report

F. HABITAT MANAGEMENT

1. General....Nothing to report
2. Wetlands....Nothing to report
3. Forests....Nothing to report
4. Croplands....Nothing to report
5. Grasslands....Nothing to report
6. Other Habitats....Nothing to report
7. Grazing....18
8. Haying....Nothing to report
9. Fire Management....Nothing to report
10. Pest Control....Nothing to report
11. Water Rights....Nothing to report
12. Wilderness and Special Areas....20

13. WPA Easement Monitoring.....Nothing to report

G. WILDLIFE

1. Wildlife Diversity.....22
2. Endangered and/or Threatened Species.....23
3. Waterfowl.....Nothing to report
4. Marsh and Water Birds.....23
5. Shorebirds, Gulls, Terns and Allied Species.....25
6. Raptors.....Nothing to report
7. Other Migratory Birds.....Nothing to report
8. Game Mammals.....Nothing to report
9. Marine Mammals.....28
10. Other Resident Wildlife.....Nothing to report
11. Fisheries Resources.....Nothing to report
12. Wildlife Propagation and Stocking.....Nothing to report
13. Surplus Animal Disposal.....Nothing to report
14. Scientific Collections.....28
15. Animal Control.....Nothing to report
16. Marking and Banding.....Nothing to report
17. Disease Prevention and Control.....Nothing to report

H. PUBLIC USE

1. General.....29
2. Outdoor Classrooms-Students.....Nothing to report
3. Outdoor Classrooms-Teachers.....Nothing to report
4. Interpretive Foot Trails.....Nothing to report
5. Interpretive Tour Routes.....Nothing to report
6. Interpretive Exhibits/Demonstrations.....Nothing to report
7. Other Interpretive Programs.....Nothing to report
8. Hunting.....Nothing to report
9. Fishing.....Nothing to report
10. Trapping.....Nothing to report
11. Wildlife Observation.....29
12. Other Wildlife Oriented Recreation.....Nothing to report
13. Camping.....Nothing to report
14. Picnicking.....Nothing to report
15. Off-Road Vehicling.....Nothing to report
16. Other Non-Wildlife Oriented Recreation...Nothing to report
17. Law Enforcement.....Nothing to report
18. Cooperating Associations.....Nothing to report
19. Concessions.....Nothing to report

I. EQUIPMENT AND FACILITIES

1. New Construction.....Nothing to report
2. Rehabilitation.....Nothing to report
3. Major Maintenance.....Nothing to report
4. Equipment Utilization and Replacement....Nothing to report
5. Communications Systems.....Nothing to report
6. Computer Systems.....Nothing to report

7. Energy Conservation.....Nothing to report
8. Other.....Nothing to report

J. OTHER ITEMS

1. Cooperative Programs.....31
2. Other Economic Uses.....Nothing to report
3. Items of Interest.....Nothing to report
4. Credits.....31

K. FEEDBACK

1. Feedback.....Nothing to report

Flock of black-legged kittiwakes near Cape Lisburne.
07/30/85 G.V.B.

Black-legged Kittiwake--At Cape Lisburne, observations in late July 1985 indicated that this species was more successful than in 1984, but that reproductive success was still well below the level of the early 1980's. Of 117 kittiwake nests checked, 93 were empty, 22 had one egg each, and two nests contained two eggs each. Thus about 20% of the nests that were built, contained an egg in late July compared to less than 5% in 1984. Judging from past experience at Cape Lisburne, it is likely that most of the empty nests never contained an egg.

In cold springs like 1985 (see Section B), kittiwakes apparently experience food shortages, and many fail to lay eggs. Most birds that do lay under such conditions lay only a single egg, as was the case in 1985 (22 of 24 clutches). In years when warm spring temperatures prevail, most nests contain eggs. Also a much higher percentage of two-egg clutches occurs.

Murres--It is not possible to determine reproductive success of murres in a single short visit, but on ledge we could view there were numerous murre eggs. The monitoring effort for murres is limited to a count of the number of birds present on established plots. Counts were restricted to four plots in 1985 (these contained over 6,500 birds). Comparisons with past counts indicated no major differences.

Cliffs on the west side of Cape Lisburne; this area supports most of the cliff-nesting seabirds on the sub-unit.
07/30/85 G.V.B.

8. Game Mammals

Caribou--The western arctic caribou herd migrates from calving grounds southwest of Barrow westerly to Cape Lisburne and then south to Cape Thompson before turning northeast again. The animals typically are in the Lisburne area in early July, and some animals may spend the summer in the vicinity. In years when July is warm and there are lots of caribou-biting insects, the animals form dense aggregations, often on the refuge in the hills around Cape Lisburne where wind from the ocean reduces the insect problem. When this happens, Alaska Department of Fish and Game (ADF&G) biologists are able to count the entire herd. In cold Julys the animals apparently are not so bothered by insects, and they remain scattered making accurate census impossible. In 1985 July was relatively cold as it has been each year since 1982, the last year a total census was obtained (D. Anderson, ADF&G, pers. comm.). Animals used the Lisburne and Thompson areas, but there was no tight aggregation.

It was necessary to use recruitment counts to attempt to estimate the present size of the herd. The herd has been increasing at approximately 10%/year since 1982, so ADF&G biologists estimated that the 1985 population was somewhere between 200,000 and 270,000 animals (D. Anderson, pers.

comm.).

Muskox--Two aerial surveys conducted by ADF&G in 1985 indicated that about 50 animals were using the area around Cape Thompson (D. James, ADF&G, pers. comm.). Several radio transmitters were placed on muskox by ADF&G, and they were successful in tracking the movement. ADF&G plans to continue this work in the future to help determine the fate of these reintroduced animals.

9. Marine Mammals

Beaches within one mile of Cape Lisburne are used by walruses in late summer when the ice pack is at its greatest distance from land. In late July 1985 we saw less than 10 animals, but in some years peak counts exceed 300 (Alan Springer pers. comm.). Air Force personnel saw several polar bears near the station during winter as usual, but no problems were reported.

14. Scientific Collections

The following seabirds were collected by Alan Springer for food habits studies at Cape Lisburne: black-legged kittiwake, 10; common murre, 8; thick-billed murre, 26.

H. PUBLIC USE

8. Hunting

In 1985 Phil Driver, the permitted guide in the area, reported that fall weather was so poor that he was unable to hunt on the unit.

J. OTHER ITEMS

4. Credits

The report was written by WB Byrd, edited by RM Martin and ARM Early, and produced by CT Fellows.

and to check especially for toxic materials (old transformers containing PCB's or drums of fuel or chemicals). We counted over 800, 55 gal barrels, but most were empty and deteriorated. Other items in various stages of decomposition included an old generator, three large spools of wire cable, a walk-in freezer, a large gas tank, five antenna poles, four pieces (about 150 ft. long each) of galvanized pipe, and three dilapidated quonset huts.

Weather tower on Crane Prairie--The weather tower installed in 1981 by Brown and Caldwell on this area which was temporarily owned by CIRI corporation (see discussion in 1984 narrative report on the land trade, litigation, and ruling) was orderly. CIRI still has three good sealed drums of jet fuel at the tower.

Exxon navigation tower (AKM--09--85)--Although we were unable to check the tower on top of Sugarloaf Mt., ARCO sent photographs of the site after tower removal in fall 1985, and the site appeared to be left in excellent condition.

On the shoreline of St. Matthew near Pterodactyl Point several pieces of petrified wood are exposed. Several tree trunks reach over a foot in diameter.

Petrified wood near Pterodactyl Point, St. Matthew Island.
7/86 T.J.E.

G. WILDLIFE

1. Wildlife Diversity

Information was obtained about various species of wildlife on the BSU during summer at three "monitoring" sites: Bluff (Murphy 1985, op. cit.), St. Matthew (Martin et al. 1985 op. cit.), and the Pribilofs (Byrd et al. 1985. Population trends and productivity of fulmars, cormorants, kittiwakes, and murres in the Pribilof Islands, Alaska in 1985. Report for Alaska Maritime NWR, Homer, AK). Abstracts of the efforts at the first two sites are provided in Section D.5, but the latter effort was an inhouse survey in compliance with wildlife inventory plans. Refuge personnel also gathered information about seabirds at Pinnacle Island, near St. Matthew during 1985. Information from that inventory is incorporated in the appropriate places in this section, and a complete report is available at the refuge office (Byrd, G.V. and T.J. Early. 1985. Trip report to St. Matthew Island, July 1985. Alaska Maritime NWR, Homer, AK.).

Volunteer viewing one of the productivity plots at St. George
08/02/85 G.V.B.

Bio. Tech. Paul Sievert beside one of the plot markers at St. Paul. The same plots are used each year for the long-term monitoring program.
08/08/85 G.V.B.

2. Endangered and/or Threatened Species

Peregrine Falcon--A pair of peregrines was present near a scrape at Bluff in July 1985, but they apparently were not nesting. The pair was joined by an immature bird, in August (E. Murphy pers. comm.). A pair has been present in this area annually since 1980, and they have nested in most years.

4. Marsh and Water Birds

Northern Fulmar--Information was gathered at St. Matthew and the Pribilofs, but this is a difficult species to monitor for two reasons. Nests are not constructed. Instead birds simply sit in depressions on cliffs, and non-breeders assume a similar posture to incubating birds. Of all the species of cliff-nesters, fulmars remain most sedentary on cliffs offering few opportunities to observe whether an egg is present. In addition, the number of birds present varies

highly hourly, daily, and seasonally. For these reasons, little baseline data are available on the BSU, and relatively little was learned about the reproductive success of the species in 1985.

At St. Matthew about 45% of the estimated number of active sites contained chicks when investigators last checked the plots. No chick mortality was noted, so at least we know that fulmars had some success there. Also at St. Matthew counts of birds on plots in 1985 were not significantly different from counts on the same plots in 1983. The first detailed census of fulmars on Pinnacle I. revealed about 34,000 birds.

In the Pribilof Islands, no chick mortality was noted, but no quantitative data are available on reproductive success. Counts of fulmars on plots indicated an increase is occurring at St. Paul Island, but highly variable counts did not provide a clear pattern of population change at St. George.

Red-faced Cormorant--This species had excellent success in the Pribilof Islands in 1985. The average clutch in 37 nests was 2.9 eggs and 2.3 chicks fledged per nest. Although the average clutch size was similar to past years (1976-1978) the average number of chicks fledged was well above the highest value previously recorded there (1.6 in 1978).

Pinnacle Island, near St. Matthew, where we conducted seabird counts in 1985.
08/07/85 T.J.E.

Pelagic Cormorant--Estimated reproductive success (chicks/nest) for this species was 1.8 at Bluff, 1.3 at Hall I., and 1.0 at St. Matthew in 1985. The few years of past data that are available for comparison suggest that 1985 was probably above average at Bluff, but similar to or lower than past years at St. Matthew. No prior data are available for Hall.

5. Shorebirds, Gulls, Terns, and Allied Species

Black-legged Kittiwake--This species had relatively poor reproductive success in the Bering Sea in 1985. There was nearly a total failure at Bluff, where few birds even laid eggs. Success was slightly better at St. Matthew where about 25% of the nests contained eggs and less than 20% fledged chicks. In the Pribilofs, this species did better at one island than at the other. On St. Paul Island about 26% of the nests had a chick fledge, while only 12% fledged a chick at St. George.

It appears black-legged kittiwakes have not had very good reproductive success for the past four or five years in the central and northern Bering Sea. In the Pribilofs where success usually ranged from 36% to 62% during the last half of the 1970's (Hunt et al. 1981), it has not exceeded 15% since (except for the 26% success in 1985 at St. Paul). The most reasonable explanation is probably that food has been limited during the breeding season since no excessive depredation or habitat destruction has been noted. It is known that environmental conditions (e.g. temperature, wind velocity) can affect availability of food, primarily juvenile walleye pollock in the Pribilofs, but it has also been suggested that commercial fishing pressure may have reduced pollock stocks. It will be interesting to see whether reproductive success increases again in the near future in response to favorable weather conditions. If not, populations of kittiwakes are bound to begin to decline. It appears, from limited data, that the species has declined in the Pribilofs since 1976, but not at St. Matthew or Bluff. About 2300 black-legged kittiwakes were counted at Pinnacle, the first attempt to census birds there. Continued monitoring is needed to more clearly document trends and to try to learn the reasons for change.

Red-legged Kittiwake--Only four breeding stations are known for this species, all in the Bering Sea. Over 80% of the total world's breeding population occurs in the Pribilofs, primarily at St. George. For that reason, refuge personnel include red-legged kittiwakes in the seabird monitoring program in 1985. It appeared this species had even poorer reproductive success than black-legged kittiwakes in the Pribilofs in 1985. Interestingly, the species did better at St. Paul (18% of the nests started produced a fledgling) than at St. George (only 3% of the nests produced fledglings, nearly a complete failure). The difference in the success

rates was almost totally during the chick stage. More chicks died at St. George.

Like black-legged kittiwakes, red-legs have experienced poor success for several consecutive years. From 1975 to 1977 the species did fairly well (.34 to .63 fledglings/nest start), but less than 15% of the nests produced fledglings in 1978. Success was up slightly in 1979 and 1980 (18%-34%), but has remained very low since then. Counts of red-legged kittiwakes on a series of plots suggest 1985 populations are down from 1976 levels. Like its congener, this species eats pollock in summer along with a deep water myctophid fish. The fact that chick mortality was such an important part of the reduced success in 1985 suggests food shortages, but the reasons for these shortages are not completely clear.

Black-legged kittiwake with two-week old chick at St. Paul
08/14/85 G.V.B.

Common Murre--The cold spring delayed laying in 1985, especially in the northern Bering Sea. It is difficult to directly compare success among monitoring sites since the duration of surveys varied (i.e. at Bluff the last visit to

sites was before all eggs had hatched, whereas in the Pribilofs observations extended through the peak of fledging; the duration of observations at St. Matthew was slightly shorter than at the Pribilofs). Nevertheless, available data suggest common murres experienced moderate to good reproductive success (fledglings/egg x 100) at various sites; Bluff (50%-70%), St. Matthew (<=53%), Pribilofs (<=68%).

Counts of common murres at Bluff were higher than in 1984, a year when fewer birds may have attended cliffs due to breeding failures, but still lower than in any previous year. A similar decline in common murres is suggested at St. Paul I., Pribilofs where counts in the 1980's are far below those in 1976. In contrast, counts at St. George, the other Pribilof Island, have been highly variable, and no clear trend has emerged. Plot count data at St. Matthew in 1985 were not significantly different from counts there in 1983.

Thick-billed Murre--Reproductive data for St. Matthew (maximum of .44 chicks/egg) and the Pribilofs (.55 at St. Paul, .73 at St. George) in 1985 indicate this species did moderately to very well in spite of the cold spring. Prior comparative data were not available for St. Matthew, but the figures for the Pribilofs were average or above.

This distant concentration of cliff-nesting seabirds included one of our "population" plots at St. George.
08/06/85 G.V.B.

Counts of thick-billed murres on the same plots at St. Matthew in 1983 and 1985 were not significantly different. In the Pribilofs, counts in 1985 were lower than in 1976 and

similar to or lower than 1984. The first intensive survey of Pinnacle resulted in a total count of 90,000 murres (including both species).

Least Auklet--Counts were made on monitoring plots at St. Matthew for the third consecutive year, but results were not yet available at the time of this report. In addition to plot counts time lapse cameras were used at St. Matthew and in the Pribilofs to determine the diurnal activity patterns of least auklets. When these data are available, it may be possible to improve the design of our fledgling monitoring program for this important plankton-feeding seabird.

9. Marine Mammals

Fur Seals--Although the management of marine mammals in the Pribilof Islands is the responsibility of the National Marine Fisheries Service, it behooves us to be familiar with their population surveys since these marine mammals play such an important part in the ecology of the area. Fur seal populations have been declining at a rate of about 5-8% per year over the past several years after remaining relatively stable for over 50 years prior to that (Natl. Marine Fish. Serv. Records). Since one of the primary foods of seals in the Pribilofs is pollock, there may be a connection with the overharvest of this commercial fish and the decline. Recent studies in the Bering Sea are beginning to explain trophic relationships more clearly, and it may be possible to begin to assess causes of observed population changes if annual monitoring of various components of the ecosystem continues. Entanglement in fishing nets that have been lost at sea also causes mortality in seals and perhaps plays a large part in the decline.

Pacific Walruses--Traditional haul sites were monitored at St. Matthew and Hall islands in 1985. Ten animals were observed at Lunda Bay on July 8, but repeated checks of the former haul site near Cape Upright indicated animals were not using this area during our surveys. The Hall Island site, which has been used more consistently than any other area, contained up to 144 animals during our surveys. Time-lapse film taken in late July and early August showed higher concentrations, roughly 400 animals (A. Sowls pers. comm.).

Steller's Sea Lion--This animal apparently does not breed north of the Pribilof Islands in the Bering Sea, but animals do haul out at various locations. The major haul area in the vicinity of St. Matthew Island, several rocks off Pinnacle Island, was visited on July 10-12 and 257 young bulls or cows were counted.

14. Scientific Collections

St.Matthew: rufous-necked stint (2), semi-palmated sandpiper (1), arctic warbler (1)

Bluff: black-legged kittiwake (30), common murre (23) St. George: black-legged kittiwake (41), red-legged kittiwake (24), common murre (18), thick-billed murre (42).

H. PUBLIC USE

1. General

An interesting public use occurs on part of the refuge when the famous Iditarod sled dog race and the Iron-dog (snowmachine) race occur in late winter. These races cross the Topkok Head and Bluff areas in Norton Sound. Special Use Permits are issued for the events. Since the racers seek good snow, they cross refuge areas, which are confined to near the coast, only when deep snow occurs there. As a result, no damage to the land occurs. When coastal areas have little snow, mushers go farther inland. A check of the Bluff area in July revealed no signs from the race. Neither habitat damage nor litter was observed.

WB Byrd presented a paper entitled "Suggested ways to improve monitoring of cliff-nesting seabirds" at the annual meeting of the Pacific Seabird Group in San Francisco, December 1985.

11. Wildlife Observations

Hundreds of tourists visit St. Paul Island in the Pribilofs annually, most on package tours set up by Exploration Holiday Cruises. During the summer, three tours per week (two 2-day and one 3-day) are held. Transportation is via Reeve Aleutian Airways from Anchorage. The tour company has a bus which takes visitors to a refuge area where they observe and photograph seabirds. At least 1000 people took this tour in 1985. In addition to those who took the organized tour dozens of people visited the island on their own.

The St. George Village Corporation began providing four-day tours of this rather remote island in 1984. In 1985 about 60 people took advantage of this excellent natural history tour. We plan to evaluate the need and determine the best approach to providing interpretive information to these visitors and those at St. Paul.

A natural history cruise vessel, the M/V World Discoverer, visited the Pribilofs, St. Matthew, and Sledge Island. Nearly 100 people were on this tour, including author Robert Mitchner and several well-known naturalists. RM Martin joined the vessel at St. Paul and acted as a "local expert" for the northern Bering Sea islands. After leaving the Bering Sea, the vessel continued through the Chukchi Sea and around the northwest passage to the north Atlantic!

The M/V World Discoverer, a natural history cruise vessel that visited the refuge in 1985.
08/19/85 J.L.M.

Sight-seers from the World Discoverer at St. Matthew.
08/24/85 J.L.M.

J. OTHER ITEMS

1. Cooperative Programs

SUP AKM-40-85--City of St. Paul--Construction of temporary access road to remove stones from a talus site near Antone Lake, St. Paul I.--In 1984 the State of Alaska funded a project to construct a breakwater to create a harbor at St. Paul. That summer the structure began, but due to poor design or failure to comply with design specifications the 1984 effort was washed out by winter storms. The breakwater was redesigned in 1985 and the new design called for boulders in the 12-14 ton class to be used as armor on the sides of the structure. The identified source for these armor rocks contained too few boulders to complete the winterization of the section the breakwater constructed during 1985. The only other known source of these large rocks that could be obtained economically and before winter storms was an old talus slope on refuge property near Antone Lake. In October 1985 the City of St. Paul requested a special use permit to construct an access road to remove talus boulders.

The boulders were on the surface and they were covered only by a thin, broken layer of vegetation, so no blasting was necessary. Boulders smaller than 12 tons were not needed, and a number of these had to be removed to get the larger rocks. This talus area was probably used formerly by nesting least auklets and other crevice nesting species, but weathering and subsequent encroachment by vegetation had rendered the area practically useless for these birds. Observations made at the site in 1984 indicated almost no use by auklets.

A special use permit was issued for the removal with the stipulation that small talus be spread over the area after the large boulders were removed. It is hoped that the project might enhance nesting habitat for least auklets and other crevice-nesting species. The refuge has surface rights only on our lands in the Pribilofs with the entire subsurface estate being owned by the Aleut. Corp.

4. Credits

The narrative for this unit was written by WB Byrd and produced by CT Fellows. RM Martin and ARM Early edited the report. BA Hagglund provided funding summaries.

Site of the boulder removal project at St. Paul. The boulders remaining at the site may provide restored nesting habitat for crevice-nesting birds
11/21/85 T.J.E.

Equipment moving boulders from Lake Antone talus for harbor construction at St. Paul
11/21/85 T.J.E.

View of Lake Antone talus site prior to removing large boulders.
10/21/85

T.J.E.

CHUKCHI SEA UNIT

ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Homer, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1985

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

CHUKCHI SEA UNIT
ALASKA MARITIME NATIONAL WILDLIFE REFUGE
Homer, Alaska

ANNUAL NARRATIVE REPORT
Calendar Year 1985

John L. Martin ____ 3/26/86
Refuge Manager Date Refuge Supervisor Review Date

_____ ____
Regional Office Approval Date

INTRODUCTION

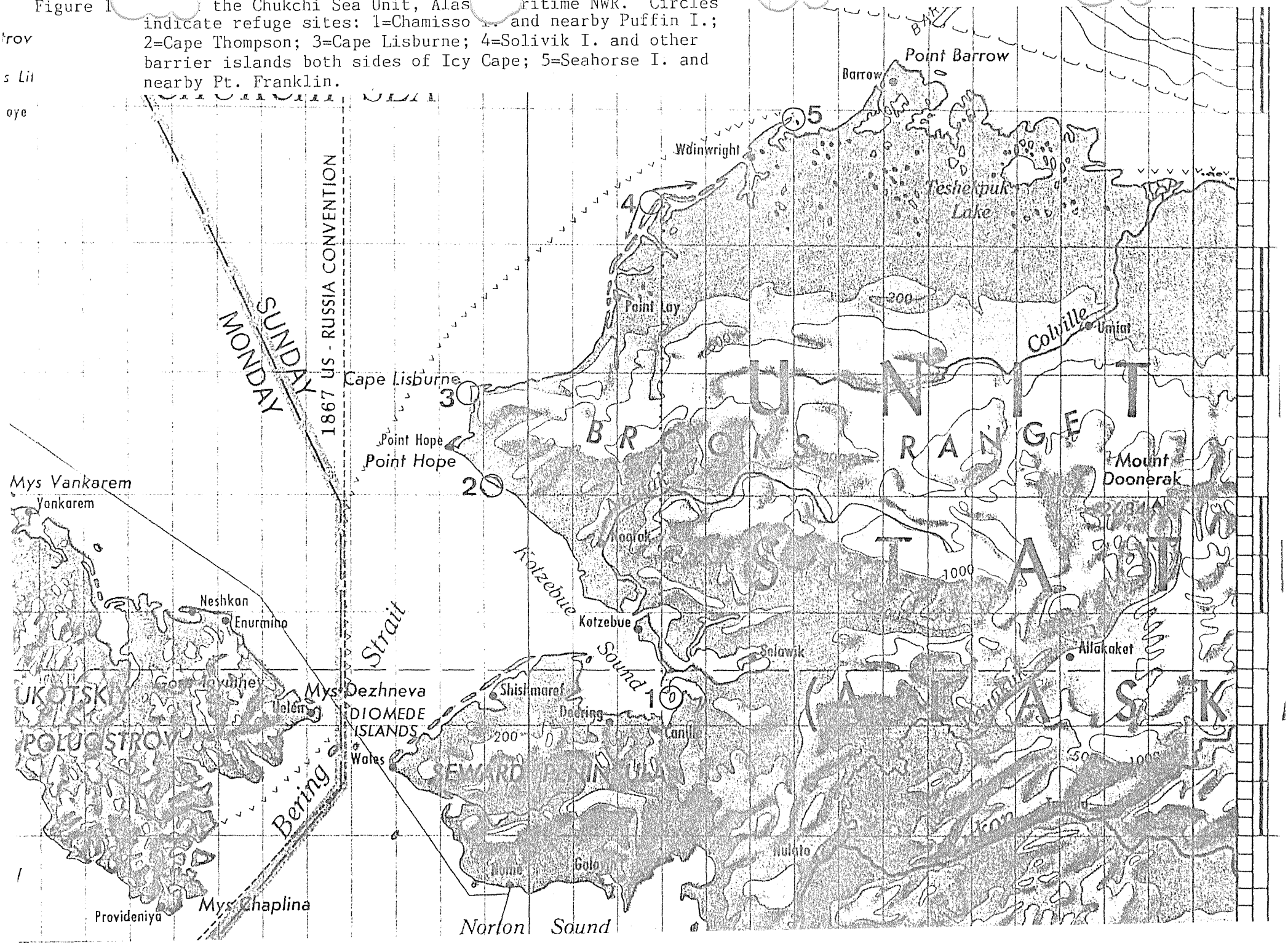
The Alaska Maritime National Wildlife Refuge (AMNWR) was created by the Alaska National Interest Lands Conservation Act in 1980. It was established to conserve fish and wildlife populations and habitats in their natural diversity, fulfill international fish and wildlife treaty obligations, provide opportunities for continued subsistence uses by local residents, provide a program of national and international scientific research on marine resources and ensure water quality and necessary water quantity within the refuge. This Act consolidated management of eleven existing refuges with 460,000 additional acres resulting in a 35,000,000 acre refuge. Although relatively small in land mass, its lands are scattered through most of coastal Alaska and extends from Forrester Island in Southeast Alaska along the Gulf of Alaska to the Aleutian Islands and northward until near Barrow in northwest Alaska. There are over 2,500 islands, islets, and pinnacle rocks within the refuge which are used annually by millions of seabirds of at least 30 species. The AMNWR has five units with all former refuges designated subunits.

Lying north of the Arctic Circle, the Chukchi Sea Unit includes scattered areas extending from just west of Point Barrow to just north of the Bering Strait (Fig. 1). Unlike other units of the Alaska Maritime NWR, this unit includes mainland areas. Habitats range from low, sandy barrier islands in the Arctic Ocean to high, rocky spires in the western Brooks Range.

Nearly half a million kittiwakes and murres breed on cliffs at Cape Lisburne and Cape Thompson; these are the most spectacular concentrations of seabirds on the unit. An extra-limital population of black guillemots, a species which normally is found in the north Atlantic, extends as far south as Cape Thompson and may be increasing. The most common species of bird nesting on the low barrier islands between Cape Lisburne and Point Barrow is the common eider. One of the refuge islands, Solivik Island, has the largest eider colony in the Chukchi Sea (>500 birds).

Up to several hundred walruses haul out annually at Cape Lisburne when the sea ice recedes well offshore. In winter, polar bears occur at Cape Lisburne. Terrestrial mammals include grizzly bear, muskox, wolverine, and caribou. Thousands of caribou from the western arctic caribou herd congregate near Cape Lisburne in a summer post-calving aggregation.

Figure 1 [illegible] the Chukchi Sea Unit, Alas[illegible]ritime NWR. Circles indicate refuge sites: 1=Chamisso I. and nearby Puffin I.; 2=Cape Thompson; 3=Cape Lisburne; 4=Solivik I. and other barrier islands both sides of Icy Cape; 5=Seahorse I. and nearby Pt. Franklin.



INTRODUCTION Page

TABLE OF CONTENTS i

A. HIGHLIGHTS 1

B. CLIMATIC CONDITIONS 1

C. LAND ACQUISITION

1. Fee Title.....Nothing to report
2. Easements.....Nothing to report
3. Other.....Nothing to report

D. PLANNING

1. Master Plan.....1
2. Management Plan.....2
3. Public Participation.....Nothing to report
4. Compliance with Environmental and Cultural Resource Mandates.....Nothing to report
5. Research and Investigations.....2
6. Other.....3

E. ADMINISTRATION

1. Personnel.....4
2. Youth Programs.....Nothing to report
3. Other Manpower Programs.....Nothing to report
4. Volunteer Program.....4
5. Funding.....4
6. Safety.....5
7. Technical Assistance.....Nothing to report
8. Other .....Nothing to report

F. HABITAT MANAGEMENT

1. General.....Nothing to report
2. Wetlands.....Nothing to report
3. Forests.....Nothing to report
4. Croplands.....Nothing to report
5. Grasslands.....Nothing to report
6. Other Habitats.....Nothing to report
7. Grazing.....Nothing to report
8. Haying.....Nothing to report
9. Fire Management.....Nothing to report
10. Pest Control.....Nothing to report
11. Water Rights.....Nothing to report
12. Wilderness and Special Areas.....Nothing to report

13. WPA Easement Monitoring.....Nothing to report

G. Wildlife

1. Wildlife Diversity.....Nothing to report
2. Endangered and/or Threatened Species.....Nothing to report
3. Waterfowl.....6
4. Marsh and Water Birds..... .Nothing to report
5. Shorebirds, Gulls,Terns & Allied Species.....6
6. Raptors.....Nothing to report
7. Other Migratory Birds.....Nothing to report
8. Game Mammals.....8
9. Marine Mammals.....9
10. Other Resident Wildlife.....Nothing to report
11. Fisheries Resources.....Nothing to report
12. Wildlife Propagation and Stocking.....Nothing to report
13. Surplus Animal Disposal.....Nothing to report
14. Scientific Collections.....9
15. Animal Control.....Nothing to report
16. Marking and Banding.....Nothing to report
17. Disease Prevention and Control.....Nothing to report

H. PUBLIC USE

1. General.....Nothing to report
2. Outdoor Classrooms-Students.....Nothing to report
3. Outdoor Classrooms-Teachers.....Nothing to report
4. Interpretive Foot Trails.....Nothing to report
5. Interpretive Tour Routes.....Nothing to report
6. Interpretive Exhibits/Demonstrations.....Nothing to report
7. Other Interpretive Programs.....Nothing to report
8. Hunting.....9
9. Fishing.....Nothing to report
10. Trapping.....Nothing to report
11. Wildlife Observation.....Nothing to report
12. Other Wildlife Oriented Recreation.....Nothing to report
13. Camping.....Nothing to report
14. Picnicking.....Nothing to report
15. Off-Road Vehicling.....Nothing to report
16. Other Non-Wildlife Oriented Recreation...Nothing to report
17. Law Enforcement.....Nothing to report
18. Cooperating Associations.....Nothing to report
19. Concessions.....Nothing to report

I. EQUIPMENT AND FACILITIES

1. New Construction.....Nothing to report
2. Rehabilitation.....Nothing to report
3. Major Maintenance.....Nothing to report
4. Equipment Utilization and Replacement....Nothing to report
5. Communications Systems.....Nothing to report
6. Computer Systems.....Nothing to report
7. Energy Conservation.....Nothing to report

8. Other.....Nothing to report

J. OTHER ITEMS

1. Cooperative Programs.....Nothing to report
2. Other Economic Uses.....Nothing to report
3. Items of Interest.....Nothing to report
4. Credits.....9

K. FEEDBACK

1. Feedback.....Nothing to report

A. HIGHLIGHTS

Black-legged kittiwakes experienced poor reproductive success at Cape Lisburne for the second straight year (Section D.5)

An ongoing food habits study of murres and kittiwakes at Cape Lisburne was summarized, and some clear relationships between nesting success and factors affecting food availability are beginning to emerge (Section D.5)

B. CLIMATIC CONDITIONS

Data from the National Weather Service station at Kotzebue probably best illustrate conditions affecting the environment in the Chukchi Sea Unit. It was a cold spring in the eastern Chukchi Sea as it was elsewhere in western Alaska. Following an extremely warm January, winter arrived in February. Record lows occurred in April when the average temperature for the month was nearly 18 F below normal (Table 1). Ice recession was also relatively late. Similar conditions occurred in the Bering Sea, and these affected the sea temperatures and biological oceanography of the Chukchi since Bering Sea water flows into the Chukchi through Bering Straits. Such cold spring temperatures delay the development of the food base for seabirds and can cause breeding failures, especially in surface-feeding kittiwakes.

Table 1. January to July 1985 temperatures at Kotzebue, Alaska.

Month	Average Temp. (F)	Departure (F)
Jan	16.2	19.2
Feb	-7.0	-0.9
Mar	-4.3	-3.7
Apr	-5.4	-17.7
May	26.6	-5.0
Jun	39.3	-4.5
Jul	54.1	1.0

D. PLANNING

1. Master Plan

The Alaska National Interest Lands Conservation Act (ANILCA) requires all Alaskan refuges to prepare a Comprehensive Conservation Plan. (CCP) These plans are to serve as the station master plan and will be initiated by a special planning team from the Regional Office. The primary

objectives of the comprehensive plans are to (a) inventory and describe the resources and values of the refuge, (b) specify management programs for conserving fish and wildlife resources and /or values, (c) specify other compatible uses, and (d) specify opportunities for fish and wildlife oriented recreation, research, etc.

The schedule for the AMNWR CCP was accelerated and active involvement by the planning team and refuge staff has been initiated. In June we provided input to the team for listing all lands included on the refuge. In August, two members of the planning team, Vivian Mendenhall and Poppy Benson accompanied the charter vessel NORPAC from Adak to Homer to familiarize them with the remote and inaccessible lands typical of the refuge. In October, the biologists provided basic input to the "Affected Environment" section of the CCP. In November and December a mailing list of interested persons to be contacted during the planning process was compiled. As scheduled, the first drafts of the affected environment section of the plan were drafted for each unit in 1985.

The schedule for completion of the plan follows:

Activity	Date
"Alternatives and Effects" draft complete	3/28/86
Finalize "Alternatives and Effects"	4/25/86
Scoping complete	5/15/86
Assess impacts and effects	10/30/86
Identify preferred alternative	11/15/86
Inhouse draft of document	12/15/86
Publish draft of document	1/15/87
Distribute document	3/30/87
Public review of document complete	6/30/87
Publish final document	10/15/87
Protest period complete	12/02/87

2. Management Plans

Final reversions on the wildlife inventory plans are awaiting completion of the seabird censusing techniques manual being written by the Research staff in Anchorage.

5. Research and Investigations

AMNWR-NR85. Food habits of seabirds at Cape Lisburne(74500-CSU-01).

Alan M. Springer, Univ. of Alaska, Fairbanks (refuge contract).

Ref: Springer, A.M. 1985. Food habits of seabirds at Bluff and Cape Lisburne. Final report to Alaska Maritime NWR, Homer, AK. (the Bluff portion of the report is discussed in the narrative report for the Bering Sea Unit).

In most years since 1978 a few kittiwakes and murres have been collected to determine what they were eating. The idea was to compare food items of birds taken in years when they had relatively good versus relatively poor reproductive success. Success was generally good in the early 1980's at Cape Lisburne, but in 1984, a very cold spring, kittiwakes experienced a nearly total reproductive failure. In contrast, murres seemed to do moderately well in all years.

Because comparative data were finally available for a poor kittiwake reproductive season (1984) to contrast with good years, we asked Alan Springer to analyze stomach contents collected in 1984 and compare them with those found in past years. He used a method of analysis which takes into account the original size of the prey items based on measurements of parts found in stomachs (see Section D.5 in the Bering Sea Unit narrative report for 1985 and Springer et al. 1984. Environmental controls of marine food webs: food habits of seabirds in the eastern Chukchi Sea. Can. J. Fish. Aquat. Sci. 41:1202-1215).

Past data indicate that Arctic cod, saffron cod, and sand lance are important food items for kittiwakes and murres (particularly common murres) at Cape Lisburne. Sculpins are important for thick-billed murres, and this murre also takes a lot of bottom invertebrates. In some years capelin are commonly found in all species. In 1984 common murres were getting sand lance and capelin, but these important fish were apparently not available to kittiwakes. Perhaps surface water temperatures following the cold spring were too cold to bring the prey close enough to the surface for the kittiwakes; this species is unable to dive more than 2-3 feet below the surface.

Springer (p. 6 of referenced report) summarized the relationship between water temperatures and food availability by stating, "Interannual differences in seasonal warming patterns are associated with changes in food habits and reproductive success of seabirds breeding at ...Cape Lisburne ... water temperature in Ledyard Bay [the area where the seabirds feed from the Lisburne colony] in late July 1984 was only 6-7 C, while in warm years, it is as warm as 10-13 C by mid-July. Coastal fishes such as sand lance and capelin were not abundant in 1984 as they are in warm years, and kittiwakes, which apparently depend on these species, especially sand lance, had a poor breeding season."

8. Other Items

A Special Use permit was issued to Phil Driver to guide caribou hunters into the Ann Stevens-Cape Lisburne and Cape Thompson sub-units of the refuge. An ANILCA section 810 consultation process was completed with no objections received.

E. ADMINISTRATION

1. Personnel

Permanent Full Time

1. John L. Martin, Refuge Manager, GS-13, EOD 12-21-81, PFT
2. Tom J. Early, Assistant Refuge Manager, GS-11, EOD 08-23-81, PFT
3. Edgar P. Bailey, Refuge Biologist, GS-11, EOD 10-01-81,PFT
4. Mike Nishimoto, Refuge Biologist, GS-11, EOD 4-15-84, PFT
5. G. Vernon Byrd, Refuge Biologist, GS-11, EOD 4-29-84, Perm. Int.
6. Carol M. Hagglund, Budget Assistant, GS-7, EOD 08-21-83, PFT
7. Trina B. Fellows, Clerk-Typist, GS-3 EOD 11-28-83, PFT

Volunteer

1. Alan Springer, 7/25/85-8/01/85

4. Volunteer Program

Alan Springer, Univ. of Alaska Fairbanks, volunteered to accompany WB Byrd to Cape Lisburne to monitor seabird populations in 1985. Dr. Springer has done most of the past monitoring work at this site under various contracts, and we were fortunate to have him return this season.

5. Funding

Funding for the Alaska Maritime National Wildlife Refuge (AMNWR) is through the Homer headquarters. The funds are then internally distributed between Homer and the Aleutians Islands Unit (AIU) at Adak. The funding for AIU is discussed in that unit's section. All other unit funds are distributed from the Homer office. Following is a summary of the total refuge funding:

	1260 Wildlife Resources	1480 Endangered Species	1520 Youth Program Corps	Total
FY-82	346,000	75,000	0	421,000
FY-83	730,000	250,000	0	980,000
FY-84	1,124,000	245,000	0	1,369,000
FY-85	1,110,000	239,000	3,010	1,352,010
FY-86	969,000	246,000	4,410	1,219,410

Rental receipts for quarters maintenance (8610), previously subactivity (1994), were not included since there has been considerable latitude in where those funds were used. In FY82 and FY 83, the funds collected were used at the station where collected. In FY84 the funds were retained in the regional office for distribution on a "need" basis. Beginning in January of FY85, 90% of the funds collected were

to be used at the station where collected, and would remain available until expended.

In FY82 the vessel charter costs came out of the regional office budget. Since then, all charter costs have come from the refuge budget.

Accelerated Refuge Maintenance Management (ARMM) projects accounted for $580,000 of FY84; and $543,000 of FY85; and $349,600 of the FY86 funding advance.

A comparison of FY82 to FY86 Homer funding is as follows:

	1260 Wildlife Resources	1480 Endangered Species	1520 Youth Program Corps	Total
FY-82	230,000	31,000	0	261,000
FY-83	462,200	155,400	0	617,600
FY-84	502,500	140,000	0	642,500
FY-85	615,000	140,000	2800	757,800
FY-86	501,640	141,195	3010	645,845

The Alaska Maritime National Wildlife Refuge is headquartered in the Ross Duncan building located on Pioneer Avenue in downtown Homer. A total of $59,400 (which includes utilities, snow and refuse removal) was paid for approximately 4,032 sq ft of leased office/storage space in FY85.

6. Safety

No lost time accidents were reported for the year. Assistant Manager Early is the Station Safety Officer. Monthly safety meetings are scheduled the first monday of each month with most permanent staff members attending.

The following is a list of the monthly meetings:

Month	Subject
January	Winter Walking Safety
February	Hand Tool/Appliance Safety
March	Cold Weather Safety
April	Boating/Survival/Comprehensive First Aid & CPR
May	Back Country Skiing/Hiking Safety
June	Office Safety
July	Home Safety
August	Lifting Moving Safety
September	Gun/Hunting Safety
October	Fire Prevention
November	Winter Driving Safety
December	Winter Recreation Safety

The session in April involved several field volunteers as well as the permanent staff. We used the local High School

swimming pool and practiced donning survival suits in the water, being in the water with hip boots, using floatation coveralls and being in the water with field gear on. Another similar session was held in early June for personnel going to the Pribilofs. All personnel are required to put a survival suit on and use it in the water prior to geing on a refuge boat. This exercise is very effective in familiarizing people with a survival suit, as well as giving them confidence in their use. Incidentally, we did find that several of the suits leaked slightly and they were sent in immediately for repair.

The video and workbook series entitled "Sea Survival", "Shore Survival", "Hypothermia", and "Cold Water Near Drowning" is available and used. These are made by the University of Alaska, Cooperative Extension Service, the U.S. Coast Guard, and the Kodiak Community College.

G. WILDLIFE

3. Waterfowl

During the period July 29-31, 1985 hundreds of eiders, mostly kings and commons, passed Cape Lisburne daily as they flew south around the cape. This annual late summer and early fall movement probably includes most of the eiders nesting on Alaska's north slope and on refuge barrier islands.

5. Shorebirds, Gulls, Terns, and Allied Species

A survey of seabirds at Cape Lisburne July 29-31 was the only one conducted on the unit in 1985. Kittiwakes and murres are the main species monitored in established plots at this site. A summary of the short survey is discussed below, and a more detailed account is available elsewhere (Byrd, G.V. 1985. Trip report -- Kotzebue and Cape Lisburne, 1985).

A. HIGHLIGHTS

The purchase of lands in the Pribilof Islands was completed (Section C.1).

Kittiwakes experienced poor reproductive success over the entire unit (Section G.5).

Through a cooperative effort, boulder removal from a refuge area may result in improved habitat for crevice-nesting birds (Section J.1).

Low cliffs near Tasmannia at St. Paul are part of the area purchased for the refuge
07/15/85 G.V.B.

B. CLIMATIC CONDITIONS

The U.S. Weather Service station at St. Paul provides the best source of data for the BSU. Selected information was tabularized (Table 1) to characterize conditions that affected the seabirds' environment prior to and during the nesting season.

Mild temperatures prevailed until March when winter finally arrived. April 1985 was one of the coldest ever (7.5 F below normal). Average temperatures occurred in May, but June was

again unusually cold (-2.2 F from normal). Temperatures were normal during the remainder of the breeding season.

At the north end of the unit it was also a cold spring. In Nome, west of the Bluff monitoring site, April 1985 was the coldest on record (16.6 F below normal!), and May was also colder than normal (-3.9 F departure from the long-term average).

Based on subjective opinions of Pribilof residents, 1985 was one of the foggiest in recent memory. Indeed, fog was recorded at St. Paul on 23 days or more each month from May through August. The foggiest month was July. Only two clear days were recorded May to September, and 26 or more days per month were overcast May to August. No information is available on past averages, but it could not get much foggier than it was in summer 1985. Fog may reduce feeding efficiency of seabirds.

Comparative data were not available from past years, but wind velocities were considered about normal in June and July, the two months with the lowest average figures.

Table 1. Summary of selected weather data for St. Paul I., Alaska, 1985.

	Temperature		Days of	Ave. Wind	Cloud Cover # days		
Month	Ave.	Departure	Fog	Speed	Clear	Pt.Cldy	Cldy
Jan	30.0	7.5	17	18.6	1	5	25
Feb	23.5	1.6	2	19.8	0	4	24
Mar	21.9	-1.4	8	--	-	-	--
Apr	20.2	-7.5	12	--	-	-	--
May	34.8	0.0	23	16.8	1	4	26
Jun	38.7	-2.2	25	10.8	1	1	28
Jul	45.8	0.1	31	11.4	0	1	30
Aug	47.5	0.0	28	14.1	0	0	31
Sep	44.4	-0.1	17	15.0	0	7	23

[a] temperature in F expressed as monthly average and departure from the normal; fog was recorded as both present and heavy in Weather Service records, but they were combined here; wind speed is in mph; cloud cover is expressed as number of days ranked as clear, partly cloudy, and cloudy.

C. LAND ACQUISITION

1. Fee Title

The program of land acquisition in the Pribilof Islands that began in 1982 with the purchase of 2863 acres (1159 hectares) was completed this year. The refuge now includes the islands of Walrus, Otter, and most of the important seabird nesting habitat on St. George and St. Paul islands. The total area is 6110 acres. Figures 2 and 3 show the refuge boundaries. Taken as a whole, the Pribilof Islands constitute the largest seabird colony in Alaska.

D. PLANNING

1. Master Plan

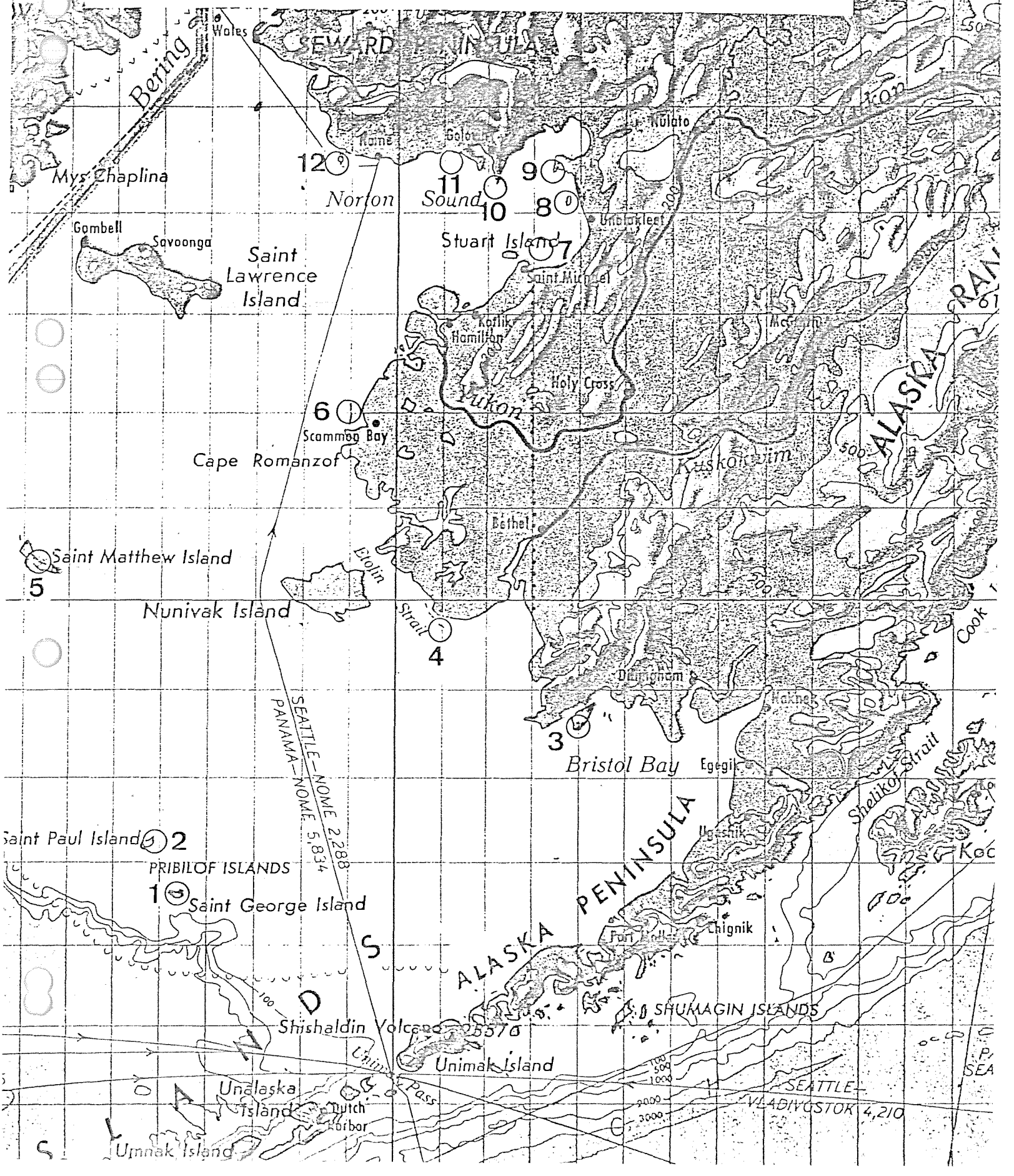
The Alaska National Interest Lands Conservation Act (ANILCA) requires all Alaskan refuges to prepare a Comprehensive Conservation Plan. (CCP) These plans are to serve as the station master plan and will be initiated by a special planning team from the Regional Office. The primary objectives of the comprehensive plans are to (a) inventory and describe the resources and values of the refuge, (b) specify management programs for conserving fish and wildlife resources and /or values, (c) specify other compatible uses, and (d) specify opportunities for fish and wildlife oriented recreation, research, etc.

The revised AMNWR schedule is as follows:

Activity	Date
"Alternatives and Effects" draft complete	3/28/86
Finalize "Alternatives and Effects"	4/25/86
Scoping complete	5/15/86
Assess impacts and effects	10/30/86
Identify preferred alternative	11/15/86
Inhouse draft of document	12/15/86
Publish draft of document	1/15/87
Distribute document	3/30/87
Public review of document complete	6/30/87
Publish final document	10/15/87
Protest period complete	12/02/87

The schedule for the AMNWR CCP was accelerated and active involvement by the planning team and refuge staff has been initiated. In June we provided input to the team for listing all lands included on the refuge. In August, two members of the planning team, Vivian Mendenhall and Poppy Benson accompanied the charter vessel NORPAC from Adak to Homer to familiarize them with the remote and inaccessible lands typical of the refuge. In October, the biologists provided basic input to the "Affected Environment" section of the CCP.

Figure 1. Map of the Bering Sea Unit, Alaska Maritime NWR. Circles indicate refuge sites: 1=St. George I.; 2=St. Paul I. and nearby Walrus and Otter is.; 3=Hagemeister I.; 4=Pingurbek I.; 5=St. Matthew I. and nearby Hall and Pinnacle is.; 6=Sand Is.; 7=Egg I.; 8=Besbora I.; 9=Cape Denbigh; 10=Cape Darby; 11=Bluff and nearby Topkok Head; 12=Sledge I.



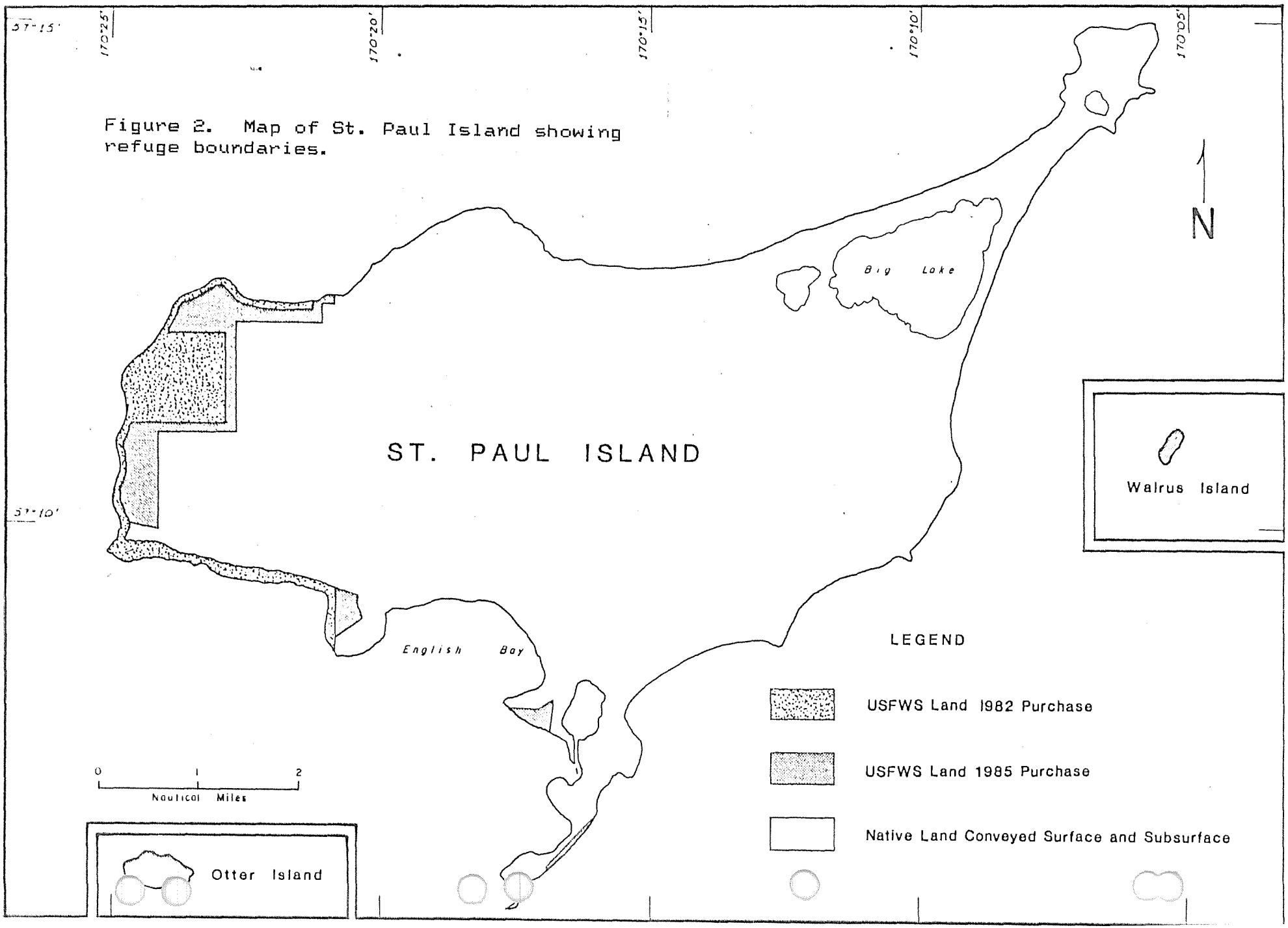


Figure 2. Map of St. Paul Island showing refuge boundaries.

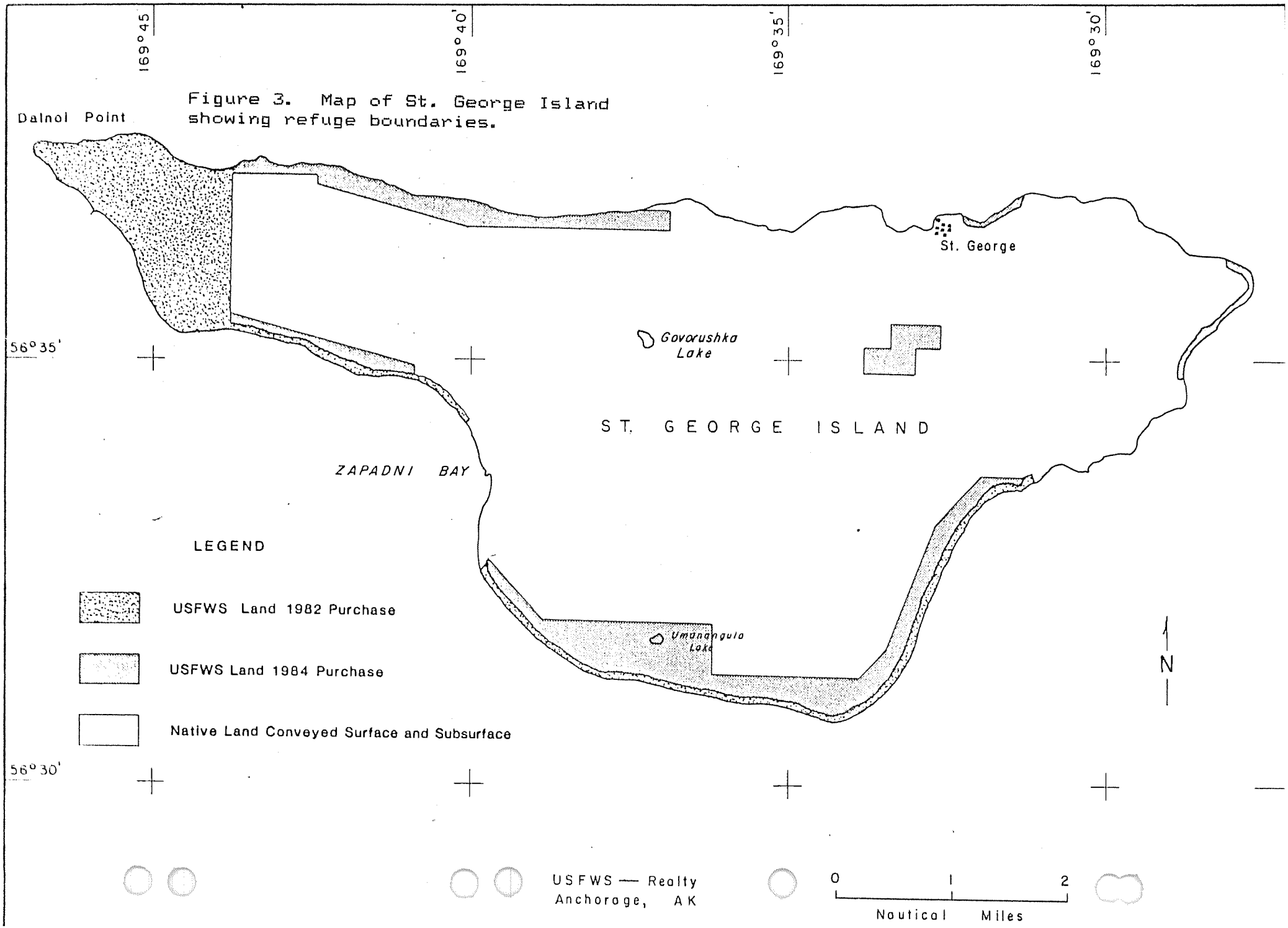


Figure 3. Map of St. George Island showing refuge boundaries.

In November and December a mailing list of interested persons to be contacted during the planning process was compiled.

2. Management Plan

Final revisions on the wildlife inventory plans are awaiting completion of the seabird censusing techniques manual being written by the Research staff in Anchorage.

5. Research and Investigations

AMNWR-NR85 Cliff-nesting seabird monitoring at Bluff (74500-BSU-03).

Ed Murphy, Univ. of Alaska, Fairbanks (refuge contract through Coop. Wildl. Research Unit, Univ. of Alaska).

Ref: Murphy, E.C. and B.A. Cooper. 1985. Population status and reproductive success of cliff-nesting seabirds at Bluff, Alaska in 1985. Report of Field Results submitted to Alaska Maritime NWR, Homer, AK.

Surveys of black-legged kittiwakes and common murres were conducted for the 11th consecutive year at Bluff in 1985. This data base is the best available for these species, and it has tremendous value for trying to understand annual fluctuations in populations and reproductive success. Through these types of surveys we will eventually be able to critically evaluate the effects of environmental change (natural and otherwise) on seabirds.

As one of the aspects of this study, Dr. Murphy addressed the problem of methodology and interpretation of counts of murres present at nesting cliffs. The number of birds present varies hourly, daily, and seasonally. Variable attendance patterns must be understood and compensated for if we are to have confidence that counts reflect actual population change. Using the data base at Bluff, Dr. Murphy is examining the effects of weather conditions, times and dates of counts, and reproductive success on the number of murres present. By understanding how various factors affect counts, surveys made at various times and under various conditions can be standardized. Thus the accuracy of assessments of population change can be improved significantly. Without standardization of counts it will be difficult to confidently detect real population changes until they have reached large proportions.

Murres present at a given time after egg laying include incubating or brooding adults, off duty breeding adults, and non-breeders. Most of the variability results from differences in the presence of non-breeders. These age classes may be particularly affected by food shortages and at such times relatively few may attend cliffs. Data from Bluff indicate that in years when relatively few eggs are laid and incubated successfully, numbers of birds present on cliffs

are low and highly variable. Such seasons seem to occur after cold springs. If the birds are alive, but simply not attending cliffs, numbers at cliffs should increase again in years following relatively warm springs when reproduction tends to be high. In contrast, if populations really are reduced, counts should remain low even in warm seasons. This latter scenario would indicate unusually high mortality from starvation due to food shortages, depredation, drowning in gill nets at sea, or some other mortality factor. In 1985 murres had slightly lower reproductive success than they do in years following warm springs, but counts indicated the number of birds present on cliffs was lower than any year since the mid-1970's except 1984 when murres failed reproductively.

In 1985 kittiwakes experienced their forth consecutive breeding failure at Bluff. Dr. Murphy presented a paper entitled "Why are there so many kittiwakes?" at the annual meeting of the Pacific Seabird Group in December 1985. This paper and his progress report discuss the ecological significance of breeding failures in kittiwakes. It seems apparent that they are able to sustain populations in spite of periodic breeding failures. It is important to understand this aspect of the natural history of the species when trying to determine effects of various activities on kittiwake populations (i.e. one need's to realize that breeding failures in particular years or even a series of years does not necessarily indicate the population is in serious decline). Dr. Murphy discusses the impact of temperatures on reproductive success of kittiwakes and murres at Bluff. Apparently, kittiwakes are more sensitive to changes in sea water temperatures than murres. Murres are probably less sensitive to changes because they are able to forage through the entire water column in Norton Sound while kittiwakes are limited to what they can get near the surface. Because of this, murres enjoyed better success in 1985 than kittiwakes (i.e. food was more available to murres).

Kittiwakes and murres feed offshore near the surface and throughout the water column respectively. In 1985 Dr. Murphy included pelagic cormorants in the monitoring study because this species feeds inshore, and it provides an indication of the annual availability of food (i.e. the development of the ecosystem) in this habitat. Bluff is one of the best sites available to monitor changes in cormorant populations because the entire seabird colony can be counted. This is particularly important for cormorants. Since they move from place to place within a colony between years, counts on set plots may not reflect real changes in populations.

In 1985 a total of 96 pelagic cormorants were detected at the Bluff colony, a count similar to those made 1978-1980, but lower than the count in 1984 (151 birds). Reproductive success was apparently higher in 1985 (1.8 chicks/nest in mid-August) than in 1978 (1.2 chicks/nest in mid-July).

AMNWR-NR85 Monitoring of seabirds at St. Matthew and Hall islands (74500-BSU-25).

Ed Murphy, Univ. of Alaska, Fairbanks (Minerals Management Service contract).

Ref: Martin, P.D. et. al. 1985. The population status of seabirds on St. Matthew and Hall Islands, 1985. Interim Report to Minerals Management Service, Anchorage, AK.

In 1985 Minerals Management Service awarded a contract to the University of Alaska for a two-year study of cliff-nesting seabirds at St. Matthew and Hall islands. The study plan called for field work in July and August 1985 and 1986. Objectives were to determine the reproductive success of cliff-nesters in three areas (south St. Matthew, north St. Matthew, and Hall) and to determine changes in populations. A series of land-based "population" plots were chosen, using previously established plots where possible, to use in judging population trends. Food habits studies were also conducted to try to understand factors affecting populations.

The problem of interpreting counts of murres on plots was addressed by using time-lapse cameras to determine the daily attendance patterns. Effects of weather variables were evaluated to attempt to standardize counts using similar techniques to those employed at Bluff (see discussion above).

Data from weather stations at Nome and St. Paul indicate the spring of 1985 was extremely cold in the Bering Sea. Egg laying was relatively late at St. Matthew and Hall for species on which data were available. Black-legged kittiwakes were particularly delayed. As at Bluff, kittiwakes may have been more severely affected by the cold spring than murres. At St. Matthew and Hall, a maximum of 15%-20% of the nests that were started contained an egg or a chick when investigators last checked. Low success resulted primarily from a failure to lay eggs; the few eggs laid had fairly high survival (80%). The number of kittiwake nests found on plots in 1985 were similar to the number found on the same plots in 1983, the only prior year for which comparable data were available.

The maximum possible reproductive success (chicks/egg) for common (.53) and thick-billed (.44) murres at St. Matthew and Hall was intermediate compared to recorded success elsewhere in the Bering Sea in 1985 and in prior years. There were no significant differences between counts of murres in 1985 and 1983, but the need was stressed to develop a method of standardization for factors affecting variablity in colony attendance patterns before it would be possible to detect relatively small changes in populations.

Pelagic cormorant nests were checked at both St. Matthew and Hall. The maximum possible fledglings/nest was 1.25 at Hall

but only 1.04 at St. Matthew. The figure for St. Matthew is similar to past data for that island in 1982 but lower than 1983.

Counts of northern fulmars in 1985 on selected plots were not significantly different from those in 1983. An attempt was made to evaluate reproductive success based on the number of chicks on plots compared to the estimated number of nest sites (sites are difficult to recognize since non-breeders occupy cliffs and behave similar to breeders). About 45% of the 40 "sites" monitored had chicks.

AMNWR-NR85 Monitoring Populations of Least Auklets at St. Matthew I. (74500-BSU-12).

Art Sowls, Wildlife Assistance, USFWS, Anchorage, AK.

For the third consecutive year in 1985 auklets were counted on designated plots at St. Matthew, and results suggest the technique used may be suitable to determine population trends.

Least auklets are difficult to monitor because they nest in crevices hidden from observers, and because they occur in very large flocks which tend to mill over colonies during periods of activity. Continuing the approach devised in 1983 by Art Sowls (USFWS, Anchorage), time-lapse cameras were used to determine daily periods of activity at colonies. By learning when birds are active at colonies, sampling schemes can be employed at appropriate times. The objective was to try to estimate the relative number of auklets using various 10 m x 10 m plots as an index to population change. This involved counting the birds present every 15 min. throughout the peak of morning activity. Counts were then averaged to provide an index to the "relative numbers" of birds using each plot in a particular year.

Data analysis was not yet complete, but a report is forthcoming (A.Sowls pers. comm.).

AMNWR-NR85. Distribution of marine birds in relation to water masses and prey communities in the northern Bering Sea (74500-BSU-18).

George Hunt, Univ. of California, Irvine (grant from NSF).

Ref: Research Cruise Report R/V Alpha Helix Cruise #073 25 July - 25 August 1985.

In 1985 Dr. Hunt continued his studies of the distribution of feeding auklets and other seabirds in the central and northern Bering Sea. His crews visited St. Matthew August 15-20 to collect food regurgitated by mist netted least auklets and to observe the distribution of feeding auklets near St. Matthew and Hall islands. Data on the distribution of

feeding birds were compared to physical and biological oceanography of the area. Dr. Hunt wanted to compare the "existence costs" of least auklets feeding near shore (as they do at St. Matthew) with birds feeding farther offshore (as they do at several colonies in the northern Bering Sea).

Sarichef Strait between St. Matthew and Hall islands was the major feeding area located during the study. Least auklets were primarily taking a small (4 mm) copepod (Neocalanus marshallae), and during Hunt's visit the food was not available in particularly high densities. This was in contrast to the situation found in the northern Bering Sea where auklets were taking abundant larger copepods which they caught by feeding well offshore (Hunt, G.L. 1985. Research Cruise Report, R/V Alpha Helix Cruise #073).

AMNWR-NR85. Food habits of seabirds at Bluff (74500-BSU-23).

Alan Springer, Univ. of Alaska, Fairbanks (refuge contract).

Ref: Springer, A.M. 1985. Food habits of seabirds at Bluff and Cape Lisburne. Report to Alaska Maritime NWR, Homer, AK.

Monitoring studies at Bluff have indicated frequent reproductive failures in kittiwakes and a possible population decline in murres. To try to understand food habits, an important element in the breeding ecology of the species, birds were collected and contents of stomachs were identified and weighed. Most food habits studies done in the past have been entirely descriptive, simply identifying what the birds were eating. More thorough studies have provided information on the percent occurrence, a measure of the relative abundance of the species in the diets. Some studies have provided information on the volume of each food item in the diets, but most of these took whatever portion of the particular item that was found in the stomach and used that for volumetric measures. This method would result in far underestimating the value of a fish, represented usually by only the middle ear bone (otolith) compared to an invertebrate which might be present in its entirety. Springer attempted to project actual importance of various items in the diet by measuring otoliths and estimating the actual size of the live fish that was eaten. He then used the biomass of various items to describe importance.

Saffron cod and sand lance were the most important items in the diets of kittiwakes and murres during summer. By evaluating the change in diet over the season, it was clear that birds switched to sand lance probably as soon as they became available. Availability seemed to coincide with warm temperatures. Springer points out that in seasons, like 1984, when sea water temperatures are unusually cold, sand lance may not be available. This seems to result in breeding failures in kittiwakes and perhaps reduced success in murres as well.

AMNWR-NR84 Effects of harbor construction and other types of disturbance on cliff-nesting seabirds at St. Paul Island (74500-BSU-06).

Michael Witter, Village of St. Paul.

Ref: Witter, M. 1986. St. Paul Seabird Monitoring Study 1985, St. Paul Island, Alaska. Report to City of St. Paul.

Work began in 1984 on a state of Alaska funded project for harbor construction. Following a recommendation from the USFWS the village hired a biologist, William Rodstrom, to monitor the effects of harbor construction on cliff-nesting seabirds. Mr. Rodstrom established a series of study plots, some of which were on the refuge, in which he monitored reproductive success of cormorants, kittiwakes, and murres. These same plots were again observed in 1985 by Mike Witter who replaced Bill Rodstrom in the position.

Witter documented sources of disturbance to seabirds at St. Paul. These included various types of noise from construction activities, routine vehicular traffic (especially motorcycles), and aircraft (especially helicopters); tourist activities; subsistance egging; and activities of researchers. Although panic flights were not observed as a result of harbor construction activities, the constant noise may have had some adverse effects on thick-billed murres and black-legged kittiwakes. Birds on study plots relatively near the construction site had significantly lower nesting success (t test, $p<.05$) than at control plots. Nevertheless, Witter concludes that extenuating circumstances (e.g. relative quality of the nesting substrate at the disturbed area, small sample sizes, and the fact that common murres at the disturbed site did not have relatively low success) may have been responsible for the reduced success. He recommends additional study in 1986.

AMNWR-NR85. Food habits of kittiwakes and murres at St. George I., Pribilof Is. (74500-BSU-31).

Don Dragoo, Univ. of Alaska, Fairbanks.

Mr. Dragoo collected adult kittiwakes and murres during the 1985 breeding season at St. George I. for analysis of food items taken and condition of birds during various stages of the breeding cycle. Similar data will be gathered in 1986 and a report will be forthcoming.

This Giant Puma helicopter supported oil drilling operations in the Navarin Basin from a support base on St. Paul.
07/10/85 G.V.B.

AMNWR-NR85. Range surveys at St. Matthew Island (74500-BSU-04).

David R. Klein, Coop. Wildl. Res. Unit, Univ. of Alaska, Fairbanks.

Ref: Klein, D.R. 1985.

In 1985 Dr. Klein resurveyed several plots he had originally set up in 1957 during a study of the effects of reindeer grazing on this island. The reindeer population, which was first introduced in 1944 as food for a small military contingent on the island, built up to over 6000 animals in 1963 and then crashed as a result of overgrazing and a harsh winter in 1964. The last animal died in 1983. The 1985 survey was a rare opportunity to evaluate the recovery of vegetation that had been decimated by introduced herbivors in a subarctic system.

A report on the findings is forthcoming (D.R. Klein pers. comm.).

E. ADMINISTRATION

1. Personnel

Permanent Full Time

1. John L. Martin, Refuge Manager, GS-13, EOD 12-21-81, PFT
2. Tom J. Early, Assistant Refuge Manager, GS-11, EOD 08-23-81, PFT
3. Edgar P. Bailey, Refuge Biologist, GS-11,EOD 10-01-81,PFT
4. Mike Nishimoto, Refuge Biologist, GS-11, EOD 4-15-84, PFT
5. G. Vernon Byrd, Refuge Biologist, GS-11, EOD 4-29-84, Perm. Int.
6. Carol M. Hagglund, Budget Assistant, GS-7, EOD 08-21-83, PFT
7. Trina B. Fellows, Clerk-Typist, GS-3 EOD 11-28-83, PFT

Temporary

1. Leslie Slater, BioTech GS-5, temporary 6/03/85-10/18/85
2. Paul Sievert, BioTech GS-5, temporary 6/03/85-11/08/85

Volunteer

1. Lisa Climo, SCA, 3/11/85 - 6/28/85 Volunteer, 6/29/85 - 9/14/85
2. Don Dragoo, 6/02/85-9/09/85
3. Gary Lyon, 7/06/85-7/20/85
4. Tony Berto, 6/02/85-9/01/85
5. Steve Kirkhorn, 7/06/85 - 7/20/85
6. Brian Cooper, FT, 7/06/85 - 7/20/85
7. Carolyn Fleshmen, 7/06/85 - 7/18/85
8. Mike Witter, 9/03/85 - 9/17/85

4. Volunteer Program

We had one volunteer from the Student Conservation Association in 1985. Lisa Climo contributed to many aspects of the refuge program during the winter and spring. She worked on the refuge slide file, helped put new publications in the reprint collection, provided interpretive presentations to various groups, led the state-sponsored breeding bird survey in the Homer area, and bought and packed supplies for the field camps. Lisa did such a good job, that she was selected as a refuge volunteer to help with the monitoring program for seabirds in the Pribilof Islands. In that capacity she gathered data on reproductive success and populations at St. George Island.

Tony Berto volunteered for the seabird monitoring project in the Pribilofs and he was assigned to St. Paul Island where he

helped collect data on populations and reproductive success of seabirds. Mr. Berto was particularly adept at mechanical things and he was made responsible for the operation and maintenance of time-lapse cameras. He also did an excellent job of mapping all the study plots. His contribution was very much appreciated.

Don Dragoo was a refuge volunteer at St. George Island where he helped gather data on cliff-nesting seabirds and worked on a food habits study of murres and kittiwakes as part of his masters project at the Univ. of Alaska Fairbanks. Mr. Dragoo is an experienced biologist, and we were indeed fortunate to have him as a volunteer. He contributed to all aspects of the study, and during the latter part of the period acted as camp leader after a biological technician had to leave the island due to an emergency.

Gary Lyon volunteered to help with wildlife surveys in the Pribilof Islands and at St. Matthew. He is a careful wildlife observer, and his contribution as one of the "biologists" on the crew was invaluable.

Steve Kirkhorn was part of the crew that surveyed seabirds at St. Matthew Island. He was an enthusiastic observer and his knowledge of wilderness travel and camping techniques was particularly helpful.

Carolyn Fleshmen accompanied us to St. Matthew where she led an effort to repeat auklet counts on plots established in 1983. Ms. Fleshmen was part of the study team at St. Matthew in 1984 and her experience at the site contributed significantly to the success of the survey.

Brian Cooper volunteered to accompany us to St. Matthew. He had originally set up the auklet monitoring plots on the large colony at Pterodactyl in 1983 and he was particularly helpful in resurveying the auklet plots.

Mike Witter, who had spent the summer as a biologist for the City of St. Paul (see Section D.5), in the Pribilofs volunteered to work with our biologists in Homer at the end of the season, so that reports of activities in the Pribilofs could be consolidated. Mr. Witter shared his data with us, and we provided information he needed for comparisons.

Lisa Climo and Don Dragoo, the two refuge volunteers on St. George, placing markers at the corners of auklet plots
08/15/85 G.V.B.

5. Funding

Funding for the Alaska Maritime National Wildlife Refuge (AMNWR) is through the Homer headquarters. The funds are then internally distributed between Homer and the Aleutians Islands Unit (AIU) at Adak. The funding for AIU is discussed in that unit's section. All other unit funds are distributed from the Homer office. Following is a summary of the total refuge funding:

	1260 Wildlife Resources	1480 Endangered Species	1520 Youth Program Corps	Total
FY-82	346,000	75,000	0	421,000
FY-83	730,000	250,000	0	980,000
FY-84	1,124,000	245,000	0	1,369,000
FY-85	1,110,000	239,000	3,010	1,352,010
FY-86	969,000	246,000	4,410	1,219,410

Rental receipts for quarters maintenance (8610), previously subactivity (1994), were not included since there has been considerable latitude in where those funds were used. In FY82 and FY 83, the funds collected were used at the station where collected. In FY84 the funds were retained in the regional office for distribution on a "need" basis. Beginning in January of FY85, 90% of the funds collected were to be used at the station where collected, and would remain available until expended.

In FY82 the vessel charter costs came out of the regional office budget. Since then, all charter costs have come from the refuge budget.

Accelerated Refuge Maintenance Management (ARMM) projects accounted for $580,000 of FY84; and $543,000 of FY85; and $349,600 of the FY86 funding advance.

A comparison of FY82 to FY86 Homer funding is as follows:

	1260 Wildlife Resources	1480 Endangered Species	1520 Youth Program Corps	Total
FY-82	230,000	31,000	0	261,000
FY-83	462,200	155,400	0	617,600
FY-84	502,500	140,000	0	642,500
FY-85	615,000	140,000	2800	757,800
FY-86	501,640	141,195	3010	645,845

The Alaska Maritime National Wildlife Refuge is headquartered in the Ross Duncan building located on Pioneer Avenue in downtown Homer. A total of $59,400 (which includes utilities, snow and refuse removal) was paid for approximately 4,032 sq ft of leased office/storage space in FY85.

6. Safety

No lost time accidents were reported for the year. Assistant Manager Early is the Station Safety Officer. Monthly safety meetings are scheduled the first monday of each month with most permanent staff members attending.

The following is a list of the monthly meetings:

Month	Subject
January	Winter Walking Safety
February	Hand Tool/Appliance Safety
March	Cold Weather Safety
April	Boating/Survival/Comprehensive First Aid & CPR
May	Back Country Skiing/Hiking Safety
June	Office Safety
July	Home Safety
August	Lifting/Moving Safety

September	Gun/Hunting Safety
October	Fire Prevention
November	Winter Driving Safety
December	Winter Recreation Safety

The session in April involved several field volunteers as well as the permanent staff. We used the local high school swimming pool and practiced donning survival suits in the water, being in the water with hip boots, using floatation coveralls and being in the water with field gear on. Another similar session was held in early June for personnel going to the Pribilofs. All personnel are required to put a survival suit on and use it in the water prior to being on a refuge boat. This exercise is very effective in familiarizing people with a survival suit, as well as giving them confidence in their use. Incidentally, we did find that several of the suits leaked slightly and they were sent in immediately for repair.

The video and workbook series entitled "Sea Survival", "Shore Survival", "Hypothermia", and "Cold Water Near Drowning" is available and used. These are made by the University of Alaska, Cooperative Extension Service, the U.S. Coast Guard, and the Kodiak Community College.

A minor injury occurred during the season to volunteer Steve Kirkhorn. He slipped on a talus slope at St. Matthew while trying to get one step closer to a bird he wished to photograph and injured a rib when he fell. Being a physician, Dr. Kirkhorn diagnosed the injury as not serious, and he continued to assist with work at St. Matthew although he was kept from lifting heavy objects.

7. Technical Assistance

WB Byrd assisted Mike Witter, biologist for the city of St. Paul Island, by reviewing his study plan for monitoring the effects of disturbance from harbor construction on cliff-nesting seabirds at St. Paul.

ARM Early assisted the City of St. Paul in planning a boulder removal project to reduce damage to the topography and to enhance habitat for least auklets (also see section J.1).

F. HABITAT MANAGEMENT

7. Grazing

The only grazing permit on the unit is for reindeer on Hagemeister Island. Prior to the creation of the Alaska Maritime NWR this 52,400 acre island was administered by BLM, who originally issued the permit for grazing and set the maximum allowable herd size at 450 animals. An aerial count

made February 6 totaled 733 animals. Lee Hotchkiss, Pilot/Manager from Togiak NWR, flew for us during the survey. Listed below is a summary of past reindeer grazing on Hagemeister.

Table 2. Summary of reindeer censuses on Hagemeister Island 1966-1985.

Year	Number Censused	Number Slaughtered
1966	80	--
1967	234	--
1968	234	--
1971	1,011	1,290 lb.
1972	435a	285 deer
1973	360	88 deer
1974	867	3,215 lb.
1975	867	159 deer
1976	854	535 deer
1977	760	355 deer
1978	600a	97 deer
1980	650a	--
1983	770b	--
1984	--	155
1985	733b	--

a BLM Aerial Census

b FWS Aerial Census

The permittee is trying to reduce the herd during the winter months and was not available to report on the number taken in 1985. We are planning to conduct a range survey in cooperation with the U.S. Soil Conservation Service in 1986.

Reindeer herd at St. Paul. These animals occur on several refuge areas.
08/12/85 G.V.B.

12. Wilderness and Special Areas

During the visit to St. Matthew Island in July, ARM Early and WB Byrd checked sites of various installations present under special use permits. These included:

NCS Navigation tower (SUP AKM-02-85)--The area around the tower was neat and orderly. The company had done a good job of complying with special conditions of the permit, and a letter to this effect was sent to the project manager.

Marinav tower (SUP AKM-06-83)--Although this permit lapsed at the end of 1983, it had not been possible to visit the site earlier and check for compliance with special conditions. We found a plywood tent platform, four tower anchor posts, two tower bases, and about 70 antenna ground lines extending from the tower base out about 100 ft. The company (now called Oceaneering, Inc.) was contacted and told to remove these materials which were left in violation of the special use permit. They contracted with Exxon in October and final removal was made.

WWII Coast Guard station--A check was made of the old Coast Guard station on St. Matthew to inventory remaining debris

GULF OF ALASKA UNIT

ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Homer, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1985

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

GULF OF ALASKA UNIT
ALASKA MARITIME NATIONAL WILDLIFE REFUGE
HOMER, ALASKA

ANNUAL NARRATIVE REPORT
CALENDAR YEAR 1985

Refuge Manager Date

Refuge Supervisor Review Date

Regional Office Approval Date

INTRODUCTION

The Alaska Maritime National Wildlife Refuge (AMNWR) was created by the Alaska National Interest Lands Conservation Act in 1980. It was established to conserve fish and wildlife populations and habitats in their natural diversity, fulfill international fish and wildlife treaty obligations, provide opportunities for continued subsistence uses by local residents, provide a program of national and international scientific research on marine resources and ensure water quality and necessary water quantity within the refuge. This Act consolidated management of eleven existing refuges with 460,000 additional acres resulting in a 35,000,000 acre refuge. Although relatively small in land mass, its lands are scattered through most of coastal Alaska and extends from Forrester Island in Southeast Alaska along the Gulf of Alaska to the Aleutian Islands and northward until near Barrow in northwest Alaska. There are over 2,500 islands, islets, and pinnacle rocks within the refuge which are used annually by millions of seabirds of at least 30 species. The AMNWR has five units with all former refuges designated subunits.

The Gulf of Alaska Unit extends from Alaska's southcentral coast near Kodiak Island then eastward to southeast Alaska and includes four former refuges; Tuxedni, St. Lazaria, Hazy and Forrester islands. Major seabird colonies occur on the following islands or island groups within the Unit: Chisik, Barren, Gull, Pye, Chiswell, Middleton, St. Lazaria, Hazy and Forrester.

This Unit has the only forest habitat on the AMNWR. Spruce-hemlock forests are the dominant plant community on nearly all islands until Cook Inlet. The transition zone occurs in the Barren Islands where there is only a small forested area on Ushagat Island with alpine tundra the dominant vegetation type. Like much of the refuge, topography in the Unit is often precipitous with seabirds using cliffs, talus slopes, burrows, boulder rubble and rock crevices to breed and nest. Besides terrestrial habitat, submerged lands also occur around Afognak and some waters around Kodiak Island.

Seabird colonies in this Unit are probably the most visited in Alaska. Unlike most units, three colonies are readily accessible by charter boat or pleasure craft. St. Lazaria Island is 15 mi. from Sitka; the Chiswell Islands are 35 mi. from Seward and Gull Island is 1 mi. from Homer.

INTRODUCTION Page

TABLE OF CONTENTS i

A. HIGHLIGHTS 1

B. CLIMATIC CONDITIONS 1

C. LAND ACQUISITION

1. Fee Title.....Nothing to report
2. Easements.....Nothing to report
3. Other.....Nothing to report

D. PLANNING

1. Master Plan.....2
2. Management Plan.....2
3. Public Participation.....Nothing to report
4. Compliance with Environmental and Cultural Resources Mandates.....Nothing to report
5. Research and Investigations.....3
6. Other.....Nothing to report

E. ADMINISTRATION

1. Personnel.....5
2. Youth Programs.....5
3. Other Manpower Programs.....Nothing to report
4. Volunteer Program.....6
5. Funding.....6
6. Safety.....7
7. Technical Assistance.....8
8. Other.....8

F. HABITAT MANAGEMENT

1. General.....Nothing to report
2. Wetlands.....Nothing to report
3. Forests.....8
4. Croplands.....Nothing to report
5. Grasslands.....Nothing to report
6. Other Habitats.....9

7. Grazing.....10
8. Haying.....Nothing to report
9. Fire Management.....Nothing to report
10. Pest Control.....Nothing to report
11. Water Rights.....Nothing to report
12. Wilderness and Special Areas.....11
13. WPA Easement Monitoring.....Nothing to report

G. WILDLIFE

1. Wildlife Diversity.....11
2. Endangered and /or Threatened Species.....11
3. Waterfowl.....11
4. Marsh and Water Birds.....11
5. Shorebirds, Gulls, Terns and Allied Species.....12
6. Raptors.....18
7. Other Migratory Birds.....Nothing to report
8. Game Mammals.....18
9. Marine Mammals.....18
10. Other Resident Wildlife.....Nothing to report
11. Fisheries Resources.....Nothing to report
12. Wildlife Propagation and Stocking.....Nothing to report
13. Surplus Animal Disposal.....Nothing to report
14. Scientific Collections.....Nothing to report
15. Animal Control.....Nothing to report
16. Marking and Banding.....Nothing to report
17. Disease Prevention and Control.....Nothing to report

H. PUBLIC USE

1. General.....18
2. Outdoor Classrooms - Students.....Nothing to report
3. Outdoor Classrooms - Teachers.....Nothing to report
4. Interpretive Foot Trails.....Nothing to report
5. Interpretive Tour Routes.....Nothing to report
6. Interpretive Exhibits/Demonstrations....Nothing to report
7. Other Interpretive Programs.....Nothing to report
8. Hunting.....Nothing to report
9. Fishing.....Nothing to report
10. Trapping.....Nothing to report
11. Wildlife Observation.....Nothing to report
12. Other Wildlife Oriented Recreation.....Nothing to report
13. Camping.....Nothing to report
14. Picnicking.....Nothing to report
15. Off-Road Vehicling.....Nothing to report
16. Other Non-Wildlife Oriented Recreation..Nothing to report
17. Law Enforcement.....Nothing to report
18. Cooperating Associations.....Nothing to report
19. Concessions.....Nothing to report

I. EQUIPMENT AND FACILITIES

1. New Construction.....Nothing to report
2. Rehabilitation.....Nothing to report
3. Major Maintenance.....Nothing to report
4. Equipment Utilization and Replacement.....18
5. Communications Systems.....Nothing to report
6. Computer Systems.....Nothing to report
7. Energy Conservation.....Nothing to report
8. Other..... .....Nothing to report

J. OTHER ITEMS

1. Cooperative Programs.....Nothing to report
2. Other Economic Uses.....Nothing to report
3. Items of Interest.....Nothing to report
4. Credits.....20

K. FEEDBACK

1. Feedback.....Nothing to report

A. HIGHLIGHTS

Storm-petrel populations down at St. Lazaria Island (Section G.5).

Refuge assumes fork-tailed storm-petrel monitoring at East Amatuli Island (Section G.5).

Gull Island kittiwakes continue to do well (Section G.5).

B. CLIMATIC CONDITIONS

Although it does not extend as far south as the Aleutians, the Gulf of Alaska probably has the most moderate climate among units of the Alaska Maritime National Wildlife Refuge. Winter temperatures normally remain above freezing except for lands adjacent to the Kenai Peninsula. The climate is most temperate in Southeast Alaska where it is often overcast, but seldom experiences the wind and summer fog of the other units.

In Homer, we had above normal snowfall in March and April resulting in a long winter here. Temperatures were also colder than normal this spring which delayed the seabird breeding phenology by about two weeks. Summer temperatures were near normal, but considerably overcast. Cold weather followed us into the fall with the second coldest October on record and below normal temperatures continuing into November. This trend turned around in December when temperatures soared to 13.9 degrees (F) above normal.

Meteorological Data - Homer 1985

	Ave. Temp				Precip.		Ave.
Month	Max.	Min.	Ave.	Norm.	Total Water	Snow	Wind Sp.
Jan.	40.9	31.0	36.0	20.8	4.23	3.6	8.9
Feb.	26.3	14.4	20.4	24.3	1.02	13.1	8.8
Mar.	35.6	24.4	30.0	26.9	3.69	29.8	9.7
Apr.	34.0	21.7	27.9	35.1	1.49	9.9	10.4
May	47.7	35.0	48.4	42.2	1.49	0.4	10.1
Jun.	52.9	40.8	46.9	48.8	0.85	-0-	9.0
Jul.	59.1	47.9	53.5	52.8	2.91	-0-	6.8
Aug.	58.1	46.5	51.8	52.8	2.46	-0-	7.2
Sep.	53.9	40.3	47.1	46.9	3.06	-0-	---
Oct.	39.5	26.1	32.8	37.3	0.92	3.70	---
Nov.	32.1	17.6	24.9	28.9	0.90	6.1	---
Dec.	41.4	30.0	35.7	23.6	2.36	1.9	---

D. PLANNING

1. Master Plan

The Alaska National Interest Lands Conservation Act (ANILCA) requires all Alaskan refuges to prepare a comprehensive plan. (CCP). These plans are to serve as the station master plan and will be initiated by a special planning team from the Regional Office. The primary objectives of the comprehensive plans are to (a) inventory and describe the resources and values of the refuge, (b) specify management programs for conserving fish and wildlife resources and/or values, (c) specify other compatible uses, and (d) specify opportunities for fish and wildlife oriented recreation, research, etc.

The revised AMNWR schedule is as follows:

Activity	Date
"Alternatives and Effects" draft complete	3/28/86
Finalize "Alternatives and Effects"	4/25/86
Scoping complete	5/15/86
Assess impacts and effects	10/30/86
Identify preferred alternative	11/15/86
Inhouse draft of document	12/15/86
Publish draft of document	1/15/87
Distribute document	3/30/87
Public review of document complete	6/30/87
Publish final document	10/15/87
Protest period complete	12/02/87

The schedule for the AMNWR CCP was accelerated and active involvement by the planning team and refuge staff has been initiated. In June we provided input to the team for listing all lands included on the refuge. In August, two members of the planning team, Vivian Mendenhall and Poppy Benson accompanied the charter vessel NORPAC from Adak to Homer to familiarize them with the remote and inaccessible lands typical of the refuge. In October, the biologists provided basic input to the "Affected Environment" section of the CCP. In November and December a mailing list of interested persons to be contacted during the planning process was compiled.

2. Management Plan

Final revisions on the wildlife inventory plans are awaiting completion of the seabird censusing techniques manual being written by the Research staff in Anchorage.

5. Research and Investigations

AMNWR-NR85."Reproductive Ecology of Seabirds at Middleton Island, Alaska---Summer 1985" (74500-GAU-11).

D. R. Nysewander, Wildlife Assistance, U.S. Fish and Wildlife Service; B. Roberts, University of Alaska-Fairbanks; and S. Bonfield. 1986. Unpubl. Admin. rpt, U.S. Fish and Wildlife Service, Anchorage.

The Marine Bird Management Project (Wildlife Assistance, USFWS, Anchorage) continued to monitor the Middleton Island colony. Data on numbers and productivity of black-legged kittiwakes and pelagic cormorants are now available from Middleton Island seven summers between 1976 and 1985. Two brief visits each summer since 1981 can be compared with data obtained in 1976 and 1978 from extended stays by biologists from other earlier programs. Preliminary analysis suggests the following trends or patterns:

1) Kittiwakes exhibit a generally stable pattern of nesting attempts which resemble an oscillating wave that may vary up to 34 per cent any one year from the mean annual number (64,237 nests) seen over seven of the last ten years.

2) Kittiwake productivity was essentially low over a six year period with three busts and three years that included mostly low and medium levels of production. The poor production appears to relate to unusual oceanic occurrences: warmer or colder than usual patterns of water temperature.

3) The productivity and nesting attempts of cormorants and kittiwakes do not correlate with each other in any one year suggesting that different facets of the food chain need to be represented in a thorough monitoring effort. In 1985 kittiwakes produced only 0.04 prefledging chicks per nest attempt, one of the lowest rates ever recorded on Middleton Island. This contrasted dramatically with that observed in 1984 (0.68) which was the highest recorded on this island in the last decade. Cormorants have never been observed to have the total breeding failure any single year that the kittiwake colony periodically has.

AMNWR-NR85 "Breeding Populations and Productivity of Cormorants and Kittiwakes in Chiniak Bay, Kodiak Island 1975-85" (74500-GAU-12).

D. R. Nysewander, and J. L. Trapp, Wildlife Assistance, U.S. Fish and Wildlife Service. 1986. Unpubl. Admin. rpt., U.S. Fish and Wildlife Service, Anchorage.

study area was bounded on the east by Resurrection Bay and on the west by Pt. Bede and Pt. Adam. The Chugach Islands were the southernmost survey area and the northern boundary was Seward. Refuge lands surveyed included the Pye and Chiswell island group.

AMNWR-NR85 "Bald eagle survey at Forrester Island, Alaska" (74500-GAU-33)

J. Jacobson, Raptor Management Studies, U.S. Fish and Wildlife Service. 1985. Unpubl.admin. rpt, U.S. Fish and Wildlife Service, Juneau, Alaska.

Although the Forrester Island Subunit was surveyed in 1976 as part of the outer continental shelf environmental assessment program, the eagle population was not extensively studied. The project this year was the first to specifically study raptors. Observations of 17 bald eagle nests were made in the survey of Forrester, Lowrie and Petrel islands compared to 4 in 1976. The difference between years probably does not represent population change, but greater nest recognition by raptor specialists.

E. ADMINISTRATION

1. Personnel

Permanent Full Time

1. John L. Martin, Refuge Manager, GS-13, EOD 12-21-81
2. Tom J. Early, Assistant Refuge Manager, GS-11, EOD 08-23-81
3. Edgar P. Bailey, Refuge Biologist, GS-11, EOD 10-01-81
4. Mike Nishimoto, Refuge Biologist, GS-11, EOD 4-15-84
5. G. Vernon Byrd, Refuge Biologist, GS-11, EOD 4-29-84 Intermittent
6. Carol M. Hagglund, Budget Assistant, GS-7, EOD 08-21-83
7. Trina B. Fellows, Clerk-Typist, GS-3, EOD 11-28-83

SCA

1. Janie Brixey, 7/01/85 - 8/30/85
2. Lisa Climo, Volunteer 9-10-85/9-15-85

YCC

1. Donna Jones 6/13/85 - 8/23/85

Volunteers

1. Kent Hanson, 7/23/85 -7/30/85
2. Hal Smith, 7/1/85 - 7/30/85
3. Susan McLane, 7/1/85 - 7/30/85

2. Youth Programs

Donna Jones our YCC working out of the Homer Office gave interpretive talks onboard the M/V Stormbird which had three

daily tours to the Gull Island seabird colony. She also assisted in our Gull Island and Kachemak Bay surveys (Section G.).

4. Volunteer Program

Several volunteers assisted in our Gull Island and Kachemak Bay surveys including: Hal Smith, Susan McLane and Janie Brixey. In July Kent Hanson, a retired chemistry teacher and avid birder from Sitka, helped us monitor storm-petrels at St. Lazaria Island. After monitoring seabirds at St. George Island in the Pribilofs, volunteer Lisa Climo helped us monitor fork-tailed storm-petrel fledging success at East Amatuli Island in the Barrens.

5. Funding

Funding for the Alaska Maritime National Wildlife Refuge (AMNWR) is through the Homer headquarters. The funds are then internally distributed between Homer and the Aleutians Islands Unit (AIU) at Adak. The funding for AIU is discussed in that unit's section. All other unit funds are distributed from the Homer office. Following is a summary of the total refuge funding:

	1260 Wildlife Resources	1480 Endangered Species	1520 Youth Program Corps	Total
FY-82	346,000	75,000	0	421,000
FY-83	730,000	250,000	0	980,000
FY-84	1,124,000	245,000	0	1,369,000
FY-85	1,110,000	239,000	3,010	1,352,010
FY-86	969,000	246,000	4,410	1,219,410

Rental receipts for quarters maintenance (8610), previously subactivity (1994), were not included since there has been considerable latitude in where those funds were used. In FY82 and FY83, the funds collected were used at the station where collected. In FY84 the funds were retained in the regional office for distribution on a "need" basis. Beginning in January of FY85, 90% of the funds collected were to be used at the station where collected, and would remain available until expended.

In FY82 the vessel charter costs came out of the regional office budget. Since then, all charter costs have come from the refuge budget.

Accelerated Refuge Maintenance Management (ARMM) projects accounted for $580,000 of FY84; and $543,000 of FY85; and $349,600 of the FY86 funding advance.

A comparison of FY82 to FY86 Homer funding is as follows:

	1260 Wildlife Resources	1480 Endangered Species	1520 Youth Program Corps	Total
FY-82	230,000	31,000	0	261,000
FY-83	462,200	155,400	0	617,600
FY-84	502,500	140,000	0	642,500
FY-85	615,000	140,000	2800	757,800
FY-86	501,640	141,195	3010	645,845

The Alaska Maritime National Wildlife Refuge is headquartered in the Ross Duncan building located on Pioneer Avenue in downtown Homer. A total of $59,400 (which includes utilities, snow and refuse removal) was paid for approximately 4,032 sq ft of leased office/storage space in FY85.

6. Safety

No lost time accidents were reported for the year. Assistant Manager Early is the Station Safety Officer. Monthly safety meetings are scheduled the first monday of each month with most permanent staff members attending.

The following is a list of the monthly meetings:

Month	Subject
January	Winter Walking Safety
February	Hand Tool/appliance Safety
March	Cold Weather Safety
April	Boating/Survival/Comprehensive First Aid & CPR
May	Back Country Skiing/Hiking Safety
June	Office Safety
July	Home Safety
August	Lifting Moving Safety
September	Gun/Hunting Safety
October	Fire Prevention
November	Winter Driving Safety
December	Winter Recreation Safety

The session in April involved several field volunteers as well as the permanent staff. We used the local high School swimming pool and practiced donning survival suits in the water, being in the water with hip boots, using floatation coveralls and being in the water with field gear on. All personnel are required to put a survival suit on and use it in the water prior to being on a refuge boat. This exercise is very effective in familiarizing people with a survival suit, as well as giving them confidence in their use in the cold ocean waters. Incidentally, we did find that several of the suits leaked and they were sent in immediately for repair.

The video and workbook series entitled "Sea Survival", "Shore Survival", "Hypothermia", and "Cold Water Near Drowning" is available and used. These are made by the University of Alaska, Cooperative Extension Service, the U. S. Coast Guard, and the Kodiak Community College.

We are attempting to purchase a VHF radio and depth recorder to improve the Safety features of a 25-foot Whaler used in Kachemak Bay and Cook Inlet. WB Nishimoto attended the regional dive board meeting in Sitka where he participated in a mock sea rescue with the U.S. Coast Guard helicopter. The staff also completed first aid and CPR training given by personnel from the local fire department. The entire safety training was one of the best we have seen. Instruction by practicing professionals added an invaluable dimension to the training exercise.

7. Technical Assistance

Several times this year we inspected sites for Corps of Engineers permit applications at Beluga Lake in Homer to assist the Western Alaska Ecological Services Anchorage field office. WB Nishimoto also worked with Ecological Services biologists to develop an evaluation system for proposed log transfer facilities.

During the spring we assisted the Lake Clark Preserve in transporting equipment to their field headquarters on Chisik Island, a subunit of the refuge.

8. Other

In May a Special Use Permit (SUP) was issued to the U.S. Coast Guard to install a VHF-FM repeater station on Ushagat Island in the Barren Island Group. This station will close an important communication gap for boats using the Barren Island area. This SUP is intended to be in effect until a Right-of-Way permit is issued by our Regional Realty Office.

A SUP was issued to Maritime Helicopters, Homer for access to two of the Barren Islands for sightseeing tours. One use was made of this permit during the late summer.

F. HABITAT MANAGEMENT

3. Forests

Forested islands exist only in the Gulf of Alaska Unit, with Ragged Island (5,400 ac) in the Pye Islands being the largest island totally covered by spruce. Except for Forrester, and St. Lazaria in southeast Alaska, all forested islands including Discoverer and Delphin islands near Afognak island were incorporated into the refuge by the Alaska Lands Act. Though better timber exist on other Federal, State and Native

lands, ANILCA provides the Koniag Native Corporation use of timber on both Discoverer and Delphin islands. Both islands are heavily used by Sitka black-tailed deer and brown bear, and Delphin also has a small seabird colony and nesting eagles. Delphin Island is particularly important to wildlife and has magnificent trees up to 5 feet in diameter.

Studies by the Alaska Department of Fish and Game suggest that old growth forests provide important winter range for black-tailed deer by retaining snow on the forest canopy and reducing snow depth and hence access to winter feed. Due to slow growth rates, Alaskan old growth forests have been recognized as a non-renewable resource.

In the past, Ouzinkie and Kodiak Natives owned lands on Afognak Island have been logged and the timber transferred through a barge loading facility at Perenosa Bay. There are current plans to expand operations to the south side of the island where transfer facilities would have to be constructed on refuge waters. Discoverer and Delphin islands may be threatened by similar logging operations.

6. Other Habitats: Submerged Lands

Nearshore marine habitat on the refuge exist at Women's Bay and Karluk along the Kodiak Island coast and the former Afognak Forest and Fish Culture Reserve surrounding Afognak Island. Both Women's Bay and Afognak are threatened by development activities. A Coast Guard Base, freight transfer facility and seafood reduction plant are in various stages of expansion at Women's Bay. The bay supports a herring fishery which resulted in landings of 95.9 tons in 1984 and 90 tons is expected to be landed in 1985. A dungeness crab commercial and subsistence fishery also occur in the bay. The bay provides habitat for large numbers of king and tanner crab as well as shrimp and several species of salmon. It is used as a staging area by waterfowl and seaducks winter here. Several seabird colonies occur on islands within Women's Bay and have been monitored by Wildlife Assistance as part of their Chiniak Bay study described above. For more details see: M. Nishimoto, D. Ferrell, W. Crayton and R. Jackson. 1985. A reconnaissance of the nearshore waters of Women's Bay, Kodiak Island. Unpubl. Admin. rpt, U.S. Fish and Wildlife Service, Homer.

Within two miles of Kodiak town is a seafood reduction plant that created sufficient air and water pollution problems that it resulted in an investigation by the State. The plant has been taken over by the City of Kodiak and is being renovated with substantial State funding. Due to the controversy surrounding the project, refuge and Ecological Services biologists conducted underwater surveys to inspect the alleged pollution problem. Contrary to previous reports, we found no evidence of a polluted marine environment at the end of the outfall pipe and surrounding area. The plant had

Viesoki Island, one of the Chiniak Bay islands being monitored by Wildlife Assistance, experienced reproductive failure in 1985.
8/85 M.L.N.

The Marine Bird Management Project also resumed monitoring studies on kittiwakes and cormorants in Chiniak Bay in 1984 and 1985, offering comparison with data gathered 1975-78 at the same site by earlier studies. It was a "bust" year for production of both kittiwakes and cormorants at Chiniak Bay in 1985, unlike that observed here in 1984. However, the most dramatic development recorded by the 1984-85 work was the documentation of the doubling in numbers of nesting kittiwakes since 1975-78. Both species of cormorants increased their nesting numbers at a slightly smaller but still impressive rate.

AMNWR-NR85 "Peale's peregrine falcon (Falco peregrinus pealei) studies in Alaska June 12-24, 1985" (74500-GAU-41).

C.A. Janik and P.F. Schempf. Raptor Management Studies, U.S. Fish and Wildlife Service. 1985. Unpubl. admin. rpt, U.S. Fish and Wildlife Service, Juneau, Alaska.

Survey coverage for peregrines along the Alaska coast has been incomplete and variable in intensity. The lack of trend data, increased development activity in Alaska and declines of falcon populations in British Columbia creates a need for better information the Peale's peregrines of Alaska. The

closed down about three months prior to our dive and apparently the stormy north Pacific seas flushed all evidence of plant effluents. For more details see: M. Nishimoto, D. Ferrell, W. Crayton and Rodney Jackson. 1986. A Reconnaissance of the nearshore waters at the Bio-Dry waste reduction plant, Gibson Cove, Kodiak Island.

Marine life at Afognak are quite similar to Women's Bay. Underwater surveys were conducted at several proposed log transfer facilities in April due to plans for logging as described in the previous section. Recommendations were made for use of an existing facility, however, logging operations had not commenced by the end of the year. For more details see: D. Ferrell, R. Jackson and M. Nishimoto. 1985. Assessment of alternative log transfer facility sites at Kazakof Bay, Afognak Island, Alaska, April 3-6, 1985. Unpubl. admin. rpt, U.S. Fish and Wildlife Service, Anchorage.

Inspite of snow and freezing temperatures, refuge and ecological Services biologists conducted underwater surveys at the site of a proposed freight transfer dock expansion project at Women's Bay, Kodiak Island.
4/85 M.L.N.

7. Grazing

The only cattle grazing permit on this unit is for Bear and Harvester islands in Uyak Bay, Kodiak Island. This permit

covers 430 acres on the two islands and includes only 7 to 12 head of cattle. Thirty head of cattle are the maximum number allowed. There have been no problems the past several years in administering this permit. Both islands have been selected by both the State of Alaska and the Native Association therefore active range surveys based on the low number of cattle grazed are not warranted.

12. Wilderness and Special Areas

Only Forrester, Hazy, St. Lazaria and Chisik (Tuxedni subunit) islands are designated Wilderness areas in the unit.

Below is a breakdown of these areas:

Island	Acres	Designation Date
Forrester	2832	10/23/70
Hazy	32	10/23/70
St. Lazaria	64	10/23/70
Tuxedni	5547	10/23/70

Presently Kenai NWR is handling the Tuxedni Subunit area. The transfer of management for this island from Kenai NWR to the Alaska Maritime NWR has been locked up in litigation over trespass cabins on the island.

G. WILDLIFE

1. Wildlife Diversity

Since many of the islands in the Gulf of Alaska are forested, the diversity of North American avifauna in this region is greater than elsewhere in the refuge.

2. Endangered and/or Threatened Species

Occasional individuals of the endangered or threatened races of the peregrine falcon may visit the area during migration.

3. Waterfowl

Migrating and wintering waterfowl abound around the Pye Islands and in the Barrens. Canada and White-fronted geese and Brant visit the Barrens in migration.

4. Marsh and Water Birds

Little breeding habitat for loons and grebes exists, except for Ushagat Island in the Barrens. Many such birds winter around the Pyes, Chiswells, Barrens, and off Kodiak.

At Gull Island, Kachemak Bay, about fifty pairs of pelagic and four red-faced cormorants nest there. Double-crested cormorants visit the island, but there are no breeding

records for this species. On Sixty-Foot Rock, we found 28 pelagic cormorants roosting, but no nests were observed. For more details see: M. Nishimoto. 1986. Seabirds of Gull Island and Sixty-foot Rock, Kachemak Bay. Unpubl. Adm. Rpt. U.S. Fish and Wildlife Service, Homer.

We assumed monitoring of fork-tailed storm-petrels at East Amatuli Island when Dr. P. D. Boersma, University of Washington, was unable to continue work there. This colony of petrels has been studied by the University of Washington for the past nine years making it the longest studied storm-petrel colony in Alaska. East Amatuli Island was visited from July 10 to 20, to determine nesting attempts and continue banding studies. A total of 643 burrows were searched which resulted in 48.0% active burrows. A second visit in September was made to determine fledging success. Our results indicate that there were an average of 0.44 chicks/active burrow after searching 248 previously active burrows.

The breeding population of fork-tailed and Leach's storm-petrels at St. Lazaria Island dropped to 8,477 and 22,607 birds respectively compared to estimates of about 100,000 for both species reported in 1981 and 1982. This year we had an average of 1.3 active burrows of both species per 2m x 2m meter plot and much reduced from the 5.9 and 7.2 burrows per plot found in 1981-82. A late spring was experienced throughout much of Alaska and possibly could have affected petrel food sources.

Brandt's cormorants reported here last year could not be found although the island was circumnavigated in July. No attempt was made to census pelagic cormorants due to insufficient time. Several nests, however, were observed along the southwest end of the island.

5. Shorebirds, Gulls, Terns, and Allied species.

Many species of shorebirds utilize the islands, especially Ushagat, during migration. Oystercatchers nest on nearly all of the islands.

At Gull Island, Kachemak Bay, we found 4,655 pairs of black-legged kittiwakes on July 11. Seven cliff plots were censused on August 20 and 23. The plots had a total of 400 nests which produced an average of 0.33 chicks/per nest. This census was probably two weeks beyond the optimal counting period. About 90% of the kittiwakes had well developed primaries and several fledgings were observed flying around the water. Thus, our data represents conservative estimates of fledging success. This is the earliest date that we could have censused this colony since the survey boat was being used by the Kenai National Wildlife Refuge and all our biologists were out at various field camps.

Although glaucous-winged gulls nest on the island, no attempt was made to land there to minimize the disturbance to this often visited colony. Counts of individual birds were estimated at 442. Counts of common murres were also made from the water where we observed 1,370 individuals. No attempts were made to make replicate counts since we lacked a boat during mid to late incubation. Some population plots possibly could be established, but most of the murres use the top of the island and it would be difficult to census accurately from the water. Incidental counts of 8 tufted puffins and 13 pigeon guillemots were made during the July 11, survey. For details see: M. Nishimoto, 1986, Seabirds of Gull Island and Sixty-foot Rock, Kachemak Bay. unpubl. Adm. rpt., U. S. Fish and Wildlife Service, Homer.

Sixty-foot Rock, a small seabird colony in Kachemak Bay was censused in August 23. A total of 177 black-legged kittiwake nests and 17 chicks were counted which calculates to 0.10 chicks/per nest. This figure is consistent with previous comparisons between these two colonies. We also observed 91 common murres on the colony on this date.

At East Amatuli Island, no black-legged kittiwake chicks were observed on cliffs along the Southeast end of the island. Similar findings were reported in late August when the Fish and Wildlife Service charter vessel M/V Norpac circumnavigated the island. The glaucous-winged gull colony on the southwest ridge of the island also failed this year. After a complete nest search of the colony on July 14 we found 47 nests, but only one chick. Although adults were present, none were on the nests or exhibited territorial behavior. Common murre productivity was difficult to assess from land due to poor viewing sites and limited observations. We viewed the colony on Amatuli Light Rock once for several hours and found only one egg. A strenuous hike along wind swept and fog shrouded ridges restricted frequent visits to the colony. Tufted puffins at colony "B" were monitored from two 10 m strip transects. Burrow densities were similar to past studies, but no attempt was made to determine occupancy rates.

Although estimates of 74,000 puffins have been reported on East Amatuli, colonies are located along steep slopes and would be difficult to routinely monitor. We are currently evaluating our monitoring efforts for this species. For more detail see: M. Nishimoto, E. Bailey and L. Climo. 1985 Status of fork-tailed storm-petrels at East Amatuli Island during the summer of 1985. Unpubl. Adm. rpt., U. S. Fish and Wildlife Service, Homer.

Two glaucous-winged gulls banded at Skilak Lake in 1984 were observed roosting on rocks near tidewater at St. Lazaria Island. At the central and southwest part of the island chicks or nest with eggs were noted, however, no attempt was

made to conduct a full colony count. A ratio 52% common murres to 48% thick-billed murres were counted on the colony at the southwest corner of St. Lazaria on July 25. About 1,000 murres were counted from land, but the entire colony could not be viewed in this manner. It would be difficult to accurately monitor this colony since murres were densely packed on the entire cliff face and the cliff lacks natural breaks that could serve as plot boundaries. Several common murre eggs were observed, but no thick-billed eggs. Several flocks of 20-40 rhinoceros auklets were observed while approaching St. Lazaria from Sitka, but no attempt was made to specifically monitor this species. Rhino burrows found while monitoring storm-petrels, however, were noted. No burrows were encountered on the east side of the island, but auklet carcasses were present on both sides of the island. They apparently were being preyed upon by peregrine falcons and/or bald eagles. Tufted puffins were very common on the west side of the island, but no attempt was made to monitor this species. For more details see Nishimoto, M., J. Trapp, D. Williamson, K. Hansen. 1985. Status of fork-tailed and Leach's storm-petrel populations at St. Lazaria Island in the summer of 1985. Unpubl. admin. rpt., U.S. Fish and Wildlife Service, Homer.

Study colonies at both sides of the Valley at Amatuli Cove and near an alpine lake, in the foreground, were monitored at East Amatuli Island.

7/85 M.L.N.

Fork-tailed storm-petrels at East Amatuli Island were banded while monitoring nesting attempts in July.
7/85 M.L.N.

Nest boxes have been used to monitor fork-tailed storm-petrels at several study colonies on East Amatuli Island.
7/85 M.L.N.

East Amatuli Light Rock is used by large numbers of murres, but can be viewed from land only after a strenuous hike over several steep wind swept and fog shrouded ridges.
7/85 M.L.N.

The fork-tailed storm-petrel colony at East Amatuli Island was visited in September to determine fledging success.
9/85 M.L.N.

Over 300 glaucous-winged gulls were roosting near tidewater at St. Lazaria Island. We observed two gulls banded as chicks from Skilak Lake mixed among these birds.
7/85 M.L.N.

Don Williamson, Southeast Alaska Ecological Services (far right), Kent Hanson, a Sitka volunteer (middle) and John Trapp, Wildlife Assistance (far left) assisted in our burrow searches at St. Lazaria.
7/85 M.L.N.

6. Raptors

Bald eagles nest on many of the islands; peregrine falcon eyries have been found in the Pyes, Chiswells, Barrens, and Forrester Island. Over 50 nests have been located along the south side of the Kenai Peninsula, which includes the Pye and Chiswell islands.

8. Game Mammals

Black bears wander onto the Pye Islands, while brown bears periodically visit Delphin and Discoverer islands, Latax Rocks, and other islands near Afognak and Kodiak. Sitka deer inhabit Delphin and Discoverer islands.

9. Marine Mammals

Sea otters and harbor seals are common around the Barren Islands. Sugarloaf island in the Barrens, Outer Island, in the Pye Islands, and Forrester Island contain major sea lion rookeries. Minor haul outs are found in the Latax Rocks, Sea Otter Island, and on other islands.

H. PUBLIC USE

1. General

Most public use in this unit occurs as wildlife observation from offshore waters. There are several charter boat services that offer tours from Sitka, Seward, and Homer specifically to observe seabird populations on AMNWR lands. The M/V Stormbird operating out of Homer had over 2,000 people onboard tours to Gull Island. Interpretive talks were given on the M/V Stormbird through the summer.

I. EQUIPMENT AND FACILITIES

4. Equipment Utilization and Replacement

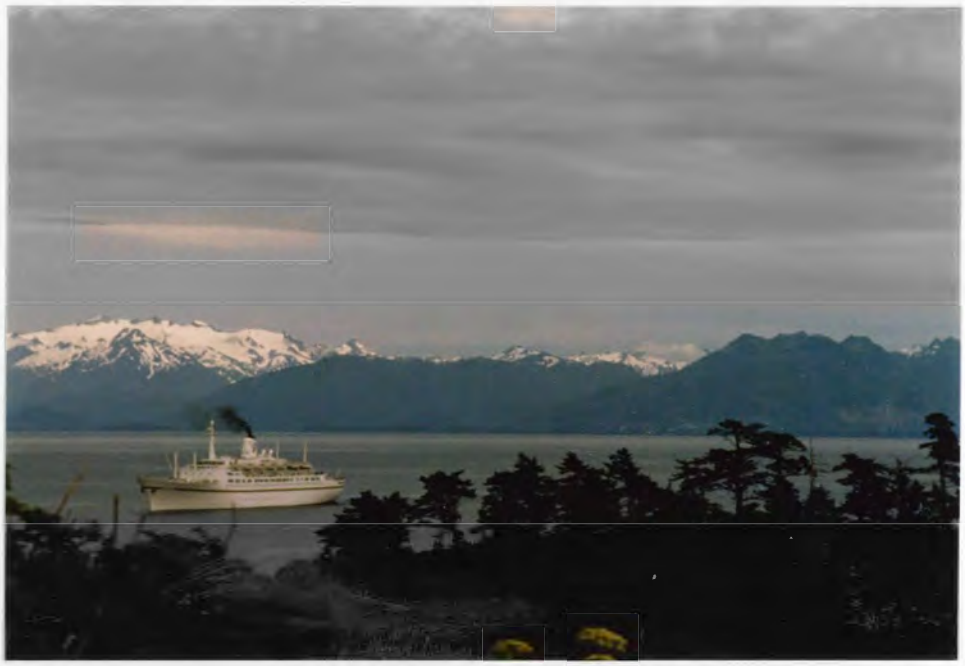
A 25-foot Boston Whaler used to survey Gull Island and Kachemak Bay had its motors replaced with two 120 horsepower Evinrude engines. The Whaler is owned by the Kenai NWR and was returned to Kenai in July where field work was conducted on sockeye salmon at Tustumena Lake.

The murre colony on the Southwest end of St. Lazaria Island is densely packed on a cliff face that lacks natural breaks that could serve as plot boundaries.

M.L.N.

Tours to Gull Island, Kachemak Bay, began early in the spring before snow had melted and continued through early fall.
5/85

M.L.N.



St. Lazaria Island near Sitka is frequently visited by local boaters, tour boats and even cruise ships.
7/85 M.L.N.

J. OTHER ITEMS

4. Credit

Sections A,B,C,D. 4, E.2-7, F. 1,2,3,12; G and H were written by WB Nishimoto. Sections D.1,E.6,8 and F.7 were written by ARM Early. BA Hagglund wrote section E.1,5. The report was edited by RM Martin and ARM Early. C/T Fellows typed the narrative.