ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Homer, Alaska

ANNUAL NARRATIVE REPORT

CALENDAR YEAR 1990

U.S. Department of Interior
Fish and Wildlife Service

NATIONAL WILDLIFE REFUGE SYSTEM

HOMER OFFICE

ALASKA MARITIME NATIONAL WILDLIFE REFUGE

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REVIEW AND APPROVALS

ALASKA MARITIME NATIONAL WILDLIFE REFUGE

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ANNUAL NARRATIVE REPORT

Calendar Year 1990

Refuge Manager — 12/31/91 Date

Deputy

Associate Manager, Refuges & Wildlife — 3/16/92 Date

Regional Office Approval — Date

INTRODUCTION

Homer Headquarters Office

Alaska Maritime National Wildlife Refuge

The 3,500,000 acre Alaska Maritime National Wildlife Refuge (Maritime Refuge) was established in 1980 by the Alaska National Interest Lands Conservation Act (Lands Act). This act added 460,000 acres 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 75 million nesting seabirds representing about 80 percent of Alaska's seabird population.

Each of the eleven refuges included in the Maritime Refuge had their own establishing authority and purposes, but the Lands Act added to 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. The Lands Act also established five distinct geographic refuge units: the Chukchi Sea Unit, the Bering Sea Unit, the Aleutian Islands Unit, the Alaska Peninsula Unit, and the Gulf of Alaska Unit (Figure 1).

The five units which comprise the Maritime Refuge have headquarters located in Homer, Alaska. Homer is situated on the south end of the Kenai Peninsula about 220 miles by road from Anchorage. There is a sub-headquarters at Adak which administers the Aleutian Islands Unit.

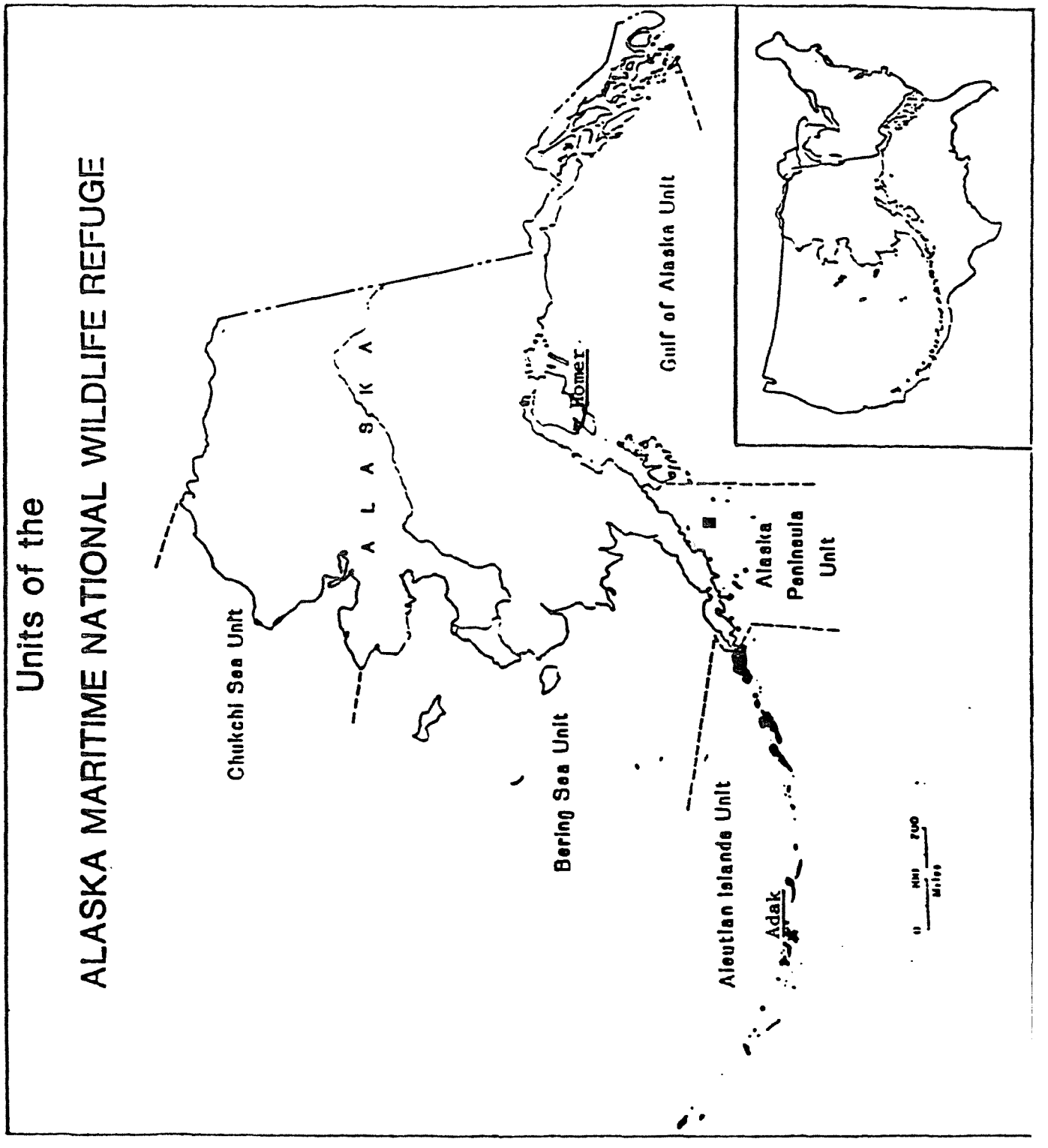
The sea is common to all refuge areas, but each unit has its own unique features. Lush rain forests dominate much of the precipitous small islands in the Gulf of Alaska Unit; there are mountains rising directly from the sea to over 9,000 feet on the volcanic and treeless Aleutian Islands Unit; and areas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

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.

Homer, Alaska is the homeport for the motor vessel Tiglax. This vessel was commissioned in 1987 and services the needs of Region 7, Alaska Maritime National Wildlife Refuge and a variety of other users. Operation of the Tiglax is administered from refuge headquarters in Homer.

Prior to 1987 the refuge relied on chartering privately owned vessels. This arrangement resulted in too many compromises in safely accomplishing our mission.

Figure 1. Location of the units of the Alaska Maritime National Wildlife Refuge



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L. INFORMATION PACKET

A. HIGHLIGHTS

- Tragic boat accident results in death of two employees (See Aleutian Islands Unit).
- A successful program launched placing a refuge naturalist on the Alaska State Ferry (See Homer Section).
- Tiglax performs rescue (See Tiglax Section).
- Special Achievement Awards (See Homer Section).
- Region 5 Administrative Officer spent a week (July) working on the refuge.
- Soviet scientist aboard the Tiglax (See Tiglax Section).
- Advance Plan for refuge visitor center and headquarters complex goes to Congress (See Homer Section).

D. PLANNING

1. Master Plan

Planning for the new refuge headquarters and visitor center began in earnest in 1990. The refuge's Comprehensive Conservation Plan approved in 1988 called for establishment of a permanent headquarters and visitor center in Homer. In the fall of 1989, Congress authorized $100,000 for development of a concept plan. The plan which was completed in May of 1990 was done in-house with a team headed up by Bruce Sherwood of Engineering. Refuge Manager (RM) Martin, Deputy Refuge Manager (DRM) Blenden and Outdoor Recreation Planner (ORP) Benson represented the refuge on the planning effort.

Two all-employee refuge meetings were held in early January as part of the planning process. The first meeting, which was also attended by the Regional Office members of the planning team, delineated refuge space and program needs for the new facility. The second meeting prioritized themes and brainstormed ideas for the visitor center. DRM Blenden and ORP Benson traveled to the Regional Office to prepare for and do an initial briefing on the headquarters complex. ORP Benson visited the staffs of Kenai Fjords National Park, Begich-Boggs Visitor Center, and the Alaska Public Lands Information Center to gain ideas on visitor center development. Benson prepared a visitor profile and an estimate of expected attendance (50,000 in 1995 and 100,000 in 2005) based

on statistics available from the state and other Kenai Peninsula visitor centers. Benson also prepared a narrative on the visitor center themes, facilities, and objectives.

The projects's citizen working group met in March to review the draft concept plan. RM Martin briefed Regional Director Stieglitz on the concept plan in late March. The plan was finalized, sent to the Washington office and then on to Congress in May.

The plan called for a refuge headquarters to consist of an office, visitor center, bunkhouse, warehouse, and shop on approximately 15 acres of land. The large visitor center, 14,000 square feet, would contain environmental education spaces including a lab, an auditorium, and about 5500 square feet of exhibit space including a focal exhibit featuring live seabirds (alcids). Cost of all facilities and land would be in the range of $20 million.

The refuge chose the controversial live bird exhibit, because research showed that live exhibits were far more effective in involving the viewer with the subject. RM Martin, ORP Benson, and regional office engineers visited the Seattle Aquarium and the Point Defiance Zoo to determine the desirability and feasibility of a live bird exhibit. An in-depth look at seabirds seemed the most appropriate focus of a visitor center for a refuge containing most of the continent's seabird nesting habitat.

At year's end, the refuge learned it had received all the money requested ($3.4 million) for the first year's activities of land purchase and design. RM Martin traveled to the Regional Office in November for the initial planning meeting for the project.

2. Management Plan

The Alaska Maritime National Wildlife Refuge Fisheries Management Plan was sent out for agency review early in 1990. The refuge is cooperating with the Kenai Fisheries Assistance Office who are taking the lead in preparation of this plan.

3. Public Participation

In December of the preceding year Benson created a citizen's working group representing all facets of the Homer community to advise the refuge on visitor center planning. The group met again in March to review the ideas the Service was presenting in the concept plan. The refuge kept in touch with the group by mail, sending them copies of the final concept plan and notifying them when Congress authorized the money for land acquisition and design.

E. ADMINISTRATION

Personnel

PERMANENT:

1. John L. Martin, Refuge Manager, GM-13, entered on duty December 21, 1981, permanent full-time.
2. Michael D. Blenden, Deputy Refuge Manager, GS-12, entered on duty February 27, 1989, permanent full-time.
3. David R. Nysewander, Supervisory Wildlife Biologist, GS-12, entered on duty September 28, 1986, permanent full-time.
4. Edgar P. Bailey, Wildlife Biologist, GS-11 entered on duty October 1, 1981, permanent full-time.
5. Michael L. Nishimoto, Wildlife Biologist, GS-11, entered on duty April 15, 1984, permanent full-time.
6. Arthur L. Sowls, Wildlife Biologist, GS-11, entered on duty September 28, 1986, permanent full-time.
7. Carol M. Hagglund, Budget Assistant, GS-7, entered on duty August 21, 1983, permanent full-time.
8. Trina B. Fellows, Refuge Clerk, GS-4, entered on duty November 28, 1983, permanent full-time.
9 Bekki J. Andrew-Miller, Clerk-Typist, GS-3, entered on duty January 5, 1990, permanent full-time.
10. Laurie (Poppy) A. Benson, Outdoor Recreation Planner, GS-9, entered on duty July 17, 1988, permanent full-time.
11. Alvin D. Bayer, Ship Operator, WG-12, entered on duty October 6, 1986, permanent full-time.
12. Kevin D. Bell, Ship Operator 1st Mate, WG-11, entered on duty July 8, 1987, permanent full-time.
13. Eric A. Nelson, Marine Machinery Mechanic, WG-10, entered on duty February 21, 1989, permanent full-time.
14. Marcia J. Macone, Cook/Deckhand, WG-8, entered on duty August 8, 1988, permanent intermittent.
15. Jerry M. Andrew-Miller, Deckhand, WG-5, entered on duty December 1, 1989, temporary full-time, re-entered on duty April 8, 1990, permanent intermittent.
16. Gregory B. Snedgen, Deckhand, WG-5, entered on duty June 1, 1989, permanent intermittent.
17. Susan D. Schulmeister, Biological Technician, GS-5, entered on duty May 22, 1989. permanent intermittent.
18. Donald E. Dragoo, Biological Technician, GS-6, entered on duty May 27, 1987, permanent intermittent.

TEMPORARY:

19. Ira S. Bailey, Relief Ship Operator, WG-11, entered on duty June 25, 1989, temporary full-time, re-entered on duty May 23, 1990, permanent intermittent.
20. Crispin H. Dippel, Wildlife Biologist, GS-9, entered on duty November 13, 1989, temporary full-time.
21. Anna Marie Bott, Cook/Deckhand, WG-8, entered on duty December 1, 1989, temporary full-time.
22. Belinda K. Bain, Biological Technician, GS-5, entered on duty April 29, 1989, temporary full-time.
23. Laura A. Fairchild, Biological Technician, GS-5, entered on duty June 12, 1989, temporary full-time, terminated October 20, 1989.
24. Ivan F. Daves, Marine Machinery Mechanic, WG-10, entered on duty March 25, 1990, permanent intermittent.
25. Colleen Baggot, Biological Technician, GS-7, entered on duty June 7, 1990, terminated July 7, 1990, temporary full-time.
26. Kurt Schmidt, Biological Technician, GS-4, entered on duty May 19, 1990, terminated August 29, 1990, temporary full-time.
27. Maureen L. deZeeuw, Park Ranger, GS-5, entered on duty June 11, 1990, temporary full-time.
28. John Jamieson, Deckhand, WG-5, entered on duty July 6, 1990, terminated August 28, 1990, temporary full-time.
29. Greg Thompson, Biological Technician, GS-5, entered on duty May 6, 1990, temporary full-time.

VOLUNTEERS:

30. Robert C. Angell, Student Conservation Association volunteer, May 13, 1990 - August 20, 1990.
31. Katherine N. Ashley, Student Conservation Association volunteer, April 1, 1990 - July 3, 1990.
32. Steven Corbin, Volunteer, April 25, 1990 - May 1990.
33. David Wimpfheimer, Student Conservation Association volunteer, June 7, 1990 - August 24, 1990.
34. Jeff Wraley, Student Conservation Association volunteer, April 23, 1990 - August 30, 1990.
35. David Boyd, Student Conservation Association volunteer, June 10, 1990 - August 23, 1990.
36. Anna Perillo, Student Conservation Association volunteer, May 4, 1990 - August 29, 1990.
37. Cameron Thomas, Student Conservation Association volunteer, May 4, 1990 - September 19, 1990.
38. Mary Schacht, Student Conservation Association volunteer, May 4, 1990 - August 21, 1990.
39. Mary Ellen Pitts, Student Conservation Association volunteer, June 11, 1990 - August 20, 1990.

Homer office personnel, (kneeling from left to right) Sowls, Dippel, Fellows, (standing from left to right) Martin, Nysewander, Hagglund, Blenden, Benson, Andrew-Miller, Bailey. MB 1990

Tiglax crew, (left to right) Bayer, Bell, Nelson. MB 1990

40. Andrea Dudley, Student Conservation Association volunteer, June 11, 1990 - August 21, 1990.
41. Christine L. Moran, Student Conservation Association volunteer, June 11, 1990 - August 29, 1990.
42. Paula White, Volunteer, July 1, 1990 - August 25, 1990.

Four of the five units of the refuge are supported by personnel located in the Homer office. Personnel for the Aleutian Islands Unit are presented in that section. The staffing pattern for the Homer office is presented in Table 1.

Table 1. Staffing Pattern, 1986 to 1990

	Permanent		Temporary	Total FTE
	Full-Time	Part-Time/ Intermittent		
FY90	13	5	11	28.00
FY89	13	3	21	25.77
FY88	13	3	4	15.20
FY87	10	0	0	10.00
FY86	7	0	0	7.00

4. Volunteer Program

The volunteer program is actually the backbone of the summer field program. We have had tremendous success with this program by utilizing Student Conservation Association volunteers and other non-Association/refuge volunteers. We pay $88 per week per student through the Student Conservation Association or $20 per day for a refuge volunteer. Transportation costs are provided for all volunteers recruited from outside the local area.

5. Funding

Alaska Maritime Refuge funding by programs for the last five fiscal years is presented in Table 2. Funding for the entire refuge is through the Homer headquarters office. Funds internally distributed to the Aleutian Islands Unit are discussed in that unit's section.

Volunteers are an important part of the refuge operation. Here Student Conservation Association volunteer Jeff Wraley fills in at the visitor center. 1990.

Table 2. Alaska Maritime Refuge Funding, FY 1986 to FY 1990

	1260	1400/ 1480/1113	1520	8610	1971	5390	1975	Totals**
FY90	1,392,300	206,000	-	26,597	12,697	55,000	-	1,801,594
FY89	1,544,000	330,000	-	15,933	60,036	-	11,438	1,961,407
FY88	1,395,600	340,000	-	17,700	-	-	69,498	1,823,023
FY87	1,154,000	346,000	-	19,000	-	-	68,201	1,587,201
FY86	882,000	476,000	1,975	26,781	-	-	-	1,389,136

**Includes 6850 funds of $2,380 for 1986 and $225 for 1988.

The Alaska Maritime National Wildlife Refuge is headquartered at 202 Pioneer Avenue in downtown Homer. A total of $59,400 (which includes utilities, snow and refuse removal) is paid for approximately 4,032 square feet of leased office space. An additional 1,400 square feet of storage space located at 509 Sterling Highway, is leased at the rate of $769 per month.

6. SAFETY

First aid and CPR training were given to field people before leaving for field camps. In addition, all employees receive survival suit training and must complete the U.S. Coast Guard Water Survival Series of video tape training. All permanent employees who operate boats must complete the U.S. Coast Guard Auxillary Small Boat Safety and Seamanship course.

See Aleutian Islands Unit Section for discussion of M/V Kittiwake Accident.

First Mate Kevin Bell demostrates proper technique during a safety meeting on immersion suits. MB 1990

All staff that potentially use boats during the year received immersion suit training. MB 1990

During 1989 and early 1990 the regular Safety Meeting schedule was suspended. Regular meetings were initiated in the spring of 1990 as follows:

Month	Topic	Presenter
April	Bear Safety Immersion Suits	Ed Bailey Kevin Bell
May	Right to Know Laws	Mike Nishimoto
June	Office Safety	Carol Hagglund
July	Seat Belts	John Martin
August	Fire Safety	Mike Blenden
September	Winter Driving	Don Dragoo
October	EPIRB's	Trina Fellows
November	Static Electricity	Art Sowls
December	Back Safety	S. Sculmeister

Following the M/V Kittiwake accident, a committee consisting of Ship Operators Bayer and Bell, Wildlife Biologists Nishimoto and Byrd, and maintenance worker Schulmeister met to review and rewrite the refuges boating safety policy. Recommendations were provided to the refuge manager and a new refuge boating policy was prepared. The group will annually review our boating procedures and policy.

Later in the year, Kevin Bell, first mate on the Tiglax, was appointed to a regional committee that reviewed Region 7's small boating policy.

8. Other

Thirty Special Use Permits were issued for activities in all refuge units except the Aleutian Islands Unit, which are prepared in the Adak office (see Aleutian Islands Unit section).

Twenty-five permits were issued for the following activities in the Gulf of Alaska Unit (number issued): oil spill related activities (9), commercial set net fishing (6), commercial guided hunts and hunter transport (4), cattle grazing (1), charter

vessel operation in refuge waters (2), mineral investigation and surficial geology (1), helicopter access (1) and operation of navigation station (1).

Special Achievement Award recipients, (left to right) Hagglund, Nelson, Fellows. 1990 JM

Four permits were issued for the following activities in the Alaska Peninsula Unit (number issued): cattle grazing (2), operation and maintenance of seismic stations (1) and mineral investigation and surface geology (1).

Two permits were issued for the following activities in the Chukchi Sea Unit (number issued): commercial guided hunts (1) and mineral investigation and surficial geology (1).

For their outstanding contribution during the Service's response to the Exxon Valdez oil spill the following employees received Special Achievement Awards:

Trina Fellows	Refuge Clerk
Carol Hagglund	Budget Assistant
Dave Nysewander	Supervisory Wildlife Biologist
Mike Nishimoto	Wildlife Biologist

The following employees received Performance Awards during the year as a result of their level 4 or 5 performance evaluations:

Becki Andrew-Miller	Clerk Typist
Kevin Bell	First Mate M/V Tiglax
Poppy Benson	Outdoor Recreation Planner
Chris Dippel	Wildlife Biologist
Marcia Macone	Cook/deckhand M/V Tiglax
John Martin	Refuge Manager
Dave Nysewander	Supervisory Wildlife Biologist
Art Sowls	Wildlife Biologist

While on detail to Region 7, Kathy McClellan, Region 5's Administrative Officer/Refuges and Wildlife, spent July 30 through August 3 at the refuge office assisting with year-end redistributions and FY 1991 budget requests. Her expertise and ideas were appreciated and well utilized. She and Refuge Manager Martin travelled to the Barren Islands to monitor oil spill clean up work on August 2.

H. PUBLIC USE

1. General

1990 was a year of expansion for visitor services at the Homer office. Visitor center use was up 74 percent, a new program "Naturalist on the Ferry" was a smash success, and the refuge received $3.4 million to buy land and design a new headquarters which would include a large visitor center. A concept plan for the new visitor center and headquarters had been prepared and submitted to Congress in May. The new visitor center will be quite large (14,000 square feet) and include environmental

education classrooms, outdoor areas, an auditorium and 5,500 square feet of exhibits including a live seabird (alcids) exhibit. (See the discussion under planning.)

2. Outdoor Classrooms - Students

April and May were busy months for environmental education activities in Homer. Homer is the marine field trip destination for schools from throughout Alaska particularly the Anchorage area. ORP Benson gave presentations on seals and sea lions for SeaWeek to eight different groups, a total of 250 students, at Paul Banks Elementary School. Benson also gave her oil spill slide show, "Tarred Feathers: Wildlife and the Exxon Valdez" to two different Anchorage school groups and all Homer 7th graders. Benson gave her slide show on the refuge to a school class from Nikiski and a group of home learning students. Tiglax First Mate Kevin Bell gave three lessons to Homer 5th graders on the natural and human history of the Aleutian Islands. Bell and DRM Blenden also gave tours of the Tiglax to 70 Homer 4th graders. Benson and Wildlife Biologist (WB) Nysewander gave presentations on the oil spill to an ornithology class from the University of Alaska, Anchorage.

Elderhostel, a college sponsored education program for senior citizens expanded again to three sessions per year. The new session was in July for RV's only. Surprisingly, it was the least well attended of the sessions. Benson gave her oil spill program to all three sessions and Park Ranger deZeeuw accompanied the July session to Seldovia on the ferry helping with sightings and identification of birds and mammals.

Benson also gave a talk on seabirds to residents of the long term care unit at South Peninsula Hospital.

6. Interpretive Exhibits/Demonstrations

The refuge continued to make due with the cramped "storefront" it uses for the visitor center. In spite of the space limitations particularly on parking and group activities, visitation grew dramatically, up 74 percent from 1989 to 6,216 visitors. Homer tourism grew at a much slower rate, so this large an increase must be due to greater visibility of the refuge in the community. A new "wildflower" meadow created by refuge volunteer Jeff Wraley was quite flashy and undoubtedly attracted more attention to the building. Student Conservation Association volunteer Mary Ellen Pitts returned for a second year to lend her considerable expertise to the smooth running of the visitor center.

Earth Day 1990 was a big deal for Homer and a big deal for the refuge as well. The refuge celebrated with concurrent open houses on the M/V Tiglax and at refuge headquarters. All staff worked on some aspect of the program, guiding the 265 visitors

through the boat, painting signs and seabirds on the refuge windows, or answering questions to the 48 people who visited the office. Benson gave a slide program on the refuge on the hour and movies were shown on the half hour. Benson also took the refuge traveling exhibit to the Earth Day Ecofair held in the high school commons. About 70 people stopped by the booth.

Benson also took the traveling exhibit to "Rigarama", a commercial fishing equipment show held in Soldotna. Response was very positive from a small crowd of about 2,000. The refuge hopes to reach commercial fishers, a very significant refuge user group, at more and larger fishing shows in the future.

7. Other Interpretive Programs

In June, the refuge put the first Fish and Wildlife Service naturalist on a state ferry. ORP Benson worked out a cooperative agreement with the State Marine Highway System to put a naturalist on the ferry under the Challenge Grant program. The refuge supplied a trained naturalist, Park Ranger Maureen deZeeuw, and the ferry supplied transportation, food, storage, and a stateroom.

DeZeeuw worked on the Homer to Kodiak weekly trip and the once a month Homer to Dutch Harbor trip. These ferry routes pass islands and waters of the Alaska Maritime Refuge and four other refuges: Kodiak, Izembek, Alaska Peninsula, and Becharof. Nearly all the scenery viewed from the ferry is part of a refuge, and the ferry calls in three ports which are home to refuge headquarters. DeZeeuw was trained by both the Alaska Maritime and Kodiak Refuge staffs so she could adequately represent both refuges. Other refuges contributed information and brochures for use on the ferry.

DeZeeuw did programs on wildlife topics, ran a lending library of wildlife oriented materials, showed videos and slides, and helped with wildlife spotting and identification. The ferry offers wonderful opportunities for observing marine wildlife including uncommon species such as whiskered auklets and fin whales. The audience was composed of mainly sophisticated retired travelers enjoying a free (to over 65) ride and local people from the small towns of the Alaska Peninsula. About 6,000 people ride the ferry per year and about 25 to 35 would attend every program.

The ferry program was a huge success for the refuge. It gave us access to our hard to reach local audience, increased the visibility of the refuge in the region and increased watchable wildlife opportunities in the only feasible setting for a marine refuge. Both travelers and the ferry system were very pleased with our program. Benson sold the Service on the program in two enthusiastic presentations, one to the Regional Director's staff meeting and the other to the Southern Refuges' Project Leaders

meeting.

Supervisory biologist Dave Nysewander bravely volunteered as naturalist on a fund-raising trip to the Barren Islands for the Center for Alaskan Coastal Studies in September. High seas forced the boat to turn back but the small group had a reasonably good time and Nysewander had the opportunity to identify some birds for the group.

The refuge brochure was finally reprinted, all 14,000 copies.

Demand for Exxon Valdez slides continued into 1990. Benson's slide program, "Tarred Feathers: Wildlife and the Exxon Valdez", was put into video format by the Kodiak Refuge. A copy of the slide program was given to a Minnesota school and a loaner copy was used by a California college, by Refuge Volunteer Mary Ellen Pitts in St. Louis schools, and by Leslie Kerr of the Regional Office in a presentation to her landscape architecture professional association. Benson furnished slides from the refuge's oil collection to law enforcement in Anchorage for preparation for the Exxon trial, to an anthropologist from Brandeis writing a book on the human impact, and the Homer Rotary Club to be shown on their trip to Africa.

11. Wildlife Observation

Wildlife watching opportunities increased dramatically in the Homer area as boats were no longer monopolized by oil spill clean-up work and "spillionaires" were able to buy bigger and better boats. Several new boats came on line in both Homer and Seward. No numbers are available for Homer marine wildlife watching, but Seward use increased to 37,000 visits to the Chiswell Island unit of the refuge. Unlike lower 48 bird viewing areas, boats are allowed to approach as close to the rocks as possible, often within 10 feet, unless there are sea lions present. The birds do not seem to come off the nest, but more work should probably be done to study more subtle impacts.

Recognizing that charter boat operators do most of the marine wildlife interpretation, the refuge and Kenai Fjords National Park held a half day session for 22 Seward charter operators. Benson gave two talks to the group, one a slide talk on seabird interpretation and a talk on sea lion population declines and the new sea lion regulations. This was the first meaningful contact between the refuge and some of the operators. Feedback from the operators was very enthusiastic, and more sessions will be held in the future.

Benson prepared an information sheet on marine wildlife charters in the Homer area to help tourists get out on the bay.

The "Naturalist on the Ferry" program improved the wildlife

viewing opportunities for the 6,000 people who take the state ferry to Dutch Harbor and Kodiak. Park Ranger deZeeuw used the microphone to announce bird and mammal sightings and helped individuals spot and identify wildlife while "roving" on deck. (See the discussion under 7. Other Interpretive Programs.)

17. Law Enforcement

Benson and Blenden attended the law enforcement refresher course at Marana, Arizona in March. Both qualified in shooting both at Marana and in Anchorage in September at the Rabbit Creek Rifle Range.

18. Cooperating Associations

This was the second year of operation for the Homer branch of the Alaska Natural History Association. In spite of a 74 percent increase in visitors and a 50 percent increase in products offered, sales dropped 6 percent to $6684. The per customer dollar take fell from about $2.00 in 1989 to $1.10 in 1990. Sales of books actually increased slightly with the big drop coming in videos, posters, and mobiles. Since no changes were made in the display area and the personnel involved were the same, the only explanation can be the extraordinary sales generated by the oil spill in 1989. Numerous oil spill workers, Service and non-Service, with lots of money to spend bought souvenirs to take back home. The branch created a new product, M/V Tiglax hats, which were a tremendous success, particularly with the military and refuge staff. The hats were sold on the boat and in Homer and wholesaled to the Adak office.

20. Subsistence

1990 was a year of upheaval for wildlife management on federal lands in Alaska. The federal government took over wildlife management on federal lands because the state law on subsistence was no longer consistent with federal law. This had less impact on this refuge than any other because the Maritime has few game animals, and very little sport or subsistence hunting and fishing. However, our noninvolvement did not spare us from the only known subsistence demonstration in the state. One Homer resident picketed the office for a day in August proclaiming "Feds go home. No subsistence discrimination". The Alaska Lands Act specifies that local rural residents will be given subsistence preference on federal lands

I. EQUIPMENT AND FACILITIES

4. Equipment Utilization and Replacement

See section "M/V Tiglax."

During the second year of damage assessment studies following the Exxon Valdez oil spill, extensive use was made of the M/V Surfbird. This 65-foot T-Boat is normally stationed in Juneau and used by Migratory Bird Management's Raptor Management Office. Also used in the study was M/V Sandlance, a 25-foot Boston Whaler used, to date, only on oil spill work.

Preparation for field operations this year were plagued with continual discoveries of equipment misplaced or damaged during the response period to the Exxon Valdez oil spill. The problem was compounded by the difficulty inherent in maintaining organization in our cramped warehouse spaces which are four miles apart. Some semblance of order returned to the warehouse by the end of the year.

Due to our office landlord's financial problems, he was unable to construct much-needed additions of office and warehouse space at our current location on Pioneer Avenue. To keep us at bay while he reorganizes his finances, he converted the dance floor of a bar he owns four miles east of town into secure storage for our use. Although he space offers some relief, it is no substitute for the additional construction planned. We would like to think construction will start in the near future, but our landlord's track record prevents such optimism.

J. OTHER ITEMS

3. Items of Interest

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, the Alaska Natural History Association, on the Board of Directors for the Kachemak Bay Ski Club, and a member of the Homer Society of Natural History. Blenden is a member of the Kachemak Land Heritage Trust. Nysewander, Bailey, Nishimoto, Sowls, Hagglund and Fellows are members of the Kachemak Bay Conservation Society and Homer Society of Natural History. Bailey is a Board Member of the Kachemak Bay Conservation Society and serves on the city's Hazardous Wastes Task Force.

4. Credits

The Homer office section was written and edited by Hagglund, Blenden, Martin, and Benson and typed and edited by Andrew-Miller.

K. FEEDBACK

M/V TIGLAX OPERATIONS REPORT

by

John L. Martin, Refuge Manager

Alvin D. Bayer, Captain, M/V Tiglax

January 23, 1991

U.S. Fish and Wildlife Service
Alaska Maritime National Wildlife Refuge
202 Pioneer Avenue
Homer, Alaska 99603

M/V Tiglax off of Carlisle Island, 1990

CONTENTS

INTRODUCTION

The M/V Tiglax was commissioned on July 2, 1987 in Homer, Alaska. The keynote speaker at the ceremony was Senator Ted Stevens, and Kathryn Stevens christened the vessel. The 120-foot vessel was designed by Jenson Maritime Consultants of Seattle, Washington, and built by Moss Point Marine Inc. of Escatawpa, Mississippi. This report describes the 1990 operations of the Tiglax. The Refuge Manager, Alaska Maritime National Wildlife Refuge is responsible for the operation and management of the Tiglax and for the coordination of the U.S. Fish and Wildlife Service's (Service) science program utilizing the vessel. The vessel provides essential support to all aspects of management to this refuge and enables the Service to collect the information needed to monitor the condition of various marine resources, especially marine birds. It is used to transport personnel, equipment, and supplies from remote work sites. Scientists use the vessel to monitor seabird colonies, survey island habitats, work to reestablish endangered species, identify archaeological and historical resources, monitor human impacts on wildlife habitats and populations, monitor commercial activities in refuge waters, assess populations and distribution of forage fishes upon which seabirds feed, and respond to oil spills and other pollution incidents. Tiglax provides a seagoing research platform used by refuge personnel and scientists from the Alaska Office of Fish and Wildlife Research, other research offices and other agencies.

The Tiglax crew is:

Captain.....Alvin D. Bayer, PFT

First Mate.....Kevin D. Bell, PFT

Marine Machinery Mechanic (Engineer)..Eric A. Nelson, PFT

Cook/Deckhand.....Marcia J. Macone, PI

Deckhand.....Jerry M. Andrew-Miller, PI

Deckhand.....Gregory B. Snedgen, PI

Relief Captain/First Mate.....Ira S. Bailey, PI

Relief Cook/Deckhand.....VACANT, PI

Relief Engineer.....Ivan F. Daves, PI

Relief Deckhand.....John Jamieson, PI

FY 1990

Nice white sand beaches are not always available for Aleutian "beach" landings.

PROJECTS FY 1990

The Tiglax spent almost 6 months at sea and travelled over 17,000 nautical miles in supporting Service projects.

October 1-13
Supported oiled seabird assessment around Kodiak Island, Alaska Peninsula and Shelikof Straits.

October 31 - November 18
Supported sea otter radio tagging and research program in Prince William Sound. Also supported a 27-ft. Boston Whaler and its operations and crew.

December 3-14
Supported sea otter radio tagging and research program in Prince William Sound. Also supported a 27-ft. Boston Whaler and its operations and crew.

May 13-16
Support Semidi oil assessment.

May 17
Drop off research field camp at Big Koniuji. (We supplied boats, motors, Munson boat, portable hydro-acoustics, fuel, survival gear, etc. to make this camp possible.)

May 18
Delivered a load of steel sign posts to Izembek National Wildlife Refuge at Cold Bay.

May 19-22
Support fox eradication in the Islands of the Four Mountains. We believe we removed all foxes from Carlisle Island. Follow up work will occur in 1991.

May 23 - June 1
Load field camps at Adak; deliver, off load and assist in setting up at Buldir, Agattu and Alaid-Nizki. This week supported goose counts, seabird surveys, and the seabird/drift net study.

June 2-3
Collect seabirds at Buldir for plastics studies.

June 4-13
Supported endangered Aleutian Canada Goose surveys on Chagulak and Amukta islands. (A joint effort with the

Alaska Department of Fish and Game, Alaska Maritime National Wildlife Refuge and Endangered Species.)

June 13-18
Supported biological fox control study on Adugak and Uliaga islands; removed field camp.

June 19-30
Supported Aleutian Canada Goose surveys and habitat studies at Davidof, Khvostof and Little Kiska islands; delivered field camp to Little Kiska; picked up and dropped off various personnel, resupplied Buldir and two camps at Agattu Island. Supported Defenders of Wildlife plastics pollution studies along shorelines; had "Author" Peter Eiseman of Batam Books on board. Bob "Sea Otter" Jones, former Refuge Manager of Aleutian Islands Unit, was aboard and contributed greatly with his knowledge of habitat, weather and his vast experience in the Aleutians.

July 1-5
Supported puffin studies at Boot Bay and Aiktak; dropped off a field camp at Aiktak; collected seabirds for "plastics study".

July 6-19
Supported fox eradication in the Shumagin Islands; conducted hydro-acoustics surveys around Semidi Islands; supported seabird studies at Semidis; resupplied Semidi Islands camp, picked up research field camp at Big Koniuji. During this voyage four Soviet scientists and one Armenian translator were aboard. Future joint US/USSR seabird work was outlined during this trip.

July 20 - August 16
Picked up Aiktak camp; supported goose surveys; supported goose translocation and picked up Buldir field camp. Picked up and delivered L. Johnson and crew to island to conduct archaeological work.

August 17-22
Picked up Alaid-Nizki, Island Cove, Aga Cove and Little Kiska field camps; transported and delivered field camps and crews to Adak and off loaded.

August 23-28
Loaded Munson boat at Sand Point; dropped off L. Johnson's boat and motors at Squaw Harbor; picked up oil assessment field camp at Semidis and transported to Homer.

August 29 - September 3 (Homer)
Off loaded field camps; took fuel, food and supplies; prepared for BIA trip; loaded BIA gear and crew.

September 4-28
Supported BIA archeological studies in the Shumagin and Pavlof islands and Alaska Peninsula; delivered BIA to Homer.

September 28
Off loaded and stored research field camp at Homer; refueled and secured the vessel.

FISCAL 1990 IIGLAX SCHEDULE

DATE	LOCATION	ACTIVITY	PERSONNEL (*Denotes Leader)
OCT 01	AT Sea	Conducting oil/seabird assessment	Sanger* and 4 others
OCT 13	AR Homer	Off load personnel from assessment work	
		NOTE: OIL ASSESSMENT PAID FOR SEABIRD WORK (13 DAYS)	
OCT 14-30	AT Homer	Prepare for otter research trip in Prince William Sound	
OCT 31	LV Homer	En route Prince William Sound	
NOV 02-16	AT Prince William Sound	Conducting sea otter research	Monet* and 4 others
NOV 16	LV Prince William Sound	En route Homer	
NOV 18	AR Homer		
		NOTE: OIL PAID FOR PRINCE WILLIAM SOUND TRIP (19 DAYS)	
NOV 19-DEC 02	AT Homer	Maintenance and preparation for next trip	
DEC 03	LV Homer	En route Prince William Sound	
DEC 04-12	AT Prince William Sound	Conducting sea otter research	Monet* and 4 others
DEC 13	LV Prince William Sound	En route Homer	
DEC 14	AR Homer		
		NOTE: OIL PAID FOR OTTER WORK IN PRINCE WILLIAM SOUND (12 DAYS)	

DEC 15-MAY 01	AT Homer	Tied up for maintenance	
MAY 02-03	AT Homer	Load field gear	
May 13	LV Homer	En route Semidis	Nysewander*, Dippel, Dragoo, Bain, Piatt and 4 others

NOTE: A SMITHSONIAN WRITER AND PHOTOGRAPHER MAY BE ABOARD SEVERAL LEGS DURING THE TRIP
AL MANVILLE MAY BE ABOARD ONE OF THE LEGS
DATES WILL BE CONFIRMED LATER

May 14	AR Semidis	Off load	Nysewander*, Dippel, Dragoo, Bain, Piatt and 4 others
MAY 15	AT Semidis	Support Semidis oil assessment work	Nysewander*, Dippel, Dragoo, Bain, Piatt and 4 others

NOTE: OIL PAYS FOR SEMIDI TRIP AND SUPPORT (3 DAYS)

MAY 16	LV Semidis	En route Shumagins	Piatt* and 4 others
MAY 17	AR Shumagins	Off load gear and passengers	Piatt* and 4 others
	LV Shumagins	En route Cold Bay	
MAY 18	AR Cold Bay	Off load materials	
	LV Cold Bay	En route Dutch Harbor	
MAY 19	AR Dutch Harbor	Pick up Bailey and 3 others	
	LV Dutch Harbor	En route Uliaga, Adugak, Carlisle	Bailey* and 3 others

NOTE: DURING THIS TIME PERIOD (MAY 20-21) A QUICK CHECK OF ULIAGA AND ADUGAK MAY BE MADE

MAY 20	AR Carlisle	Start off loading	Bailey* and 2 others
MAY 21	AT Carlisle	Support fox eradication and off loading. Bailey and 3 others remain at Carlisle	Bailey* and 2 others
MAY 22	LV Carlisle	En route Adak	
MAY 24	AR Adak		
MAY 25	AT Adak	Load gear	

MAY 26	LV Adak	En route Buldir	Klett,Byrd, Schulmeister, and 10 others
MAY 28	AR Buldir	Off load camp	Klett*,Byrd, Schulmeister, and 10 others
	LV Buldir	En route Agattu	Klett* and 6 others
May 29	AR Agattu	Off load seabird camps at Aga Cove and Island Cove	Klett* and 6 others
MAY 30	LV Agattu	En route Alaid/Nizki	Klett* and 2 others
JUN 01	AR Alaid/Nizki	Unload camp and crew	Klett* and 2 others
	LV Alaid/Nizki	En route Buldir	Klett*
JUN 02	AR Buldir	Support seabird collections and load Byrd and Schulmeister.	Klett*, Byrd, and Schulmeister
JUN 03	LV Buldir	En route Adak	Klett*, Byrd, and Schulmeister
JUN 04	AR Adak		
JUN 05-06	AT Adak	Resupply	
JUN 07	LV Adak	En route Chagulak	Boylan*, Byrd, Anderson, Rothe, and 2 others
JUN 08	AR Chagulak		Boylan*, Byrd, Anderson, Rothe, and 2 others
JUN 09-14	AT Chagulak	Support goose survey	Boylan*, Byrd, Anderson, Rothe, and 2 others
JUN 15	LV Chagulak	En route Carlisle	Boylan*, Byrd, Anderson, Rothe, and 2 others
JUN 16	AR Carlisle	Pick up Bailey's camp and crew	Boylan*, Byrd, Anderson, Rothe, and 2 others
	LV Carlisle	En route Adak	Boylan*, Byrd, Anderson, Rothe, Bailey, O'Neal, Strahle, and 2 others
Jun 18	AR Adak	Resupply	

NOTE: DAVEES COMES ON BOARD FOR ORIENTATION TO VESSEL

JUN 19	LV Adak	En route Crater Bay	Byrd*, Knechtel and 1 other

JUN 21	AR Crater Bay	Support work on Davidof and Kvostof	Byrd*, Knechtel and 1 other
JUN 22	LV Crater Bay	En route Little Kiska	Byrd*, Knechtel and 1 other
JUN 23	AR Little Kiska	Begin goose survey	Byrd*, Knechtel and 1 other
JUN 24	LV Little Kiska	En route Alaid/Nizki	Byrd*, Knechtel and 1 other
JUN 25	AR Buldir	Resupply	Byrd*, Knechtel and 1 other
	LV Buldir	En route Alaid/Nizki	Byrd*, Knechtel and 1 other
JUN 26	AR Alaid/Nizki	Pick up camp and personnel.	Byrd*, Knechtel and 1 other
	LV Alaid/Nizki	En route Shemya	Byrd*, Knechtel and 3 others
	AR Shemya	REFUEL	

NOTE: MAY NOT HAVE TO PICK UP THE CAMP BUT MAKE A PERSONNEL EXCHANGE INSTEAD
DECISION WILL BE MADE BY JUN 18

	LV Shemya	En route Agattu	Bio Tech*, Knechtel, and 1 other
JUN 27	AR Agattu	Resupply camps and collect birds	Bio Tech*, Knechtel, and 1 other
JUN 28	LV Agattu	En route Adak	Bio Tech*, Knechtel, and 1 other
JUN 30	AR Adak	Off load	
JUL 01	AT Adak	Transport fisheries biologist to Boot Bay for stream investigations	Sonevil* and 1 other
JUL 02	AT Adak	Resupply	
	LV Adak	En route	Bio tech and Knechtel
JUL 05	AR Aiktak	Off load camp and personnel	
	LV Aiktak	En route Dutch Harbor	
JUL 06	AR Dutch Harbor	Pick up Hatch, 4 Russians, interpreter, Wohl, Irons, Bailey, and 2 others. REFUEL and resupply	

NOTE: BELL, NELSON, AND MILLER OFF. BAILEY AND RELIEF DECKHAND ON

JUL 06	LV Dutch Harbor	En route Poperechnoi	Hatch*, 4 Russians, interpreter, Wohl,

			Irons, Bailey, and 2 others
JUL 07	AR Poperechnoi	Fox eradication work	Hatch*, 4 Russians, interpreter, Wohl, Irons, Bailey, and 2 others
JUL 08-09	AT Poperechnoi	Support fox work	Hatch*, 4 Russians, interpreter, Wohl, Irons, Bailey, and 2 others
JUL 10	LV Poperechnoi	En route Bird Island	Hatch*, 4 Russians, interpreter, Wohl, Irons, Bailey, and 2 others
JUL 10	AR Bird Island	Conduct fox work and count murres	Hatch*, 4 Russians, interpreter, Wohl, Irons, Bailey, and 2 others
JUL 11	LV Bird Island	En route Big Koniuji	Hatch*, 4 Russians, interpreter, Wohl, Irons, Bailey, and 2 others
	AR Big Koniuji	Drop off Bailey and 2 others and pick up Piatt and 3 others	Hatch*, 4 Russians, interpreter, Wohl, Irons, Bailey, and 2 others
JUL 12-17	AT Shumagins and Semidis	Seabird/hydroacoustic surveys in Shumagin and Semidi areas; resupply Semidi camp.	Hatch*,Piatt, 4 Russians, interpreter, Wohl, Irons, and 3 others
		NOTE: OIL PAYS FOR FOUR DAYS OF SEMIDI TRIP	
JUL 17	LV Semidis	En route Big Koniuji: Pick up Bailey and 2 others	Hatch*,Piatt, 4 Russians, interpreter, Wohl, Irons, and 3 others. Bailey and 2 others
JUL 18	AR Big Koniuji	Drop off Piatt and 3 others	Hatch*,Piatt, 4 Russians, interpreter, Wohl, Irons, Bailey, and 5 others
	LV Big Koniuji	En Route Sand Point	Hatch*,4 Russians, interpreter, Wohl, Irons, Bailey, and 2 others
JUL 19	AR Sand Point	All passengers disembark	
		NOTE: ANGELL OFF	
	LV Sand Point	En route Aiktat	
JUL 21	AR Aiktak	Pick up camp and 2 people	

	LV Aiktak	En route Adak	Bio tech* amd Knechtel
JUL 24	AR Adak	Off load, resupply, load	
JUL 25-26	AT Adak	Load supplies and REFUEL	

NOTE: ON THE 27 BELL, NELSON, AND MILLER RETURN. BAYER, MACONE, DAVIES AND SNEDGEN OFF
BAILEY AND BOTT LN

JUL 27	LV Adak	En route Chagulak and/or Buldir (if geese are late nesting, a trip will be made to Chagulak to band geese for several days prior to Buldir translocation)	Boylan*, Klett, Byrd, Lewis, Bio Tech, Knechtel, Anderson, 3 others, and DOBs
JUL 30-AUG 17	AT Western Aleutians	Support Goose trap and transplant	Various personnel
AUG 17	LV Buldir	En route Shemya	10 people
AUG 18	AR Shemya	Drop off 6 people and depart immediately for Alaid/Nizki	4 people

NOTE: BAILEY, BOTT, AND DECKHAND OFF
BAYER, MACONE, AND SNEDGED ON

	LV Shemya	En route Alaid/Nizki	4 people
	AR Alaid/Nizki	Pick up camp and 2 people	4 people
	LV Alaid/Nizki	En route Agattu	6 people
AUG 19	AR Agattu	Pick up camps and personnel	6 people
	LV Agattu	En route Little Kiska	10 people
AUG 20	AR Little Kiska	Pick up camp and personnel	10 people
	LV Litle Kiska	En route Adak	12 people
AUG 22	AR Adak	Passengers off	
AUG 23	AT Adak	Off load gear	
AUG 24	LV Adak	En route Semidis	

AUG 28	AR Semidis	Pick up camp and 4 people	
AUG 29	LV Semidis	En route Homer	Nysewander*, Dippel, and 2 others

NOTE: OIL PAYS FOR SEMIDI PICK UP (2 DAYS)

AUG 30	AR Homer	Passengers and crew off!	
SEP 03	AT Homer	Off load	
SEP 04	AT Homer	REFUEL Load BIA gear and personnel	Slaughter* and 7 others
	LV Homer	En route Shumagins	Slaughter* and 7 others
SEP 06	AR Shumagins	Support BIA work	Slaughter* and 7 others
SEP 06-23	AT Shumagins	BIA work	Slaughter* and 7 others
SEP 24	LV Shumagins	En route Homer	Slaughter* and 7 others
SEP 26	AR Homer		Slaughter* and 7 others
SEP 27	AT Homer	Off load BIA	
SEP 28	AT Homer	REFUEL	

NOTE: BIA PAYS FOR SHUMAGIN TRIP (22 DAYS)

VESSEL ACCOMPLISHMENTS FY 1990

Following are some accomplishments which do not show up in schedules and work advices. The accomplishments generally increased the SAFETY margin and added to efficiency of supporting field groups:

1. Added two professional deckhands and relief crew for all positions. The addition of professional deckhands will greatly increase SAFETY margin in case of an emergency.

2. Kevin Bell presented a program and gave tours of the Tiglax to the Homer 4th grade class.

3. Greg Snedgen became a U.S. Fish and Wildlife Service scuba diver.

4. Held open house for the public on Earth Day; had 280 visitors.

5. Implemented a viable and much needed Maintenance Management System for the Tiglax.

6. Increased vessel's fuel economy due to a change in propeller design.

7. Increased cargo handling system by redesigning cargo nets.

8. Increased SAFETY when transporting and handling gasoline,etc. by constructing portable fuel can boxes.

9. Constructed fresh produce box for field camp produce.

10. Designed a wire line counter which proved to be very effective on vertical plankton tows.

11. Discovered unknown puffin colony on islets near Attu Island.

12. Made five positive I.D.'s on immature short-tailed Albatross in the Aleutians.

13. Swept with sonar, sounded and charted previously uncharted coastal waters and bays at Chagulak Island, Amukta Island, Nagai Island, Bird Island, Simeonof Island, Semidi Islands, Little Koniuji Island, Big Koniuji Island, Castle Rock, Spectacle Island, Sutwik Island, Mitrofania Island, Ugaiushak Island, Chiginagak Bay and Agripina Bay.

14. First Mate Bell designed a Tiglax cap to be sold through the Alaska Natural History Association. These are sold from the Homer and Adak outlets. First Mate Bell also sells them (as a branch of the Homer office) from the boat. These caps are

very popular on the military bases. We hope to sell enough caps to develop a new brochure for the Tiglax.

15. The Tiglax and the refuge loaned Research the following items:
    A. Munson Boat
    B. Three outboard motors
    C. One 15-foot inflatable skiff
    D. One 10-foot inflatable skiff
    E. Mustang work suits
    F. Survival suits
    G. EPIRB
    H. Biosonics portable unit and V-fin
    I. Survival kit
    J. Miscellaneous gear (paddles, anchors, line, charts, etc.)

    The above equipment was used by Research in their Shumagin Island field camps.

16. The following was loaned by the Tiglax and the refuge to Archaeologist Lucy Johnson:
    1. Weatherport (only got the door back, the rest was blown over a cliff)
    2. HF radio, battery, and antenna
    3. Generator
    4. Kerosene heater
    5. Stove
    6. Funnel
    7. Line
    8. Sleeping bags
    9. Utensils
    10. Miscellaneous camping items

    The Tiglax made an unscheduled stop to drop Dr. Johnson and her team off to study an archaeological site discovered by refuge biologists.

Two other items are of special note. The Tiglax rescued 2 fishermen from the shores of Kagalaska Straight and returned them and their swamped boat and skiff to Adak.

In September the Tiglax towed a sailboat to SAFETY. The sailboat had lost its engine and its sails had blown out. It was drifting into rocks. The Tiglax overheard a conversation between the crippled boat and a Coast Guard C-130. The Tiglax responded to the call for help and set out in 30-foot seas to render assistance. After finding the distressed vessel, the Tiglax connected a tow line by line gun. In addition, she provided a survival suit to the sailboat (they only had one suit). The Tiglax then towed the sailboat to Sand Point. Two letters concerning this issue follow.

U.S. Department of Transportation
United States Coast Guard

Commander
Seventeenth Coast
Guard District

MAILING ADDRESS:
P. O. Box 3-5000
Juneau, AK 99802
Staff Symbol (osr)
(907) 586-7351

OCT -2 1990

10/10

DRL
ARW

U.S. Fish and Wildlife Service
Attn: Walter Stiegliz
Regional Director
1011 E. Tudor Rd.
Anchorage, AK 99503

Dear Mr. Stiegliz:

On September 15, 1990 the M/V TIGLAX assisted the distressed sailing vessel ROBRIAN in gale force winds near Sand Point, Alaska. I commend the actions taken by the captain and crew of M/V TIGLAX. TIGLAX voluntarily departed from safe harbor to assist ROBRIAN and did not turn back despite seas up to 30 feet. By safely towing ROBRIAN to port, TIGLAX displayed outstanding seamanship and courage. The heroic actions of the captain and crew are directly responsible for saving two lives aboard the S/V ROBRIAN.

Please pass on my thanks to the captain and crew of TIGLAX for their brave efforts.

Sincerely,

D. E. CIANCAGLINI
Rear Admiral, U.S. Coast Guard
Commander, Seventeenth Coast Guard District

NOV 2 6 1990

UNITED STATES GOVERNMENT

memorandum

Date: November 7, 1990

From: Charles F. Bunch, Director
Bureau of Indian Affairs ANCSA Office

Subject: Letter of Appreciation

To: Walter O. Stieglitz, Regional Director
U.S. Fish and Wildlife Service

I recently returned from the Shumagin Islands after completing field investigations of 14(h)(1) cemetery sites and historical places in that area. In order to complete the Bureau's portion of these investigations we utilized the services of the U.S. Fish and Wildlife Service (USF&WS) vessel, the M/V Tiglax for transportation, berthing and sustenance.

I would like to take this opportunity to express my appreciation to Captain Alvin Bayer and the entire crew of the Tiglax for the high degree of professionalism which they constantly displayed. I was impressed with the expertise of the crew and the courteous demeanor exhibited throughout the entire trip.

Although the conditions in the Aleutians are sometimes hostile and subject to some degree of danger I felt the crew of the Tiglax always had the safety of my staff as their highest priority. It is quite reassuring to go to work on a daily basis knowing that one can rely on the proficiency exhibited by the entire Tiglax crew.

This proficiency was exhibited on more than one instance but the occasion that I wish brought to your attention occurred during one of the more severe storms when Captain Bayer volunteered to rescue a sailboat that was floundering off the coast of Nagai Island. The entire episode, from initially locating the small vessel in a vast area, to rigging a towline, to bringing the vessel safely to port was done with adeptness and proficiency. The timely actions of the Tiglax crew averted this potential disaster.

The crew of the Tiglax are to be commended as their actions reflect favorably on USF&WS and the entire Department of the Interior.

If I have one complaint concerning my stay on the Tiglax it would be that I lacked the will power to refuse additional helpings of the excellent food prepared by the ship's cook.

Again, please relay my sincere appreciation to Captain Bayer and his crew. I look forward to working with them in the future.

Charles F. Bunch

MAINTENANCE FY 1990

The following maintenance and major repairs were performed aboard the M/V Tiglax in FY 1990:

1. Performed a P.A.R. test on both Main engines (similar to a dyno test).
2. Replaced zincs on keel coolers.
3. Had diver inspect props for damage.
4. Replaced six hydraulic hoses on crane.
5. Replaced water tight deck penetrations on forward hydraulics.
6. Moved vent for centerline fresh water tanks to main deck.
7. Replaced condenser water maker with a reverse osmosis unit.
8. Moved voice operated phone from engine room to aft stores area.
9. Welded up leak in freshwater stand pipe.
10. Replaced black water check valve with stainless unit.
11. Found and corrected alarm sensor mounting problems.
12. Rewired Marine Sanitation Device.
13. Replaced vane switch in crew quarters ventilation blower.
14. Repaired slow start on aft hydraulic electric motor.
15. Wired galley stove fire extinguisher to the galley stove ON/OFF switch and inter-tied to vent blower.
16. Repaired galley deep fat fryer.
17. Replaced microwave oven.
18. Repaired door and condenser heaters on all three walk in freezers.
19. Repaired galley stove (oven).

20. Repaired two clothes washers and one clothes dryer.

21. Repaired cassette tape deck.

22. Replaced piping for shaft cooling pump.

23. Found and repaired source of the short in the foam AFFF system.

24. Repaired crew quarters ventilation fan.

25. Repaired numerous ship's hot water heating fans.

26. Repaired three emergency battle lanterns.

27. Repaired warped doors on bridge.

28. Repaired hydraulic control spool valves on forward crane.

29. Repaired Belfort anemometer.

30. Replaced wire rope on both cranes.

31. Replaced net railing supports on helo deck.

32. Replaced packing on both main engine cooling pumps.

33. Pumped out and cleaned chain locker.

34. Repaired exhaust leaks in auxiliary engine exhaust tubing.

35. Replaced crown pin and split links in anchor.

36. Repaired fuel oil centrifuge.

37. Performed scheduled oil, grease, water, and coolant changes on two cranes, two main engines, two auxiliary engines, one oily water separator, one MSD, one fuel oil centrifuge, two air compressors, two refrigeration compressors and a ship's boiler.

38. Performed constant and unceasing repairs to ten outboard engines.

39. Performed maintenance and repairs to a very wide variety of equipment from field radios to 12 volt batteries to various pumps, etc.

40. Repaired five inflatable boats.

41. Repaired seven float suits and three survival suits.

42. Repaired deck coverings, drawers, trim, door latches, windows, tools, oars, bilge pumps, deck drains, mooring lines, heaving lines, etc.

43. Had all fire fighting systems inspected and replaced three fire extinguishers.

44. Had U.S. Coast Guard safety inspection.

45. Oiled all teak trim and painted all main deck exterior areas.

In addition, a reverse osmosis water maker was installed. This season it made over 40,000 gallons of fresh water. Previously, the Tiglax had to use waste heat water makers. Their inefficiency would cause water rationing. They only worked when underway. Because of the amount of time spent at anchor, the boat could not keep up with water needs. Sometimes the boat would run at night just to make water. At other times the Tiglax has had to make unscheduled stops at Amchitka to get water. The reverse osmosis water maker solved the problems. Water rationing is not needed now.

PROBLEMS FY 1990

During the 1990 season field work was not interrupted by mechanical problems. This is in contrast to the 1989 season when 3 projects had to be dropped because of major mechanical and electronic breakdowns. However, vessel operation did present challenges in 1990.

In contrast to 1988, the refuge had problems with financial tracking and cost accounting. Our financial spreadsheet which held the vessel costs was included as part of a larger spreadsheet for the entire refuge. We ended up with over 2,000 transactions on this spreadsheet. When we tried to sort, the computer memory would lock up and the spreadsheet would get mixed up so we were not able to track costs of all the different line budget items. We still can not access the information in our 1990 financial spreadsheet. We hope to solve this problem by keeping Tiglax costs on a spreadsheet separate from other refuge costs. This will reduce the size of the database to be manipulated by our computer. We also will increase the computer's memory.

Another major problem had to do with redistribution (RDS) of costs. Part of the normal operating costs on the vessel covers some of the wintertime maintenance that is done. As a consequence, when we did not receive oil money up front we could not use it in a timely manner to offset maintenance costs. We then had to go back and RDS out amounts to make up the difference. This was a pain for our staff. It was certainly a pain for the oil people. Since we did not keep records of the oil, as requested by AWR, it seemed that the information disappeared in a deep hole. We tried to have oil people extract the information, but it was buried in among all their other oil transactions (same problem we had). The way to solve this, I believe, is for other divisions, such as oil, to assign money to the refuge with a cost code so that we have it up front. We can use part of that money to pay some of the wintertime maintenance as well as sea time costs. It is similar to getting a confirmed room at a motel where you give them your credit card number. We receive an advice with the cost code and a fund target that goes into the refuge budget. For example, in 1991 the boat will be used by oil for 6 days at $3000 per day. The refuge should receive a fund target advice $18,000 and an advice to maintain and to provide vessel support to oil assessment for 6 days as per the schedule. Then the boat is available for oil to use. This will eliminate much of the RDSing. More importantly, it will also keep users from being surprised at vessel costs at the end of the year. This process is already in action as far as BIA goes since they are a different agency. It has not occurred for internal Fish and Wildlife Service use and we need to start that system.

Because of the RDSing and hardware problems we had we were not able to analyze vessel costs by budget item. By keeping a separate spreadsheet for the Tiglax and getting a fund advice up front from various users we hope to solve these problems.

FY 1991

First Mate Bell directing an abandon ship drill. All passengers participate in abandon ship and fire fighting drills. (RA 1990)

PROJECTS FY 1991

This schedule is different than the one planned and approved last year. Research dropped the 2 proposed Prince William Sound trips for sea otter research. They also shortened up the length of seabird cruise in September. The Russian trip has moved from the Commanders to the Diomedes. The refuge dropped the winter fox project. Because this was dropped, the schedule had to be changed to allow time to check islands worked last year.

At the time this is being written the endangered species work advices for the refuge have not been finalized. The refuge portion of the schedule still requires some fine tuning. This will not alter the schedule for other users. It is more of an internal adjustment.

Now, for the good news: There are no conflicts to be resolved in the schedule!

The 1991 schedule is 137 days long and supports the following projects:

1) Support BIA archaeological work in the eastern Aleutians.

2) Support oil assessment work in the Semidi Islands.

3) Conduct refuge fox eradication work. This includes follow up work and initiation of fox work on new islands.

4) Conduct Aleutian Canada goose work (nesting surveys, transplants, etc.).

5) Support seabird/high seas drift net study.

6) Support US/USSR seabird work at Diomedes and Chukota coast.

7) Support refuge seabird surveys at St. Matthew. This work is scheduled once every 5 years.

8) Support Research Division's study of seabird food habits in eastern Aleutians and islands south of the Alaska Peninsula.

In summary, the Tiglax will support 6 days of oil assessment, 38 days of Research (includes US/USSR trip), 69 days of refuge work, and 24 days of BIA work. This totals 137 days of sea time. The refuge time also includes travel (dead head) time from and to Homer.

FISCAL YEAR 1991 TIGLAX SCHEDULE FEBRUARY 04, 1991

DATE	LOCATION	ACTIVITY	PERSONNEL (*Denotes Leader)
		NOTE: TIGLAX WILL HOLD OPEN HOUSES WHEN POSSIBLE AT VILLAGES	
OCT 01-APR 18	AT Homer	Dockside Maintenance	
APR 11	AT Homer	Load FWS and BIA field gear. VESSEL USERS CONFIRM WITH CAPTAIN BAYER	
APR 23	LV Homer	En route Dutch Harbor	
APR 25	AR Dutch Harbor	Pick up BIA crew	
	LV Dutch Harbor	En route BIA sites	Slaughter* and 10 others
APR 26-MAY 17	AT Eastern Aleutians	Support BIA work	Slaughter* and 10 others
MAY 18	AR Dutch Harbor	Off load BIA and pick up Semidi crew (OIL ASSESSMENT) NOTE: BIA PAYS FOR TRIP (24 DAYS @ $ 3882 = $ 93,168. THIS INCLUDES 15% DFC O/H only $79,200 comes to vessel)	
MAY 19	LV Dutch Harbor	En route Semidis	Nysewander*, Dippel, and 3 others
May 20	AR Semidis	Off load	Nysewander*, Dippel, and 3 others
MAY 21	LV Semidis	Nysewander, Dippel, and 3 others off vessel and remain in Semidis. En route Adak. NOTE: OIL PAYS FOR DUT/SEMIDI/DUT TRIP (4 DAYS @ $ 3300 = $ 13,200)	
MAY 22	AR Dutch Harbor	Pick up Bailey and 3 others	

	LV Dutch Harbor	En Route Carlisle Island	Bailey* and 3 others
MAY 23	AR Carlisle Island	Begin fox check (FOX ERADICATION)	Bailey* and 3 others
MAY 24-26	AT Carlisle Island	Support fox check	Bailey* and 3 others
MAY 27	LV Carlisle Island	En Route Adak	Bailey* and 3 others
MAY 28	AR Atka	HOLD OPEN HOUSE. ORP FROM ADAK MEETS BOAT AT ATKA. RIDES TO ADAK ON BOAT	ORP
	LV Atka	En route Kasatochi	ORP, Morey, Lewis, Bailey and 2 others
MAY 29	AR Kasatochi	Repair cabin, set up camp, 2 seasonals off	
	LV Kasatochi	Enroute Adak	Bailey*, ORP, Morey and Lewis
MAY 30	AR Adak	Bailey and others off	
MAY 31	AT Adak	Load	
JUN 01	LV Adak	En route Buldir	Boone*, Klett, Byrd, and 12 others
JUN 03	AR Buldir	Off load, Byrd and 6 others off	
	LV Buldir	En route Agattu	Boone*, Klett, and 6 others
JUN 04	AR Agattu	Unload. Four seasonals off	
JUN 05	LV Agattu	En route Buldir	Boone*, Klett and 2 others
JUN 06	AR Buldir	Load Byrd	
	LV Buldir	En route Little Kiska	Boone*, Klett, Byrd, and 2 others
JUN 07	AR L. Kiska	Survey for returning geese	Boone*, Klett, Byrd, and 2 others
JUN 08	LV L. Kiska	En route Delarofs	Bonne*, Klett, Byrd, and 2 others
JUN 09	AR Delarofs		Boone*, Klett, Byrd, and 2 others
JUN 10-11	AT Delarofs	Survey for potential release sites	Boone*, Klett, Byrd, and 2 others
JUN 11	LV Delarofs	En route Kasatochi	Boone*, Klett, Byrd, and 2 others
JUN 12	AR Kasatochi	Pick up crew	Boone*, Klett, Byrd, and 4 others
	LV Kasatochi	En route Adak	Boone*, Klett, Byrd, and 6 others

JUN 13	AR Adak	Offload	
JUN 14	AT Adak	REFUEL	Bailey* and 1 other
JUN 15	LV Adak	En route Ulak	Bailey*, Klett, Byrd, and 4 others
JUN 16	AR Ulak	Off load, Bailey and 3 others off	Klett*, Byrd, and 1 other
	LV Ulak		Klett*, Byrd, and 1 other
JUN 18	AR Buldir	Resupply	Klett*, Byrd, and 1 other
	LV Buldir		Klett*, Byrd, and 1 other
JUN 19	AR Agattu	Move camps	Klett*, Byrd, and 1 other
	LV Agattu	En route Adak	Klett*, Byrd, and 1 other
JUN 22	AR Adak	REFUEL	
JUN 23	LV Adak	En route Pribilofs	
JUN 26	AR Priblofs	Pick up Researchers, refuge people and Russians	
		NOTE: BELL, NELSON, MACONE, AND MILLER OFF BAILEY, DAVES, COOK, AND JAMIASON ON	
	LV Pribilofs	En route St Matthew	Researchers, Russians, and Refuge
JUN 27	AR St Matthew	Off load refuge personnel and camp (SEABIRD SURVEYS)	Researchers, Russians, and Refuge
JUN 28	LV St Matthew	Finish offloading and en route Diomedes	Researchers and Russians
JUN 30	AR Diomedes	Begin seabird work (SEABIRD SURVEYS)	Researchers and Russians
JUL 01-14	AT Diomedes and Chukota Penninsula	Support seabird work. HOLD OPEN HOUSE AT LITTLE DIOMEDE. RESEARCHERS HELP BOAT CREW	Researchers and Russians
JUL 15	LV Diomedes and Chukota Penninsula	En route St Matthew	Researchers and Russians
JUL 17	AR St Matthew	Load refuge personnel and camp	Researchers and Russians

JUL 18	LV St Matthew	En route Pribilofs	Researchers, Russians, and Refuge
JUL 19	AR Pribilofs	Off load passengers	
		NOTE: BELL, NELSON, MACONE, AND MILLER ON. BAYER, DAVES, COOK, AND SNEDGEN OFF	
	LV Pribilofs	En route Adak	Byrd*
JUL 22	AR Adak		
JUL 23-24	AT Adak	Load and REFUEL	
JUL 25	LV Adak	En Route Ulak NOTE: TIGLAX MAY GO TO CHAGULAK TO BAND GEESE BEFORE GOING TO ULAK/BULDIR. DEPENDS UPON GOOSE CHRONOLOGY	Boone*, Klett, Byrd, and 4 others
JUL 26	AR Ulak	Pick up camp and personnel	Boone*, Klett, Byrd, and 4 others
JUL 27	LV Ulak	En route Buldir	Boone*, Klett, Byrd, Bailey, and 8 others
JUL 29	AR Buldir	Set up camp	Boone*, Klett, Byrd, Fuller, and 4 others
JUL 30-AUG 15	AT Western Aleutians	Support goose trap and transplant and pickup personnel on Agattu and make personnel trades at Shemya. HOLD OPEN HOUSE AT SHEMYA	Various personnel
		NOTE: ON AUGUST 11 BAYER AND SNEDGEN COME ON AND BAILEY AND JAMIESON GO OFF. TRANSFER WILL BE MADE AT SHEMYA	
AUG 15	LV Buldir	En route Adak	Klett*, Byrd, Fuller, and 12 others
		NOTE: IF GOOSE WORK IS DONE EARLIER, VESSEL WILL HEAD EAST EARLIER. WORK MAY GO LATER IF GOOSE CHRONOLOGY IS LATE	
AUG 18	AR Adak	Passengers and gear off	
	LV Adak	En route Dutch Harbor	
AUG 20	AR Dutch Harbor	Pick up Researchers and REFUEL	Hatch* and 12 others

AUG 21-SEP 04	AT Alaska Peninsula waters	Support Research project NOTE: DURING THIS TIME PERIOD TIGLAX WILL PICK UP SEMIDI CAMP AND TRANSPORT PERSONNEL TO NEAREST PORT WITH SCHEDULED AIR TRAFFIC. ESTIMATE THAT OIL WILL PAY FOR TWO DAYS (2 DAYS @ $ 3300 = $6600)	Hatch* and 12 others
SEP 05	LV Alaska Peninsula waters	En route Homer	
SEP 06	AR Homer	Off load	
SEP 10	LV Homer	Conduct BIA surveys along Alaska Peninsula	
SEP 29	AR Homer	Off load BIA NOTE: BIA PAYS FOR TRIP (20 Days @ $3882 = $77,640)	
SEP 30	AT Homer	REFUEL	

COSTS FY 1991

The preliminary vessel budget based upon $500,000 only allowed for 80 days of sea time. However, by adding $84,000 of maintenance management system (MMS) money we could meet the need for additional time. In addition, oil assessment and BIA will provide funding. At this time the total operating budget is:

AWR Base	500,000
MMS	84,000
Oil Assessment	18,000
BIA	72,000
Total	674,000

The budget analysis of the above amount follows. We do not have any built in contingency of this time. For planning purposes we thought to charge $3,000 per day for charters. This breaks down to:

Salaries	1,850
Fuel	770
Food	290
Expendables (filters, oil, etc.)	90
Total	$3,000

This does not cover any breakdown costs. If we charged an extra $300 per day, it would provide a maintenance contingency fund of $9,000.

Last year we charged $3,011 per day and were able to pay for some maintenance costs. I recommend we charge $3,300 per day. We have increased fuel and salary costs.

PRELIMINARY BUDGET ANALYSIS TIGLAX FY 1991

	1261	1262	TOTAL
SALARIES			
Permanent			
Bayer	45588.00	15000.00	60588.00
Bell	30800.00	28000.00	58800.00
Nelson	0.00	54544.00	54544.00
Perm Int Cook	20000.00	3879.00	23879.00
Perm Int DH	9442.00	9000.00	18442.00
Perm Int DH	10000.00	11323.00	21323.00
Relief Cook	2648.00	0.00	2648.00
Relief Mate	2310.00	0.00	2310.00
Relief Eng	0.00	1240.00	1240.00
Relief DH	2490.00	.00	2490.00
Subtotal	123278.00	122986.00	246264.00
Performance award	2000.00	1000.00	3000.00
Premium pay	500.00	0.00	500.00
Overtime	118442.00	53000.00	171442.00
Home leave	0.00	0.00	0.00
Uniforms	0.00	0.00	0.00
TOTAL SALARY COSTS	244220.00	176986.00	421206.00
TRAINING			
Fire	2200.00	0.00	2200.00
Other mandatory	0.00	0.00	0.00
Subtotal	2200.00	0.00	2200.00
Other training	2050.00	0.00	2050.00
TOTAL TRAINING COSTS	4250.00	0.00	4250.00
TRAVEL			
Mandatory training	0.00	0.00	0.00
Other training	5300.00	0.00	5300.00
Subtotal	5300.00	0.00	5300.00
Pro. Leaders meeting	0.00	0.00	0.00
Waterfowl Workshop	0.00	0.00	0.00
Professional meeting	0.00	0.00	0.00
Other	0.00	0.00	0.00
Subtotal	0.00	0.00	0.00
Field	7003.00	1825.00	8828.00
Volunteer	0.00	0.00	0.00
TOTAL TRAVEL COSTS	12303.00	1825.00	14128.00

TRANSPORTATION			
GBL-HHG	0.00	0.00	0.00
GBL, other	0.00	0.00	0.00
GSA vehicles	0.00	0.00	0.00
Vessel Charter	0.00	0.00	0.00
Aircraft Charter	0.00	0.00	0.00
TOTAL TRANS. COSTS	0.00	0.00	0.00
FACILITY RENT/LEASE			
Office	0.00	0.00	0.00
Residence	0.00	0.00	0.00
Bunkhouse	0.00	0.00	0.00
Storage	3000.00	0.00	3000.00
Tiedown	0.00	0.00	0.00
Moorage	1100.00	0.00	1100.00
Hanger	0.00	0.00	0.00
Other	0.00	0.00	0.00
TOTAL RENT COSTS	4100.00	0.00	4100.00
UTILITIES			
Telephone	0.00	0.00	0.00
Electricity	4000.00	0.00	4000.00
Sewer	0.00	0.00	0.00
Water	0.00	0.00	0.00
TOTAL UTILITY COSTS	4000.00	0.00	4000.00
POL PRODUCTS			
Build'g & Structure	0.00	0.00	0.00
Aircraft	0.00	0.00	0.00
Vehicles	1230.00	0.00	1230.00
Vessels	84960.00	8900.00	93860.00
TOTAL POL COSTS	86190.00	8900.00	95090.00
MAINT. & REPAIRS			
Build'g & Structure	0.00	0.00	0.00
Aircraft	0.00	0.00	0.00
Boats & Motors	0.00	85750.00	85750.00
Vehicle	0.00	0.00	0.00
Heavy Equipment	0.00	0.00	0.00
Other	0.00	0.00	0.00
TOTAL M & R COSTS	0.00	85750.00	85750.00

MATERIAL & SUPPLIES			
Office Supplies	2300.00	0.00	2300.00
Film & Processing	200.00	0.00	200.00
Field supplies	35000.00	779.00	35779.00
TOTAL SUPPLIES COST	37500.00	779.00	38279.00
EQUIPMENT PURCHASE			
Replacement, fire	500.00	0.00	500.00
Replacement, other	0.00	400.00	400.00
New, fire	0.00	0.00	0.00
New, other	0.00	6900.00	6900.00
TOTAL EQUIP. COSTS	500.00	7300.00	7800.00
PRINTING			
Refuge Brochures	0.00	0.00	0.00
RCCP's	0.00	0.00	0.00
Other	0.00	0.00	0.00
TOTAL PRINTING COSTS	0.00	0.00	0.00
CONTRACTS-EP'T & SERV			
Coop Agreements	0.00	0.00	0.00
Contracts (SCA, etc)	0.00	0.00	0.00
TOTAL CONTRACT COSTS	0.00	0.00	0.00
OTHER ITEMS			
.05% Contingency	0.00	0.00	0.00
EEO	0.00	0.00	0.00
TOTAL OTHER COSTS	0.00	0.00	0.00
TIGLAX TOTAL	393063.00	281540.00	674603.00

MAINTENANCE FY 1991

As the Tiglax gets older, maintenance becomes more and more important. Although it may seem expensive, the alternative is more expensive. For example, we have $2,000 planned to replace one shot of anchor chain and repair the crown pin on the anchor. If we do not do this we may lose the anchor. It costs $15,000 to replace the anchor on the Tiglax.

Engineer Nelson conducting extremely important maintenance. The coffee maker broke just before 6 refuge managers came aboard. PANIC CITY!

Other measures may be of a stopgap nature. The lower berthing area gets flooded by gray and black water during heavy weather. Not only is this a messy inconvenience, it could be a health hazard. The solution requires redesign by a naval architect and shipyard work. We hope to control the problem this year by installing start and stop probes with time delays in the gray/black water tanks. Hopefully this will slow the problem down.

Other items are required inspections. We have budgeted $11,100 for required inspections (U.S. Coast Guard Safety inspection, fire inspections, life raft inspection, high pressure vessel inspections, hazardous chemical inspections, etc.). Other costs are for filters and spare parts. We try to keep a good spare parts inventory on hand to meet breakdowns in the field. Last year the vessel engineer rebuilt 6 outboards that belonged to passengers. He has also repaired cameras and fabricated tools for use by Research Division.

The following list gives the planned maintenance for the Tiglax in 1991. This does not include the portable Biosonics gear which was loaned to Research to use in the Shumagins. Part of this equipment was broken in the field. We expect this to be repaired by Research.

PLANNED MAINTENANCE FY 1991

1.	Install life ring dump stations for port and starboard side of wheelhouse.	$1800.00
2.	Deck projects (Construct tool boards and shelves for fo'c'sle, field battery rack for containing field camp batteries, make modifications to the fuel box lids, build new catch-all box for the helo deck, build separation racks for dry stores, build VHS tape rack for smoking lounge, build glove box with ventilation for drying room, paint stairways and doors, and teak oil all teak and seal with sealer.)	3500.00
3.	Replace one shot of anchor chain and repair anchor crown pin.	2000.00
4.	Inspect and repair life rafts.	1400.00
5.	Repair all inflatables on Tiglax.	2400.00
6.	Contract for fire inspection.	1000.00
7.	Inspect and repair survival suits.	600.00
8.	Inspect and repair survival kits.	100.00
9.	Inspect and repair all skiff equipment.	200.00
10.	Cover AFFF hoses with canvas.	600.00
11.	Cover trash pump hose with canvas.	300.00
12.	Shampoo all carpets.	100.00
13.	Add duplex strainers to bilge and ballast system.	1400.00
14.	Plumb oily water separator to bilge ballast manifold.	500.00
15.	Replace fire screens on fuel vents.	100.00
16.	Add circulating pumps to heating loops.	500.00

17.	Replace bearings in heater blowers.	100.00
18.	Modify the air horn plumbing.	900.00
19.	Purchase and install new ship's air regulator.	1200.00
20.	New check valves for air receivers and compressors.	1200.00
21.	Install shock mounts for reverse osmosis water maker.	200.00
22.	Repair the overboard check for black water tank.	900.00
23.	Send off reduction gear actuators for overhaul.	600.00
24.	Replace cooler anodes.	500.00
25.	Overhaul both steering rams.	1000.00
26.	Overhaul boom up rams on both cranes.	1800.00
27.	Rehose forward crane.	1000.00
28.	Rehose aft crane.	1000.00
29.	Rehose pot puller.	500.00
30.	Rehose and stop leaks in scientific winch.	500.00
31.	Install movable swivel on lube oil hose.	50.00
32.	Install new rings in starboard main.	5000.00
33.	Do valve job on both auxiliaries.	3000.00
34.	Improve exhaust system connections on auxiliaries.	500.00
35.	Stop oil leaks on port reduction gear.	100.00
36.	Hydrotest scuba receivers.	300.00
37.	Visually inspect scuba tanks.	200.00
38.	Conduct air test on scuba air compressor.	1000.00
39.	U.S. Coast Guard safety inspection.	3500.00

40.	Replace all exterior start/stop boxes.	3000.00
41.	Install remote cut-off for deep fat fryer.	500.00
42.	Move electrical panel L-4 to hallway and install copper bus.	2000.00
43.	Repair high level alarm for gray water tanks.	500.00
44.	Lower low oil level alarm for steering oil.	200.00
45.	Repair three-way wiring in wet lab.	100.00
46.	Install a slow start for the fire pump.	1300.00
47.	Install start and stop probes for gray/black water tanks with time delays.	1500.00
48.	Check kw sharing and kh fluctuations on Tracor.	100.00
49.	Replace meters in generator panel.	250.00
50.	Repair surge suppression problems in wheelhouse.	1300.00
51.	Build a bypass for reverse osmosis water maker for back flush and to run seawater pump and cut out high pressure pump and low pressure shutdown.	350.00
52.	Wire a category I EPIRB to 110 volts.	500.00
53.	Install stainless steel tubes for gate lock backs.	400.00
54.	Install vent on sewage holding tank.	500.00
55.	Install air eliminator on fire pump suction.	200.00
56.	Install check valve on oily water separator suction to centrifuge sump.	400.00
57.	Install vent on centrifuge sump.	500.00
58.	Install fill pipe on starboard wing potable water tank.	200.00

59.	Weld fittings on sea chest vent.	200.00
60.	Filters and parts supply.	20,000.00
61.	Hazardous chemical inventory.	3700.00
62.	Electronics	6500.00
	TOTAL	85,750.00

PROBLEMS FY 1991

With the mideast situation, we do not know what will happen to the price of fuel. We planned using a price of $1.26 per gallon. Last year fuel cost $.78 per gallon. We can only guess. The 1991 schedule could be held hostage by the price of fuel.

Another problem is the paint used on the Tiglax. We have learned that the epoxy type of paint used gives off cyanide gas. To use the paint, the painter must have an oxygen mask on. This greatly limits the crew's ability to do touch up painting. We hope to find a safer paint which is compatible in color and chemistry to the paint being used.

Cost of operations is another problem. Our base of $500,000 is eroding. We have had no increase since the base level was received. Last year our salary costs (includes oil and BIA work) was in excess of $423,000. An annual raise of 4 percent represents an increase of $17,000 of salary cost. This represents the loss of 5 days of sea time in just one year of salary increases.

If we averaged 4 percent inflation per year since 1988, then our $500,000 base represents $442,000 of buying power. I suspect the average inflation rate is greater that 4 percent. I believe we need to develop a strategy to bring our base up to a realistic level. This should be an annual program of some sort.

A potential problem lies in the scientific collecting done on the Tiglax by Migratory Birds and Research. Last year 1500 birds were collected off the Tiglax. My concern has to do with any problems that could result in the public finding out about the projects without a prior public involvement effort. I suggest that the public affairs officer work with the groups doing the collecting to develop some sort of awareness program. The Service does not need a black eye on this subject 2 years in a row!

FY 1992

First Mate Bell cleaning the Tiglax after the field season. Winter maintenance is important to get the Tiglax in top operating order for the coming season.

PROJECTS FY 1992

The proposed 125-day schedule again presents no conflicts needing resolution. The proposed projects include:

1) Support Oil Assessment in the Semidis

2) Open house (boat) at Atka

3) Fox eradication on new islands and check up on last year's work

4) Support 5-year follow up study of 1080 experimental use at Kiska

5) Support seabird surveys at Buldir

Inflatable skiffs are used for lightering supplies and personnel. All personnel using skiffs are required to wear Mustang work suits.

6) Support goose surveys at Alaid/Nizki

7) Support seabird surveys and ptarmigan surveys at Attu

8) Support seabird surveys in eastern Andreanof Islands

9) Support sea lion counts at Attu

10) Support seabird and sea lion surveys at Agattu

11) Support Buldir/Near Island/Commander Islands seabird research

12) Support Aleutian Canada goose transplant

13) Support seabird research in eastern Aleutians and south of Alaska Peninsula

No other projects were submitted and we were able to include all in the schedule. In addition, the Tiglax will travel to Seattle/Bellingham area to go to the dockyard and conduct the 5-year refit of the vessel (painting, redoing electronics and mechanics, etc.). This will be done during the winter.

FISCAL YEAR 1992 TIGLAX SCHEDULE (01/04/91)

DATE	LOCATION	ACTIVITY	PERSONNEL (*Denotes Leader)
		NOTE: TIGLAX WILL HOLD OPEN HOUSES WHEN POSSIBLE AT VILLAGES	
OCT 1-JAN 14	AT Homer	Dockside maintenance	
JAN 15	LV Homer	En route Seattle area	
JAN 22	AR Seattle	Take to shipyard	
JAN 23-APR 19	AT Seattle	Shipyard maintenance	
APR 20	LV Seattle	En route Homer	
APR 26	AR Homer		
APR 27-MAY 13	AT Homer	Dockside preparations	
MAY 14	AT Homer	Load gear	
MAY 15	LV Homer	En route Semidis	4 people
MAY 16	AR Semidis	Off load and orient (OIL ASSESSMENT STUDIES) OIL PAYS FOR 3 DAYS	4 people
MAY 19	LV Semidis	En route Atka	
MAY 23	AR Atka	HOLD OPEN HOUSE ON TIGLAX. ADAK ORP WILL FLY TO ATKA AND MEET BOAT, HOLD OPEN HOUSE AND GO TO ADAK ON TIGLAX	
	LV Atka	En route Adak	1 person
MAY 24	AR Adak	Resupply	
MAY 25	AT Adak	Load field camps and personnel	
MAY 26	LV Adak	En route Ulak	16 people

MAY 27	AR Ulak	Off load camp (FOX ERADICATION)	16 people
	LV Ulak	En route Kiska. Leave 2 people.	14 people
	AR Kiska		14 people
MAY 28-29	AT Kiska	Off load camps. 2 people at Kiska Harbor and 4 at Sirius Point. Conduct eagle survey. (1080 STUDY)	
MAY 30	LV Kiska	En route Buldir	8 people
MAY 31	AR Buldir	Off load camp. Five people off. (SEABIRD SURVEYS)	8 people
JUN 01	LV Buldir	En route Alaid/Nizki	3 people
JUN 02	AR Shemya	Pick up 1 person	3 people
	LV Shemya	En route Alaid/Nizki	4 people
	AR Alaid/Nizki	Off load camp. Two people off (ALEUTIAN CANADA GOOSE NESTING SURVEY)	
	LV Alaid/Nizki	En route Attu	2 people
JUN 03	AR Chichigof Harbor, Attu	Off load camp. Two people off (SEABIRD AND PTARMIGAN SURVEY)	2 people
	LV Chichigof Habor, Attu	En route Buldir	
JUN 04	AR Buldir	Pick up 1 person.	
	LV Buldir	En route Ulak	1 person
JUN 05	AR Ulak	Pick up 2 people	1 person
	LV Ulak	En route Bobrof	3 people
JUN 06	AR Bobrof	Drop off 2 people (FOX ERADICATION)	3 people
	LV Bobrof	En route Adak	1 person
JUN 07	AR Adak	Resupply	

JUN 08	LV Adak	En route Kasatochi	5 people
JUN 09	AR Kasatochi	Drop off camp and 2 people (FOX ERADICATION)	5 people
	LV Kasatochi	En route Little Tanaga	3 people
JUN 10-13	AT Little Tanaga	Work will be done from vessel in the general vicinity of Little Tanaga Island (FOX ERADICATION AND SEABIRD SURVEYS)	3 people
JUN 14	LV Little Tanaga	En route Kasatochi	3 people
JUN 15	AR Kasatochi	Pick up 2 people	3 people
	LV Kasatochi	En route Koniuji	5 people
	AR Koniuji	Drop off camp and 2 people (SEABIRD SURVEYS)	5 people
JUN 16	LV Koniuji	En route Adak	3 people
JUN 17	AR Adak	Resupply CREW CHANGE. BELL, NELSON, MILLER OFF. RELIEF MATE, DAVES, JAMIESON ON	
JUN 18	AT Adak	REFUEL	
	LV Adak	En route Bobrof	1 person
JUN 19	AR Bobrof	Pick up crew	1 person
	LV Bobrof	En route Kiska	3 people
JUN 20	AR Kiska	Eagle survey and resupply	3 people
JUN 21	LV Kiska	En route Buldir	3 people
JUN 22	AR Buldir	Resupply	3 people
	LV Buldir	En route Nizki/Alaid	3 people
JUN 23	AR Nizki/Alaid	Pick up camp and crew	3 people
	LV Alaid/Nizki	En route Attu	5 people
	AR Attu	Pick up camp and crew	5 people

JUN 24	AT Attu	Conduct sea lion counts	7 people
	LV Attu	En route Agattu	7 people
JUN 25	AR Agattu	Drop off 2 camps and 4 people. Conduct sea lion surveys (SEABIRD AND SEALION SURVEYS)	7 people
JUN 26	LV Agattu	En route Kiska	3 people
JUN 27	AR Kiska	Pick up crews	3 people
	LV Kiska	En route Kasatochi	9 people
JUN 29	AR Kasatochi	Pick up camp and crew	9 people
	LV Kasatochi	En route Adak	11 people
JUN 30	AR Adak	Off load and pick up Russian trip personnel	
JUL 01-07	LV Adak	Support Buldir/Near Island/Commander Islands work	Researchers and Russians
JUL 08	AT Shemya	NOTE: CREW CHANGE BELL, NELSON, MILLER, RELIEF COOK ON. BAYER, DAVES, SNEDGEN, MACONE OFF.	
JUL 09-20		Support Buldir/Near Island/Commander Islands work	
JUL 21	AR Adak	Offload and change personnel	Researchers, Russians, and Refuge
JUL 22	LV Adak	En route Chagulak	
JUL 23	AR Chagulak	Support goose banding	
JUL 28	LV Chagulak	En route Adak	Load and REFUEL
JUL 29	AR Adak	Load REFUEL NOTE: CREW CHANGE BAYER, SNEDGEN ON. RELIEF MATE, DAVES, JAMIESON OFF	Boone*, Klett, Byrd, and 4 others
JUL 31	LV Adak	En route Buldir	Boone*, Klett, Byrd, and 4 others
AUG 01	AR Buuldir	Support Goose transplant	Boone*, Klett, Byrd, Bailey, and 8 others
AUG 02-AUG 15	AT Western Aleutians	Support goose trap and transplant and pickup personnel on Agattu and make personnel trades at Shemya	Various personnel

		HOLD OPEN HOUSE ON TIGLAX AT SHEMYA	
AUG 15	LV Buldir	En route Adak	Klett*, Byrd, Fuller, and 12 others
		NOTE: IF GOOSE WORK IS DONE EARLIER, VESSEL WILL HEAD EAST EARLIER. GOOSE WORK MAY GO PAST AUG 15, HOWEVER.	
AUG 18	AR Adak	Passengers and gear off	
	LV Adak	En route Dutch Harbor	
AUG 20	AR Dutch Harbor	Pick up Researchers and REFUEL	Hatch* and 12 others
AUG 21-SEP 15	AT Alaska Peninsula waters	Support Research project	Hatch* and 12 others
		NOTE: DURING THIS TIME PERIOD TIGLAX WILL PICK UP SEMIDI CAMP AND TRANSPORT PERSONNEL TO NEAREST PORT WITH SCHEDULED AIR TRAFFIC. ESTIMATE THAT OIL WILL PAY FOR TWO DAYS	
SEP 16	LV Alaska Peninsula waters	En route Homer	
SEP 17	AR Homer	Off load	

MAINTENANCE FY 1992

The annual maintenance list is similar to the last 2 years, both in content and cost. The big difference is that the Tiglax needs to go to the yard in 1992.

The yard list contains our Maintenance Management System projects plus a few more that have come up. Clearly, we are not going to get the money to do all the items. This list is in priority order for planning purposes. The running total allows one to easily find what can be done with various funding levels. The refuge has listed $517,000 of projects as the highest refuge priority in the Maintenance Management System (MMS).

There may need to be another strategy besides MMS to secure funding for the 5-year refit. Some options are to not have a field season during the refit year. Another suggested option is to split refits between years. This means paying twice for transporting the boat south. Suggestions are appreciated!

ANNUAL MAINTENANCE FY 1992

	PROJECT	MMS INSPEC. NUMBER	COST	RUNNING TOTAL
1.	Replace starter solenoids on main engines	9250	4,040	4,040
2.	Replace 8D emergency batteries	9299	2,000	6,040
3.	Replace medical supplies	9290	4,000	10,040
4.	Inspect and test fire equipment	9289	500	10,540
5.	Replace SAFETY equipment	9278	6,000	16,540
6.	Replace wiper motors	9203	2,000	18,540
7.	Repair faulty doors, cabinetry	9218	3,960	22,500
8.	Replace defective deck gear	9287	6,000	28,500
9.	Repair outboards	9236	2,000	30,500
10.	Replace carpeting	9217	2,280	32,780
11.	Replace charts	9288	1,920	34,700
12.	Repair skiffs	9271	6,500	41,200
13.	Repair hand-held radios	9286	4,000	45,200
14.	Repair helo lights	9239	1,000	46,200
15.	Clean carpets	9216	1,100	47,300
16.	Replace MSD grinder	9228	2,200	49,500
17.	Parts replacement		20,000	69,500
18.	Deck replacement		10,000	79,500

5-YEAR YARD MAINTENANCE FY 1992

PRIORITY	PROJECT	MMS INSPECT. NUMBER	COST	RUNNING TOTAL
1.	Transport Tiglax, crew, construction, engineering	9265	64,200	64,200
2.	Dry dock	9264	17,000	81,200
3.	Conduct sea trials	9267	12,000	93,200
4.	Inspect and repair, as needed, shafts, bearings, rudder posts and bearings	9258	15,000	108,200
5.	Replace rusted out salt water line	9243	20,000	128,200
6.	Inspect and repair steering gear	9251/9252	5,400	133,600
7.	Inspect and test sea chests	9242	1,420	135,020
8.	Inspect internal structure	9205	1,200	136,220
9.	Hire marine architect	9266	25,600	161,820
10.	Install larger keel coolers		26,000	187,820
11.	Paint hull below water line	9215	55,560	243,380
12.	Relocate boiler		6,400	249,780
13.	Weld up divits in hull	9206	5,800	255,580
14.	Remove fuels from tanks	9208	7,400	262,980
15.	Replace zinc anodes	9227	7,360	270,340
16.	Rebuild all seawater valves	9245	17,650	287,990
17.	Replace anchor chain	9225	9,000	296,990
18.	Install backup reverse osmosis water maker	9235	15,000	311,990

19.	Repitch both propellers		4,000	315,990
20.	Install bulbous bow chain guards	9207	31,000	346,990
21.	Repaint all painted tanks	9209	8,000	354,990
22.	Remove and inspect sonar shaft	9213	3,100	358,090
23.	Fabricate and install anchor roller		13,000	371,090
24.	Clean grey water and black water tanks, rebuild both pumps	9246	1,280	372,370
25.	Inspect and test pneumatic controls	9248	1,440	373,810
26.	Other services	9267	12,000	385,810
27.	Clean waste oil tank	9233	2,000	387,810
28.	Replace all interior hydraulic hoses	9238	1,440	389,250
29.	Replace oily water separator electrodes	9230	2,440	391,690
30.	Paint transducer void	9212	8,680	400,370
31.	Replace bridge engine gauges	9201/9202	3,480	403,850
32.	Paint engine room bilges	9244	25,000	428,850
33.	Replace exhaust tube insulation	9241	18,000	446,850
34.	Repair navigation electronics	9276	15,600	462,450
35.	Replace ship's stepdown transformers		18,000	480,450
36.	Rebuild lower berthing	9210	90,000	570,450
37.	Clean exhaust boiler tubes	9249	9,180	579,630
38.	Paint chain locker	9211	8,400	588,030
39.	Repair watertight doors and hatches	9223	6,120	594,150

40. Clean ventilation ducting	9231	1,920	596,070
41. Paint superstructure	9221/9222	90,960	687,030
42. Replace starter solenoids on main engines	9250	4,040	691,070
43. Replace damaged wood decking	9224	3,920	694,990
44. Replace wall heater fans	9282	3,000	697,990
45. Replace turbos on main and auxiliary engines	9254/9260	6,000	703,990
46. Insulate walkway O/H	9242	7,400	711,390
47. Replace outboard motors	9281	3,800	715,190
48. Replace inflatable skiff	9270	4,000	719,190

COSTS FY 1992

Based upon the uncertainty of the mideast crises we assumed a 14 percent increase in vessel costs of FY 1991. We hope this is a worst case scenario. The $500,000 base will provide 60 days of operation. We figured a 25 percent fuel cost increase and concomitant increases in other supplies and services.

Based upon the inflated costs, the Service will need $695,727 money to fund the entire 125-day schedule. This full schedule budget analysis follows. We hope this is a worst case scenario. With mid east hostilities we can only guess at costs in 1992.

BUDGET ANALYSIS TIGLAX FY 1992

	1261	1262	TOTAL
SALARIES			
Permanent			
Bayer	45000.00	18011.00	63011.00
Bell	31151.00	30000.00	61151.00
Nelson	0.00	56725.00	56725.00
Perm Int Cook	18048.00	3120.00	21168.00
Perm Int DH	9792.00	11769.00	21561.00
Perm Int DH	9936.00	15840.00	25776.00
Relief Cook	2910.00	0.00	2910.00
Relief Mate	2500.00	0.00	2500.00
Relief Eng	0.00	2220.00	2220.00
Relief DH	1900.00	2000.00	3900.00
Subtotal	121237.00	139685.00	260922.00
Performance award	1000.00	1000.00	2000.00
Premium pay	500.00	0.00	500.00
Overtime	117360.00	49920.00	167280.00
Home leave	0.00	0.00	0.00
Uniforms	0.00	0.00	0.00
TOTAL SALARY COSTS	240097.00	190605.00	430702.00
TRAINING			
Fire	500.00	0.00	500.00
Other mandatory	800.00	0.00	800.00
Subtotal	1300.00	0.00	1300.00
Other training	1000.00	0.00	1000.00
TOTAL TRAINING COSTS	2300.00	0.00	2300.00
TRAVEL			
Mandatory training	1600.00	0.00	1600.00
Other training	2400.00	0.00	2400.00
Subtotal	4000.00	0.00	4000.00
Pro. Leaders meeting	0.00	0.00	0.00
Waterfowl Workshop	0.00	0.00	0.00
Professional meeting	0.00	0.00	0.00
Other	0.00	0.00	0.00
Subtotal	0.00	0.00	0.00
Field	8000.00	2100.00	10100.00
Volunteer	0.00	0.00	0.00
TOTAL TRAVEL COSTS	12000.00	2100.00	14100.00

TRANSPORTATION			
GBL-HHG	0.00	0.00	0.00
GBL, other	0.00	0.00	0.00
GSA vehicles	0.00	0.00	0.00
Vessel Charter	0.00	0.00	0.00
Aircraft Charter	0.00	0.00	0.00
TOTAL TRANS. COSTS	0.00	0.00	0.00
FACILITY RENT/LEASE			
Office	0.00	0.00	0.00
Residence	0.00	0.00	0.00
Bunkhouse	0.00	0.00	0.00
Storage	3000.00	0.00	3000.00
Tiedown	0.00	0.00	0.00
Moorage	1100.00	0.00	1100.00
Hanger	0.00	0.00	0.00
Other	0.00	0.00	0.00
TOTAL RENT COSTS	4100.00	0.00	4100.00
UTILITIES			
Telephone	0.00	0.00	0.00
Electricity	0.00	4000.00	4000.00
Sewer	0.00	0.00	0.00
Water	0.00	0.00	0.00
TOTAL UTILITY COSTS	0.00	4000.00	4000.00
POL PRODUCTS			
Build'g & Structure	0.00	0.00	0.00
Aircraft	0.00	0.00	0.00
Vehicles	1875.00	0.00	1875.00
Vessels	100000.00	11000.00	111000.00
TOTAL POL COSTS	101875.00	11000.00	112875.00
MAINT. & REPAIRS			
Build'g & Structure	0.00	0.00	0.00
Aircraft	0.00	0.00	0.00
Boats & Motors	0.00	79500.00	79500.00
Vehicle	0.00	0.00	0.00
Heavy Equipment	0.00	0.00	0.00
Other	0.00	0.00	0.00
TOTAL M & R COSTS	0.00	79500.00	79500.00

MATERIAL & SUPPLIES			
Office Supplies	2300.00	0.00	2300.00
Film & Processing	200.00	0.00	200.00
Field supplies	38750.00	0.00	38750.00
TOTAL SUPPLIES COST	41250.00	0.00	41250.00
EQUIPMENT PURCHASE			
Replacement, fire	500.00	0.00	500.00
Replacement, other	0.00	7300.00	7300.00
New, fire	0.00	0.00	0.00
New, other	0.00	1100.00	1100.00
TOTAL EQUIP. COSTS	500.00	8400.00	8900.00
PRINTING			
Refuge Brochures	0.00	0.00	0.00
RCCP's	0.00	0.00	0.00
Other	0.00	0.00	0.00
TOTAL PRINTING COSTS	0.00	0.00	0.00
CONTRACTS-EP'T & SERV			
Coop Agreements	0.00	0.00	0.00
Contracts (SCA, etc)	0.00	0.00	0.00
TOTAL CONTRACT COSTS	0.00	0.00	0.00
OTHER ITEMS			
.05% Contingency	0.00	0.00	0.00
EEO	0.00	0.00	0.00
TOTAL OTHER COSTS	0.00	0.00	0.00
TIGLAX TOTAL	402122.00	295605.00	697727.00

ACKNOWLEDGEMENTS

Bekki Andrew-Miller typed and assembled this report. Her patience was greatly appreciated by the authors.

ALASKA PENINSULA UNIT

ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Homer, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1990

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

INTRODUCTION

Alaska Peninsula Unit

Alaska Maritime National Wildlife Refuge

The Alaska Maritime National Wildlife Refuge 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 3,500,000 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 Maritime Refuge has five units with all former refuges designated subunits.

The Alaska Peninsula Unit is the second largest unit of the Alaska Maritime National Wildlife Refuge. Over 800 islands, totaling 600,000 acres comprise this unit, which incorporated two refuges established before designation of the Maritime Refuge. The Semidi Islands, designated a refuge in 1932, and Simeonof Island, a refuge since 1958, also are the only areas in the Alaska Peninsula Unit which extend beyond mean high tide.

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.

Surprisingly, few of the islands remain truly pristine due to past introductions of foxes, rodents, and ungulates. 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.

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. Egging and

hunting of seabirds is generally negligible in this region where most residents derive their livelihoods from commercial fishing. The first contact between Russians and Alaska Natives occurred in 1741 in the Shumagin Islands. The islands have been little affected by off shore oil exploration and development, but exploration has begun in Shelikof Strait to the north and is planned elsewhere off the Peninsula. Human competition for fish relied upon by marine birds and mammals probably poses the greatest potential threat.

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H. PUBLIC USE (cont.)

I. EQUIPMENT AND FACILITIES

J. OTHER ITEMS

K. FEEDBACK

A. Highlights

In 1990 most time in the field spent by Alaska Peninsula Unit personnel was on Carlisle Island (Islands of Four Mountains) to remove introduced arctic fox. Apparent success of the use of red fox as control agents against arctic fox also was verified on two nearby islands in the Aleutians, and a thorough check of Poperechnoi (Pavlof Islands) and Big Koniuji (Shumagin Islands) also failed to divulge any sign of surviving red fox.

Oil spill related monitoring of seabird breeding success occurred in the Semidi Islands, and monitoring of nesting crested auklets and studies of seabird feeding ecology were conducted by Research personnel on Big Koniuji (Shumagin Islands). Russian biologists also joined research and refuge biologists on a cruise principally between the Pavlof and Semidi islands.

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 miles to the northeast. Sand Point's annual mean temperature is 37.9°F, and it averages 60.3 inches (four-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.

In 1990 the annual mean temperature at Cold Bay, located near the tip of the Alaska Peninsula, was nearly a degree above average (Table 1). Below average monthly mean temperatures were experienced only in February and July. Extreme temperatures were 8°F in February and 63°F in September. Annual precipitation was 2.57 inches above average. With almost 6 inches of rain, December was the wettest month, while the least precipitation was experienced in April (1.16 inches). Cold Bay weather patterns generally reflect those on the rest of the Alaska Peninsula.

Table 1. Weather Summary, Cold Bay, Alaska, 1990

Month	TEMPERATURE (°F) Extremes High	Low	Average	(Deviation)	PRECIPITATION (INCHES) Amount	(Deviation)	#Days (≥.01)	WINDS (MPH) Average	1-Minute*	Gust
January	42	14	30.4	(+2.1)	3.99	(+1.29)	25	16.7	46	58
February	40	08	26.3	(-1.2)	2.18	(-0.09)	21	16.1	40	52
March	44	15	32.1	(+3.5)	1.84	(-0.47)	21	16.3	40	55
April	49	26	36.4	(+3.4)	1.16	(-0.79)	15	14.6	47	35
May	57	29	36.9	(+1.9)	3.23	(+0.76)	25	19.7	40	52
June	60	39	42.8	(+1.5)	1.38	(-0.78)	15	13.8	49	37
July	59	41	50.1	(-0.2)	2.13	(-0.37)	17	16.4	36	45
August	68	43	52.2	(+1.0)	2.89	(-0.81)	18	16.2	41	54
September	63	31	47.6	(+0.1)	6.55	(+2.78)	23	16.4	40	54
October	57	27	40.3	(+0.8)	4.21	(-0.08)	27	17.3	46	60
November	56	13	34.6	(+0.3)	2.06	(-1.98)	20	18.7	51	71
December	54	14	36.4	(+6.9)	5.96	(+3.11)	24	20.5	52	69
	68	8	38.8	(+0.8)	37.58	(+2.57)	251	16.9	52	69

* Greatest sustained wind for a 1-minute period.

D. PLANNING

1. Master Plan

See Homer office section.

2. Management Plan

See Homer office section.

5. Research and Investigations

Archaeology

Continued archaeological studies by Dr. L. Lewis Johnson from Vassar College had been scheduled in the Shumagins and Fox Islands in July, but our discovery of Aleut burial caves elsewhere in June diverted their efforts.

Use of red fox as a biological control agent against introduced arctic fox

In June 1983 three male red foxes were released on Adugak Island, where arctic fox were introduced in 1925, to determine if male red fox alone will eliminate arctic fox from a small island. Five female and five vasectomized male red foxes were released on Uliaga Island in May 1984 to see if they would extirpate arctic fox on this much larger island stocked with arctic fox in 1930.

Contrary to previous visits to Adugak following the release of red fox, no fox of either species were observed in 1987, but judging from scats and tracks at least one fox, believed to be a red, remained on this island in September 1987. In May 1990 at least one red fox was found on Adugak. One red fox was retrapped and another observed on Uliaga Island, both in 1987 and 1990. No arctic fox sign was found on Uliaga in 1987 or 1990. The introduced reds appear to have eliminated arctic fox, but final confirmation must await the disappearance of all fox sign from both islands. Nevertheless, success is certain enough to try this technique on other small islands. In the future the removal process could be shortened by eliminating the red foxes after it was evident that arctic foxes were gone rather than allowing the introduced reds to die of old age.

Research activities on Big Koniuji Island in the Shumagins

Marine bird research was conducted on Big Koniuji Island in the Shumagin group during the summer of 1990 by John Piatt and Bay Roberts from the Alaska Fish and Wildlife Research Center, Anchorage (Region 8), Dr. Jay Pitochelli (American Museum of Natural History), Scott Neuman (veterinary student, Yale University), John Lang (volunteer and student, Humbolt College), and Leslie Pulcher (volunteer). They arrived at Flying Eagle Harbor on May 18 and unloaded their gear in 60 knot winds accompanied by driving rain. This type of weather prevailed throughout most of the subsequent 2 months and limited ability to conduct research at Big Koniuji. Nonetheless, they had moderate success with several investigations:

Plastic ingestion studies--Several hundred individuals comprising some 20 species of seabirds were collected to assess the degree of plastic particle consumption by seabirds in the Shumagins. This research was funded by the Migratory and Coastal Bird Project, Region 7, to assess whether plastic consumption is a problem for seabirds in the Alaska region. Preliminary results show that some species, e.g., parakeet auklets, consume large quantities of plastic (up to 50 particles per stomach) and plastic consumption persists unabated since previous studies conducted in the 1970's.

Foraging behavior and trophic studies--At-sea surveys of seabirds and hydroacoustic surveys for fish and plankton were conducted to assess spatial and temporal patterns of birds foraging from Big Koniuji. Stomachs of birds collected for plastic studies were also examined for food items. Most foraging flocks were found in an area of intense upwelling where Thysanoessa euphausiids were concentrated, and these formed the main diet of planktivorous seabirds. Fish-eating seabirds also consumes capelin, sand lance and pollock. Muscle and bone tissue of seabirds were preserved for later analysis of stable isotopes (in collaboration with Keith Hobsen, University of Saskatchewan, Canada). This technique provides information on trophic-level feeding interactions of different species.

Crested auklet monitoring--Foxes were eradicated from Big Koniuji Island in 1986 and auklet census plots at Yukon Harbor were established and censused at that time to monitor the future recovery of auklets from fox predation. Those study plots were relocated and auklets attending plots in 1990 were censused. Preliminary analysis suggests that auklet numbers on those plots have increased substantially since 1986.

Other research--Blood samples from 16 seabird species were obtained to determine normal (control) blood cell and chemistry parameters for comparison with birds oiled in the Exxon Valdez spill. Hundreds of tissue samples from 21 species were obtained and preserved in liquid nitrogen for later DNA studies. Hundreds of skeletons were prepared and shipped for permanent housing in the American Museum of Natural History and for later morphometric studies.

While refuge personnel were on Bird Island on July 9 checking for fox sign, Scott Hatch and other research personnel aboard the Tiglax conducted a census of cliff-nesting seabirds on the west end of Bird Island. They detected 6000-8000 murres, 8000-10,000 black-legged kittiwakes, and approximately 130 glaucous-winged gulls. About 500 nonbreeding red-faced cormorants were loafing on rocks. A small colony of northern fulmars, first discovered during fox eradication activities in 1984, still persists. However, the large tufted puffin numbers reported in 1970 were absent. Only a few puffins were seen flying offshore. The kittiwake colony evidently failed, as no nests with eggs or chicks were observed; also, there were few, if any, common or thick-billed murres with eggs or chicks.

E. ADMINISTRATION

1. Personnel

See Homer office section.

2. Youth Programs

See Homer office section.

4. Volunteer Program

See Homer office section.

5. Funding

See Homer office section.

6. Safety

See Homer office section.

7. Technical Assistance

See Homer office section.

F. HABITAT MANAGEMENT

7. Grazing

No visits were made to Dolgoi or Wosnesenski to inspect habitat conditions or enumerate cattle using those two islands. These are the only two islands in the Alaska Peninsula Unit with refuge lands where grazing continues. Cattle were recently removed from Caton, Simeonof, and Chernabura, but these islands unfortunately have not since been visited to denote presumed vegetative recovery.

G. WILDLIFE

1. Wildlife Diversity

While checking Big Koniuji Island for fox sign, an Oriental cuckoo was sighted in dense alder habitat at Flying Eagle Harbor. Although this Asian species occasionally appears in the Aleutians and along the Bering Sea coast, this may be the easternmost record. Plumage characteristics seemed to indicate it was an oriental cuckoo, but it is possible that it was a common cuckoo, which is very similar and also is a rare visitor to western Alaska.

2. Endangered and/or Threatened Species

While conducting seabird studies on nearby Chowiet Islands, Don Dragoo and Belinda Bain visited Kiliktagik Island to ascertain the number of endangered Aleutian Canada geese nesting on this tiny island. A total of 16 nests was found during two visits to the island. Seven geese (four goslings and three adults) were banded. Laying appeared asynchronous, and mean clutch size was 4.2.

3. Waterfowl

Izembek/Alaska Peninsula National Wildlife Refuge personnel again conducted spring surveys for emperor geese along the Alaska Peninsula, but these flights did not include any islands, such as Sanak, Shumagins, or Sandman Reefs where large wintering populations historically were reported. The full survey conducted by Rod King revealed a total of nearly 110,000 emperor geese on the Alaska Peninsula, a 55 percent increase in the fall population of 1989 and 62 percent above the spring count. Twenty-four percent were young, which is slightly above the 6-year average.

5. Shorebirds, Gulls, Terns, and Allied Species

Changes in colony size and reproductive success of seabirds at the Semidi Islands

When the Exxon Valdez ran aground on Bligh Reef in Alaska's Prince William Sound, it released some eleven million gallons of crude oil, the largest such spill in American history. While most of the oiling occurred in western Prince William Sound, oil also washed ashore in the western Gulf of Alaska, southern Kenai Peninsula, the Barren Islands, lower Cook Inlet, and the Kodiak archipelago, Shelikof Strait and the Alaska Peninsula as far west as Ivanof Bay. An estimated 100,000 and 300,000 marine birds were killed as a result of the oil spill. Of the 30,000 oiled bird carcasses recovered after the spill, 74 percent were murres.

The U.S. Fish and Wildlife Service initiated a program to assess the injury to the highly susceptible marine birds that utilize the coastal areas affected by the oil. As part of this program, monitoring of the productivity and populations of seabirds was initiated or continued at colonies in Prince William Sound, the outside coast of the Kenai Peninsula, the Barren Islands, the Alaska Peninsula and the Semidi Islands. Nearly 400 seabird colonies occur within the area affected by the oil spill.

Chowiet Island in the Semidi Islands was chosen as a monitoring site because it is near to, but outside of, the area of oiling from the Exxon Valdez spill. Thus, these colonies served as controls to those that were within the oiled area (e.g., Barren Islands and Puale Bay). The results from the Semidi Islands can be compared to those from oiled colonies to aid in the assessment of the damage to seabird resources from oil pollution.

The objectives of the study in the Semidi Islands were to: 1) determine if populations and productivity of northern fulmars, black-legged kittiwakes, and murres on plots had changed relative to those reported in previous studies, 2) compare the results from this year to those from other areas in Alaska,and elsewhere.

The Semidi Islands, located about 80 km south of the Alaska Peninsula, are of major importance to marine birds, providing breeding sites for approximately 25 percent of the total number of seabirds in the Gulf of Alaska. These islands constitute one of only four major breeding areas for northern fulmars in the northeastern Pacific Ocean. An estimated

90,000 northern fulmars, more than 15,000 black-legged kittiwakes, and 220,000 murres (common and thick-billed combined) were present on Chowiet Island alone.

Field camp on Chowiet Island in the Semidi Islands. Dragoo 1990

Don Dragoo and Belinda Bain arrived at Chowiet Island, aboard the M/V Tiglax, on May 15 and departed, again aboard the Tiglax, on August 26, 1990.

Beginning in 1976 a series of population and productivity plots was established along 2 km of cliffs, ranging from 50m to 200m in height, on the west side of Chowiet Island. One new plot for monitoring black-legged kittiwake productivity was established in the same area in 1990. These plots consist of discrete areas on the cliff face which have easily identifiable boundary features. Black and white or color photographic enlargements, with boundaries drawn on them in permanent ink, were used to locate plots.

Population data were collected by counting individual birds on plots from designated observation points, utilizing spotting scopes and/or binoculars. Counts were conducted only on days with good visibility and light to moderate winds. Fog, rain and high winds impaired our ability to obtain accurate counts.

The census period differed somewhat with each species or genus (murres). Counts occurred during the period in which daily variability in bird attendance on the cliffs was at its lowest. Counts also occurred between the hours of 0900 and 1800 Alaska Daylight Time, the hours during which within-day variability in cliff attendance of seabirds is least.

Productivity monitoring plots were visited every 3 days, weather permitting. New nest starts were noted (i.e., eggs laid by fulmars or murres, sites with new vegetation added by kittiwakes) on plots by assigning each such site a unique number. During subsequent visits, the status (i.e., egg(s) or chick(s), or adult present, but nest contents unknown) of each numbered nest site was noted.

Population estimates were calculated by taking the means of the total numbers of birds counted on all plots on any given count day (replicate). These means represent estimates of the population levels of birds on the plots, not on the island as a whole. Estimates of this type can be used to identify trends in the numbers of birds present on monitored plots. By assuming that events on plots reflect those that occur island-wide one can then infer that any trends identified on plots represent changes in the island bird populations.

Black-legged kittiwake numbers declined appreciably this year after the fourth replicate count (June 21). This was probably due to a nearly complete breeding failure and is, therefore, not indicative of a true population decline.

Murres counted on population plots were not differentiated by species during the early years of counts (1977-1981). Because of this, the numbers of the two murre species were combined for the purposes of testing for differences among all years. In 1990, however, counts of common and thick-billed murres were documented separately.

Different techniques were used to calculate productivity estimates for each of the four monitored species. The productivity estimate used for northern fulmars was the number of chicks that survived to fledging per egg laid (chicks fledged/egg laid) at the sites that were monitored this year. The number of chicks living long enough to fledge for every monitored black-legged kittiwake nest on the plots where at least one egg was laid (chicks fledged/nest with eggs) was

used to estimate the annual productivity of this species. Murre productivity was characterized as the number of fledged chicks for every site at which an egg was laid (chicks fledged/breeding site. The ultimate fate of every monitored nest site present on productivity plots was recorded.

Northern Fulmar--A total of 11 replicate counts was made on plots between June 17 and July 10, 1990. The 1990 estimate of the numbers of northern fulmars on population plots declined from the high point reached in 1989 to a level similar to those found during the period 1977 through 1980.

Northern fulmar counts from 1976 were significantly lower than those from 1980, 1981, and 1989. The two years with the highest counts (1981 and 1989) were each significantly higher than 1977.

Northern fulmars began laying earlier in 1990 than in 1989. Both the date of first laying and the mean laying data were similar to those reported in the years prior to 1989. The date on which the last new fulmar egg was recorded was the earliest, by one day, of any year for which there are data. The 1990 mean hatching data was earlier than all other years except 1976. The same is true for the projected fledging date for the chicks that were still alive when last checked.

The 1990 estimate of northern fulmar productivity is one of the lowest recorded for this species on Chowiet Island. Only 51 percent of the eggs laid at monitored sites hatched. Likewise, 51 percent of the chicks that hatched were still alive in late August, and were assumed to have fledged. There were highly significant differences in the productivity of fulmars among years.

Black-legged Kittiwake--A total of 12 replicate counts was made of population levels of black-legged kittiwakes on plots between June 14 and July 25, 1990. The estimate of black-legged kittiwakes on plots for 1990 is the second highest on record. There was a highly significant difference between the estimated population levels on plots among all years.

Between 1977 and 1981 black-legged kittiwakes on plots did not change appreciably from first egg laying through the end of hatching within any one season. This was not the case in 1989 or 1990, when number of adults attending the cliffs declined significantly after failing to breeding.

No correlation existed between kittiwake population levels and productivity. However, a significant correlation did exist between the number of kittiwake nests counted on plots and the productivity of this species in any given year, suggesting that nest counts are more indicative of breeding effort within

a given year than any actual change in the populations of breeders.

Black-legged kittiwakes began laying 1 day earlier in 1990 than in any other year on record. The mean laying data was similar to those in other years except 1989, when mean laying was several days later. The last new kittiwake egg was laid slightly earlier in 1990 than in most other years. The mean date of hatching was similar to those in other years.

Kittiwakes essentially failed to produce young on Chowiet Island in 1990. They laid eggs in only roughly half the nests that they built. The mean clutch size was 1.47 eggs per nest where eggs were laid. Of the nests that contained an egg(s) 10 percent hatched a chick(s). Black-legged kittiwake eggs failed to hatch on four of the ten plots monitored. Only one chick fledged out of all of the nests monitored. Black-legged kittiwake reproductive output on plots varied from year to year in such a way that no pattern was evident.

Black-legged kittiwake productivity varies considerably between years and colonies in Alaska, and years of poor reproductive success seem not to be related to any discernable environmental variable but may be caused by food shortages during either the pre-laying or chick-rearing periods.

Thousands of murres, fulmers, and other seabirds nest on Chowiet's rugged south side. Dragoo 1990

Monitoring plots have been established on ledges to determine population dynamics of murres. Dragoo 1990

Common and Thick-billed Murres--A total of 10 replicate counts was made of murres on plots at Chowiet Island between June 25 and August 1, 1990. The population estimate of murres on plots for 1990 was the highest on record. A highly significant difference between murre population levels on plots occurred among years.

When the counts of the two murre species were considered separately for the last 2 years, it was found that there was no significant difference for common murres, while thick-billed murre counts were marginally higher in 1990.

The date of first egg laying for common murres in 1990 was 9 days earlier than in 1989, but was similar to all other years. The mean laying date and the date of last egg laying were both somewhat later this year than in any other year except 1989. Mean hatching and fledging dates were both exactly the same this year as last year, and both were later than normal. The same can be said for the mean fledging dates in 1989 and 1990. Thick-billed murre phenology was similar this year to that exhibited in other years.

Productivity of common murres that bred on the plots in 1990 was the second lowest ever recorded for this species on Chowiet Island. Chicks were observed at 66 percent of monitored common murre breeding sites. Of those chicks that hatched, 82 percent fledged, most mortality occurring during incubation.

The 1990 productivity estimate for thick-billed murres breeding on plots on Chowiet Island was very similar to all other years except 1981, when success was significantly higher. Eggs hatched at 60 percent of the monitored thick-billed murre sites, while 69 percent of the chicks that hatched fledged in 1990. As was the case with common murres, most mortality of thick-billed murre young occurred during the egg stage. There were no patterns to the differences in productivity estimates for either species of murres.

6. Raptors

Donna Dewhurst and other Alaska Peninsula National Wildlife Refuge biologists surveyed many islands by helicopter for eagle eyries in conjunction with the reconnaissance of the effects of the Exxon Valdez oil spill. Many more nests were located by helicopter than were previously recorded in general surveys by fixed-wing aircraft and inflatable boats. Populations also must have increased considerably since the era of fox farming on islands and bounties. A total of 89 active bald eagle nests was found on refuge islands between Katmai National Park and the Chaichi Islands. Twenty nests were found on Sutwik Island. Nest productivity in all areas averaged 1.8 eggs laid and 0.8 young fledged per active nest. About 55 percent of nesting pairs produced young. Brown bears destroyed at least five nests. The highest elevation that a nest was observed was at roughly 1000 feet on Karpa Island.

8. Game Animals

Alaska Peninsula National Wildlife Refuge biologist Dewhurst observed two brown bears on Sanak Island feeding on whale and cattle carcasses. Reaching Sanak entails a swim of 20 miles from Unimak Island or the Sandman Reefs. Unfortunately, Sanak itself is Native-owned, and these bears probably were shot, as complaints were made by local Natives about cattle being killed by bears.

9. Marine Mammals

Sea lion counts were made by NOAA on island rookeries south of the Alaska Peninsula. In June Richard Merrick and others observed sea lions on 21 islands off the south side of the Alaska Peninsula. Traditional rookeries occur on six islands in this region and the counts were as follows:

Location	Adults and Juveniles	Pups
Chirikof	1061	607
Chowiet (Semidis)	897	344
Chernabura (Shumagins)	442	193
Atkins (Shumagins)	728	435
Clubbing Rocks (Sandmans)	1021	no count
Pinnacle Rock (Sandmans)	305	no count
Total	5454	1579

Approximately 7300 adults and juveniles were counted on all islands south of the Peninsula, and the incomplete pup total was 1579. Total numbers of sea lions in this region like in nearly all other parts of the state are drastically lower than in recent years. In 1978, over 30,100 were counted on the above six rookeries!

15. Animal Control

Although the principal fox removal efforts of the Alaska Peninsula Unit crew in 1990 were on Carlisle Island in the eastern Aleutians, three islands off the Alaska Peninsula from which fox were eradicated between 1984 and 1988 were rechecked to verify the absence of fox and note recovery of birds.

Kurt Schmidt, Jeff Wraley, and Ed Bailey arrived in Dutch Harbor on July 6 and boarded the Tiglax bound for the Pavlof Islands. Also aboard were Scott Hatch, cruise leader, other Research personnel from Anchorage, and four Soviet biologists.

We arrived at Poperechnoi on the afternoon of July 7 and went ashore to check for fox sign. Twelve red foxes were removed from this rugged island in 1988. The Exxon Valdez oil spill prevented the return of the same crew in 1989. Nevertheless, Vern Byrd did make a brief inspection of Poperechnoi in July 1989 and found half of the 48 traps left set on the island. A fox foot and several non-target animals were found in traps in 1989. Byrd also found tracks indicating that at least one fox remained, and thus 24 new traps were set along with reset traps from the previous summer.

After complete coverage of the island on July 8, no fox tracks, scat, or other sign were found. However, the skeletal remains of a fox were found in one trap reset in 1989. Along beaches additional foxes may have been taken in traps which would have been swept away by winter storms. It was too soon after the apparent absence of fox on Poperechnoi to detect any changes in bird populations.

The Tiglax arrived at Bird Island on July 9, and much of the island was again covered afoot to verify the presumed eradication of arctic fox 6 years earlier. No fox sign was detected, and an accessible gull colony on the southeast end of the island confirmed the lack of fox. Other signs also indicated that numbers of some species of birds were increasing. For example, in 1984 only five rock ptarmigan were observed during a month on the island, but we saw 21 in a single day on Bird Island on this brief visit. Green-winged teal broods also were seen. Nearly all fox trails have disappeared or were delineated by strips of dogwood which often fill in the unused trails. Only at high elevations were trails still sporadically evident as depressions in crowberry cover, primarily in mountain passes.

On July 10 we were dropped off at Flying Eagle Harbor on Big Koniuji where we camped near where John Piatt's crew had been since May. The Tiglax then proceeded to the Semidi Islands until July 18 when they picked us up enroute to Sand Point for departure to Homer the next day.

Although John Piatt had reported suspected fox tracks on a beach on the northeast end of the island in June, we were unable to locate any tracks or other evidence of red fox believed eradicated in 1985-86. During their 2 months on Big Koniuji Piatt's crew only covered the east side of the island near their camp. We circumnavigated the entire island and checked critical beaches on the south and west sides not visited by Piatt. No trace of fox was found anywhere, and judging from increased birdlife, they must be gone. In 1985 and 1986 a total of eight and zero ptarmigan was recorded after periods of 2 and 1 month, respectively, were spent on the island. On this visit, however, we noted 113 willow ptarmigan in only a week! At the 10 x 10 m plots established in 1986 at the crested auklet colony above Yukon Harbor, Piatt's crew noted increases from prior counts in 1986-1987. Moreover, as on Bird Island trails were overgrown, teal broods were sighted, and two accessible glaucous-winged gull colonies were evident. Parakeet auklets also seemed much more numerous around Big Koniuji than in past years. Unfortunately a considerable increase in ground squirrel numbers also has occurred following the removal of fox. They will limit any possible recovery of fossorial seabirds, such as tufted

puffins, since they locally overuse vegetative cover and probably eat eggs and chicks of burrowing birds.

H. PUBLIC USE

Very little recreational use takes place on refuge islands south of the Alaska Peninsula. Sea kayaking occurs in rare instances because of the costly and different logistics and frequent foul weather. Increasing numbers of people ride the state ferry to Sand Point in the Shumagins and on to Dutch Harbor and thus at least have an opportunity to see some of our islands at a distance.

1. General

See Homer office section.

17. Law Enforcement

See Homer office section.

I. EQUIPMENT AND FACILITIES

4. Equipment Utilization and Replacement

See Homer office section.

J. OTHER ITEMS

3. Items of Interest

See Homer office section.

4. Credits

Most of the Alaska Peninsula section of this report was compiled by Edgar Bailey and typed by Bekki Andrew-Miller. The section on the Semidi Islands was excerpted from a report by Don Dragoo and Belinda Bain.

ALEUTIAN ISLANDS UNIT
ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Adak, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1990

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

DEDICATED

IN MEMORY OF

Karen Norton
John Cantu

Gone But Not Forgotten

They Will Be Remembered
In Our Hearts
Forever

A routine boat trip ended in tragedy as one staff member and a volunteer died when the 25-foot refuge vessel Kittiwake capsized the night of January 29, 1990 while returning to Adak from adjacent Kagalaska Island with four persons aboard. Student Conservation Association Volunteer Karen Norton and Maintenance Worker John Cantu perished after the boat became lost in a sudden and prolonged snow squall. Biological Technician Jim Fuller and SCA Volunteer Heather Vose survived and were rescued by Coast Guard-Navy search-and-rescue personnel the following morning. An investigation into the accident is scheduled. The support of the people of Adak and Service employees throughout Alaska helped tremendously throughout this most difficult time.

A standing-room-only Memorial Service was held February 1 for John and Karen at the Adak chapel as they were being returned to Sinton, Texas and Syracuse, New York, respectively, for burial. Alaska Maritime RM John Martin, on detail in Denver, represented the Service in Texas while Montezuma NWR RM Gene Hocutt and ARM Berry Christianson represented us at Karen's funeral along with SCA President Scott Izzo.

The good part of February was consumed with seeking counseling for staff, making travel arrangements for parents of survivors Heather Vose and Jim Fuller to visit Adak, salvaging the wrecked Kittiwake, scheduling a Board of Inquiry to visit Adak and generally attending to myriad tasks that accrue following such a tragedy. BT Fuller left the hospital within two days of the accident to be with his pregnant wife Dawn due to give birth any day. Heather Vose left the hospital a few days later after refuge and hospital staff helped celebrate her 25th birthday.

The Board of Inquiry, consisting of Special Agent Ed Wickersham of Vancouver, Washington, Great Lakes boat Captain Ed Parry from Charleviox, Michigan, Kanuti NWR Manager Tom Early and Safety Officer Virginia Hyatt met with Adak staff to review the Kittiwake accident February 27-28. They returned to Anchorage to interview survivor Heather Vose on February 29 and to complete their report.

After shocks:

A letter was received in October form the Student Conservation Association (SCA) notifying us that attempts to acquire a copy of the Board of Inquiry report on the Kittiwake accident have been unsuccessful. Until they had a chance to review the report they would not be fielding any Resource Assistants (volunteers) to this station. This decision eliminated the three SCA volunteers we had requested for the January - March 1991 time frame and put our summer program in peril.

We supplied Deputy Assistant Regional Director, Refuge and Wildlife (RW) Schmidt and Senior Refuge Operations Specialist (RW) Heuer copies of all correspondence involving our failure in obtaining a copy of the Kittiwake Board of Inquiry report. As

the year ended, neither the Service, families of the deceased employees, or survivors of the accident have been able to obtain a copy of this report. It is our understanding that the families of the deceased and the survivors have appealed to their respective Congressmen in an effort to obtain the report. The failure of the Service to release this report is giving the Service in Alaska and the Alaska Maritime National Wildlife Refuge a bad reputation and is severely impacting the operations of this station.

THE ALASKA LEGISLATURE

In Memoriam

* KAREN NORTON *

The Sixteenth Alaska State Legislature and the State of Alaska offer their deepest and most sincere sympathies to the friends and family of Karen Norton, a United States Department of the Interior, Fish and Wildlife Service volunteer in the Aleutian Islands Unit, Alaska Maritime National Wildlife Refuge.

Karen reported for work the first part of January 1990 as a volunteer for the Fish and Wildlife Service in Adak. On January 29, while returning from an expedition, the FWS vessel Kittiwake was caught in a sudden severe snowstorm that cut visibility to zero. With the vessel's navigational equipment apparently damaged, the vessel drifted to the western side of Adak Island, where it was swamped by a wave. It was the icy waters of the Bering Sea that claimed the lives of Karen Norton and John Cantu, a fellow FWS worker.

Karen was born April 15, 1965, in Syracuse, New York. She was raised in Syracuse and attended both high school and college there. Karen was a vital member of her high school and participated in activities such as the marching band, the Honor Society, was placed on the list of High Schools Who's Who. In 1987, Karen received a Baccalaureate degree in Wildlife Biology from the University of New York in Syracuse. She was a volunteer in the local fire department and she worked on a Wildland Firefighting Crew during the summers.

"Karen knew what she wanted and went after it." Her friends and family remember her as a friendly, cheerful woman who always had something positive to say. Fish and Wildlife personnel remember her as being "a very dedicated person, one of the best they've ever had."

It is with sorrowful hearts the Sixteenth Alaska State Legislature offers its sympathies to the family and friends of Karen Norton. Her goodness, her cheerfulness, her spirit shall remain forever with those who knew and loved her.

SPEAKER OF THE HOUSE

PRESIDENT OF THE SENATE

Date: March 16, 1990

Requested by: Senators Zharoff, Halford, Binkley, Kertt[illegible]d [illegible]n; Representatives Davidson, Jacko, Gruenberg and Kubina

THE ALASKA LEGISLATURE

In Memoriam

* JOHN CANTU *

With heavy hearts the Sixteenth Alaska State Legislature offers its condolences to the friends and family of John Cantu, a United States Department of the Interior Fish and Wildlife Service employee in the Aleutian Islands Unit, Alaska Maritime National Wildlife Refuge.

John was hired by FWS in November shortly after joining his wife, Linda Carlson-Cantu, in Adak. On January 29, while returning from an expedition, the FWS vessel Kittiwake was caught in a sudden severe snowstorm that cut the visibility to zero. With the vessel's navigational equipment apparently damaged, the vessel drifted to the western side of Adak Island, where it was swamped by a wave. It was the icy waters of the Bering Sea that claimed the lives of John Cantu and Karen Norton, a fellow FWS worker.

John was born in Sinton, Texas on June 13, 1949, and spend most of his life in Texas and California. John joined the United States Marine Corps and was a dedicated service member to our country, until his retirement in early September of 1989. John then travelled to Adak, Alaska to join his new bride, a move he was very excited about making. John enjoyed bowling, fishing and hunting.

Fish and Wildlife personnel remember John as "a very dedicated individual who had a number of talents" when it came to his work. Friends and family will remember John as a person who "always made you feel good and was always positive." He brought out the best in the people around him.

With solemn hearts we, the Sixteenth Alaska State Legislature, offer our deepest most sincere sympathies to the friends and family of John Cantu. John will continue to live through the impression he made on those lives around him, and in doing so will not be forgotten, but instead he will forever be in the hearts and minds of those who knew and loved him.

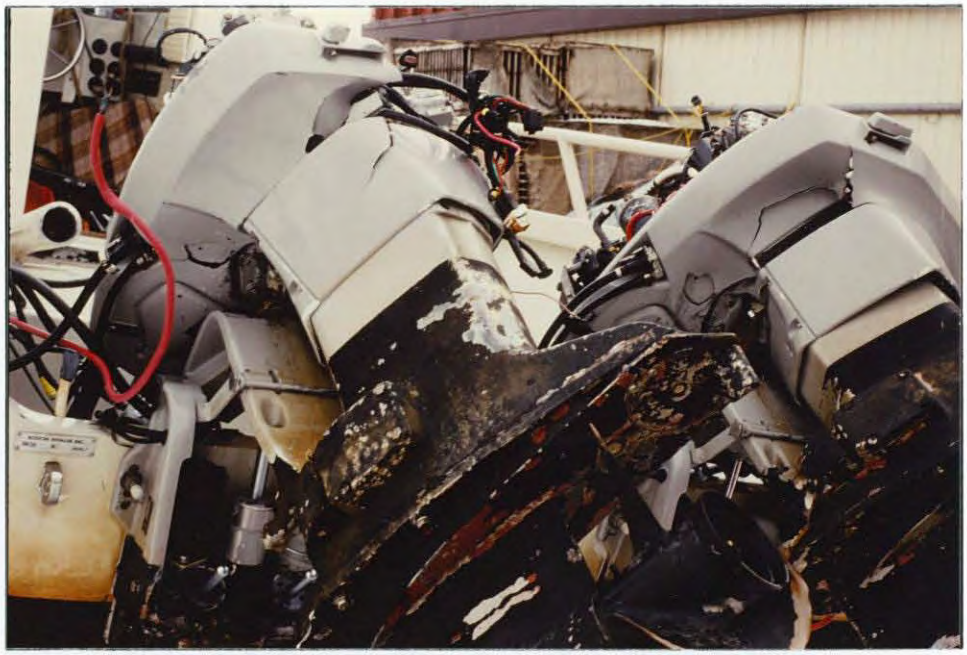
SPEAKER OF THE HOUSE

PRESIDENT OF THE SENATE

Date: March 16, 1990

Requested by: Senators Zharoff, Hanlford, Binkley, Kert[illegible]on; Representatives Davidson, Jacko, Gruenberg, Kubina and Leman

The Kittiwake received major damage to the cabin -- all windows lost, radar gone, radios, antenna, depth finder and gauges waterlogged or gone. (EVK)



The dual 115HP outboards on the Kittiwake received major damage from the pounding surf. (EVK)

INTRODUCTION

G. WILDLIFE

H. PUBLIC USE

I. EQUIPMENT AND FACILITIES

J. OTHER ITEMS

K. FEEDBACK .....Nothing to report

L. APPENDICES

M. INFORMATION PACKET

A. HIGHLIGHTS

Tragedy strikes as two U.S. Fish and Wildlife Service personnel die in a boating accident that occurred in the first and only "Alpha" or white out blizzard conditions of the year. The one glimmer of hope in what had been the darkest moments for our staff was the incredible support of the people of Adak and our Service family in Anchorage and elsewhere.

A joint National Park Service/Fish and Wildlife Service World War II Visitor Center has been proposed for Unalaska/Dutch Harbor. The National Park Service received over 200 letters from Unalaska residents urging the establishment of a park to commemorate the Aleutian campaign. There is also congressional interest as the 50th anniversary of the start of World War II approaches.

The Adak caribou hunt sets new records in the number of hunting permits issued and total harvest. After the final figures were tabulated we learned that 445 permits had been issued and 215 animals had been harvested (182 animals had been the previous high).

Assistant Secretary of the Navy, Jacqueline Schafer toured Adak July 12, fresh from signing a model wetlands agreement with the U.S. Fish & Wildlife Service that allows the Service to map and help protect wetlands on this country's naval bases. Her visit included repeated stops at the Fish & Wildlife Visitor Center.

The Service's M/V Tiglax rescued two Adak fishermen when their vessel capsized while commercial halibut fishing. The two fishermen became stranded in an out of the way section of Adak after making it to shore in their inflatable boat only to see it drift away afterwards.

Summer storms plagued field camps in the Western Aleutians during August. The M/V Tiglax was forced to stay anchored in a sheltered cove for four days while 70-80 knot winds punished the islands. The weatherport tent at Buldir was moved four feet to the side, foundation floor and all, when it was hit by one of those gusts. No major damage occurred.

A Challenge Grant program between the Service and the Adak Boy Scout troop was completed in September. The refuge provided tools and materials for the construction of approach stairways and a foot bridge across a deep drainage ditch that bisects the Shagak Bay hiking trail. It was proposed that the local troop adopt the maintenance of this popular hiking trail as a long-term community improvement project.

Once again the refuge Alaska Natural History Association outlet sets new sales records. Annual sales during FY90 totaled $41,800

an increase of $5,800 over FY89's record sales.

Refuge Manager Boylan departed in August for Washington, D.C. to become involved in the Departmental Managers Development Program. Our new manager, Daniel L. Boone, Turnbull NWR, Cheney, WA, was selected in October to fill the position. He is to report for duty in early January.

B. CLIMATIC CONDITIONS

The complex, highly irregular Aleutian weather is a frequent subject of discussion in and away from the islands. Conditions vary greatly and change abruptly. Individual islands have their unique micro-climates based upon storm tracks and topography. Weather data for 1990 were available from Shemya and Adak.

Due to the lack of nearby mountains to snag passing clouds, Shemya receives considerably less precipitation than other Aleutian weather stations. In 1990, they received 30.3 inches of rain compared to 49.2 inches at Adak. Rainfall and the number of days of measurable precipitation were about the same each year as was total snowfall (Table 1). Overall the winter/spring months had higher temperatures in 1990 as compared with 1989 and the summer/fall months were cooler.

Total precipitation on Adak was about equal to 1989's; however, both years were approximately 30% below normal (Table 2). Snowfall in 1990 was 41.3 inches below normal. Above average amounts of snow occurred in January, but all other months were below average. Maximum, minimum, and average temperatures were similar between years.

Storm force winds on the 25th and 26th of January prevented the daily Reeve Aleutian Airline flights from arriving and blizzard conditions prevailed during early evening and night on the 29th, engulfed Adak in the first "Alpha" or white-out of the year.

Earthquakes are a monthly occurrence and residents soon learn to "roll with the punch" and go on about their business; however, everyone took notice in March when two earthquakes measuring 5.4 and 6.3 rocked the island. The Thanksgiving period was a time to remember with a 5.6 on the 21st and a 5.1 on the 22nd. Several reports of volcanic activity were received throughout the year including a large cloud of steam and ash from Kiska volcano. The M/V Tiglax passed Kiska the next day and observed no activity; however they did find a large black/grey smoke plume emanating from Gareloi volcano.

Table 1. 1990 Shemya, Alaska, weather summary with comparisons to 1989.

	Inches of precipitation		Inches of snow		Days of measureable precipitation		Degrees fahrenheit				
							Maximum		Minimum		Average
	1989	1990	1989	1990	1989	1990	1989	1990	1989	1990	1990
JAN	2.42	2.24	18.9	17.4	26	23	40	39	20	20	31
FEB	2.92	2.63	13.9	20.5	22	23	40	38	25	18	30
MAR	0.58	1.32	1.9	8.4	14	19	40	39	27	27	34
APR	0.99	0.62	2.8	1.1	18	11	42	45	26	32	38
MAY	2.06	2.06	0.2	T	18	20	41	48	35	35	40
JUN	1.74	1.13	0.0	0.0	14	14	51	49	38	39	44
JUL	2.02	2.68	0.0	0.0	22	12	64	59	41	41	49
AUG	4.36	9.36	0.0	0.0	21	20	57	56	46	46	51
SEP	4.34	2.02	0.0	T	25	17	55	56	40	37	48
OCT	2.98	1.91	T	T	19	20	50	53	38	35	44
NOV	2.51	1.40	12.0	2.6	22	18	46	48	28	28	40
DEC	1.85	2.93	14.0	4.1	27	25	40	44	25	29	37
Totals:	28.77	30.30	63.5	54.1	248	222					
Extremes:							64	59	20	18	
Dates:							7/28	7/26	1/19	2/9	

Table 2. 1990 Adak, Alaska, weather summary with comparisons to 1989.

	Inches of precipitation			Inches of snow			Days of measurable precipitation		Degrees fahrenheit				
									Maximum		Minimum		
	1989	1990	NORM	1989	1990	NORM	1989	1990	1989	1990	1989	1990	NORM
JAN	2.30	6.60	6.11	39.2	36.5	17.5	2828	31	44	44	15	9	32
FEB	2.79	3.62	4.75	7.8	14.2	19.2	20	24	44	45	18	17	31
MAR	2.42	6.11	5.85	5.7	1.5	20.1	19	25	49	43	15	20	35
APR	3.12	1.97	4.50	4.2	2.2	9.9	20	14	50	47	26	22	37
MAY	2.76	4.36	4.10	T	T	2.1	24	21	55	52	32	31	41
JUN	1.30	0.90	3.17	0.0	0.0	T	17	10	67	57	39	36	46
JUL	1.28	2.47	2.98	0.0	0.0	0.0	17	10	67	63	39	40	51
AUG	3.79	6.20	4.15	0.0	0.0	T	21	19	67	68	41	42	52
SEP	7.34	5.01	5.36	0.0	T	0.1	21	21	58	59	36	30	45
OCT	3.40	2.58	6.61	T	0.0	1.9	25	23	57	53	34	30	42
NOV	3.13	3.10	8.17	10.4	3.7	12.4	27	20	51	56	24	27	39
DEC	8.61	6.10	7.33	12.0	3.9	20.1	23	28	45	48	17	22	37
Totals:	42.24	49.02	63.08	79.3	62.0	103.3	262	246					
Extremes:									67	68	15	9	
Dates:									6/17	8/03	1/22	1/24	

D. PLANNING

5. Research and Investigations

Alaska Maritime NR90-"Surveys for Aleutian Shield Fern and other Rare Plants"
Dr. David Smith, Univ. of Tennessee, was principal investigator on this project to try to locate previously undiscovered populations of the endangered Aleutian shield fern. Field surveys were conducted July 16-20 at Adak, and from July 21-27 at Atka. No shield ferns were found in areas searched on Mt. Moffett, Adak or anywhere on Atka. Nevertheless, the rare plant Takakia was found on both islands, and the discovery of plants with sporophytic structures allowed the botanists to determine its classification (there had been doubt whether Takakia was a moss or a liverwort). It apparantly is a moss.

Alaska Maritime NR90-"Plastic Ingestion by Seabirds"
John Piatt, U.S. Fish and Wildlife Research Division, Anchorage, Alaska was the principal investigator on this project. The objectives were to determine whether the amount of plastic pellets ingested by tufted puffins and parakeet auklets has changed since the 1970's. A reduction in pellets ingested would presummably reflect a reduction in the amount of material present in the ocean in response to legislation and publicity aimed at reducing this problem. Results were not available at the end of the reporting period.

Alaska Maritime NR90 - "Survival, Body Condition, and Population Changes of Crested Auklets at Buldir Island, Alaska"
Ian Jones, a post doctoral researcher at Cambridge University, color-banded a sample of crested auklets at Buldir in 1990 and plans detailed observations of these birds in 1991.

Alaska Maritime NR90-"Beach Debris and Wildlife Entanglement"
This is an ongoing study by Dr. Al Manville designed to estimate the amount of plastic and other debris on Alaskan beaches. He records types and amounts of debris and all instances of entanglement. Field surveys were conducted in 1990 on Agattu, Buldir, Khvostof, Davidof, Little Kiska, Ogliuga, and Ulak islands.

Alaska Maritime NR90-"Sea Otter Ecology"
Jim Estes, U.S. Fish and Wildlife Service Research, is continuing a long term study to evaluate changes in the nearshore marine community as sea otter populations recovery in the Near Islands. He conducted studies at Attu during 1990.

Alaska Maritime NR90-"Sea Otter Population Monitoring"
Tony DeGange, U.S. Fish and Wildlife Service, Anchorage is

conducting aerial surveys for sea otters throughout the Aleutians over a several-year period to evaluate population trends. His work was concentrated in the western Aleutians during 1990.

Alaska Maritime NR90-"Steller Sea Lion Population Trends and Productivity"
An aerial survey of sea lion populations was conducted throughout the Aleutians by National Marine Fisheries Service biologists from the Marine Mammal Laboratory in Seattle, WA. Furthermore, pups were counted at selected rookeries in the eastern and central Aleutians. These studies are the main monitoring component of the recovery program for this threatened species.

6. Other

Wildlife Biologist Byrd continued to fulfill the position as leader of the Aleutian Canada Goose Recovery Team. A team meeting was held in March to continue the discussion of criteria for downgrading of the goose from "endangered" to "threatened" status. A considerable amount of time was also spent in revising the Aleutian Canada Goose Recovery Plan.

WB Byrd was also appointed a member of the Steller Sea Lion Recovery Team. In this capacity he has attended several team meetings and has been involved in drafting the habitat protection section of the recovery plan.

INTRODUCTION

Aleutian Islands Unit

Alaska Maritime National Wildlife Refuge

The Alaska National Interest Lands Conservation Act (ANILCA) combined a majority of Alaska's seabird habitat into one refuge by adding 1.9 million acres of land to 11 existing refuges to create Alaska Maritime National Wildlife Refuge.

The Aleutian Islands Unit (AIU) comprises about 3.3 million acres in southwestern Alaska and extends over 1,100 miles from Unimak Island west to Attu Island. The Aleutians are actually tips of an arc of 57 submerged volcanoes, 27 of which are active and rise 2,000 to over 9,000 feet above sea level. Izembek National Wildlife Refuge borders the east end of the unit.

Bounded by the Pacific Ocean to the south and the Bering Sea to the north, the unit includes over 200 treeless islands, islets and rocks. These surrounding oceans affect the climate and weather, and provide habitat and migrational pathways for fish, birds, and mammals.

The AIU is divided into seven island groups; The Near Islands, Rat Islands, Delarof Islands, Andreanof Islands, Islands of the Four Mountains, Fox Islands, and Krenitzen Islands. Unimak Island is also presently part of the unit but is not considered part of the Aleutian chain.

Approximately 68 percent or 2.3 million acres of the AIU is congressionally designated wilderness; this includes Unimak Island which has 910,000 acres of wilderness. Unimak has been proposed for transfer to Izembek National Wildlife Refuge.

The Aleutians have a maritime climate characterized by overcast skies, frequent, violent storms, high winds, fog and precipitation. Year-round temperatures are cool but not normally severe, with a mean annual temperature of 40 degrees F. Strong winds, sometimes approaching 100 m.p.h., can induce very cold chill factors.

The AIU provides unique nesting habitat for several million seabirds, the endangered Aleutian Canada goose, and other waterfowl. It is also an important migration and staging area for a wide variety of waterfowl, shorebirds and passerines and provides wintering habitat for emperor geese and other waterfowl. The refuge is one of the few places in North America where Asiatic birds are frequently seen in spring and fall. Fully 35 percent of all bird species observed in the Aleutians breed only in Asia; most are seen at the western end of the chain. Some 260 bird species have been recorded in the AIU.

The AIU has the largest nesting population of seabirds (approximately 10 million) in North America. It is one of the few refuges in the United States managed primarily for seabirds. A major problem affecting seabirds in the AIU is the widespread introduction of foxes. The Aleutians' 10 million seabirds is probably a fraction of what it was prior to fox introduction. Only 44 units of over 100 named islands, islets and rocks in the Aleutian Islands Unit, are fox-free; this constitutes approximately 6% of the total acreage.

Land mammals found in the AIU (other than Unimak Island) are generally non-native. Reindeer were introduced to Atka for food and for antlers to be sold as an aphrodisiac. The commercial venture failed and over 2,000 feral reindeer remain on the island. Caribou, from mainland Alaska, were released on Adak in 1958 for emergency food and recreational hunting. The herd is managed for a post-season population of 250 animals.

The Norway rat was accidentally introduced by early Russians and again during World War II and is now found on 20 islands throughout the chain. Introduced rodents act as predators of ground nesting birds; voles and ground squirrels cause erosion by overgrazing the vegetation.

Arctic and red fox were originally found on a few of the eastern Aleutians, but were introduced to over 80 other islands between 1836 and 1930. The damage to native bird populations on these islands is significant. Plans call for eradication of introduced foxes to allow native bird species to recover.

The Aleutian Islands were originally established as a refuge in 1913 to protect the sea otter. Since that time, the sea otter has made a dramatic recovery. Their population in the Aleutians is estimated to be 55,000-75,000.

An estimated 85,000 harbor seals are found throughout the Aleutians and can be seen hauled-out on offshore reefs, rocks, ledges, and beaches along the main islands. The northern or Steller sea lion is also found throughout the Aleutian Chain. The world population of northern sea lions has decreased by more than 50 percent in a decade and National Marine Fisheries Service is considering a "depleted" status for them. On certain rookeries in the eastern Aleutian Islands, the sea lion population is estimated to be 20 percent or less of its original numbers. In the western Aleutians, populations may have declined by over 60%.

Fourteen species of cetaceans have been observed in the waters of the Aleutian Chain: Orcas, Dall porpoises and Minke whales are the three species most commonly observed.

The Aleutian Canada goose, short-tailed albatross, Chinese egret, and the Aleutian shield fern are the four endangered species that have been observed in the Aleutians.

The Aleutian Canada goose historically nested throughout the Aleutians. Since the introduction of arctic foxes, these birds occur naturally on only two islands (Chagulak and Buldir) in the AIU. Neither island had foxes introduced. A reintroduced goose population is developing on Agattu Island following fox removal.

To aid in the recovery, fox are being eradicated on selected islands and geese transplanted from Buldir to fox free islands where the birds historically nested. The Aleutian Canada goose population is estimated to be about 5,000 birds up from its 1975 population of 700 geese.

The Aleutian shield fern, historically found only on Adak and Atka islands, was listed as endangered in 1988. Field work continues in an effort to prepare a recovery plan for this species, recently found only on Adak.

The Aleutians were originally occupied by the Aleuts, related to the Eskimos. Subsistence was entirely maritime, with extensive exploitation of local whales, sea mammals, fish, invertebrates, seabirds, eggs and plants.

The Russian fur trade and Russian Orthodox Church dominated Aleut life from the 1850's until the American purchase of Alaska. The early years, before the founding of the Russian-American Company, saw considerable loss of population from epidemic and other causes. Today's Aleut population numbers some 2,000 in only four villages but up to 20,000 once called these islands home.

The later history of the Aleutians was marked by a continuation of fur trapping, the introduction of fox farming, and the development of commercial fishing. The 20th century was dominated by World War II including the first occupation of America soil since the War of 1812.

During World War II, the Japanese seized Kiska and Attu islands after bombing the military bases on Dutch Harbor. The U.S. constructed large bases in the Aleutians with thousands of structures erected on Adak, Amchitka, Shemya, and other refuge islands. An assault on Attu Island resulted in a hard-won victory for the United States, followed by the Japanese evacuation of Kiska Island. Prior to the invasion of Kiska, there were 100,000 American and Canadian soldiers in the Aleutians. The recapture of Attu was the only battle of the war fought on U.S. soil; also the only battle fought in a National Wildlife Refuge.

Several sites in the Aleutians are National Historic Landmarks due to their significance in World War II. Attu, Shemya, Amchitka, and Adak are military bases. The Coast Guard maintains a base on Attu Island and Shemya is an Air Force Base while the Navy is on Amchitka and Adak islands, the latter AIU headquarters. With over 5,000 people, Adak is the sixth largest community in Alaska.

The Department of Defense continues its Defense Environmental Restoration Program (DERP) to rehabilitate World War II military sites including chemical sampling and analysis for contaminants. Sites on Alaid, Agattu, Buldir, Amchitka, Tanaga, Atka, Great Sitkin, and Unimak islands in the AIU are targeted for cleanup.

Olaus Murie called the Aleutians "a melting pot" for species from two continents while Michael Frome described them as a "great oceanic crossroads". Ironically, the Aleutians' remoteness has not guaranteed their preservation and may have hastened their demise. Would Amchitka Island have been thrice-choked by nuclear blasts were it near Anchorage? Was it not the isolation that allowed a "forgotten war" of three years to leave a legacy of debris and toxic wastes that we are unable to clean up after half-a-century? And was it not this isolation that allowed foreign foxes to wipe out native birds as native Aleuts were being exterminated by foreign entrepeneurs and armies?

Geologically, the Aleutians are the youngest part of Alaska. But in 100 years, humankind has inflicted considerable damage by manipulating these islands, trying to make them something other than the Aleutians. Aldo Leopold said the first rule of intelligent tinkering is to "save all the pieces". Only time will tell if we have done so in the Aleutians. If we have not, time will not matter...

E. ADMINISTRATION

9a 7 6 2 8 Boone

Personnel

1. Michael F. Boylan, Refuge Manager, GS-12, PFT (Transferred 8/3/90)
2. Evan V. Klett, Assistant Refuge Manager, GS-11, PFT
3. G. Vernon Byrd, Wildlife Biologist, GS-11, PFT
4. Cheryl L. Cline, Outdoor Recreation Planner, GS-9, PFT
5. James P. Fuller, Biological Technician, GS-6, PI (transferred 4/22/90)

5a. Jeff C. Williams, Biological Technician, GS-5, PI (EOD 9/9/90) also Seasonal Biotechnician, GS-5, 5/12/90-9/8/90

6. Dorothy G. Wheeler, Clerk-typist, GS-4, PFT
7. Brenda J. Wiles, Clerk-typist, GS-3, PFT (EOD 7/2/91)
8. Robert P. Schulmeister, Maintenance Worker, WG-8, PFT
9. John Cantu, Maintenance Worker, WG-5, TFT (Deceased)

9a. Jeff Lewis, Maintenance Worker, WG-5, TFT (EOD 5/14/90)

10. Mark Snigaroff, Maintenance Worker, WG-5, Emergency hire (4/3/90-6/1/90)
11. Hector Douglas, Seasonal Biotechnician, GS-5 (5/12/90-12/26/90)
12. Elizabeth Mayock, Seasonal Biotechnician, GS-5 (5/1/90-9/28/90)

13. Donna O'Daniel, Seasonal Biotechnician, GS-5 (5/12/90-9/28/90)
14. Karen Norton, SCA Biological Aid (1/4/90-1/30/90, Deceased)
15. Heather Vose, SCA Resource Assistant, (1/20/90-3/6/90)
16. Karen Kreisel, SCA Biological Aid (5/12/90-8/27/90)
17. Mark Hipfner, SCA Biological Aid (5/12/90-9/28/90)
18. Ian Jones, SCA Biological Aid (5/12/90-8/27/90)
19. Steve Barclay, SCA Biological Aid (5/12/90-9/1/90)
20. Don Dearborn, SCA Biological Aid (5/12/90-9/28/90)
21. Hugh Knechtel, SCA Biological Aid (5/12/90-8/18/90)
22. Scott Richardson, SCA Biological Aid (5/12/90-8/27/90)
23. Steven Courts, SCA Resource Assistant (5/24/90-9/1/90)
24. Liza Tulio, ANRA Aid, PT (5/10/90-6/8/90)

Volunteers

1. Tom Nichols and border collies "Cap" and "Lass"
2. Bill Hall
3. Bob Bruff
4. Terry Fortney
5. Danny Lambert
6. Paul Fisher
7. Tami Fisher
8. Claire Gallagher
9. Mike Steward
10. Sue Martin
11. Bruce Martin
12. Julie Ridley
13. Gary Laliberte
14. Jean Kohl
15. Jim Kohl
16. Chrisite Zanon
17. Brenda Hoskyns
18. Donna Venglar
19. Judy O'Neale
20. Jack O'Neale
21. Karen Conrad
22. Liz Lang
23. Greta Johnson
24. Scott Crabtree

Table 3. AIU Staffing, FY 1985-1990.

Year	Permanent FT	Permanent PT	TEMP	Total FTE'S	Volunteers SCA/ANHA	Volunteers OTHER
90	7	2	7	10.1	10/1	26*
89	8	1	5	10.2	10	24*
88	8	0	4	8.3	9	12
87	8	0	2	8.6	10	5
86	7	0	2	7.1	4	3
85	7	0	5	10.8	4	3

* includes two dogs

There were several major changes in the AIU staff in 1990. In January we lost Maintenance Worker John Cantu in a boating

accident. This vacant position was finally filled by Jeff Lewis in May.

On March 8, BT Fuller and his wife Dawn added to the refuge family with the birth of a son: Paul John (P.J.), weight-8lbs. 14 ozs. It was quickly discovered that P.J. had a respiratory problem so he was medivaced to Anchorage where it was discovered that the problem was not life-threatening. On doctor's recommendation that the Fuller family relocate to be near medical facilities, Jim transferred to the Regional Office. This position was filled by Seasonal Biotech Jeff Williams in September.

In July, Brenda Wiles joined the staff as our new Clerk-typist.

Refuge Manager Mike Boylan departed on August 3rd for Washington, D.C. to begin a 9 month stint in the Departmental Managers Development Program. Assistant Refuge Manager Bud Olivera, Tetlin NWR, Tok, Alaska, served as Acting Manager for two weeks before returning home due to other obligations. In October, Daniel L. Boone, Refuge Manager at Turnbull NWR, Cheney, Washington was selected to fill our vacant managers position. Daniel is no newcomer to the Aleutians or Alaska. He assisted in constructing the captive Aleutian Canada goose breeding facility at Amchitka in 1976 and served a tour at the Kodiak NWR, Kodiak, Alaska. He is scheduled to arrive in early January.

ORP Cline departed on 9 August for a two week detail in the Regional office to assist personnel in the Subsistence Division. She was still there at year's end and her return seems indefinite.

Refuge personnel took advantage of a variety of training and professional meetings on and off island this year. ORP Cline began by attending a one-week Archaeology Resources Protection Act course February 5-9 at the Federal Law Enforcement Training Center in Brunswick, GA.

In March, refuge officers Boylan, Klett and Cline left some of the world's worst weather for balmy southern Arizona and Alaska's second law enforcement refresher training at Marana in cooperation with Region 2. Improved course content and hospitable weather made this year's training better than last years.

WB Byrd, leader of the Aleutian Canada Goose Recovery Team, organized a meeting in Portland, Oregon in March to further discuss/define the criteria to be used in delisting the endangered Aleutian Canada goose and to obtain thoughts to be used in revising the recovery plan.

ARM Klett and WB Byrd attended a "Southern Coastal" project leaders meeting aboard the Service's M/V Tiglax in Homer, Alaska during 14 and 15 November. This "mini" meeting was an excellent way to get a small group together to discuss problems that were specific to southern coastal refuges. It was a very good meeting and big Thank You is given to the staff of the Alaska Maritime Refuge and the Tiglax crew for hosting this meeting.
MW Bob Schulmeister was off island for two weeks in April on Adak Region School Board business followed by a detail to the Homer office to assist with outboard motor/field equipment maintenance. While in Homer he attended a workshop dealing with handling/ storage of hazardous materials.

4. Volunteer Programs

During 1990 we again relied on the Student Conservation Association (SCA) to provide biological assistants for summer field work as well as resource assistants for refuge public use programs winter and summer. The dedicated efforts of these young people living prolonged periods in remote field camps in the world's worst weather cannot be overestimated. Their contributions to the Aleutian Canada goose translocation, seabird monitoring, beach debris surveys, visitor center operations, interpretive and environmental education programs were critical. Previous SCA volunteer Hector Douglas returned to us as a Biological Technician in 1990 (his third year in a row), proving that hard work has its rewards. We also had two biological aids return for their second year.

Tom Nichols and Robert Lewis' trained border collies "Cap" and "Lass" were our most extraordinary volunteers once again in 1990. The dogs' enthusiasm for their work was contagious, enabling their human helpers to overcome the hard work, long hours, stormy weather and rugged living conditions. Having proven their worth, Lass and Cap will join us again in 1991.

Our volunteer program not only grew in number in 1990 but also in variety. A dedicated cadre of local volunteers assisted by a seasonal SCA'er maintained visitor center operations. Another dedicated group of hardy Adak outdoorsmen assisted refuge staff by camping on nearby islands for weeks at a time during the winter to trap fox and help restore native birds.

A volunteer "Thank You" pot-luck dinner and awards ceremony was held at the refuge bunkhouse the evening of January 26. Of 52 staff, volunteers and spouses invited, 50 were in attendance. All volunteers received certificates and gifts to recognize their individual contributions.

6. Safety

A lot of time was spent reviewing the Kittiwake accident and completing required accident forms. An all employee meeting was held to discuss aspects of the accident and review procedures and policies. Even with the clarity of hindsight, it was generally agreed everyone had done all they could under the circumstances.

Assistant Refuge Manager Klett served as station safety officer during 1990. Nine structured safety meetings were held and seven movies/videos were shown. Topics included winter driving tactics, drunk driving, CPR certifications, flotation and survival suits, first aid, defensive driving and highway safety, and fire safety in office and homes.

A variety of safety training was taken by refuge personnel during the year. Fourteen permanent, seasonal, and volunteer employees were certified for CPR. A week long spring training session for field personnel included viewing U.S. Coast Guard cold weather/cold water survival films, use of personal flotation and survival suits via swimming in the small boat harbor, use of compass and maps, the care and use of outboard motors and inflatable boats, radio operation and communication procedures. Because of our boating accident, we spent a lot of time with hands on boating practice with stress on safe operation, paying attention to weather reports and radio procedures.

SCA volunteers Karen Kriesel and Ian Jones receive hands on instruction in operation of the fire hoses on the Tiglax under supervision of deck hand Jerry Andrew-Miller. (EVK)

All field personnel had a safety tour of the refuge vessel Tiglax, shown the location of all safety and survival equipment and its use discussed or demonstrated. All personnel participated in fire and abandon ship drills.

Safety related purchases included new batteries for ELT's and EPIRB's, new EPIRB's, pocket survival kits containing flares, dye markers, fire starter kits and signaling mirrors and one large first aid kit. The old first aid kits were checked and old, outdated, contaminated medications/compresses replaced.

Two radios were assigned to each AIU field camp in 1990. One served as the primary communication unit and the other was a backup in the event of failure of the primary unit. Multi-frequency whip antennas were used at all field camps.

All field crews continued to be briefed regularly on the safety aspects of their duties relating to sea conditions, weather, getting lost and the necessity for maintaining equipment in good working order. Minimum of twice-daily radio contact was maintained between Adak and all field camps as well with the M/V Tiglax.

A staff meeting was held in September with all members of our field camps to discuss the field crew emergency plan, their initial training and what they thought could be improved, changed or expanded on.

> Boat Training: Was okay, but more emphasis should be given to boating and beach landings under adverse weather/sea conditions on beaches further away from Sweepers Cove, add lecture on seamanship, have written instructions on boat/motor maintenance to go along with practical training.
>
> Boat Emergency Equipment: Add bottled/canned water, extra air pump, anchor and anchor line.
>
> CPR/First Aid: Split into two 4 hour periods instead of one 8 hour class.
>
> Camp Safety: Reinforce the need for separate storage of different fuel types and proper fresh food storage (reduce possibility of food poisoning).
>
> General Safety: Reinforce policy of working in pairs, not as individuals.

Overall they thought that the safety training they received was very good and directly related to their field activities.

On 27 November, personnel from NAS Safety Office conducted a short walk through inspection on the administrative and auto shop

sections of our headquarters building. Infractions noted were minor, i.e., general house keeping, lack of retainer wires under fluorescent light bulb fixtures, unlabeled electric breakers.

MW Jeff Lewis, also president of the Adak Boating Association and U.S.C.G. Auxiliary member, assisted in conducting a U.S. Coast Guard boating safety class for 16 people in the Fish & Wildlife Center.

7. Technical Assistance

RM Boylan met on March 26th, with National Park Service personnel in Anchorage and briefed NPS Regional Director Boyd Evison on the joint NPS/FWS/Navy effort "Project Seamark" surveying WWII artifacts in the Aleutians. From March 27-29, Boylan accompanied five NPS personnel to Dutch Harbor for a feasibility study about establishing a national historic park in the eastern Aleutian community to include a visitor center. NPS received over 200 letters from Unalaska residents urging the establishment of a park to commemorate the Aleutian campaign and there has also been congressional interest as the 50th anniversary of the war approaches (1992).

Sandy Faulkner and Bonnie Houston, National Park Service historians arrived on 6 August to review/inspect historic sites on the Naval Air Station. While here, they presented bronze plaques to the Naval Air Station, U.S. Coast Guard and Fish & Wildlife Service for the National Historic sites on Adak, Attu and Kiska. Certificates of recognition were also presented from the Alaska State Historic Preservation Office.

On 8 August, the Naval Air Station hosted approximately 90 World War II veterans of the 11th Air Force Bomber Squadron. They were provided a tour of the base and visited many historic sites, including the original location of their squadron headquarters. ORP Cline and ARM Klett assisted as tour guides.

RM Boylan and FWS Archaeologist Chuck Diters visited Attu May 12-13 with representatives of the Corp of Engineers, National Park Service, and State Historic Preservation Office. The group inspected a proposed Air Force project to replace a deteriorated bridge across the Henderson River. The Air Force's request for a Special Use Permit was denied since they intended to remove a unique WWII bridge which is a contributing structure to the National Historic Landmark.

RM Boylan, ORP Cline and SCA'er Courts helped Adak's Ducks Unlimited chapter draft a request to ADFG for funds to install wildlife viewing and interpretive aids around Clam Lagoon. A similar proposal went to the Regional Office seeking funds under the "America The Beautiful" wetlands initiative. The road surrounding Clam Lagoon is a natural auto tour route offering

superior views of sea otter, sea lion and harbor seals as well as numerous species of birds.

The refuge received $10,000 under the "America The Beautiful" program for FY91. Preliminary planning continues and at year's end we heard that the U.S. Navy may be able to provide an additional $50,000 under the "Watchable Wildlife" program.

As 1990 came to an end, U.S. Fish & Wildlife Service personnel were providing resource data to U.S. Navy consultants for the Environmental Impact Statement (EIS) covering the construction of the second Relocatable Over The Horizon Radar (ROTHR) on Amchitka. The Navy had agreed to provide for the support of a Service representative on the island during construction of this second facility just as they had the first.

On May 18-24, RM Boylan visited Amchitka with personnel from Navy contractors, FWS Ecological Services, Environmental Protection Agency, and Corp of Engineers to inspect proposed mitigation measures for this second site. An estimated 200 acres of wetlands including 30 acres of open water will be lost to the project. A number of mitigation priorities were identified for the Navy's EIS. In October, the EIS was received, reviewed and comments supplied to the Ecological Service Division in Anchorage. Planning continued slowly and than came to a standstill when "Desert Shield" became a reality. It appears this second site has been postponed for a rumored 5 year period.

The refuge staff contributed comments to the draft NAS Adak Natural Resources Management Plan being developed by the Soil Conservation Service under contract to the Navy. RM Boylan spent much of January editing this important document which will provide much needed guidelines for future military administrations on Adak which change every two years and improve cooperative efforts between the Navy and the service. Navy Natural Resource Planner Richard Rugen visited Adak in July and met with the refuge staff at length discussing the final draft of this important (for the Service) plan.

Stoney Wright, Director of the Alaska Plant Materials Center, Palmer, AK, proposed his assistance with the FWS/Adak Boy Scout Challenge Grant Program to rehabilitate the Shagak Bay Trail. He will provide $3,000 for revegetation work that was slated for the Navy on Adak. ARM Klett and the refuge maintenance staff assisted the local Boy Scout troop by providing lumber and tools to complete the construction of a foot bridge across a deep drainage that bisects the Shagak Bay hiking trail and terraced steps leading down to and up from the bridge. This will be a welcome addition to the trail.

Before and after photos show steps and foot bridge the Scout troop installed in a deep drainage on the Shagak Bay trail. (EVK)

The Service vessel M/V Tiglax carried a variety of passengers on their summer's journey. Endangered Species Specialist Brian Anderson and ADFG's Dan Rosenberg participated in Aleutian Canada goose surveys. Dr. Al Manville of the Washington, D.C. based Defenders of Wildlife completed a third summer of beach debris surveys. Writer Peter Isleman of Bantam Publishers gathered information for his book, A Portrait of Alaska and Its People. Our most experienced volunteer was former Aleutian Islands National Wildlife Refuge Manager, Robert "Sea Otter" Jones, 74, who came out of retirement to visit islands aboard the Tiglax he had last reached two decades ago via an 18' wooden dory!

Bob Jones, Refuge Manager of the Aleutian Island Refuge from 1948 to 1974, returned to visit the refuge in July. He was very impressed with the increase in seabird numbers and sad about the decline in sea lions. He stated that he used the noise and smell of the sea lion rookeries to navigate his dory from island to island in the fog. (CC)

8. Other

Last June, a joint investigation team from the Environmental Protection Agency and Alaska Department of Environmental Conservation gave the Navy one year to clean up the old hazardous waste storage sites, landfills and other WWII contaminated areas on Adak. To help meet this objective, NAS contracted with a consulting firm to do a complete detailed study of the sites. During the year refuge staff met with members of the consulting group to answer many detailed questions. This is an interesting

process when you are discussing specific sites over the telephone with someone in California or Washington who has never been on Adak or even seen photographs of the site. Clean up continues.

The refuge staff remains involved with the Aleutians West Coastal Resource Service Area Management Plan. ORP Cline attended a planning meeting at Atka and the refuge staff was involved in reviewing a draft of the organization's goals and objectives as set forth by their parent organization.

Military bases on Adak, Amchitka, Shemya and Attu received technical assistance from our office on a number of projects including the demolishing of an old wooden pier next to the SeaBee Battalion complex, construction of a new LORAN transmitter, snow mobile use, and military exercises, as well as hunting/fishing information.

Arrangements were made with Don Miller, a noted New York artist and Adak WWII vet, for an Aleutian Islands poster. After lecturing at the Anchorage Museum of History and Art, Miller visited the island last year to assist the Adak Historical Society in their effort to restore a WWII chapel. He returned this year as a guest speaker at the high school graduation. In return for the Alaska Natural History Association assisting with airfare, Miller will provide the artwork for a color poster for the refuge. An accomplished artist whose works include the 60-foot mural in Washington D.C.'s Martin Luther King Memorial Library, Miller's poster should be a best seller.

With a staff of nine and the challenge of managing 1,100 miles of islands and the wildlife, historical and cultural resources scattered throughout them, cooperation is the name of the game in the Aleutians. That means cooperating with agencies such as the Alaska Division of Fish and Wildlife Protection to combat commercial fishing violations, the National Park Service to prevent violations of archaeological or historical resources, EPA and the State's Department of Environmental Conservation to prevent pollution of air, soil or water and insure legal disposal by the military of hazardous wastes.

Special Use Permits were issued to the following: 1) Alaska Plant Materials Center, Palmer, AK for the collection of cuttings and seeds from mountain ash and willow from Attu and Adak. These samples will be used to develop young native shrubs for planting in the NAS housing area. The use of native plants was one of the big issues worked out in the NAS Adak Natural Resource Management Plan. 2) U.S. National Marine Fisheries Service for the placement of temporary radio receivers on selected islands in the eastern Aleutians to track migratory subadult fur seals during the fall. The information will assist in better management of the species.

F. HABITAT MANAGEMENT

1. General

The AIU contains some 300 islands totaling 3.3 million acres. These islands stretch over 1,100 miles from the tip of the Alaska Peninsula to within 500 miles of the Soviet Union's Kamchatka Peninsula. Commonly referred to as "The Chain", all but portions of the seven larger eastern Aleutian islands are included in the refuge unit. Due to their close proximity to the Alaska Peninsula, Unimak (1.0 million acres) and Amak islands are administered by the Izembek National Wildlife Refuge, headquartered at Cold Bay, Alaska. The refuge's Comprehensive Conservation Plan (CCP) recommends that these islands be formally transferred to Izembek NWR. The Sanak Islands south of the Alaska Peninsula are managed from refuge headquarters at Homer, Alaska. Except for the Aleut village at Atka, the Navy bases at Adak and Amchitka, the U.S. Air Force base at Shemya, and the U.S. Coast Guard LORAN Station at Attu, the only recent signs of human activity on the AIU are the unhealed scars and debris remaining from World War II.

2. Wetlands

Many of the islands have numerous freshwater "potholes", some superficially resembling the prairie pothole country of the midwest. A few areas at lower elevations produce aquatic growth and support modest waterfowl populations, especially Amchitka, Kanaga and Agattu islands. We have been working with a "no net loss of wetlands" management policy for years. Current management efforts include orienting military development away from lowland wetlands and lagoons. The AIU staff monitors construction projects on military installations at Adak, Amchitka, Shemya and Attu, and provides recommendations on proposed activities by Native Corporations on the refuge as well. The military, especially at Adak, were cooperative and sensitive to our suggestions throughout the year.

6. Other Habitats

Beach Debris Surveys--Increasing use of man-made materials that are highly resistant to environmental decomposition has resulted in the presence of unprecedented amounts of debris in the oceans. Plastic materials, netting, lines, and other material are deposited on refuge beaches in large amounts, and its effect on wildlife can be harmful (e.g., entanglement, ingestion, etc.).

In 1989 and 1990, we conducted debris surveys and also recorded dead animals along selected beaches on Little Kiska, Buldir, and Agattu islands. The purpose of the surveys was to describe the quantity and type of items present and to provide a basis for future comparisons. Very little change was noted when the

results of the 1990 surveys were compared with results from 1989.

7. Grazing

Two grazing operations continue under Special Use Permits. The policy of charging a $100.00 administration fee is working well for everyone. The permittees felt they could afford this fee and the Service resolved the problem of obtaining payment. A request by the owner of Umnak Ranch to expand his 28,000 acres grazing lease by 20%/year over the next five years was denied by RM Boylan in accordance with the approved Comprehensive Conservation Plan. At the same time, a proposed agreement between the rancher and a Native Corporation to manage reindeer allegedly belonging to the corporation was not recognized since the animals must be marked/branded before the Service or the Alaska Department of Fish and Game will acknowledge "ownership". The permittee of the third lease has been taken to court by a Native Corporation for non-payment of his lease with them. The Native Corporation controls approximately 90% of the land under this lease. We have decided to wait and see how the case is resolved before we continue any attempt to reissue a permit for this small grazing operation.

12. Wilderness and Special Areas

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

During PacEx 89, refuge staff worked with military planners to insure designated wilderness areas on Adak, Amchitka and other islands were off-limits to military activities. The three-week exercise went off as planned without any damage to wilderness values.

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

Area	Designation
Aleutian Islands Unit	International Biosphere Reserve
Agattu Island	Research Natural Area
Buldir Island	Research Natural Area
Naval Air Station, Adak	National Register of Historic Landmarks
Kiska Island Occupation Site	National Register of Historic Landmarks

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

G. WILDLIFE

1. Wildlife Diversity

Sightings of rare to accidental species in the central and Western Aleutians in 1990.

Species	Island(s)	Species	Island(s)
Arctic Loon	Adak	Slaty-backed Gull	Agattu, Attu, Buldir, Nizki
Yellow-billed Loon	Attu	White-tailed Eagle	Attu
Sandhill Crane	Attu, Buldir	Northern Harrier	Adak
Bean Goose	Attu	Rough-legged Hawk	Attu
Brant	Adak	Osprey	Adak
American Wigeon	Adak	Merlin	Adak
Garganey	Buldir	Gyrfalcon	Buldir
Common Pochard	Nizki, Attu	Common Cuckoo	Agattu, Buldir
Tufted Duck	Adak, Agattu, Attu, Buldir, Nizki	Eurasian Skylark	Attu
ing Eider	Attu	Common House Martin	Buldir
Surf Scoter	Little Tanaga	Gray-spotted Flycatcher	Agattu
Smew	Adak, Attu, Buldir (dead), Nizki	Siberian Flycatcher	Attu, Buldir
Semipalmated Plover	Adak, Buldir	Middendorff's Grass. Warbler	Buldir
Mongolian Plover	Attu	Eye-browed Thrush	Attu, Nizki
Black-tailed Godwit	Adak, Attu	Bluethroat	Attu
Lesser Yellowlegs	Buldir	Siberian Rubythroat	Attu, Buldir, Tanaga
Common Sandpiper	Agattu, Attu, Buldir	American Pipit	Attu
Terek Sandpiper	Agattu, Attu, Nizki	Olive Tree Pipit	Attu, Buldir
Gray-tailed Tattler	Adak, Attu, Buldir, Nizki	Pechora Pipit	Buldir
Wood Sandpiper	Agattu, Attu, Buldir	Red-throated Pipit	Attu, Buldir
Long-billed Dowitcher	Adak, Attu	Black-backed Wagtail	Attu
Common Snipe	Adak, Attu, Buldir	Yellow Wagtail	Adak, Agattu, Attu, Buldir
Long-toed Stint	Attu, Buldir	Gray Wagtail	Attu
Little Stint	Buldir	Yellow-breasted Bunting	Buldir
Temminck's Stint	Buldir, Nizki	Rustic Bunting	Attu, Buldir
Rufous-necked Stint	Attu, Buldir	Pine Siskin	Adak
uff	Adak	Common Rosefinch	Attu
Common Black-headed Gull	Adak, Attu, Buldir	Hawfinch	Adak, Attu
Herring Gull	Adak	Oriental Greenfinch	Attu
Iceland Gull	Adak	Brambling	Adak, Amchitka Pass (off Tiglax), Attu, Buldir

2. Endangered and Threatened Species

a. Aleutian Canada Goose (Translocation).--(Excerpts from Byrd, G.V. and E. Mayock. 1990. Translocation and banding of Aleutian Canada geese in the western Aleutian Islands in 1990. U.S. Fish and Wildlife Service Report, Adak, Alaska). This ongoing project involves capturing flightless geese at Buldir Island and moving them to a fox-free island for restoration of nesting populations. In 1990, families of geese were moved from Buldir to two different locations; Nizki (38) and Little Kiska (25). Female goslings flying for the first time at release sites will return there to nest. Resightings in California during the winter of 1990-91 indicated that over 65% of the goslings (over 80% of adults) survived the fall migration. This is an excellent rate indicating little mortatlity associated with the move. Nevertheless, 4 birds died during handling and transport.

b. Aleutian Canada Goose (Nesting Surveys).--(Excerpts from Byrd, G.V. 1990. Nesting surveys for Aleutian Canada geese throughout their range in 1990. U.S. Fish and Wildlife Service Report, Adak, Alaska).

Since the Aleutian Canada goose was classified as endangered in 1963, an active program has been underway to try to save it from extinction. The approved recovery plan indicates that the species would be recommended for reclassification from "endangered" to "threatened" status when at least 100 nesting pairs have been reestablished (also implies rediscovered) on islands other than Buldir Island. In the past decade, geese have been rediscovered on 2 islands and have begun to nest again on 5 others in 3 different island groups.

In 1990 the recovery team recommended that an attempt be made to survey all nesting areas to determine whether the criterion for reclassification had been met. The U.S. Fish and Wildlife Service agreed and assigned the Alaska Maritime National Wildlife Refuge to complete these surveys.

Nesting pair surveys were conducted in 1990 for Aleutian Canada geese at every known nesting area within their range except Buldir Island. At Agattu Island during June, two crews of two people each surveyed the coastal fringe of tall plants between the U.S.G.S. marker "VILE" on the east side, around Cape Sabak, and as far west as the central north shore of Otkriti Bay. They also searched lake edges near the coast, and covered some areas of upland tundra. A total of 56-59 nests was discovered (up from 25-30 in 1988) indicating the reestablished goose population on Agattu Island continues to increase rapidly.

The target flightless adults and goslings. (LEL)

Seasonal biotech Elizabeth Mayock and Tiglax deck hand John Jameson, unloading a crate of Aleutian Canada geese on the beach at Little Kiska. (HK)

Field work was conducted at Nizki-Alaid by a crew of two people throughout June. All lake edges and sites where nests were known from previous years, along with most densely vegetated coastal slopes, were searched on Nizki and Alaid. Evidence of 8-10 active nests was found on Nizki-Alaid in 1990, only a few more than in 1989.

At Little Kiska, only the western and eastern thirds of the island were surveyed on June 22-23 by up to six individuals. Observers concentrated on areas of lush vegetation. The discovery of two goose nests at Little Kiska was a surprise, because translocations only began there in 1988. Aleutian Canada geese probably had not nested in this area since they were extirpated by introduced arctic foxes over 50 years ago.

In the eastern Aleutians, we completed the first-ever detailed survey of Chagulak Island, where a remnant breeding population of Aleutian Canada geese was discovered in 1982. Habitats that appeared to offer potential for goose nesting (i.e., areas with less than 40 degree slopes and with tall vegetation, hummocks, or boulders that might offer cover) were surveyed at Chagulak by a crew of up to seven people walking abreast generally no more than 10 m apart. A few small patches of suitable habitat may have been missed, but coverage was fairly thorough. At least 20 nests were present in 1990.

Rugged Chagalak Island supports a small nesting population of Aleutian Canada geese. This valley is one of two locations on the island where nests have been located. (FZ)

A survey at nearby Amukta was confined to West Ridge, and was particularly thorough in the small valley where the active nest had been found in 1989. A single nest was discovered in the vicinity of the 1989 nest location.

The remaining nesting area for Aleutian Canada geese is Kaliktagik Island in the Semidi Islands. A survey in 1990 recorded 16 nests and 19 were estimated to have been present, a similar number to that found in 1984.

A conservative estimate of the total number of Aleutian Canada goose nests on islands other than Buldir in 1990 would be 101-111 (Table 4). It appears the recovery plan criteria for reclassification have been met.

c. Aleutian Canada Goose (Habitat Surveys).--(Excerpts from Byrd, G.V. 1990. Survey of Khovostof and Davidof islands for Aleutian Canada goose habitat - June 1990 and Byrd, G.V. 1991. Survey of Ugliuga, Skagul, and Unalga islands for Aleutian Canada goose habitat June 28-29, 1990. U.S. Fish and Wildlife Service Reports, Adak, Alaska). Crews evaluated five islands in the central Aleutians (Khovostof, Davidof, Ogliuga, and portions of Skagul and Unalga islands) to estimate their potential for restoration of Aleutian Canada goose. All these islands provide potential feeding habitat, but only Ogliuga and Skagul appear to have substantial areas of potential nesting habitat.

Table 4. Nesting pairs of Aleutian Canada geese at different islands in 1990.

Island	Group	Nests Found	Probable Nests	Estimated Minimum Range
Agattu	Near	56[a]	3[b]	56-59
Nizki-Alaid	Near	8	2[b]	8-10
L. Kiska	Rat	2		
Chagulak	Andreanof	18	2[b]	18-20
Amukta	Andreanof	1		1
Kiliktagik	Semidi	16	3[c]	16-19
Total		101	10	101-111

[a] includes young broods in areas where no nests were found

[b] prevalence of dropping and consistently defensive pairs in areas of suitable habitat

[c] D. Dragoo pers. comm.

d. Short-tailed Albatross.--There were four observations of short-tailed albatrosses in the Aleutian Islands in 1990. All were of first year birds sighted off the northern coast of Seguam Island by Captain Al Bayer of the M/V Tiglax on August 27. It is interesting to note that subadults have been seen off the coast of Seguam for the last 3 years.

e. Aleutian shield fern.--Spore-bearing fronds of shield ferns were collected in 1989 and were cultured by Dr. Pat Holloway, University of Alaska. During the winter of 1990, we received word that several sporophytes were propagated.

In August, 1990, the refuge biological staff hiked up Mt. Reed, Adak, to collect more shield fern fronds for the propagation program. We were fortunate and timed our collection activities at the most optimum time - just before the sori were released from their spores. We were able to collect 10 fronds and all arrived at the University of Alaska in Fairbanks in excellent condition. They should produce viable sporophytes.

f. Steller Sea Lions.--(Excerpts from Douglas, H. and G.V. Byrd. 1990. Observations of northern sea lions at Agattu, Alaid, and Buldir islands, Alaska in 1990. U.S. Fish and Wildlife Service Report, Adak, Alaska). In cooperation with National Marine Fisheries Service, refuge crews counted sea lions at Nizki-Alaid, Agattu, and Buldir islands during summer 1990. Populations in these western Aleutian sites continue to decline like other populations in central and western Alaska (Fig. 1). Reasons for declines are not well understood, but may be related to food stress. Scat collections were made for food habits studies.

Before and after: Inner Rock, Buldir Island. Top photo taken in 1975 (BD), bottom photo 1990 (VB).

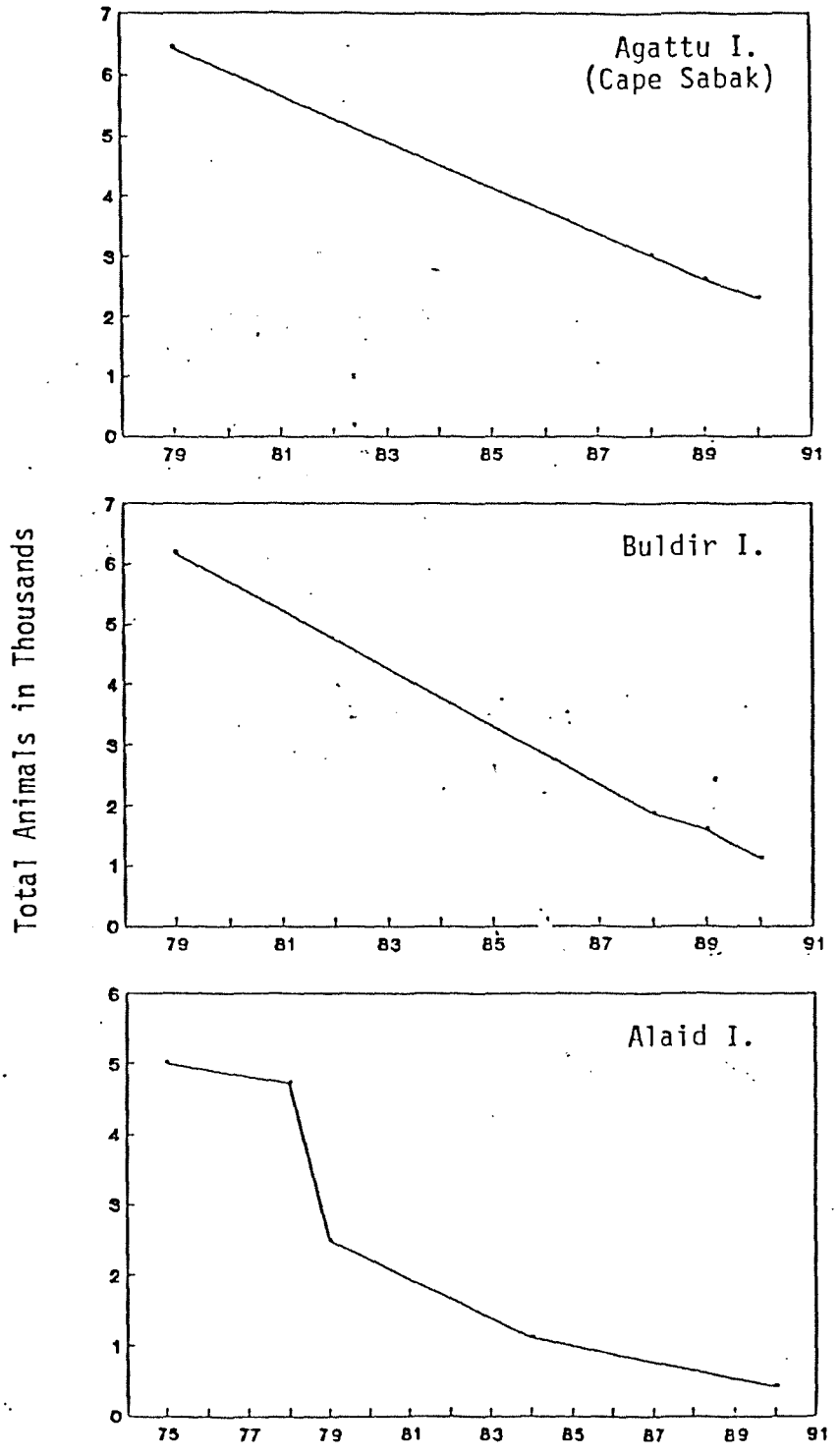


Figure 1. Population trends among northern sea lions at Agattu, Buldir, and Alaid Islands.

3. Waterfowl

a. Emperor Goose.--(Excerpts from Byrd, G.V. 1991. Winter observations of emperor geese in the Aleutian Islands, Alaska, October 1988-April 1991. U.S. Fish and Wildlife Service Report, Adak, Alaska). In 1990, Emperor Goose work on the refuge focused on obtaining counts, determining adult:juvenile ratios, and resighting neck-collared birds banded on the breeding and fall staging grounds of the Yukon Delta NWR. Work in the Aleutians was conducted at three sites, Adak, Amchitka, and Shemya.

Emperor geese coming in for a landing. (MB)

On study sites at Adak, the peak count of Emperor Geese in the winter of 1989-90 was 382 birds, similar to the winter 1990-91 count of 355 birds. For surveys in which we aged at least 100 birds, adults comprised 83.5% (n=4, s=2.8%) of geese in the winter of 1989-90 and 85.8% (n=6, s=7.5%) in the winter of 1990-91. We read 6 neck-collar codes in 1990-91; 308, 418, 571, 600, 603, and 715. Collared bird 603 was found dead, apparently killed by a bald eagle. None of the 4 collared birds seen at Adak in the winter of 1988-89 (6C5, J1B, L16, L19) were resighted in 1989-90 or 1990-91. All 6 collared birds seen at Adak in 1990-91 were banded in the fall of 1990, and resightings in future years may give further indications of faithfulness to wintering areas (see below).

We also surveyed Emperor Geese on the pre-established route at Shemya in the winters of 1989-90 (January 17-23, 1990) and 1990-91 (January 16-19 and February 19-22, 1991). The yearly high counts for single surveys were 358 birds in the former year and 398 birds in the latter. On the January 1990 survey, adults made up 86.0% (n=11, s=3.4%) of birds on average, and in the surveys of winter 1990-91 they made up on average 87.5% (n=6, s=3.5%). Resightings of collared birds at Shemya in consecutive winters indicate faithfulness to winter areas: two birds originally banded in August 1988 and seen at Shemya in the winter of 1988-89 (L79 and N99) were resighted there in the winter of 1989-90 and again in the winter of 1990-91. In addition, another bird banded in August 1988 (N42) was seen at Shemya in the winters of 1989-90 and 1990-91.

b. Other Waterfowl

Winter Surveys.--Waterfowl surveys were conducted by vehicle at Adak and Shemya islands during the winters of 1989-90 and 1990-91 (Tables 5 and 6). The objectives of this program were to provide indices to relative abundance and seasonal occurrence of wintering waterfowl against which future counts can be compared. At Shemya, we were especially interested in obtaining counts and sex ratios of Common Eiders and Harlequin Ducks along a pre-established route during the winter of 1990-91 (Table 6).

Increases in Waterfowl following Fox Removal.--(Excerpted from O'Daniel, D., Bird and mammal observations at Nizki and Alaid Islands, Aleutian Islands, Alaska, Spring and Summer 1990. U.S. Fish and Wildlife Service Report, Adak, Alaska). Foxes were removed from Nizki and Alaid in 1975 and 1976, and periodic bird surveys have been conducted subsequently to evaluate trends. In 1990, a crew visited Nizki and Alaid to assess trends in nesting species over the past 15 years (Table 7).

Table 5. Peak waterfowl counts (common spp.) for Winter (Dec.-Feb.) 1989-90 and 1990-91 at Adak.

Species	Winter 89-90	Winter 90-91
Mallard	98(144)[a]	185 (54)
Al. Green-winged Teal	6(144)	67 (51)
Northern Pintail	115 (29)	149 (159)
Greater Scaup	111(465)	210 (367)
Black Scoter	32 (81)	40 (24)
White-winged Scoter	61 (0)	16 (63)
Harlequin Duck	173(993)	212(1055)
Oldsquaw	48(338)	94 (177)
Common Goldeneye	120(614)	191 (386)
Bufflehead	38(128)	25 (98)
Red-breasted Merganser	25(261)	48 (271)

[a] Christmas Bird Count totals in parentheses

Table 6. Comparable Peak Counts of Common Eiders and Harlequin Ducks on Shemya survey routes.

	Fall Periods		Winter Periods	
Species	Nov 1988[a]	Nov 1990[a]	Jan 1990[a]	Feb 1991[b]
Common Eider	545	621	395	631(51%)[c]
Harlequin Duck	570	309	280	386(56%)

[a] single survey period of ≥ 2 days each

[b] two surveys, one in each month, of ≥ 3 days each

[c] mean percentage of males for all surveys in parentheses

Green-winged teal were recorded at 5 lakes on Nizki and 3 on Alaid. Even though birds were observed on the same number of lakes as in 1984, the total population seen was lower than in 1984. The primary reason for the lower count may have been the timing. Counts were later in 1990 than in 1984, so nesting teal were less conspicuous during the 1990 survey.

Mallards were observed on 12 lakes in 1990, an increase of almost 100% from 1984. We recorded 23 birds, a slight increase from 1984, and perhaps the increase was even greater for the same reasons of survey timing mentioned above. Counts have doubled since 1975.

Fewer than half the number of Common Eiders seen on Nizki in 1984 (1800) were observed there this year (742) and only approximately one-third as many were seen on Alaid (718 vs. 193). This can probably be accounted for by the fact that the 1984 survey was conducted in late May when the eiders were rafting in the waters surrounding the islands before coming ashore to breed. The 1990 survey was done after egg-laying and incubation had begun, and approximately 3 times as many males as females were observed on the shoreline surveys for each island.

Table 7. Population counts and estimates[a] of breeding birds on Nizki-Alaid, 1975-1990.

	Year											
	1975		1976		1979		1983		1984		1990	
Species[b]	Est.[c]	Count	Est.	Count	Est.	Count	Est.	Count	Est.	Count	Est.	Count
RTLO	6	-	2	-	-	-	7	-	14	-	-	28
COLO	8	-	6+	-	-	-	4	-	8	-	-	11
GWTE	-	3	6	4	-	-	-	22	-	30	-	14
MALL	-	11	8	9	-	-	-	23	-	20	-	23
COEI	-	108	700	-	1400	1010	1400	1160	-	2703	1300	1097

a Data is from the following sources: 1975--Trapp (1975), 1976--Trapp (1985), 1979--Early et al. (1980). 1983--Zeillemaker (1983), 1984--Zeillemaker and Trapp (1986), this report.

b Species codes and names listed in Appendix .

c Estimate.

4. Marsh and Waterbirds.--(Excerpted from O'Daniel, D. Bird and mammal observations at Nizki and Alaid islands, Aleutian Islands, Alaska, Spring and Summer 1990. U.S. Fish and Wildlife Service Report, Adak, Alaska).

Red-throated Loon.--In 1990, a total of 28 red-throated loons was seen at Nizki-Alaid, an island from which foxes were removed in the mid-1970's. These loons were present on 4 out of 11 lakes on Alaid and 12 of 17 lakes on Nizki. Presence of pairs during this season indicated breeding and one nest was found along the shore of Transect Lake on Alaid on June 5. There was further confirmation of breeding when adults with chicks were observed on 2 lakes on Alaid and 5 lakes on Nizki. The population of red-throated loons has increased dramatically (from 6 to 28) and steadily since the removal of foxes in the mid-1970's (Table 7).

Common Loon.--A total of 11 was seen in 1990 at Nizki-Alaid. These loons occupied all 6 of the relatively large lakes on Nizki and Alaid. In addition, on the shoreline survey, 4 birds were seen around Nizki and 1 around Alaid, and individual birds were seen frequently in several coves around Nizki. In 1984, the population was estimated at 8 birds on 3, possibly 4, lakes. There was a slight increase in number and lake usage from 1984 to 1990. Single chicks accompanied by adults were seen on Lake Sterna, Alaid, and Eider Lake, Nizki in 1990, and a fledged bird was observed in Nizki Cove on August 12. The common loon population appears to have increased only slightly between 1975 and 1990 (Table 7), in contrast to the population of its congener, the smaller red-throated loon. Red-throated loons occupy smaller lakes than common loons and may have been more susceptible to fox predation. Every pond on Nizki deep enough for diving except for Jaeger had loons present in 1990, whereas no loons were observed on 4 lakes at Alaid, at least 2 of which appeared to be relatively deep.

a. Ledge-nesting Seabirds.--(Excerpts from Hipfner, J.M., J.C. Williams, and G.V. Byrd. 1991. The status of kittiwakes and murres at Agattu and Buldir islands 1988-1990. U.S. Fish and Wildlife Service Report, Adak, Alaska).

We monitored populations and reproductive performance of kittiwakes and murres at Agattu and Buldir islands in the western Aleutians between late May and mid-August of 1988, 1989, and 1990 on index plots delineated in 1988. The objectives of the monitoring program were to detect changes in population size and reproductive performance of these ledge-nesting seabirds for comparison with similar efforts elsewhere in Alaska. This information can be used to detect problems in marine bird populations, and to provide a basis for directing management actions and assessing the effects of management.

Black-legged kittiwakes at Agattu built more nests, laid earlier, had larger clutches and experienced higher reproductive success in 1990 than in 1988 or 1989. At Buldir, black-legged and red-legged kittiwakes had better success in 1988 and 1990 than in 1989. In 1990, at Agattu, numbers of common murres were higher and their reproductive performance was better than in other years. More thick-billed murres were present on plots at Buldir in 1989 than in 1988 or 1990, but their reproductive performance was similar in all three years.

Early results of red-legged kittiwake banding and resighting efforts at Buldir indicate high adult survivorship and a high degree of nest site fidelity for this species.

Periodic counts of kittiwakes and murres on plots at Agattu and Buldir suggest populations have increased since the mid-to-late 1970's (Figs. 2, 3, and 4). We have no way of knowing whether relatively high recruitment, immigration from other colonies, or a combination of these factors has been responsible for the increases.

The short-term results of these monitoring efforts suggest that the sand lance (Ammodytes hexapterus) based foodweb of the shelf environment at Agattu is more stable than the pelagic system at Buldir. Nevertheless, the relatively high reproductive success at both islands in 2 of the last 3 years, and the substantial increases seen in the last 10-15 years, lead us to conclude that kittiwake and murre populations in the western Aleutians are relatively healthy, in contrast to some populations elsewhere in Alaska.

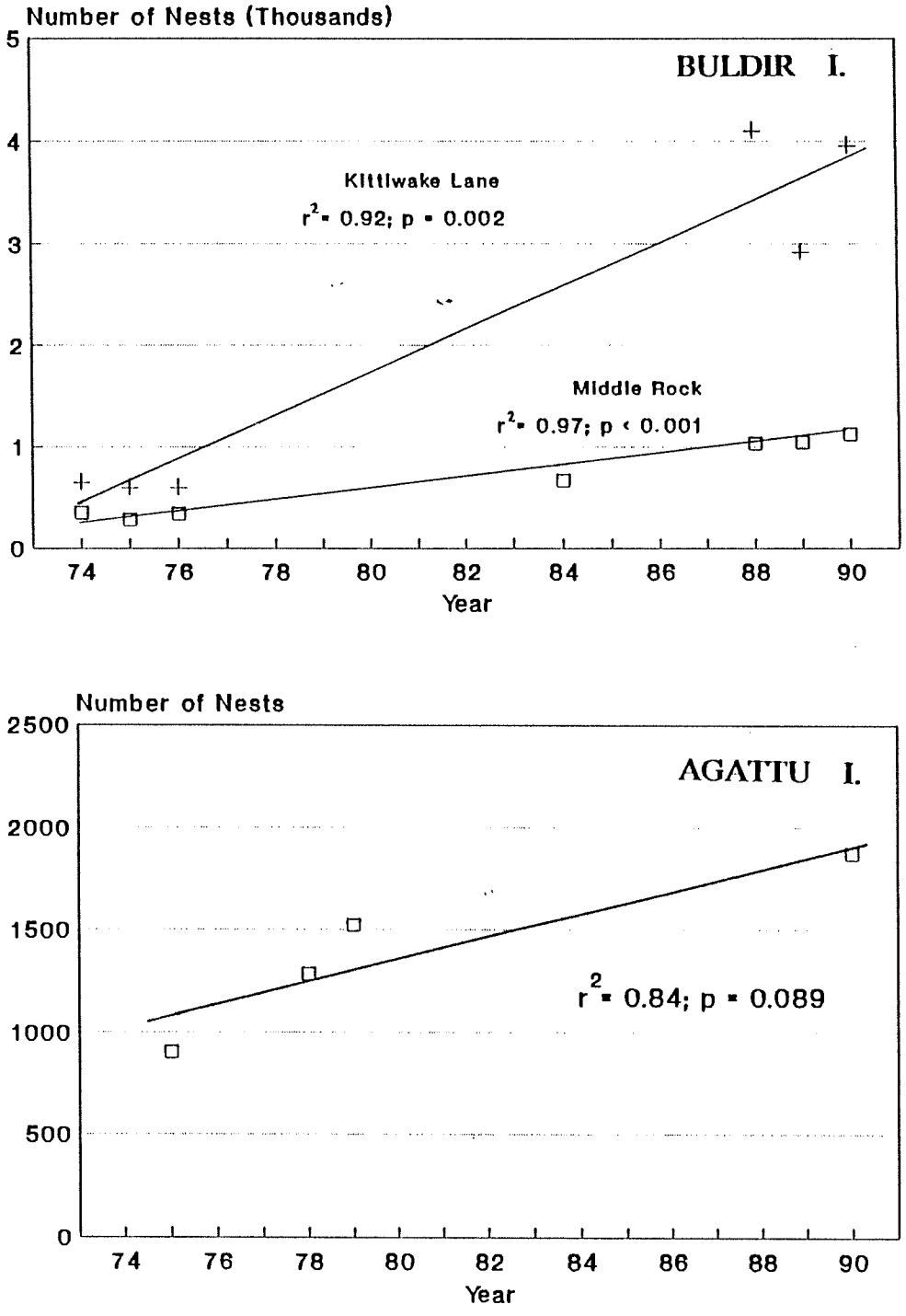


Figure 2. Trends in numbers of nests of black-legged kittiwakes at Buldir and Agattu Islands, western Aleutians.

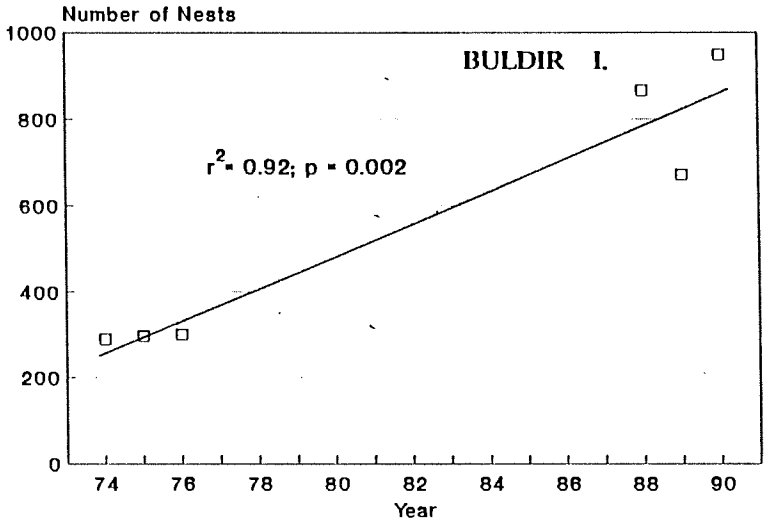
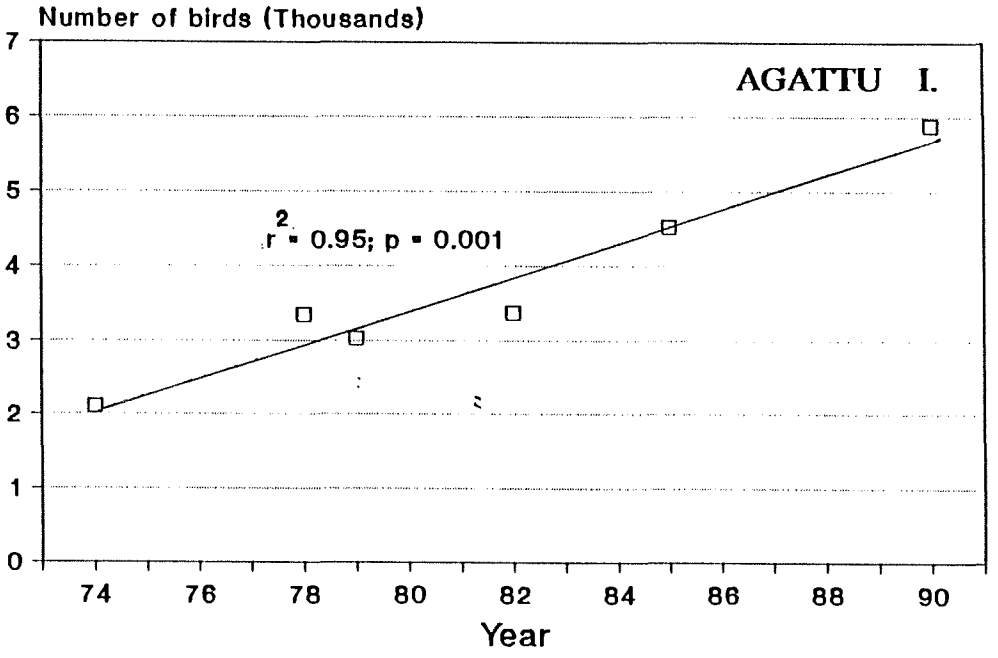


Figure 3. Trends in numbers of red-legged kittiwake nests constructed at Kittiwake Lane, Buldir Island, Alaska, 1974-1990.



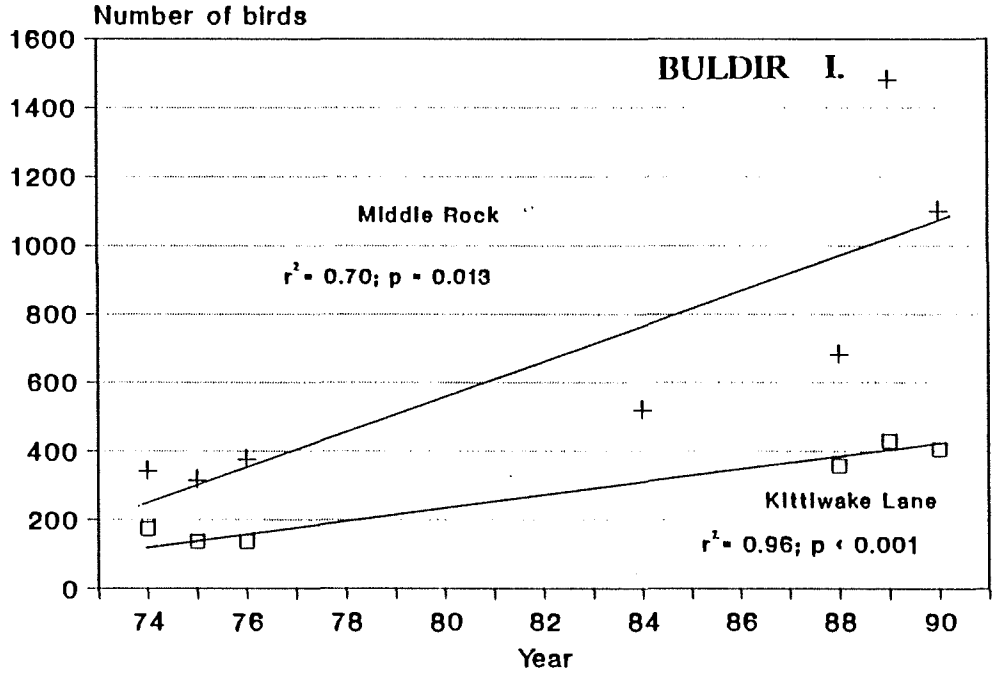


Figure 4. Trends in numbers of thickbilled and common murres, respectively, at Buldir and Agattu Islands, western Aleutians.

5. Shorebirds, Gulls, Terns, and Allied Species

a. Puffin monitoring.--(Excerpts from Byrd, G.V., et al. 1990. The status of tufted and horned puffins in the western Aleutian Islands following a ban on salmon driftnets. U.S. Fish and Wildlife Service Report, Adak, AK.).

Tufted Puffin on windswept Buldir Island. (MB)

From 1988-1990 breeding tufted (Lunda cirrhata) and horned (L. corniculata) puffins were studied in the western Aleutian Islands where thousands of birds had been killed annually in a Japanese driftnet fishery. This fishery was banned in U.S. waters in 1988. Data were gathered on the distribution of nesting colonies, and plots were established to monitor changes in densities at Agattu and Buldir islands, those sites nearest the fishery. Furthermore, reproductive success, chick growth rates, and the prey delivered to chicks were characterized at these two sites. Information about the nesting distribution and/or density was also obtained at other sites in the western (Nizki/Alaid), central (Little Kiska and Adak), and eastern (Aiktak) Aleutians.

Between 1988 and 1990, 78 puffin nesting areas were delineated along approximately 75% of the coastline of Agattu. The largest nesting concentrations of tufted puffins found on the main island were near Cape Sabak and Gillon Point, but the densest concentrations were found on offshore islets; the island in Island Cove, Kohl Island, and Tower Island. Puffins have apparently expanded on the main island. Certainly sites now used near Cape Sabak are in areas where puffins could not have nested when foxes were present. Relatively few horned puffins were found at Agattu since removal of introduced arctic foxes in the mid-1970's.

Tufted puffin colonies on Nizki (9 colonies) and Alaid (8 colonies) contained approximately 1,070 and 1,105 burrows respectively in 1990. The current distribution represents a substantial change since the mid-1970's when introduced arctic foxes were removed.

At Buldir, nesting areas for tufted and horned puffins were delineated along the north and portions of the south coast of Buldir. Few high density nesting areas of tufted puffins were found, and there appears to be unused, but potentially suitable, habitat. No obvious differences in distribution were noted in 1990 from the mid-1970's. Horned puffins were largely confined to talus slopes and cavities in cliffs at Buldir. Like tufted puffins, no changes in distribution have been noted in the past 15 years.

The largest concentrations of tufted puffins at Little Kiska in 1990 were found on the west and northeast coastlines of Little Kiska Head. Substantial concentrations were also noted near Yag Point and along the northern coast east of Navy Cove.

Tufted puffins were found around most of the periphery of Aiktak in 1990 and on surrounding islets. This distribution was similar to that recorded in 1980.

Counts of tufted puffin burrows at Agattu were slightly higher at the study site at Kohl Island in 1990 than in 1988 or 1989, however, the 1990 census was only 87% of the 1982 count. A census at Tower Island revealed that more tufted puffin burrows were present in 1990 than in 1982.

Large increases were recorded in the number of puffins and burrows for Nizki and Alaid islands between 1984 and 1990. Increases were greatest at Nizki where almost three times as many puffins were seen in 1990 as in 1984.

Comparisons of total counts of tufted puffin burrows 1988-1990 at Buldir suggest there was little change. Abundance indices of horned puffins for 1989 and 1990 were nearly identical, and mean counts for the entire system of plots were also similar between

years. Nevertheless, both were so variable that strong conclusions cannot be made about short-term change.

At Aiktak, we estimated a total of about 58,000 tufted puffin burrows. Burrow density in 1990 was similar to that in 1980.

The overall reproductive success for tufted puffins at Agattu was about 0.7 chicks still alive at last check/egg in 1989 and 1990. Reproductive success at Buldir was 0.36 chicks still alive at last check/egg in 1990, lower than 1989 (0.59) but higher than 1988 (0.25). Horned puffin reproductive success was similar in all years 1988-1990.

Tufted puffin chicks gained an average of nearly 16 g/day at Agattu in 1990, similar to 1989 but higher than 1988. At Buldir, tufted puffins grew an average of 6 g/day, slightly lower than in 1988 and 1989. Horned puffins grew at similar rates in all 3 years 1988-1990 at Buldir. Overall, tufted puffins grew slower at Buldir than at Agattu in all 3 years.

Sand lance 5-8 cm long were the most prevalent prey items fed to tufted puffin chicks at Agattu in 1990. Larger sand lance predominated in 1988 and 1989. Squid and sand lance were important prey species for both horned and tufted puffins at Buldir 1988-1990. In 1990, Atka mackerel was frequently taken by both species when it was found in nearly 70% of the bill loads of horned puffins and 25% of tufted puffin deliveries. Most food items for tufted and horned puffins were 2-11 cm long in all 3 years, but prey items were relatively small in 1990. Sand lance were found in all food loads fed to tufted puffin chicks at Aiktak and comprised 78% of total individuals.

6. Raptors

a. Distribution and Status of bald eagles.--(Excerpts from Byrd, G.V., and J.C. Williams. In Press. Distribution and status of bald eagles in the Aleutian Islands, Alaska. In P. Schempf, ed. Bald eagles of Alaska. Univ. of Alaska, Southeast, Juneau, AK). At the request of the editor, a summary of bald eagle information was prepared for the symposium and the following abstract provides an overview of the status of bald eagles on the refuge.

Bald eagles currently nest only as far west as Buldir Island in the western Rat Island group of the Aleutians, and the species is a common nester to the east. We do not yet have accurate surveys of eagle nests for every island in the Aleutians, but most islands have been surveyed at least once since 1976. We were able to account for 331 nesting territories, and estimate that approximately 70 more nests occur in areas not completely surveyed (e.g., Atka, Amlia, Umnak, Unalaska, and Unimak). Therefore, we estimate that the minimum number of nesting pairs

in the Aleutian Islands is approximately 400. The largest populations were found in the Rat Islands, especially at Amchitka, and in the western Andreanofs, particularly at Adak.

There is no basis for judging whether nesting populations have changed over the long-term, nevertheless, several complete nesting surveys at Kiska, Amchitka, and Adak suggest there is at least short-term stability.

Estimated nesting densities in different groups of the Aleutian Islands varies from about one pair per 7 km of coastline to one pair per 20 km. Densities apparently are higher in the Rat and Delarof island groups than farther east, but the lack of accurate data for several of the groups makes critical evaluation of this pattern difficult.

In the Aleutians, nest building begins as early as 20 January. Egg-laying occurs from late March to May and peaks in mid-April. Hatching occurs from early May to late June. Eaglets usually fledge from early July to late August, and the peak is in mid-August.

Bald eagle nests in the Aleutians are relatively small and at the extreme, little or no nest material is added and the young are reared in a well-trampled bare spot on a pinnacle. On Amchitka, nests varied from 1.2 m to 2.1 m in diameter and the accumulation of nest material rarely exceeded 30 cm in height. Most nests are found within the Elymus-umbel plant community, and nesting material is generally composed of common plants from nearby. Vegetation used in nest construction includes: dried stalks of Heracleum lanatum, and Angelica lucida, kelp (e.g., Nereocystis), and Sphagnum spp.

About 20 percent of the nests that were considered active (i.e., had adults present throughout the spring) at Amchitka in 1969 never contained eggs. We have no other estimates of the proportion of attended nests that are inactive. Six estimates of average clutch size are available for Aleutian sites. The mean was 2 eggs in most cases, and the overall average was 1.96 for all available data sets.

Little variation was noted in hatch success, defined as the average number of young in successful nests, among the eight estimates available. The overall mean was 1.68 young chicks per successful nest.

Approximately 1.5 eaglets fledged in nests where at least one chick fledged. There was little inter-year variation. About 78 percent of the pairs at nests with eggs were successful in hatching at least one egg in 1969, the only year for which such data are available.

A typical Aleutian eagle nest. (MB)

Available descriptive data on prey delivered to eagle eyries suggests birds are relatively important. The most frequently taken species are seabirds including northern fulmar, shearwaters, glaucous-winged gull, murres, and auklets.

Seabirds begin to congregate near breeding islands by May, and provide a major source of food in most parts of the Aleutians through early to mid-August.

Most large Aleutian Islands have numerous small streams which are used primarily by spawning pink salmon. Each fall, in August and September, eagles congregate along these streams for several weeks. As the salmon availability declines and winter approaches, eagles must switch to other prey such as gulls, various species of ducks, sea otters, and nearshore fish. Beach-cast marine mammals, including sea otters, sea lions, and whales, primarily beaked and sperm whales, attract eagles, particularly in winter.

Currently the most obvious mortality factor for eagles in the Aleutians is electrocution at Adak. In 1978, when year-round records began, 50 eagles were electrocuted on overhead power lines at the Navy base. The next year, the U.S. Fish and Wildlife Service and the Navy began a program to install perches on poles in areas known for high concentrations of eagles. In subsequent years, perches have been added on every pole where eagles have been found electrocuted, and the number of

electrocutions has declined to levels well below that in 1978. Approximately 10-15 eagles are still electrocuted annually at Adak (Fig. 4). In 1990, at least 12 eagles were electrocuted on overhead power lines. Perches will continue to be added to poles, and the Navy is gradually replacing overhead lines with underground cables. Eagles were also electrocuted at Amchitka when overhead power lines were used there in the early 1970's. Currently overhead power lines are not used at Amchitka or other sites inhabited by people in the Aleutians.

b. Injured eagles.--In early December, BT Williams captured and prepared a 1 1/2 year old male bald eagle for shipment to The Alaska Raptor Rehabilitation Center in Sitka, AK. The eagle sustained severe burns on the ventral surface of the ulna and radius on both wings from contact with a high voltage line. Despite the extensive nature of the burns, treatment under the direction of a local physician, Rod Vaught, proved wonderfully successful. He commented that he has never seen such healing in any human patient. The treatment included two stages. The first stage, frequent bandage changes of 20% chlorine bleach, was designed to dry and loosen a coating of exudate that had hardened on the surface of the burned areas. The second stage consisted of bandages of neosporin antibiotic ointment covered with a surgical dressing called "adaptic" and wrapped with padding to protect the newly forming tissues. In late December only small areas were left to be covered with new skin.

Another eagle was sent to the Arctic Animal Hospital in late December after being hit by a car. The eagle survived the long flight to Anchorage, but died shortly after arrival at the hospital.

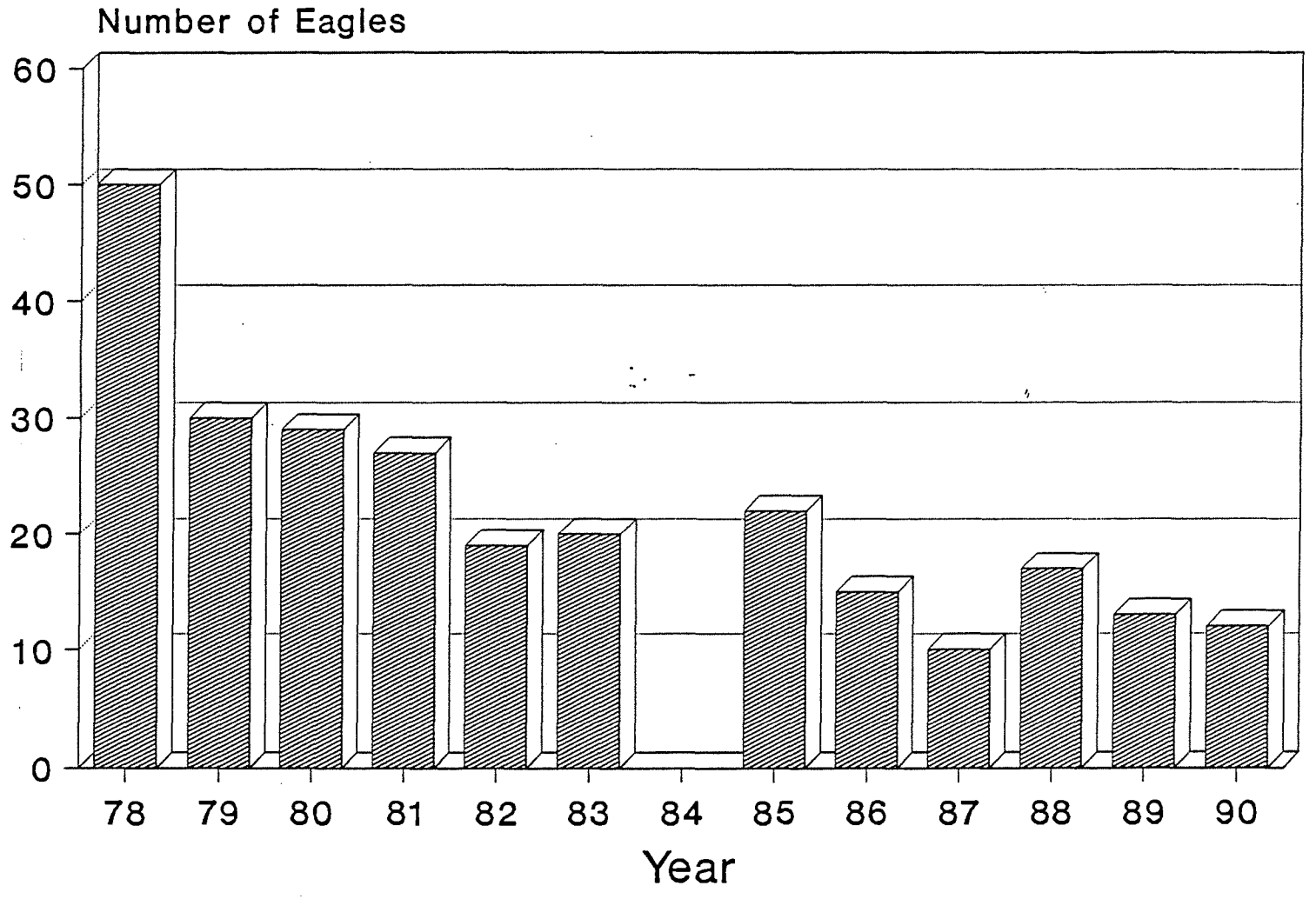


Figure 4. Numbers of bald eagles electrocuted 1978-1990.

7. Other migratory birds

The Christmas bird count was held on December 15. Twenty-four participants counted 5032 individuals of 41 different species. This years count of 41 species, tied with the previous high record. Unusual sightings of a female northern harrier and two merlins were particularly exciting.

8. Game Mammals

Caribou.--(Excerpts from Byrd, G.V. and J.C. Williams. 1991. Annual Report on caribou management at Adak Island, Alaska 1990-91. U.S. Fish and Wildlife Service Report, Adak, Alaska). At Adak, 377 permits were issued to hunters during the 1990-91 caribou season (ended March 31, 1991). About 83% of the permittees actually hunted, and 215 caribou were harvested. This is the second straight year that the harvest has exceeded 200, and this level needs to be continued to insure that the herd does not exceed the hunters capacity to control the increase.

9. Marine Mammals

a. Whales.--A male sperm whale was found washed ashore on Inner Rock, Buldir Island, in late May, 1990 by observers conducting seabird studies on the island. On 15 June, they went by Zodiac to Inner Rock where they took measurements of the whale (overall length 16.3 m) and collected several teeth. These were sent to the U.S. National Museum, Washington, D.C.

11. Fisheries Resources

Pink salmon are the most numerous and heavily harvested of the four anadromous fish species utilizing Adak streams. Dolly Varden and small kokanee salmon are harvested to a lesser extent, while halibut is available to "salty dogs". Reasonable red and silver salmon runs also occur at Adak, although the numbers have always been less in odd years than in even years for any salmon species. No specific salmon spawning counts were completed this year due to higher priority work.

14. Scientific Collection

A study to document the prevalence of plastic ingestion by seabirds was conducted by Pat Gould of Migratory Bird Management. Field crews collected 300 tufted puffins (100 each at Agattu, Buldir, and Aiktak islands) and 100 parakeet auklets at Buldir for analysis. Many of the specimens collected were salvaged for skeletal mounts for the American Museum of Natural History. Ten glaucous-winged gulls were collected by refuge staff for Douglas Bell, University of California, Berkeley, to aid in his taxonomic gull study. Seven rock ptarmigan specimens were sent to the University of Alaska Museum, where Daniel Gibson is comparing

different Aleutian subspecies. Table 8 shows the numbers of additional specimens that were salvaged during the year.

Table 8. Scientific specimens salvaged, 1990.

Species	Location	Number Salvaged
Fork-tailed Stormpetrel	Adak	1
Aleutian Canada goose	Buldir	5
Rock sandpiper	Adak	1
Aleutian tern	Oglinga	1
Crested auklet	Buldir	2
Horned puffin	Buldir	3
Bald eagle	Adak	22
Common cuckoo	Buldir	1
Short-eared owl	Adak	1
Common Raven	Adak	1
Sea otter	Adak	2

15. Animal Control

Fox Removal.--The ongoing program to remove introduced foxes from refuge islands in order to restore native bird populations involved work at two sites in winter and one in summer. Unfortunately the winter work was not completed due to a boating accident (see "Safety"). The following annotated list summarizes the results for each island.

Introduced arctic fox have severely reduced or eliminated seabird populations on the majority of the Aleutian Islands. Removal programs are allowing those birds to repopulate the islands. (PO)

a. Little Tanaga Island.--As reported in the 1989 Narrative Report, we removed 33 arctic foxes from this island during 1989, and by December 1989 very few animals were left there. In fact, the frequency of capture had become so low that we moved the main activity to nearby Kagalaska Island in January 1990. A series of live traps were left at Little Tanaga to try to get the few remaining foxes there. These traps were checked periodically, but no additional foxes had been caught by late January when the boating accident occurred. Due to the accident, it was not possible to return to Little Tanaga until April 9 at which time we found two dead foxes in the traps. Realizing that there would be no opportunity to recheck traps until summer, several kill traps were set and left. Indeed, it was July 28 before we returned to Little Tanaga, and two more dead foxes were found along with tracks from at least one additional animal.

Apparently at least a few foxes remain on Little Tanaga, but there was no opportunity to return to the island in 1990. Plans are to attempt to try to get the remaining foxes during summer 1991.

b. Kagalaska Island.--We began trapping on Kagalaska in January 1990. Volunteers Bob Bruff and Terry Fortney camped there January 7-17, and they took 17 foxes. An additional 7 foxes were taken in January. The boating accident occurred in late January, and no additional visits were made to Kagalaska until April 9, at which time two more foxes were found in traps and all traps were removed. We will probably need to start over at Kagalaska, because a number of foxes were left and the 1991 breeding season would probably have returned the population to near pre-trapping levels.

c. Carlisle Island.--(summarized from Bailey, E.P. 1990. Eradication of arctic foxes from Carlisle Island, Aleutian Islands. U.S.F.W.S. report. Homer, AK.). Ed Bailey, Wildlife Biologist from the Homer Complex office, led a crew comprising of Animal Damage Control biologist Paul O'Neal, Biological Technician Kurt Schmidt, and volunteer Jeff Wraley to Carlisle to remove arctic foxes. The crew camped on the island May 20-June 16, 1990, and 23 foxes were killed there. During the last part of the stay on the island, no additional foxes or fresh signs were observed. Apparently eradication was complete, but the crew will recheck the island in spring 1991 to be sure no animals were left.

An ancient Aleut village site provided house pits for tent protection as well as a reliable water source. Unfortunately, seas breaking on the steep beach prevented us from launching our inflatables on many occasions. (JW)

Interestingly, Bailey and Schmidt were able to age most of the foxes they removed, and the modal age was 3 years. About 25% of the foxes were 4 years old at Carlisle. Apparently arctic foxes seldom live longer than 4 years. Examination of placental scars from females indicated the litters at Carlisle in 1990 ranged from 4-7 young. Over 30% of the adult females had not produced pups in 1990.

Animal Control (Biological Control of Arctic Foxes).--Two islands near Carlisle, Adugak and Uliaga, have been sites of a biological control experiment conducted by Ed Bailey since 1984 when he introduced neutered red foxes to these islands. In 1990, surveys of the islands indicated red foxes have eliminated arctic foxes by competitive exclusion. Details will be published elsewhere.

16. Marking and Banding

The major AIU banding effort resulted in the marking of 110 Aleutian Canada geese (ACG) with metal leg bands, and yellow or blue plastic leg bands, on Buldir Island. These birds were translocated to fox free islands or released on Buldir. Observations on wintering areas in California will provide information about survival rates. Sixteen red-legged kittiwakes were banded on Buldir Island in 1990 with metal and green plastic leg bands. This was the third season in which nesting kittiwakes were banded. The objective is to estimate average annual adult survival rates through resightings in subsequent years. This is feasible since birds tend to return to the same nest site. We need to know something about adult survival so that we can predict levels of reproduction needed to maintain stable populations. This information will suggest whether recent reproductive failures signal serious problems.

H. PUBLIC USE

1. General

ORP Cline was detailed to the Subsistence Division office, Anchorage, AK on August 12 for two weeks. The two week detail extended through the end of the year. With no manager and other pressing duties the public use program was drastically reduced. We stopped accepting requests for special programs and weekly articles for the NAS newspaper, Eagles Call, were maintained by rerunning old articles.

We managed to keep the visitor center open on weekends by using our SCA assistant and local volunteers. By the end of September we were down to being open on Sunday only as our SCA assistant had departed as well as most of our trained volunteers. With no time to train new volunteers and a short period of required weekend closure due to lack of congress to pass a budget, we eliminated weekend openings altogether from October 1 to the end

of the year. Consequently, public use figures were not as high as in past years.

With the demise of Adak's privately-owned newspaper the "Ptarmigan Ptimes" in April, the refuge staff once again contributed a weekly column to just the military Eagle's Call newspaper. Our ANHA outlet will be selling the Ptarmigan Ptimes last effort - a glossy, limited-edition "Adak" magazine.

Thanks to the efforts of Patti Gallagher of the Regional office, a re-print of the Aleutian Island Unit brochure is available. The "Adak Island Map and Outdoor Recreation Guide" is being reprinted by ANHA on a limited scale with a revised edition to follow. ORP Cline assisted the Adak Historical Society with layout and design of an Adak historical guide map.

Routine activities at the visitor center included a semester of the University of Alaska "Alaska Mammals" course (16 students), (ARM Klett, WB Byrd and BT Williams were guest lecturers for three class sessions), Adak NAS "Blue Card/Firearms Safety" lectures (1,672 people), orientation lectures for new arrivals on island (308), movies (1043), special showing of Alaska at War and Report from the Aleutians videos (82), "Basic Sailing and Seamanship Class" taught by Adak Coast Guard Auxiliary (10) and routine visitation by 7,313.

We also hosted a meeting of the Ducks Unlimited Board of Directors, Adak Historical Society, NAS Search and Rescue Team, Conservation Team and Adak Coast Guard Auxiliary. The visitor center was open an average of three nights a week.

A big "Thank You" is presented to our volunteers. Without the help of one Student Conservation Resource Assistant (Steven Courts) and 17 local volunteers, our information/environmental education program would be just above water, not floating high at its present level. Three pot-lucks were held in the new bunkhouse (January, April, and August) where appreciation awards and certificates were presented to our volunteers.

2. Outdoor Classrooms - Students

A lot of our spring time involvement with the schools was either reduced or cancelled this year due either to the early departure of our SCA Resource Assistant, Heather Vose (who was a survivor of the Kittiwake accident) or the absence of our ORP (training, annual or sick leave). Activities specifically hurt were: National/Alaska Wildlife Week and Sea Week.

ORP Cline gave an orientation on the village of Atka and Aleut customs to 37 members of the Adak High School band prior to their annual visit to the Atka school in April.

Summer time activities included a sea otter discovery program at the NAS childcare center "Day Camp" to 40 interested preschoolers, a program to another group of older preschoolers at "Camp Funtime" centered on the Aleutian Canada goose translocation program and a program on the Aleutian Canada goose project to the Bob Reeve summer school science class.

3. Outdoor Classrooms - Teachers

ORP Cline contacted teachers at Atka and Adak about refuge sponsorship of science awards for excellence in ecology or conservation and participation is supporting science projects. An enthusiastic response initiated planning for the next year's school activities.

Sea Week activities centered around the preparation of activities for the elementary school, assisting teachers with curriculum materials and loaning films/videos for classroom use.

ARM Klett presented an orientation program to 8 new teachers in the Adak school system with emphasis on how we are able to help them with natural resource programs and the natural resource material that is available for their use at our center.

During the year ORP Cline paid several visits to Atka and presented programs at the school each time. During the year and a half she was on Adak she developed an excellent working relationship with the teachers at Atka, as well as the villagers.

5. Interpretive Tour Routes

As mentioned earlier, the refuge received funding in our FY91 budget, under the "America the Beautiful" program, monies to develop the interpretative tour route around Clam Lagoon. RM Boylan, ORP Cline, and SCA Courts developed a preliminary plan during the summer (FY90). Due to the delays in passing a 1991 budget and getting the information to the field stations, not much else was accomplished.

6. Interpretive Exhibits/Demonstrations

The new Fish and Wildlife Center continues to be Adak's "must see" stop for everyone. This is easy enough to explain when you remember that our 5,000 population makes us Alaska's 6th largest community. Annual visitation by military and civilian personnel from other locations swell it by another 20%.

For this predominantly military constituency which includes some high-level decision makers with large budgets, it is an unsurpassed opportunity to present the Service's message. For the majority of Adak residents, refuge programs, classes, bookstore and technical assistance are a welcome relief from

military duties and provide insight into an unusual area of a unique state.

Plexiglass wall exhibits featuring photos and text on the Aleutians were shipped via U.S. Coast Guard C-130 to Shemya Air Force Base for display in their airport terminal. Similar exhibits had previously been supplied to airports at Dutch Harbor and Attu.

Local high school teacher Jack Hodnick, who teaches taxidermy for an adult education class, completed an arctic fox exhibit for the visitor center to interpret the predation problems posed by this introduced species. All we need now is a plexiglass display case to provide protection for this excellent display.

For two weeks, starting on April 22, the Fish & Wildlife Center was dedicated to Earth Day awareness with ORP Cline, Adak Girl Scouts and volunteers creating stations where visitors could learn about topics ranging from recycling to endangered species and everything in-between. Local television covered the festivities which included special sales items not least of which were "Earth Day" T-shirts. Volunteer Donna Venglar coordinated the displays viewed by 164 people.

7. Other Interpretive Programs

Interpretive and environmental education programs beyond Adak were supported. Books, slides, and videos were provided to the Homer office for use on the Alaska State Ferry. ANHA stock was donated to the Regional office for use as Earthday incentive prizes. New York's Montezuma NWR was sent a video and brochures for a program featuring the Aleutians. Arrangements were made with the Boy Scouts to hold their summer camp on the south side of Adak as their Anchorage plan was cancelled at the last minute.

ORP Cline visited the Coast Guard LORAN station at Attu and the Air Force base at Shemya April 28-30. She presented an evening program on the refuge to the Coast Guard, sold ANHA materials, and collected cuttings from shrubs for the Palmer Plant Materials Center, working with the Navy to landscape Adak with species native to the Chain. CWO Doug Heyes and others gave ORP Cline guided tours of the facilities and insured her stay was an enjoyable one.

Special events and regular monthly meetings brought 3,396 people into the visitor center in April. Special events included outdoor skill lectures, a 3-day art show, meetings with Boy Scouts to assist in earning merit badges, a visit by an elementary school class doing research for Sea Week and a tour of the visitor center by the Child Care Center. Over 200 people attended the Adak Art Show to judge paintings, photographs, sketches, and works in other medium.

Considerable time was spent in organizing the "Outdoor Skills Workshop" that was initiated in January. Volunteers with skills in photography, birding, a dog trained for search and rescue work, hiking, beach combing, and other areas hosted bi-weekly meetings at the Fish and Wildlife Center.

Steve Courts, the public use program's SCA from Texas, provided steady and able assistance. He coordinated the Shagak Bay Challenge Grant program with the scouts, provided legwork and ideas for the Clam Lagoon tour route project, and gave Adak's first "Meet the Naturalist" (roadside information and interpretation) and all-day "Discovery Hike" programs.

SCAer Steve Courts, yellow rainsuit, prepares to lead a group on a hike to explore the wonders of Shagak Bay. (CC)

Two luncheon programs were presented at the Officers' Wives Club in honor of Earth Day. ORP Cheryl Cline gave a slide talk April 4 on "Native People of the Aleutians" while ARM Klett presented a program, "The Altered Islands" describing introduced species and other human impacts on the Aleutians.

The following refuge staff and volunteers presented a variety of programs on and off Adak:

ORP Cline - "Archaeology in the Aleutians" to 60 people at the visitor center in recognition of Alaska Archaeology Week.

ARM Klett - informal talks on beach combing and Aleutian wildlife to 16 members and parents of two dens of Tiger Cub Scouts. WB Byrd gave a presentation to the older Cub pack.

RM Boylan narrated a slide program which the Navy Broadcasting Service (NBS) converted to videotape as an orientation program for new arrivals to the Amchitka Naval Station. Boylan delivered the video when he visited the station.

Volunteer Judy O'Neale presented a 45 minute slide show on "Birds of Adak" to 50 members of the Anchorage Audubon Society Chapters monthly meeting.

Visiting National Geographic photographer, Stephen Krasemann, showed slides of his work in an informal talk with 26 participants.

Atka Principal/Teacher Phil Hardy and teachers George Donart, Moses Dirks and Peggy Baker visited Adak enroute to an Anchorage in-service February 7. RM Boylan showed them the bunkhouse, and visitor center after which Dr. Hardy met Adak School Superintendent Dr. Ed Gilley and H.S. Principal Vern Pinson to coordinate a three-day field trip March 6-8 for Atka students to learn about Adak lifestyles and careers (FWS, Navy, Coast Guard, commercial airlines and other occupations).

Ten students and two teachers arrived from the Atka School for the 3 day "Career Days" field trip. They had the opportunity to meet Adak students as well as military and civilian personnel involved with many of the activities/businesses here (bowling alley, fire department, commissary/exchange, McDonalds, Reeve airline). The students visited the office on the 8th and were given a tour of the center and a presentation on careers in the Fish and Wildlife Service. Students and teachers resided in the refuge bunkhouse during their three-day visit.

8. Hunting

Important species hunted in the Aleutians include caribou, ptarmigan, reindeer, fox and waterfowl. Areas closed to hunting are limited to the Air Force base on Shemya and the Navy base on Amchitka. The USCG only allows a waterfowl season on Attu.

The Adak waterfowl and caribou hunts are followed closely, given the large human community with great interest in hunting. Adak's caribou are large and healthy and the popular hunt is enjoyed by many. A world record bull weighing over 700 pounds was taken at Adak in 1968. The NAS tug service as well as the NSGA charter vessel Kuluk Clipper provide transportation to hunters using the south side of the island. This support is vital to the refuge's ability to manage the caribou herd.

The 1989-1990 caribou season ended on March 31. A total of 215 animals were taken and 445 permits were issued over that season. The 1990-91 season began on September 1.

The cabin permit system was updated, with clarified reservation rules, revised use regulations and new permit forms, eliminating unnecessary paperwork. Four parties spent the night in the visitor center parking lot to reserve the cabins for opening day of the caribou season. Hunter feedback still favors the long wait to gain a reservation over a raffle system.

Pre-season publicity of regulations and visible LE patrols may have contributed to no waterfowl violations. For the second year in a row, the Adak post office sold out its supply of Federal Duck Stamps. We obtained an emergency supply from the Regional Office to help us through until the post office was replenished.

9. Fishing

Both commercial and sport fishing are important activities in the Aleutians. Salmon, halibut, black bass tanner and King crab are the primary commercial targets. Saltwater sports enthusiasts enjoy catching these species along with Japanese perch, lingcod and the infinite other surprises found off these shores. Adak saltwater fishing is usually from the breakwater, a private boat or NSGA's Kuluk Clipper. Stream and lake fisherman are looking for pink, red and silver salmon, Dolly Varden and the occasional rainbow.

Fishing pressure is heaviest in salmon streams close to the base on Adak. Weekend and evening patrols by refuge officers minimize violations. The Navy commands continue to assist in managing the fishery by posting some streams for fly-fishing only or as closed.

The first red salmon were reported to be running June 20, one indicator of the beginning of summer and enthusiasm for outdoor activity! A prediction of Adak's hiking, hunting, and fishing activity on the island was compiled from license sales by the Navy Exchange and hike plans filed with NAS Quarterdeck.

10. Trapping

The trapping season for fox ran from November 10, 1989 to February 28, 1990. Free refuge permits were issued to 12 trappers on Adak during the year. Though a few of the participants invest a serious amount of time in trapping, for the most part, it is recreational trapping.

11. Wildlife Observations

The Audubon Christmas Bird Count was held December 15 at Adak. Twenty-four observers in seven parties found 41 species and 5032 individuals. Highlights were a northern harrier and two merlins. The day-long event was concluded with a potluck at the refuge bunkhouse to tally the day's results. Alaska Natural History Association paid participant's entry fees.

13. Camping

The entire AIU except Amchitka and Shemya, is open to camping. Most use, however, occurs on Adak where five FWS backcountry cabins are available on the south portion of the island on a first come, first served, reservation basis. As in past years, the cabins received moderate to heavy use by backpackers, fishermen, and caribou hunters. MWR's "gear issue" is well stocked with camping items to rent at a very reasonable rate to those residents who want to get out and explore Adak's beauty but do not own tents, pots/pans, stoves, etc.

15. Off-road Vehicling

ORV's were not a problem in the past when "Adak mobiles" were typically rusted-out two-wheel drive sedans. But now that the Navy ships personal vehicles out with accompanied personnel, Adak looks like southern California with the growth of new vehicles including its share of 4WD pick-ups.

Newspaper articles and television spots were the focus of our preventive enforcement efforts aimed at keeping vehicles on the roads rather than on the tundra where they leave scars that take years to heal. The word was also put forth at all the NAS Blue Card and Welcome Aboard lectures.

Three incidents were reported to us by NAS Security, but after investigation, only one warranted a citation. An agreement with the Navy's Judge Advocate Office enables us not only to cite violators with fines, but to refer the most heinous offenders to the court for suspension/revocation of driving privileges.

They never learn! One vehicle gets stuck and they go for assistance and the rescue vehicle bogs down also. The tundra is deceptive--just like flypaper. (MB)

16. Other Non-Wildlife Oriented Recreation

Cross-country skiing, snowboarding, sledding, tubing and snowshoeing are extremely popular winter activities on Adak when snow conditions are adequate. Hiking and beachcombing are popular throughout the year and berry picking is enjoyed by many during the fall.

17. Law Enforcement

RM Boylan, ARM Klett and ORP Cline attended the 40 hour Refuge Law Enforcement Officer refresher training session in Marana, Arizona in March. While some speaker/topics left room for improvement, the superior facilities, including firing range, made this a very worthwhile effort. The addition of the Physical Efficiency Battery (PEB) and judgement pistol shooting is long overdue.

At present, most refuge enforcement work occurs on Adak Island. The lack of logistical support makes enforcement on other islands virtually impossible. By agreement with the Navy, resource-related infractions (hunting, fishing, ORV's) are cited under the

Service's authority while other violations (litter, vandalism, etc.) will receive review by the Commanding Officer for possible military sanctions which may include loss of pay, demotion and extra duty.

After a decade of operation, the Navy's volunteer natural resource patrol was disbanded. With an anticipated record salmon run, a proliferation of off-road vehicles and target shooting, three part-time refuge officers will be stretched to monitor Adak's 5,000+ population for resource violations.

Routine law enforcement patrols included trips to Gannet Pass, Lake Bonnie Rose, Shagak Bay, Finger Bay, Lake Andrew and Clam Lagoon checking caribou hunters and fishermen. Approximately a half dozen citations were issued for hunting, fishing and off-road vehicle violations. One case of particular interest involved two persons that were cited for an over possession limit of Kokanee salmon- they had 74 (the limit is 5/person).

In October, Refuge Officer Klett qualified with his Service revolver at the Naval Air Station's outdoor range, shooting the FLETC practical pistol course under the watchful eye of the military's range officer.

During February and March, refuge officers checked licenses and permits of hunters returning on the Navy tugboat each Tuesday evening from the south end of the island. This half-hour spent with returning hunters seems to help compliance and provide a better return of information as well as giving us a current count of hunters' success.

Law enforcement patrols were drastically curtailed during the fall hunting seasons, since the only staff person with LE authority, ARM Klett, was tied up with end-of-year budget activities and required reports.

Weekend checks of waterfowl hunters occurred early in October, but no citations were issued. Pre-season publicity of regulations and visible patrols may have contributed. For two years in a row, the Adak post office sold out its Federal Duck Stamps. We obtained an emergency supply from the Regional Office to help us through until the post office was replenished.

At the Navy Exchange's request, ORP Cline held a question/answer session for clerks handling hunting and fishing license sales.

ORP Cline left Adak May 10 for a two week law enforcement detail to Cold Bay for the spring bear hunt patrol and to assist in a tundra swan survey.

During a two day visit to Atka in early May, ARM Klett and ORP Cline held a public meeting with residents to discuss the Service

emperor goose protection policy. This "preventive enforcement" yielded information about previous harvest levels and some emperor leg bands. Also discussed was the sea otter harvest policy and the threatened status of sea lions.

18. Cooperating Associations

As in past years, this year's operation was one of creation of operational stability in the new visitor center and exploring opportunities for growth and development in the future. For the fifth year, the Adak Branch of the Alaska Natural History Association had been the highest selling refuge branch.

Cooperating association sales increase visitors' appreciation of the refuge and their understanding of conservation issues.

Our small visitor center staff deserved credit for the increased success of operations. ORP Cline improved the record and inventory system, increased the number of items carried and insured shelves were well stocked. CT's Wheeler and Wiles provide a contagious enthusiasm at the front counter that makes it hard for visitors not to buy something. Both SCA and local volunteers manned the visitor center on weekends until October and helped during busy hours and with inventories.

Vital to everyday success is the character of the visitor center in the community as the location of interesting activities. For residents and visitors alike, a day on the island frequently includes a stop at the FWS Center.

Sales proceeds (85% returning to the refuge) were used in many ways: incentives for the volunteer staff, presentation of "special events", purchase of new wildlife videos, donations to Duck's Unlimited for fund raising, fees for participants in the Christmas Bird Count and refreshments, and to support interpretive and environmental education activities.

With ORP Clines detail to the Service Subsistence Division, Anchorage, the details of operating the sales outlet fell on CT's Wheeler and Wiles. With very little experience, they did an exceptional job in maintaining inventory records, making deposits and keeping up with the mundane job of tracking the order of sale items. Well done, ladies - our hats are off to you!!

I. EQUIPMENT AND FACILITIES

1. New Construction

Landscape improvements at the refuge residences was the theme throughout the year. In an effort to improve the appearance of resident housing, a rock barrier which borders the main roadside required considerable thinning; the nearby grounds also required fill and leveling. Using the refuge JCB front-end loader and back-hoe, MW Schulmeister and MW Lewis began the removal and repositioning of the large rocks. A dump truck was acquired from the Navy's Transportation Department for hauling the excess rocks away and 18 loads of fill and topsoil were acquired from a local job site.

The finishing touches for refuge residences will take place next summer.

A gate for the Finger Bay road was manufactured by MW Schulmeister to replace a tow cable which no longer prevented vehicles from driving down toward a salmon stream. The loader was used in setting the gate and placement of two very large blocks of concrete in front of each post. After a lock was installed on the gate the Naval Air Station security force was then given the keys.

A phone line was connected to the bunkhouse for use by seasonal field crews and volunteers. Excavation of the ditch was accomplished with the refuge back-hoe and the phone line hook-ups were completed by DOD personnel.

2. Rehabilitation

The Navy's C-130 Spirit of Adak generously agreed to return our Dodge pick-up truck from Amchitka for repairs. The vehicle had been in storage since our Amchitka staff member departed in February 1989. The truck received a new paint job, tires, front and rear brakes, and has been tuned-up for service back on Amchitka.

MW Schulmeister accompanied the Tiglax on the 30 hour ride to Buldir Island where he spent six days building a new roof on the refuge cabin and upgrading the material condition of the cabin.

The 17' Boston Whaler stored at Attu Island and used by Jim Estes of the University of California Santa Cruz, was brought back to Adak where MW Schulmeister and MW Lewis installed a bow rub rail, reenforced fiberglass, and resurfaced the console.

3. Major Maintenance

The Chevy Suburban received a new bumper and paint job and was put back to work removing snow from headquarters and residence parking areas.

At the headquarters, a water line in the furnace room broke creating some excitement with water running down several walls. After cleaning up the mess, the water line was repaired and a circulation pump was installed.

The residence furnaces had some contaminated fuel bled from the fuel system and the bunkhouse had a pump impeller replaced. Next season (summer) all new Racor fuel filter systems, ordered by MW Schulmeister, will be installed and this will aid in detouring the on going problems with the furnace fuel.

As spring approached preparations for the summer field season got underway with the tune-up and rechecks of 16 outboard motors.

MW Schulmeister was detailed to Homer to help tune-up 20 outboard motors and effect repairs on a Boston Whaler.

Further field preparations included the cleaning, checking, and repairs to the 13' Zodiacs, Coleman and Suzuki generators, camp stoves, lanterns, and the numerous other items of field support equipment.

J. OTHER ITEMS

1. Cooperatory Programs

ORP Cline, Alaska Plant Materials Center Manager Stoney Wright and members of the local Boy Scout troop transplanting beach rye grass cutting to reduce sand erosion. (SC)

For the past several years we have been providing information to NAS commands regarding the establishment of beach rye grass (Elymus mollis) in selected areas to reduce sand erosion. This past summer we received a request from Mr. Stoney Wright, Manager of the Alaska Plant Materials Center, Palmer, Alaska for assistance with a rye grass transplant project on denuded sand dunes adjacent to the NAVFAC facility. This facility is located near Kuluk Bay and its equipment is very susceptible to stoppages caused by sand particles or dust.

We contacted the leader of the local Boy Scout Troop who in turn supplied ten Scouts to assist in this very important project.

3. Items of Interest

The refuge vessel M/V Tiglax rescued two Adak fishermen on Sunday, July 1 when their vessel "Laura Lee" capsized while commercial halibut fishing. The men made it to shore in their inflatable boat only to see it drift away leaving them stranded. Returning from a day of bird surveys around Adak before returning to the eastern Aleutians, Tiglax sent out search parties after encountering the submerged "Laura Lee". After getting the crew members to safety, Tiglax hoisted the "Laura Lee" on board and returned her to her owner on Adak.

On June 17, ORP Cline participated as a member of the Search and Rescue Team in the ground search for 5 missing persons on Adak. With 2 other team members and 4 days of gear, she was dropped at Scabbard Bay for a 10 mile survey of the area on route to Finger Bay. The subjects, 20 hours overdue, were found by other searchers. They were in good condition at Boot Bay, on the south side of the island.

4. Credits

The 1990 Narrative Report was authored by the following:

Introduction: Mike Boylan
A. Highlights: Van Klett
B. Climatic Conditions: Van Klett
D. Planning: 1, 4 and 6 Van Klett, 5 Jeff Williams
E. Administration: 1-8 Van Klett
F. Habitat Management: 1, 2, 7, & 12 Van Klett, 6 Vernon Byrd
G. Wildlife: Vernon Byrd and Jeff Williams
H. Public Use: Van Klett
I. Equipment & Facilities: Jeff Lewis
J. Other Items: Van Klett

Word processing, computer entry, photo placement and collating of text was accomplished by Brenda Wiles, Dorothy Wheeler, and Melita Bradford. Final editing was provided by Daniel Boone.

BERING SEA UNIT

ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Homer, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1990

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

INTRODUCTION

Bering Sea Unit

Alaska Maritime National Wildlife Refuge

The Alaska Maritime National Wildlife Refuge (Maritime Refuge) 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 3,500,000 acre refuge. Although relatively small in land mass, its lands are scattered through most of coastal Alaska and extend 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 3,000 islands, islets, and pinnacle rocks within the refuge which are used annually by millions of seabirds of at least 30 species. The Maritime Refuge has five units with all former refuges in designated subunits.

The Bering Sea Unit includes far-flung islands and headlands between the Aleutian Islands and the Bering Strait. Although the topography varies from small sandy islands, like the Sand Islands off the Yukon Delta, to large volcanic islands, like St. Matthew. These 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 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 which is of sufficient intensity to detect population changes of 20 percent or greater with 90 percent confidence, and 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 1990 monitoring was conducted at three sites: St. Paul and St. George islands in the Pribilof islands (refuge personnel), and

Bluff (University of Alaska personnel under contract from the Migratory Bird Management office in Anchorage).

There are significant opportunities for interpretive programs in the unit, particularly in the Pribilof Islands where 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.

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H. PUBLIC USE (cont.)

I. EQUIPMENT AND FACILITIES

J. OTHER ITEMS

K. FEEDBACK

A. HIGHLIGHTS

Kittiwakes do better after complete reproductive bust the previous year at both St. Paul and St. George Islands (Section G.5).

Reindeer census at Hagemeister Island indicates a increase in reindeer numbers. This is unwelcome news for this overgrazed island (Section F.7).

Salvage of remaining oil, fuel, and other toxic substances from the shipwreck M/V Milos Reefer is successful at St. Matthew (Section F.6).

B. CLIMATIC CONDITIONS

All but January and November were warmer than normal at St. Paul Island. At Nome, eight out of twelve months were warmer than normal. If a long term warming trend is occurring in the Bering Sea wildlife populations will be effected. Small changes in ocean temperatures can greatly change such factors as winter ice extent, plankton and fish production, and distribution. These are key factors that influence how well wildlife species survive.

Table 1. January to December 1990 temperatures at St. Paul Island

Month	Average Temp. (°F)	Departure from Average (°F)
Jan	27.0	0.7
Feb	19.6	-2.3
Mar	26.3	3.0
Apr	30.6	2.9
May	37.7	2.9
Jun	43.3	2.4
Jul	47.8	2.1
Aug	48.9	1.4
Sep	44.1	-0.4
Oct	38.2	.6
Nov	33.5	.2
Dec	31.9	3.8

Table 2. January to December 1990 temperatures at Nome.

Month	Average Temp. (°F)	Departure from average (°F)
Jan	2.4	-3.4
Feb	-17.3	-20.6
Mar	10.8	4.2
Apr	26.0	8.1
May	40.0	4.3
Jun	47.2	1.8
Jul	56.0	5.5
Aug	54.4	4.5
Sep	40.3	-2.0
Oct	30.4	2.4
Nov	14.6	-1.6
Dec	3.8	-.6

D. PLANNING

1. Master Plan

See Homer office section.

2. Management Plan

See Homer office section.

5. Research and Investigations

AMNWR-NR90. Seabird monitoring at Bluff

Ed Murphy, Institute of Arctic Biology, University of Alaska, Fairbanks

Ref: Murphy, E.C. 1991. Population status of murres and kittiwake at Bluff, Alaska. Final Report: U.S. Fish and Wild. Serv.; Unit Cooperative Agreement No: 14-16-0009-1535; Research Work Order 48.

As part of a Fish and Wildlife Service/ Migratory Bird Office cooperative project, seabird monitoring continued at Bluff in 1990. Methods were standardized as much as possible between comparable studies at Cape Pierce (Togiak National Wildlife Refuge), St. George and St. Paul Island, and Cape Thompson (Alaska Maritime National Wildlife Refuge). Kittiwakes and

murres were censused and productivity measured on the same plots as has been done in previous years.

Jay H. Schauer, University of Alaska, Fairbanks

AMNWR-NR90. Energetics of kittiwakes and murres: density dependent factors.(74500-BSU-49208)

Schauer is a graduate student at the University of Alaska and did field work at Bluff on seabirds. He is now in the process of completing his thesis and did no new field work in 1990.

E. ADMINISTRATION

1. Personnel

See Homer office section.

4. Volunteer Program

See Homer office section.

5. Funding

See Homer office section.

6. Safety

See Homer office section.

7. Technical Assistance

WB Sowls provided assistance to the U.S. Coast Guard and Devine Salvage, Inc. related to the shipwreck M/V Milos Reefer. This ship had gone aground at St. Matthew Island in November 1989, spilling oil and other fuels. Some of the fuel tanks had not been broken and other toxins such as paints, hydraulic fluids remained.

Sowls participated in an over-flight of the wreck on May 15, 1990 and met with Coast Guard and Salvage crews at St. Paul Island in June before efforts were begun to remove remaining oils and other toxins from the wreck. Salvage efforts were reported highly successful by the U.S. Coast Guard. Booms were placed around the ship before any fluids were pumped and clean-up occurred without any problems.

The ship remains on the rocks at Glory of Russia Cape. There may be an attempt to blow-up the ship in the future as part of

a program being considered by the State to cleanup wrecks on the Alaskan coast. The refuge favors its removal. The location is near dense seabird nesting cliffs and any use of explosives would have to be done before or after the seabird nesting season to avoid disturbance.

8. Other

See Homer Office section.

F. HABITAT MANAGEMENT

6. Other Habits

The F/V Terminator went aground near Southwest Point of St. Paul on March 1989. Salvage attempts continued into 1990 with several people interested in crab pots, deck cranes, and various equipment from the ship. Salvage attempts (under permit and also illegally by unknown parties) caused damage to the tundra vegetation on cliff-top refuge lands above the wreck. Restoration plans were done and hopefully, tundra scars will only be temporary.

7. Grazing

The annual reindeer survey of Hagemeister Island was completed on July 25, 1990 by Micheal Hinkes of Togiak National Wildlife Refuge. Survey attempts during April and June were discontinued due to poor weather conditions. In past years surveys had been conducted when the island was mostly snow covered, allowing for easier sighting of reindeer groups. This year, due to the relatively late survey date, snow was virtually absent from the island. Good visibility and lighting, however, provided adequate survey conditions.

Location and group size was much different than observed during the past two years. Group sizes were larger with fewer actual groups. The groups were concentrated into a smaller area, whereas in the past two years the reindeer were spread out over the island.

Aerial photography is used to census reindeer on Hagemeister Island. July/90-3E2 MH

Cooperation with personnel of National Marine Fisheries Service on the Pribilof Islands helps both them and the Refuge program. Here, pathologist Terry Spraker retrieves dead fur seal pups from rookery. 7/89-9K ALS

During the survey 1530 reindeer were counted in 10 different groups. All but 42 were photo documented. This count represents a minimum number because reindeer were in large, tight groups and young animals were difficult to see from photos. No sex or age distinctions were made. Eight of the ten groups (totalling 1530 animals) were on high rocky ridges and bare mountain tops on the south-southwest and central parts of the island. Average elevation for these eight groups was approximately 1100 feet. One large group located on a ridge contained 916 animals, nearly two-thirds recorded for the survey.

The 1990 census was considerably higher than the 1989 census (724 adults). This is probably due largely to the fact that it occurred well after calving and the young of the year were included. A 30% recruitment is possible in a good year. Still it seems probable that some animals were missed in the 1989 census. During 1989 reindeer were very widely dispersed and some could easily have been missed.

It appears that the reindeer owner, Jack Gusak, is being unsuccessful at reducing the herd and some additional steps need to be taken.

G. WILDLIFE

The information summarized in this section comes from reports mentioned in the Planning Section (Murphy 1990 and the refuge monitoring program in the Pribilof Islands), and personnel communications from Ian Jones, graduate student at Queens University, Toronto, Canada and refuge volunteer.

4. Marsh and Water Birds

Red-faced cormorants at St. Paul Island were monitored. Clutch size of 2.69 eggs per clutch and an overall productivity was low at .56 young per nest. No cormorants were present on our plots at St. George Island in 1990.

5. Shorebirds, Gull, Terns, and Allied Species

Black-legged kittiwake. Productivity improved over 1989 which was a poor year for kittiwake production throughout monitored sites in the Bering Sea. At St. Paul black-legged kittiwake productivity was .41 chicks fledged per nest. St. George had .31 chicks fledged per nest.

Horned puffins are a common crevice-nesting seabird. Here they use a small lava tube at St. Paul Island in the Pribilof Islands. 7/89-1P16 ALS

Crested auklets are talus nesting seabirds common in the Pribilof Islands and other lands in the Alaska Maritime National Wildlife Refuge. Alaska is the only place in North America where this species nests. 6/89-1P13 ALS

The red-faced cormorant is the only nesting cormorant at the Pribilof Islands, although pelagic cormorants are common at colonies north, south east, and west of the Pribilof Islands. 6/89-1F3 ALS

Black-legged kittiwakes at Bluff in 1990 had a hatching success of 85% and a fledging success of 74%. Counts of nests were higher than any other year except 1988, but counts of active nests (nests found to contain eggs or chicks) were lower than in most other year for which data are available. In summary reproductive performance from laying through fledging was about average for Bluff. Numbers of black-legged kittiwakes were not significantly different than last year.

Red-legged kittiwake. While 1989 was a total reproductive failure on both St. Paul and St. George Islands, 1990 was a relative good year. At St. George and St. Paul productivity was .26 and .23 young fledged per nest respectively. About 95% of the world's red-legged kittiwake population nests on the Pribilof Islands, so their breeding success there is critical.

Murres. Common murres reproductive success at St. Paul was .36 chicks fledged per egg laid. This is the lowest of eight years of data from St. Paul. Data on common murres were not gathered for St. George Island in 1990. Thick-billed murres at St. Paul and St. George Island had reproductive success of .38 and .62 chicks fledged per egg laid respectively.

At Bluff, murre counts on plots suggested that murre numbers have not increased or decreased in the last decade and that fluctuations among years have been positively associated with differences in reproductive success. Murre numbers had declined dramatically in the 1970's.

Auklets. Ian Jones, volunteer with the refuge in 1988 and 1989 did not continue research on St. Paul Island in 1990. Data are to be written up as Ian's thesis for his Ph.D. dissertation and various scientific papers. We feel this research will help in devising methods to monitor auklets.

8. Game Mammals

Paula White, refuge volunteer, began a study on the natal dispersal of arctic fox (Alopex lagopus) at St. Paul Island. This was the first field season of a two year graduate research project with the University of California, Berkeley. The purpose of this study is to examine natal dispersal of arctic foxes in an insular system.

Arctic foxes are commonly described as a non-social canid; monogamous during the breeding season. On St. Paul however, arctic fox exhibit complex social behaviors at den sites throughout the summer months. During the 1990 field season, den sites with more than two adults in attendance were common.

The arctic fox, which is white or blue in their winter coat, are black or cream colored in summer. Graduate student and refuge volunteer, Paula White, began a fox study at St. Paul Island in 1990. 6/89-3D1 ALS

Interior St. Paul Island from Bogoslof Hill. The Orthodox cross reflects the influence of the first Russian settlers who came in quest of seal pelts. Descendants of them and the Aleuts brought from the Aleutian Islands make up the majority of the Pribilovians today. 8/89-19B ALS

Neighboring fox families socialized at communal rendezvous sites. In a few instances, different aged litters shared natal dens.

Island-wide surveys were conducted to provide information on: 1) abundance and distribution of den sites, 2) numbers of adults and pups present at den sites, and 3) amount and causes of mortality. A total of 96 den sites were found of which 91% were active in 1990. Eighty-five (98%) of all active dens were within 1 km of the coast and 82 (94%) were located within 2 km of a major seabird nesting cliff or fur seal rookery.

Average litter size of dens where reliable counts could be obtained (N=22) was 4.3 pups per den in early July. By mid-August pup counts coupled with morality had decreased to an average of 2.2 pups (N=38). Three natal dens were communal, containing more than one litter simultaneously. Although interactions among den mates appeared amiable, pups tended to associate more with full siblings than between litters. Age differences between litters in communal dens ranged from approximately 1.5 - 2.5 weeks.

Of 24 adults/subadults found dead, 20 died in winter coat, during the winter of 1989-1990 or early the following spring. Fourteen of these winter-kill specimens were salvaged from a single pile, discarded there unskinned after being shot over the winter. Of the remaining ten adults and subadults, two were shot, one was struck by a automobile, one died of disease, and six died of unknown causes.

H. PUBLIC USE

1. General

See Homer office section.

7. Interpretation

Regular scheduled natural history tours continued in 1990 as in the past at the Pribilof Islands. About 1100 people visited St. Paul and about 50 visited St. George Island. Tremendous increase of visitors due to the new port facilities brought in many people off commercial fishing ships. Many of these fisherman came during the winter.

I. EQUIPMENT AND FACILITIES

1. New Construction

The Pribilof "Terms and Conditions", an agreement signed by the Native Corporation and the Secretary of Interior, indicates corporations are to provide buildings for the refuge on one-acre leased administrative sites on each island. While discussions between the Tanadgusix Corporation and the Fish and Wildlife Service have occurred, no resolution to this problem has been found. Without the continued generous help from the National Marine Fisheries Service of providing us free housing on the Pribilof Islands our monitoring would not have been possible.

More information on new construction is also available in the Homer office section.

4. Equipment Utilization and Replacement

Two new Honda four wheelers were purchased to add to our aging fleet on the Pribilof Islands.

6. Computer Systems

The portable Corona computers which were used in the Pribilofs for data storage and analysis for several years were replaced with Zenith 286 lap-tops. The new computers work well and are much easier to transport to and from the islands.

J. OTHER ITEMS

3. Items of Interest

See Homer office section.

4. Credits

The report was written and typed by Sowls, and edited by Blenden and Andrew-Miller.

CHUKCHI SEA UNIT

ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Homer, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1990

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

INTRODUCTION

Chukchi Sea Unit

Alaska Maritime National Wildlife Refuge

The Alaska Maritime National Wildlife Refuge (Maritime Refuge) 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 3,500,000 acre refuge. Although relatively small in land mass, its lands are scattered through most of coastal Alaska and extend 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 3,000 islands, islets, and pinnacle rocks within the refuge which are used annually by millions of seabirds of at least 30 species. The Maritime Refuge has five units with all former refuges in designated subunits.

Lying primarily 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. Unlike other units of the Alaska Maritime Refuge, 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. Chamisso and Puffin islands in Kotzebue Sound are the largest island colonies in the unit. An extra-limitable 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, musk ox, wolverine, moose, Dall sheep and caribou. Thousands of caribou from the Western Arctic Caribou Herd congregate near Cape Lisburne in a summer post-calving aggregation.

G. WILDLIFE

H. PUBLIC USE

I. EQUIPMENT AND FACILITIES

J. OTHER ITEMS

K. FEEDBACK

A. HIGHLIGHTS

Seabird monitoring accomplished at Cape Thompson through a Mineral Management Service contract. Kittiwake populations seem to be at a high. Murres appear stable after a big decline sometime between 1960 and 1977 (Section G.5).

Corps of Engingeers begins cleanup of Cape Thompson Project Chariot site (Section F.1).

B. CLIMATIC CONDITIONS

Data from the National Weather Service at Kotzebue probably best represents weather conditions for the Chukchi Unit. During 1990, there was a warmer spring and summer than normal, but the core winter months were colder than usual. Sea surface temperatures at the field study at Cape Thompson were 4 degrees celsius higher than when studies were done here in 1988. Higher water temperatures probably greatly influence plankton and small fish which are seabirds food supply.

Table 1. Temperatures at Kotzebue in 1990.

Month	Average Temp. (°F)	Departure from Average (°F)
Jan	2.4	-3.4
Feb	-17.3	-20.6
Mar	1.8	2.4
Apr	6.5	3.6
May	38.3	6.7
Jun	45.7	1.9
Jul	58.8	5.7
Aug	56.8	4.9
Sep	40.1	-1.5
Oct	24.5	1.7
Nov	4.0	-4.1
Dec	-6.9	-2.7

D. PLANNING

1. Master Plan

See Homer office section.

2. Management Plan

See Homer office section.

4. Compliance with Cultural Resource Mandates

Archaeological Services, a cultural resources contracting firm from Pennsylvania, investigated the Pingasagruk archaeological site at Point Franklin, Chukchi Sea Unit, in 1986 (Contract No. 14-16-0007-86-6612). A final report on this project has not yet been received by the U.S. Fish and Wildlife Service, but is expected in 1991.

E. ADMINISTRATION

1. Personnel

See Homer office section.

4. Volunteer Program

See Homer office section.

5. Funding

See Homer office section.

6. Safety

See Homer office section.

7. Technical Assistance

See Homer office section.

8. Other

Table 2. Special use permits issued, 1990.

Permittee	Location	Purpose
Migratory Bird Management	Cape Thompson	Seabird studies
Phil Driver	Cape Thompson/Lisburne	Guiding

F. HABITAT MANAGEMENT

1. General

The Army Corps of Engineers began cleanup of the Project Chariot site in the fall of 1990. Cleanup will likely continue into 1991. Project Chariot was a U.S. Energy Department project in the 1960's to study the feasibility of creating a harbor through the use of an atomic bomb near Cape Thompson. The project was cancelled without using a bomb. Buildings, drilling muds, oil and fuel barrels, etc. were left abandoned.

G. WILDLIFE

5. Shorebirds, Gulls, Terns and Allied Species

The only seabird monitoring done in the Chukcki Unit in 1990 was conducted by the Migratory Bird Management (MBM) Office in Anchorage as part of a contract with the Minerals Management Service (MMS). The MMS is interested in the Chukchi Sea as part of the environmental assessment for gas and oil leasing.

No refuge activities were done in the Chukchi Sea Unit in 1990 due to lack of funds.

Seabird monitoring has been very intermittent in the Chukchi Sea, but has been spread out over a long period of time. In fact, the 1960 data from Cape Thompson represents the oldest quantative data on seabirds for Alaska. Results of seabird work done in 1990 reported below are from the draft report on the project by Brian Sharp. He was the principal investigator for the Cape Thompson field studies in 1990.

Black-legged kittiwake. Population count data for kittiwakes showed numbers of birds and nests have increased between 1960 and 1990 and between 1979 and 1990. Kittiwake numbers were apparently at their highest recorded levels at Cape Thompson in 1990.

Kittiwake productivity was estimated by two methods, which gave different results. This was necessary because sea ice conditions did not allow monitoring to start at the beginning of nest building, which is the preferred method. In any case, 1990 was a good year for kittiwakes with something about eighty-seven percent of active nests (based on when observations started) fledging at least one chick and 1.1 young being fledged per active nest. This is a very high productivity for Alaskan kittiwakes.

Herring school off Cape Thompson. Seabird reproductive success depends greatly on the supply of prey species. In the Chukchi Sea small fish populations vary tremendously from year to year. 89-5B7-BF

A kittiwake feeding flock zeros in on a fish school at Cape Thompson. 89-1D13-DF

Cape Thompson, a major seabird colony in the Chukchi Sea, was monitored in 1990. 89-19C-DF

Musk ox have been successfully reintroduced to the Cape Thompson area. 89-3E4-DF

Murre populations appear to have remained stable since 1979, but are still below 1960 levels; a precipitous, unexplained decline apparently took place between 1960 and 1977. Murre productivity was estimated in terms of chicks per adult and was found to be 0.42 for thick-billed and 0.49 for common murres.

14. Scientific Collections

On July 10, Alan Springer collected 12 thick-billed murres, six common murres, and 10 black-legged kittiwakes. Brian Sharp collected an additional six thick-billed murres, two common murres, and eight black-legged kittiwakes on August 20, at Cape Thompson. These were collected as part of the seabird monitoring study in order to get information on food habits of seabirds.

H. PUBLIC USE

8. Hunting

In 1990 a permit was issued for the Cape Thompson and Cape Lisburne refuge lands to Phil Driver, a registered hunting guide. He reported setting up a bear hunting camp east of Mt. Hamlet (east of the Cape Lisburne Unit) for spring bear season, but did not report taking any bears.

11. Wildlife Observation

Guide permit holder, Phil Driver reported taking people on wildlife viewing trips in the Cape Thompson area. Clients enjoy viewing the musk ox herd and have expressed interest in viewing the seabird colonies in the area.

17. Law Enforcement

See Homer office section.

I. EQUIPMENT AND FACILITIES

4. Equipment Utilization and Replacement

See Homer office section.

J. OTHER ITEMS

3. Items of Interest

See Homer office section.

4. Credits

The report was written and typed by Sowls and edited by Blenden and Andrew-Miller.

GULF OF ALASKA UNIT

ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Homer, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1990

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

INTRODUCTION

Gulf of Alaska Unit

Alaska Maritime National Wildlife Refuge

The Alaska Maritime National Wildlife Refuge (Maritime Refuge) 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 3,500,000 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 almost to Barrow in northwest Alaska. There are about 3,000 islands, islets, and pinnacle rocks within the refuge, which are used annually by millions of seabirds of at least 30 species. The Maritime Refuge has five units with all former refuges designated subunits.

The Gulf of Alaska Unit extends from Alaska's southcentral coast near Kodiak Island, 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 Maritime Refuge. Spruce-hemlock forests are the dominant plant community on nearly all the islands outside Cook Inlet. The transition zone occurs in the Barren Islands, where there is only a small forested area on Ushagat Island, with alpine tundra being the dominant vegetation type. As in most of the refuge, topography in this 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, two colonies are readily accessible by charter boat or pleasure craft: St. Lazaria Island is 15 miles from Sitka and the Chiswell Islands are 35 miles from Seward.

INTRODUCTION Page

F. HABITAT MANAGEMENT (cont.)

G. WILDLIFE

H. PUBLIC USE

H. PUBLIC USE (cont.)

I. EQUIPMENT AND FACILITIES

J. OTHER ITEMS

K. FEEDBACK

A. HIGHLIGHTS

Service divers monitor bark deposition at Afognak Native Corporation's log transfer site (Section F-3).

Right-of-Way permit issued for a second log transfer site at Kazakof Bay, Afognak Island (Section F-3).

The damage assessment study of murres extended for a second year; storm-petrel study at East Amatuli Island terminated by the government, but resumed by Exxon (Section G-3).

A new kittiwake colony discovered at Malina Bay, Afognak Island (Section G-5).

B. CLIMATIC CONDITIONS

Although it does not extend as far south as the Aleutians, the Gulf of Alaska has the most moderate climate among the units of the Alaska Maritime National Wildlife Refuge. Winter temperatures normally remain above 0° F except for lands adjacent to the Kenai Peninsula. The temperate climate in Southeast Alaska is often overcast, but seldom experiences the wind and summer fog of the other units.

The year began with 17 inches of snowfall in January and February, but virtually no additional snow for the remaining of the year. The temperature was 10 degrees below normal in February, but remained above normal for most of the year. Mount Redoubt, about 75 miles northwest of Homer, erupted several times during the first few months of the year disrupting air traffic. A few times the eruption produced flooding of the Drift River. An oil terminal at the mouth of the river was threatened once and had to be closed for a time.

Table 1. Meteorological Data - Homer 1990

Month	Temperatures Max.	Min.	Avg.	Precipitation Dep. Norm.	Total	Snow
Jan	41	-4	22.4	+1.6	3.07	17.7
Feb	38	-9	14.2	-10.1	1.53	17.6
Mar	48	12	32.4	+5.5	0.33	1.0
Apr	57	26	40.0	+4.9	0.40	T
May	63	30	46.7	+4.5	1.10	0
Jun	71	38	59.4	+3.0	1.20	0
Jul	67	43	54.7	+1.9	0.64	0
Aug	72	39	55.2	+2.4	2.39	0
Sep	61	32	48.9	+1.6	6.15	0
Oct	53	17	37.1	-0.2	1.66	1.2

DATA NOT AVAILABLE FOR NOVEMBER AND DECEMBER.

D. PLANNING

1. Master Plan

See Homer office section.

2. Management Plan

The Migratory Birds staff completed a draft seabird monitoring plan during the fall. The document had been reviewed by refuge staff, but the plan had not been finalized by the end of the year.

5. Research and Investigations

AMNWR NR90AKM- "Seabird population monitoring, Middleton Island, Alaska summer 1990"

Personnel of the Alaska Fish and Wildlife Research Center (AFWRC) conducted studies of seabirds on Middleton Island from 9 April through 8 August in 1990. Persons involved in the field studies this year included Scott Hatch (9-25 April), Bay Roberts (9 April -9 May), Brian Fadely (9 April - 6 August), Janey Fadely (13 June - 8 August), Meg Haynes (2-18 May), Marci Brown (18 May - 6 August), Doug Pohlman (18 May - 1 August), and Joel Schmutz (20 June - 27 June). Activities during April and May included resighting of previously banded black-legged kittiwakes for the estimation of over-winter survival and the capture and banding of about 100 new individuals on one plot to maintain a large sample

size for estimates in future years. The field crew also installed electronic balances under nests of kittiwakes and attached radio transmitters to the resident adults to monitor the attendance patterns and body weight dynamics of breeding birds.

Sugarloaf Island as viewed from Sud Island.
Nishimoto 1990

Band resighting indicated an annual adult survival (1989-90) of about 91% for kittiwakes breeding on the most intensively studied plot. That estimate is slightly lower than the 93-94% values observed in the preceding two years, but is higher than kittiwake survival reported from the North Atlantic. There are plans to observe the sample of about 400 banded birds for several more years to improve the estimate of mean survival and make accurate life-table projections.

The performance of solar-powered weighing platforms was excellent in 1990, as it was in the preceding three years. This year marked the last season that this study would deploy weight-monitoring equipment.

Other field activities in 1990 included island-wide censuses of kittiwakes, pelagic cormorants, and murres, productivity studies of kittiwakes and cormorants, and collections of adults and chick regurgitations from kittiwakes, glaucous-winged gulls, and pelagic

cormorants. The latter constitutes the most thorough investigation of seabird food habits conducted on Middleton Island to date. The census indicated a somewhat larger population of kittiwakes on Middleton in 1990 than in 1989, whereas productivity was poor for the sixth consecutive year.

Two Soviet scientists (Alexandr Kondratyev and Victor Zubakin, both of the USSR Academy of Sciences, Moscow and Magadan), accompanied by Hatch and Steve Kohl (International Affairs Office, Washington D.C.), visited Middleton Island on 2-3 July 1990. The purpose of the visit was to introduce the Soviets to representative seabirds research problems and methods in an Alaskan colony prior to their participation in the joint Soviet-U.S. seabird cruise aboard the M/V Tiglax in July.

E. ADMINISTRATION

1. Personnel

See Homer office section.

4. Volunteer Program

See Homer office section.

5. Funding

See Homer office section.

6. Safety

See Homer office section.

7. Technical Assistance

WB Nishimoto, DRM Blenden and Fish and Wildlife Enhancement biologist Gary Stackhouse met with representatives of the U.S. Army Corps of Engineers, City of Homer officials and local residents concerning a proposed wetlands fill for a camper park at the base of Homer Spit. The proposed fill would destroy wetlands used as a staging area by shorebirds. Local residents strongly opposed the project. The Service recommended that other alternatives be considered. The City of Homer eventually withdrew their application.

West Amatuli oil spill beach assessment survey. Nishimoto 1990

Landing on the south side of Ushagat Island to do oil spill shore assessment surveys. Nishimoto 1990

Nishimoto assisted the Oil Spill Office in conducting shoreline assessment along the southwest and northeast side of Afognak Island from June 23-30. Only splatters of oil were found on few beaches.

Oil found during oil spill assessment survey.
Nishimoto 1990

View of Ushagat Island (Table Mountain) as seen from Sud Island. Nishimoto 1990

From August 4-10, Nishimoto led a shoreline assessment team on a survey of beaches at the Barren Islands. He was assisted by refuge volunteer Cameron Thomas and Kenai Fisheries Assistance Office volunteer Kay Howar. Several beaches on Ushagat and West Amatuli Island had tar balls. The Service's Oil Spill Office retained the data from both surveys, but they had not been summarized by the end of the year. Heavily oiled beaches on Ushagat were previously surveyed by a multi-agency team. The Oil Spill Office also conducted beach assessments at the Pye Islands, but results were not made available to the refuge.

8. Other

See Homer Office section.

F. HABITAT MANAGEMENT

3. Forests

Forested islands exist only in the Gulf of Alaska Unit, with Ragged Island (5,400 acres) 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 exists on other Federal, State and Native lands, the Alaska National Interest Lands Act provides for the Afognak Joint Venture use of timber on both Discoverer and Delphin islands. Both islands are heavily used by Sitka black-tailed deer and brown bear. Delphin also has a small seabird colony and nesting eagles. Delphin Island is particularly important to wildlife and has magnificent trees of up to five 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 ground 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, former U.S. Forest Service lands on Afognak Island have been logged and the timber transferred through a barge loading facility at Perenosa Bay. Under Alaska National Interest Lands Act, these lands were transferred to Native Corporations. In 1986, several Native corporations working through Koncor, Inc., resumed logging on the north side of the island. Logging continued through 1987. A dive survey conducted in October 1987 indicated that bark had accumulated on the submerged lands adjacent to the transfer facility.

View of the Triplet Islands between Afognak and Kodiak islands. Nishimoto 1990

Clear-cut area, Kazakof Bay, Afognak Island. Nishimoto 1990

The Afognak Native Corporation constructed a low gradient slide log transfer facility at Kazakof Bay, Afognak Island during the fall of 1988. An inspection of the site by personnel from the Fish and Wildlife Enhancement in the summer of 1989 found that the logging operation used an unauthorized log storage site. They also have not complied with several administrative stipulations and these deficiencies have been reported to the Refuge Manager. The Right-of-Way permit also requires creation of artificial reefs and eelgrass transplants. Although submerged lands off the log transfer site were monitored by Fish and Wildlife Enhancement divers in 1989, the data collected was inadequate to quantify area of bark deposition and the amount of mitigation required.

To quantify areas of bark deposits, Fish and Wildlife Enhancement biologists Brian Anderson and Larry Dugan along with refuge deckhand Greg Snedgen conducted underwater surveys on October 23-24, 1990. We determined that 0.6 ac of algal substrate would be required to mitigate habitat lost to bark deposits. Another 0.2 ac would be required due to the fill associated with the log transfer facility.

The Afognak Native Corporation also applied for another Right-of-Way permit to construct a tidal road on a portion of the west side of Kazakof Bay. The project would impact a cobble beach that provides habitat for a sparse population of marine invertebrates. The Service completed an environmental assessment in December, but a Right-of-Way permit was not issued by the end of the year.

In 1990, Koncor, Inc. continued their efforts to obtain a Right-of-Way permit to construct a log transfer facility within four miles from the Afognak Native Corporation's project at Kazakof Bay. They had originally planned to develop a barging facility, but in 1989 changed their mind and decided to construct a low gradient slide. Since a U.S. Army Corps of Engineers permit was required, Division of Realty and Fish and Wildlife Enhancement decided to use the Corps' environmental assessment to meet our requirements of the National Environmental Policy Act. The refuge opposed it since we felt the Corps would not be responsive to our needs. However, since Realty was responsible for the project they relied on the Corps' assessment. As expected, the Corps' assessment was inadequate. Consequently, the Service hurriedly completed an assessment due to pressures to avoid delaying the project. The assessment was finally signed in March and the Right-of-Way permit was issued in April.

Kodiak Reduction, Incorporated, Gibson Cove.
Nishimoto 1990

Afognak Native Corporation Log Transfer Facility site, Lookout Cove, Kazakof Bay, Afognak. Nishimoto 1990

Aerial view of the Koncor operation, Kazakof Bay, Afognak. Nishimoto 1990

Kitoi Hatchery pen on Afognak. Alaska Department of Fish and Game. Nishimoto 1990

Preparing to dive at Afognak Native Corporation's Log Transfer Facility site at Kazakof Bay, Lookout Cove. Nishimoto 1990

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

G. WILDLIFE

1. Wildlife Diversity

This is the only unit on the refuge which supports a population of forest birds. No other unit has forest habitat.

2. Endangered and/or Threatened Species

Occasional individuals of the endangered or threatened subspecies of the peregrine falcon may visit the area during migration.

3. Waterfowl

Migrating and wintering waterfowl are abundant around the Pye Islands, Afognak Island, Womens Bay at Kodiak Island and in the Barrens. Populations of common eiders and white-winged scoters can be found in waters around Duck and Chisik islands.

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.

Cormorants. Pelagic (Phalacrocorax pelagicus) and red-faced (P. urile) cormorants were surveyed on Gull Island and Sixty-foot Rock during June/July of 1990. The number of Gull Island pelagic cormorant nests was 6.1% lower than the mean number of nests from the previous years. Red-faced cormorant nests were 11.1% greater than the mean of the four previous years. At Sixty-foot Rock, six

pelagic nests were found. We also found a red-faced nest for the first time since monitoring of this colony began in 1984. However, the Sixty-Foot Rock nests did not produce any young. An average of 246 adult pelagic cormorants were observed at Gull Island, and an average of 62 adult pelagic cormorants at Sixty-foot Rock.

Storm-petrels. The government's fork-tailed storm-petrels (Oceanodroma furcata) damage assessment study at East Amatuli was cancelled 1990. However, the Exxon Corporation continued petrel studies through the University of Washington. Dr. Dee Boersma, who worked at East Amatuli in the late 1970's and early 1980's, was their principal investigator. The University of Washington team checked 675 burrows at eight study areas. Storm-petrel chicks began hatching during the third week of June and chicks began fledging by late August. The percentage of nests with eggs in areas A, B, D, E, and Z was 51.0. Reproductive success in those same areas was 0.13 chicks per active burrow. This was the lowest reproductive rate ever recorded on East Amatuli 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.

Glaucous-winged gulls. We estimated that 713 adult birds inhabited Gull Island, based on two counts in June of 1990. For comparison, 442 birds were counted in 1985. We did not count adults during 1986-88. The numbers were more consistent at Sixty-foot Rock; we counted 80 gulls, and this is nearly the same number of birds observed during the past three years.

Murres. As the Exxon Valdez oil spill and seabird nesting seasons progressed, concern was especially acute for common murre populations in the northern Gulf of Alaska. Murres were studied at the Chiswell Islands and Barren Islands as one of the damage assessment studies. Results of this work cannot be discussed due to pending litigation. We counted 5,075 common murres at Gull Island and 190 at Sixty-Foot Rock.

Puffins. Twenty-eight tufted puffins were counted at Gull Island. This compares with a population of 530 puffins estimated in 1976. An average of one tufted puffin was counted at Sixty-Foot Rock based on five replicate counts. Four tufted puffin transects were monitored on East Amatuli Island during August. The pooled burrow density in 1990 was 0.24 burrows per m2. The density of occupied burrows (pooled) was 31%.

Pigeon Guillemots. We estimated that there were 19 pigeon guillemots at Gull Island and three guillemots at Sixty-Foot Rock in May of 1990.

Black-legged kittiwakes. Kittiwakes were first observed at Gull Island on March 31. There was 13.1% more adult birds than the average of the previous four years. There were also 13.0% more nests in 1990 than the mean of the four previous years. Both numbers of birds and nests counted in 1990 were still lower than our peak counts recorded in 1988. Gull Island produced 0.41 prefledging chicks per nest. This was 5.1% higher than the mean of the three previous years. At Sixty-foot Rock we had a mean count of 391 adults and 301 nests. This was 19.9% higher than the four-year mean of 326.0 adult birds and 34.2% higher than the mean number of nests for the same period. The colony failed in 1990.

While conducting beach assessment surveys at Afognak Island, Nishimoto counted 881 kittiwakes and 525 nests on island "D" in Malina Bay. This colony had not been previously surveyed.

Murrelets. Nishimoto attempted to continue an ongoing study to develop a methodology to monitor murrelets at sea, which would be useful for our work on refuge areas like Afognak Island. They would also provide good baseline data since logging has been proposed for the south side of Kachemak Bay. However, the refuge's effort had to stop when the refuge decided to monitor bark deposits at Afognak Island. All data collected was transferred to an oil spill restoration principal investigator for analysis. By the end of the year, that data had not been analyzed.

University of Washington field camp studying fork-tailed storm-petrels on East Amatuli Island. Oil spill study funded by Exxon. Nishimoto 1990

6. Raptors

Bald eagles nest on many of the islands. Biological technician Bain continued to conduct bald eagle surveys on the Homer Spit. A high of 643 eagles was counted in February. This was an increase over the peak of 452 birds reported in February of 1989. Between 300 and 400 eagles were counted each week of March. This dropped to less than 100 eagles by the end of April.

7. Passerines

Common ravens, four species of sparrows (golden-crowned, fox, song, and savannah), and two species of swallow (violet-green and bank) are commonly seen on most of the 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 in Kachemak Bay and around the Barren Islands. In May, a newly born sea otter pup was brought into the refuge where it was cared for by former otter center volunteers. It was sent to a veterinarian in Soldotna and then later transferred to the Shedd Aquarium in Chicago.

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 Alaska Maritime National Wildlife Refuge lands.

Daisy Lee Bitter from the Alaska Center for Coastal Studies was provided our most recent population figures for Gull Island and Sixty-Foot Rock. The Center provides tours around Gull Island and is active in coastal ecosystem education.

17. Law Enforcement

See Homer office section.

I. EQUIPMENT AND FACILITIES

5. Communications Systems

See Homer office section.

J. OTHER ITEMS

4. Credit

Sections A, B and C of the Gulf of Alaska Unit were written by Nishimoto. Blenden and Hagglund prepared Section E. Nishimoto wrote Sections F, G and J and supplied the photos. The report was edited by Andrew-Miller.

ABUNDANCE CATEGORIES

- ━━━ — Common.
- ━━━ — Uncommon.
- ——— — Rare. May not be seen every year.
- - - - - - — Casual. Not present every year but records too numerous to show individually.
- • — Accidental record.

• — nests on Adak
X — Asiatic species

HABITATS

o — open ocean
n — near shore ocean waters, bays and estuaries
w — lowland lakes, ponds and streams
b — beaches and mudflats
s — rocky shorelines
t — lowland tundra (includes town areas)
a — alpine tundra and rocky areas

LOONS

- ____ Red-throated Loon n
- ____ Pacific Loon n
- ____ • Common Loon nw
- ____ Yellow-billed Loon n

GREBES

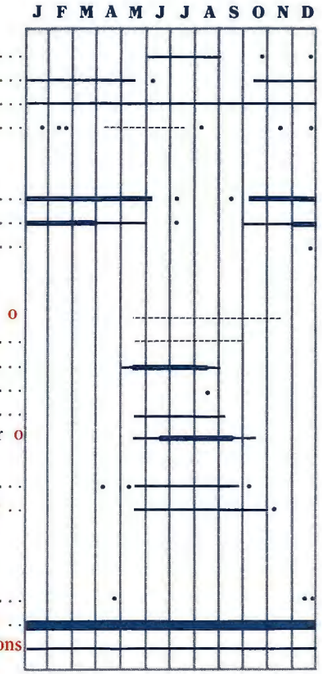
- ____ Horned Grebe n
- ____ Red-necked Grebe n
- ____ Western Grebe n

TUBENOSES

- ____ Black-footed Albatross o
- ____ Laysan Albatross o
- ____ Northern Fulmar o
- ____ Cook's Petrel o
- ____ Sooty Shearwater o
- ____ Short-tailed Shearwater o
- ____ Fork-tailed Storm-petrel o
- ____ Leach's Storm-petrel o

CORMORANTS

- ____ Double-crested Cormorant n
- ____ • Pelagic Cormorant ons
- ____ • Red-faced Cormorant ons



SWANS & GEESE

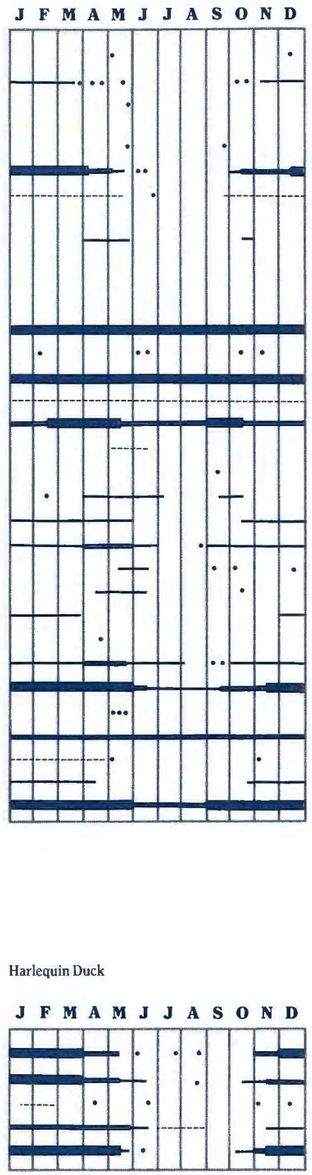
- ____ Tundra Swan nw
- ____ X Whooper Swan nw
- ____ X Bean Goose n
- ____ Greater White-fronted Goose n
- ____ Emperor Goose ons
- ____ Brant n
- ____ Canada Goose (Aleutian) nw

DUCKS

- ____ • Green-winged Teal (Aleutian) nw
- ____ X Falcated Teal nw
- ____ • Mallard nw
- ____ X Spot-billed Duck nw
- ____ • Northern Pintail nw
- ____ X Garganey n
- ____ Blue-winged Teal n
- ____ Northern Shoveler n
- ____ Gadwall nw
- ____ X Eurasian Wigeon nw
- ____ American Wigeon nw
- ____ X Common Pochard nw
- ____ Canvasback nw
- ____ Ring-necked Duck w
- ____ X Tufted Duck nw
- ____ • Greater Scaup nw
- ____ Lesser Scaup w
- ____ • Common Eider n
- ____ King Eider n
- ____ Steller's Eider n
- ____ Harlequin Duck ns

Harlequin Duck

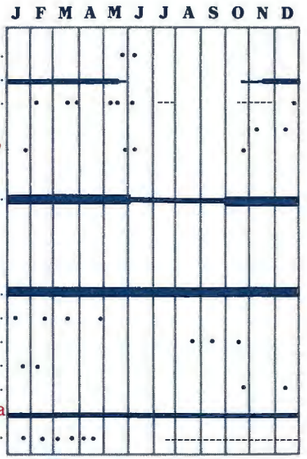
- ____ Oldsquaw n
- ____ Black Scoter n
- ____ Surf Scoter n
- ____ White-winged Scoter n
- ____ Common Goldeneye n



- ____ Barrow's Goldeneye n
- ____ Bufflehead nw
- ____ X Smew nw
- ____ Hooded Merganser w
- ____ Common Merganser nw
- ____ • Red-breasted Merganser nw

EAGLES, HAWKS & FALCONS

- ____ • Bald Eagle nwbsta
- ____ Northern Harrier n
- ____ Rough-legged Hawk t
- ____ X Eurasian Kestrel t
- ____ Merlin t
- ____ • Peregrine Falcon nwbsta
- ____ Gyrfalcon wt



Peregrine Falcon

GAME BIRDS

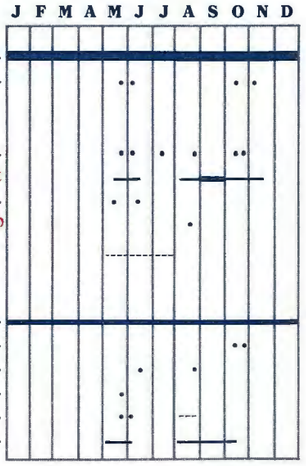
- ____ • Rock Ptarmigan ta
- ____ Sandhill Crane t

PLOVERS

- ____ Black-bellied Plover b
- ____ Lesser Golden-Plover bt
- ____ X Mongolian Plover b
- ____ X Common Ringed Plover b
- ____ • Semipalmated Plover w

SHOREBIRDS

- ____ • Black Oystercatcher s
- ____ Greater Yellowlegs b
- ____ Lesser Yellowlegs b
- ____ X Spotted Redshank b
- ____ X Wood Sandpiper b
- ____ Wandering Tattler nbs



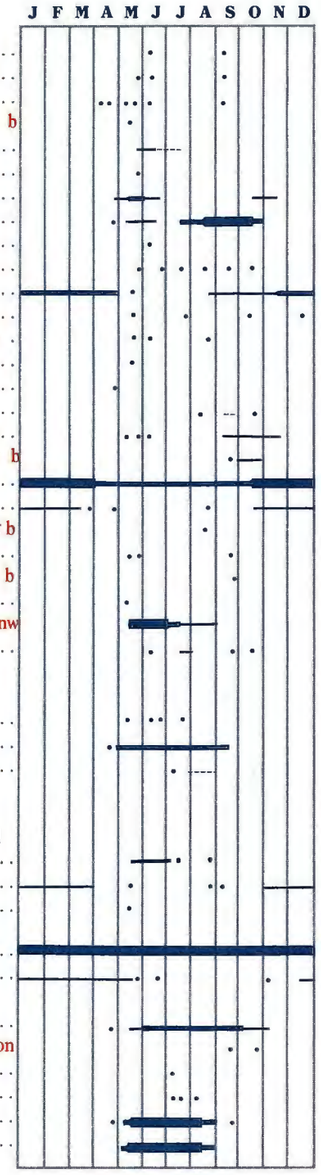
- ____ X Gray-tailed Tattler b
- ____ X Common Sandpiper b
- ____ Whimbrel b
- ____ Bristle-thighed Curlew b
- ____ X Far Eastern Curlew b
- ____ X Black-tailed Godwit b
- ____ Bar-tailed Godwit b
- ____ Ruddy Turnstone bs
- ____ X Great Knot b
- ____ Red Knot b
- ____ Sanderling b
- ____ Western Sandpiper b
- ____ X Rufous-necked Stint b
- ____ X Long-toed Stint b
- ____ Least Sandpiper b
- ____ Baird's Sandpiper b
- ____ Pectoral Sandpiper b
- ____ X Sharp-tailed Sandpiper b
- ____ • Rock Sandpiper bst
- ____ Dunlin b
- ____ X Broad-billed Sandpiper b
- ____ X Ruff b
- ____ Long-billed Dowitcher b
- ____ X Pin-tailed Snipe w
- ____ • Red-necked Phalarope nw
- ____ Red Phalarope n

JAEGERS

- ____ Pomarine Jaeger on
- ____ • Parasitic Jaeger onbt
- ____ Long-tailed Jaeger on

GULLS & TERNS

- ____ X Common Black-headed Gull nb
- ____ Mew Gull nbs
- ____ Herring Gull nb
- ____ • Glaucous-winged Gull onwbst
- ____ Glaucous Gull onb
- ____ Black-legged Kittiwake nw
- ____ Red-legged Kittiwake on
- ____ Sabine's Gull o
- ____ X Common Tern w
- ____ • Arctic Tern nwbt
- ____ • Aleutian Tern nwbt



Pigeon Guillemot

J F M A M J J A S O N D

AUKS & PUFFINS

____ Common Murre on . . . .
____ Thick-billed Murre on . .
____ • Pigeon Guillemot n. . . .
____ • Marbled Murrelet on . .
____ • Kittlitz's Murrelet on . .
____ Ancient Murrelet on . . .
____ Cassin's Auklet on. . . . .
____ Parakeet Auklet on . . . .
____ Least Auklet on . . . . . .
____ Whiskered Auklet on . .
____ Crested Auklet on. . . . .
____ • Tufted Puffin on . . . . .
____ • Horned Puffin on . . . . .

CUCKOOS & OWLS

____ X Common Cuckoo t . . . .
____ Snowy Owl ta . . . . . .
____ Short-eared Owl t . . . . .

SWALLOWS

____ Tree Swallow w . . . . . .
____ Bank Swallow w . . . . . .

RAVENS & WRENS

____ • Common Raven nwsta . .
____ • Winter Wren s . . . . . .

THRUSHES

____ Northern Wheatear ta
____ X Dusky Thrush t. . . . . .

WAGTAILS & PIPITS

____ X Black-backed Wagtail s
____ Water Pipit t . . . . . .

J F M A M J J A S O N D

WAXWINGS & SHRIKES

____ Bohemian Waxwing t . .
____ Northern Shrike t. . . . .

SPARROWS

____ Savannah Sparrow t . . .
____ • Song Sparrow st . . . . .
____ • Lapland Longspur t . . .
____ X Rustic Bunting t . . . . .
____ • Snow Bunting bsta . . . .

FINCHES

____ X Brambling t . . . . . .
____ • Rosy Finch sta . . . . . .
____ X Common Rosefinch t . .
____ White-winged Crossbill t
____ Common Redpoll t . . . .
____ Hoary Redpoll t . . . . . .
____ X Hawfinch t . . . . . .

Rosy Finch

Take Pride in America
— Public Lands are Your Lands —

Aleutian Islands Unit
Alaska Maritime National Wildlife Refuge
Box 5251 NAS Adak, AK
FPO Seattle, WA 98791-0009
(907) 592-2406

April 1987

Birds of Adak Island

Aleutian Islands Unit

Alaska Maritime National Wildlife Refuge

Bald Eagle

Adak Island is part of the Aleutian Islands Unit of the Alaska Maritime National Wildlife Refuge. It is one of some 200 islands in the Chain important to migratory birds. Adak's nearness to Siberia and Asia presents opportunities to observe birdlife not found elsewhere in North America.

A variety of habitats from barren mudflats to high alpine tundra attract birds to Adak. Birdwatching is best at low tide and during early morning and late evening. Species abundance also varies with the season and weather conditions. Clam Lagoon, especially the southwest portion, is considered the best birding area although Kuluk Bay, Sweeper Cove, Lake Andrew and other areas are also productive.

Birding in the Aleutians is fun and challenging because there is always a chance to see a unique species. Thirty-four of the 155 birds on this checklist are "Asiatic" in origin. In addition, this list is provisional and almost any observer can help fill in missing pieces with data on species range, migration dates and bird behavior.

Good birding!

____	Snowy Owl	R-sr
____	Short-eared Owl	R-m
____	Boreal Owl	AC
____	Northern Saw-whet Owl	AC
____	Chimney Swift	AC
____	Common Swift	AC
____	Fork-tailed Swift	AC
____	Belted Kingfisher	AC
____	Northern Flicker	AC
____	Eastern Kingbird	AC
____	Eurasian Skylark	CA
____	Horned Lark	AC
____	Purple Martin	AC
____	Tree Swallow	R-m
____	Violet-green Swallow	AC
____	Bank Swallow	R-m
____	Cliff Swallow	CA
____	Barn Swallow	CA
____	Common House-Martin	AC
____	Common Raven	R-sr
____	Winter Wren	C-b
____	Middendorff's Grasshopper-Warbler	AC
____	Arctic Warbler	CA
____	Golden-crowned Kinglet	AC
____	Siberian Rubythroat	AC
____	Northern Wheatear	R-m
____	Eye-browed Thrush	CA
____	Gray-cheeked Thrush	AC
____	American Robin	AC
____	Yellow Wagtail	R-m
____	Gray Wagtail	AC
____	White Wagtail	AC
____	Black-backed Wagtail	AC
____	Olive Tree-Pipit	AC
____	Red-throated Pipit	AC
____	Water Pipit	R-b
____	Bohemian Waxwing	AC
____	Orange-crowned Warbler	CA
____	Yellow Warbler	CA
____	Yellow-rumped Warbler	CA
____	Wilson's Warbler	CA
____	Savannah Sparrow	R-m
____	Fox Sparrow	CA
____	Song Sparrow	AC
____	Golden-crowned Sparrow	CA
____	White-crowned Sparrow	CA
____	Dark-eyed Junco	CA
____	Lapland Longspur	A-b
____	Rustic Bunting	AC
____	Snow Bunting	C-b
____	McKay's Bunting	R-b
____	Rusty Blackbird	CA
____	Brambling	AC
____	Rosy Finch	C-b
____	Pine Grosbeak	AC
____	Common Rosefinch	AC
____	Red Crossbill	AC
____	White-winged Crossbill	CA
____	Common Redpoll	R-m
____	Hoary Redpoll	CA
____	Pine Siskin	AC
____	Hawfinch	AC

UNSUBSTANTIATED LIST

Species that have appeared on earlier lists but the source of the record is not currently known.

Common Ringed Plover
Black Turnstone
Ruby-crowned Kinglet
Northern Shrike
Eurasian Bullfinch

Phylogenetic sequence and English names of species follow the American Ornithologists' Union (AOU) checklist of North American Birds (6th edition, 1983. Thirty-fifth supplement [Auk 102(3): 680-686, 1985.])

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Statistical data compiled by Vernon Byrd, Dan Gibson, and Bill Rodstrom; winter 1986.

Cover illustration by © John C. Pitcher 1986.

PRIBILOF BIRDLIFE

Alaska's Pribilof Islands support some of the most outstanding marine wildlife spectacles in North America. The islands' rich birdlife has been of interest to wildlife enthusiasts since Henry W. Elliott first published information about them in 1881. Over the years, the Pribilofs have come to be recognized as a "world class" attraction to visitors interested in the natural history of Bering Sea marine birds and mammals.

Over 2.8 million seabirds nest on the four main Pribilof Islands (St. Paul, St. George, Otter and Walrus), the vast majority of which are found on the steep cliffs of St. George. The most abundant species are Thick-billed Murres, Common Murres, Least Auklets, Parakeet Auklets, Horned Puffins, Tufted Puffins, Black-legged Kittiwakes, and Red-legged Kittiwakes.

The Pribilofs provide landing sites for numerous wind-blown migrant birds from North America and Asia. Of the 208 species on this checklist, over half are casual or accidental sightings. The most likely time to see these infrequently observed species is during periods of migration in spring (mid-May to early June) and fall (early August to mid-September).

St. Paul has more diversified habitat than St. George, and wetlands like Salt Lagoon and Webster Lake often attract migrants. The immense colonies of breeding seabirds are best observed on St. George at such places as First Bluff, the High Bluffs, or Ulakaia Ridge. The reader should keep in mind that the status indicated on this checklist for a particular species may not apply equally on St. George and St. Paul.

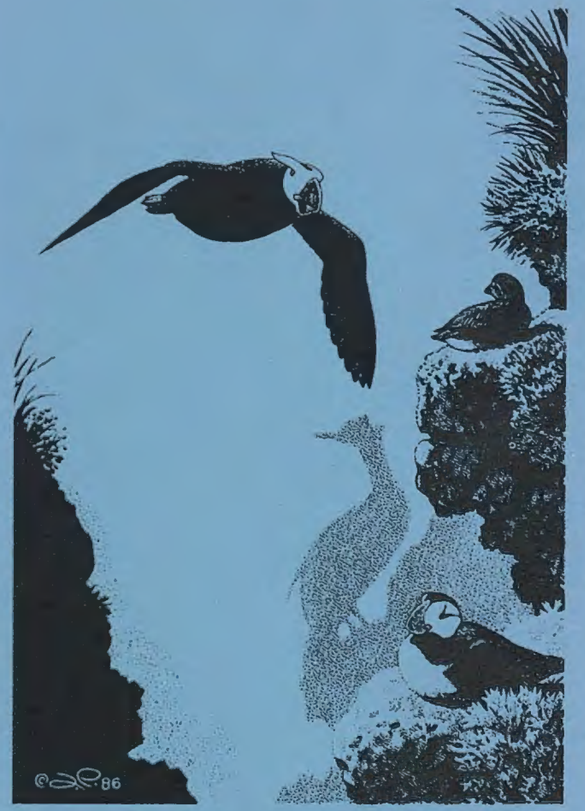
Because they fully recognized the sensitivity of the seabird nesting areas to disturbance, the islands' Aleut residents sold the major nesting areas to the U.S. Government in 1984 for inclusion in the national wildlife refuge system. These lands are now part of the Alaska Maritime National Wildlife Refuge. Visitors are encouraged to view the seabird rookeries, but care must be taken not to disturb the birds by approaching them too closely or making unnecessary noise.

The annual summer gathering of almost one million Northern Fur Seals on their island breeding rookeries also constitutes a wildlife spectacle unique to the Pribilof Islands.

REPORT NEW OR UNUSUAL SIGHTINGS

There is still much to learn about the birds of the Pribilof Islands, and you can help. If you see birds not on this list, or record additional sightings of accidental or casual species, please send details of your observations to Refuge Manager, Alaska Maritime National Wildlife Refuge, 202 Pioneer Avenue, Homer, AK 99603 (907) 235-6546.

BIRDS OF THE PRIBILOF ISLANDS, ALASKA



A CHECKLIST

NATIONAL AUDUBON SOCIETY
ST. GEORGE COMMUNITY COUNCIL
ST. GEORGE TANAQ CORPORATION
U.S. FISH AND WILDLIFE SERVICE

LEGEND

A **abundant** ..... species occurs repeatedly in proper habitats, with available habitat heavily utilized, and/or the region regularly hosts great numbers of the species.

C **common** ..... species occurs in all or nearly all proper habitats, but some areas of presumed suitable habitat are occupied sparsely or not at all and/or the region regularly hosts large numbers of the species.

U **uncommon** ..... species occurs regularly, but utilizes some or very little of the suitable habitat, and/or the region regularly hosts relatively small numbers of the species; not observed regularly even in proper habitats.

R **rare** ..... species occurs, or probably occurs, regularly within the region, but in very small numbers.

CA **casual** ..... species has been recorded no more than a few times, but irregular observations are likely over a period of years.

AC **accidental** ..... a species so far from its normal range that further observations are unlikely; usually occurs singly.

m **migrant**

sr **summer resident**

b **breeder**

w **winter visitor**

** **formerly found, but no records this century**

CHECKLIST

	SPECIES	STATUS
____	Red-throated Loon	R-m
____	Arctic Loon	CA
____	Pacific Loon	CA
____	Common Loon	CA
____	Yellow-billed Loon	R-m
____	Horned Grebe	R-m
____	Red-necked Grebe	R-m
____	Short-tailed Albatross	**
____	Northern Fulmar	C-b
____	Short-tailed Shearwater	U-m
____	Fork-tailed Storm-Petrel	R-m
____	Leach's Storm-Petrel	R-m
____	Double-crested Cormorant	AC
____	Pelagic Cormorant	R-b
____	Red-faced Cormorant	C-b
____	Black-crowned Night Heron	AC
____	Tundra Swan	R-m
____	Whooper Swan	CA
____	Bean Goose	CA
____	Greater White-fronted Goose	CA
____	Snow Goose	CA
____	Emperor Goose	R-m
____	Canada Goose	CA
____	Green-winged Teal	U-m, R-b
____	Baikal Teal	CA
____	Falcated Teal	CA
____	Mallard	R-m
____	Northern Pintail	U-m, R-b
____	Garganey	CA
____	Northern Shoveler	U-m
____	Gadwall	CA
____	Eurasian Wigeon	R-m
____	American Wigeon	R-m
____	Common Pochard	CA
____	Canvasback	CA
____	Redhead	AC
____	Ring-necked Duck	CA
____	Tufted Duck	R-m
____	Greater Scaup	U-m
____	Lesser Scaup	AC
____	Common Eider	CA-sr
____	King Eider	R-sr
____	Spectacled Eider	CA
____	Steller's Eider	U-sr
____	Harlequin Duck	C-sr
____	Oldsquaw	C-m, U-b
____	Black Scoter	AC
____	Surf Scoter	CA
____	White-winged Scoter	C-w
____	Common Goldeneye	U-m
____	Barrow's Goldeneye	CA
____	Bufflehead	U-m
____	Smew	CA
____	Hooded Merganser	AC
____	Common Merganser	R-m
____	Red-breasted Merganser	R-m
____	Osprey	CA
____	Bald Eagle	CA
____	Steller's Sea-Eagle	AC
____	Rough-legged Hawk	CA
____	Northern Hobby	AC
____	Peregrine Falcon	CA
____	Gyrfalcon	CA
____	Eurasian Coot	AC
____	Sandhill Crane	U-m
____	Black-bellied Plover	CA
____	Lesser Golden-Plover	U-m
____	Mongolian Plover	R-m
____	Semipalmated Plover	U-b
____	Killdeer	AC
____	Black Oystercatcher	AC
____	Common Greenshank	CA
____	Greater Yellowlegs	CA
____	Lesser Yellowlegs	R-m
____	Spotted Redshank	CA
____	Wood Sandpiper	R-m
____	Solitary Sandpiper	AC
____	Wandering Tattler	U-m
____	Gray-tailed Tattler	R-m
____	Common Sandpiper	CA
____	Terek Sandpiper	CA
____	Eskimo Curlew	**
____	Whimbrel	R-m
____	Bristle-thighed Curlew	R-m
____	Far Eastern Curlew	CA
____	Black-tailed Godwit	CA
____	Bar-tailed Godwit	U-m
____	Ruddy Turnstone	C-m
____	Great Knot	AC
____	Red Knot	CA
____	Sanderling	CA
____	Semipalmated Sandpiper	CA
____	Western Sandpiper	R-m
____	Rufous-necked Stint	R-m
____	Little Stint	CA
____	Temminck's Stint	CA
____	Long-toed Stint	CA
____	Least Sandpiper	R-b
____	Baird's Sandpiper	R-m
____	Pectoral Sandpiper	U-m
____	Sharp-tailed Sandpiper	U-m
____	Rock Sandpiper	C-b
____	Ruff	R-m
____	Dunlin	R-m
____	Curlew Sandpiper	CA
____	Stilt Sandpiper	CA
____	Buff-breasted Sandpiper	CA
____	Short-billed Dowitcher	CA
____	Long-billed Dowitcher	R-m
____	Jack Snipe	AC
____	Common Snipe	R-m
____	Red-necked Phalarope	R-b, U-m
____	Red Phalarope	R-m
____	Pomarine Jaeger	U-m
____	Parasitic Jaeger	U-m
____	Long-tailed Jaeger	U-m
____	Franklin's Gull	AC
____	Bonaparte's Gull	AC
____	Common Black-headed Gull	R-m
____	Herring Gull	R-m
____	Thayer's Gull	CA
____	Slaty-backed Gull	R-m
____	Glaucous-winged Gull	U-b
____	Glaucous Gull	R-sr
____	Black-legged Kittiwake	A-b
____	Red-legged Kittiwake	A-b
____	Ross' Gull	CA
____	Sabine's Gull	CA
____	Ivory Gull	CA
____	Common Tern	CA
____	Arctic Tern	R-m
____	Aleutian Tern	CA
____	Dovekie	CA
____	Common Murre	A-b
____	Thick-billed Murre	A-b
____	Pigeon Guillemot	C-w, R-sr
____	Marbled Murrelet	CA
____	Kittlitz's Murrelet	CA
____	Ancient Murrelet	R-sr
____	Parakeet Auklet	A-b
____	Least Auklet	A-b
____	Crested Auklet	C-b
____	Tufted Puffin	C-b
____	Horned Puffin	C-b
____	Common Cuckoo	AC
____	Oriental Cuckoo	AC