

ALASKA MARITIME NATIONAL WILDLIFE REFUGE
Homer, Alaska

ANNUAL NARRATIVE REPORT
Calendar Year 1992

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US FISH & WILDLIFE SERVICE--ALASKA



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

ALASKA MARITIME NATIONAL WILDLIFE REFUGE

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REVIEW AND APPROVALS

ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Homer, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1992

John L. Matk
Refuge Manager Date

Greg M. Co 10/14/92
Associate Manager Date
Refuges and Wildlife

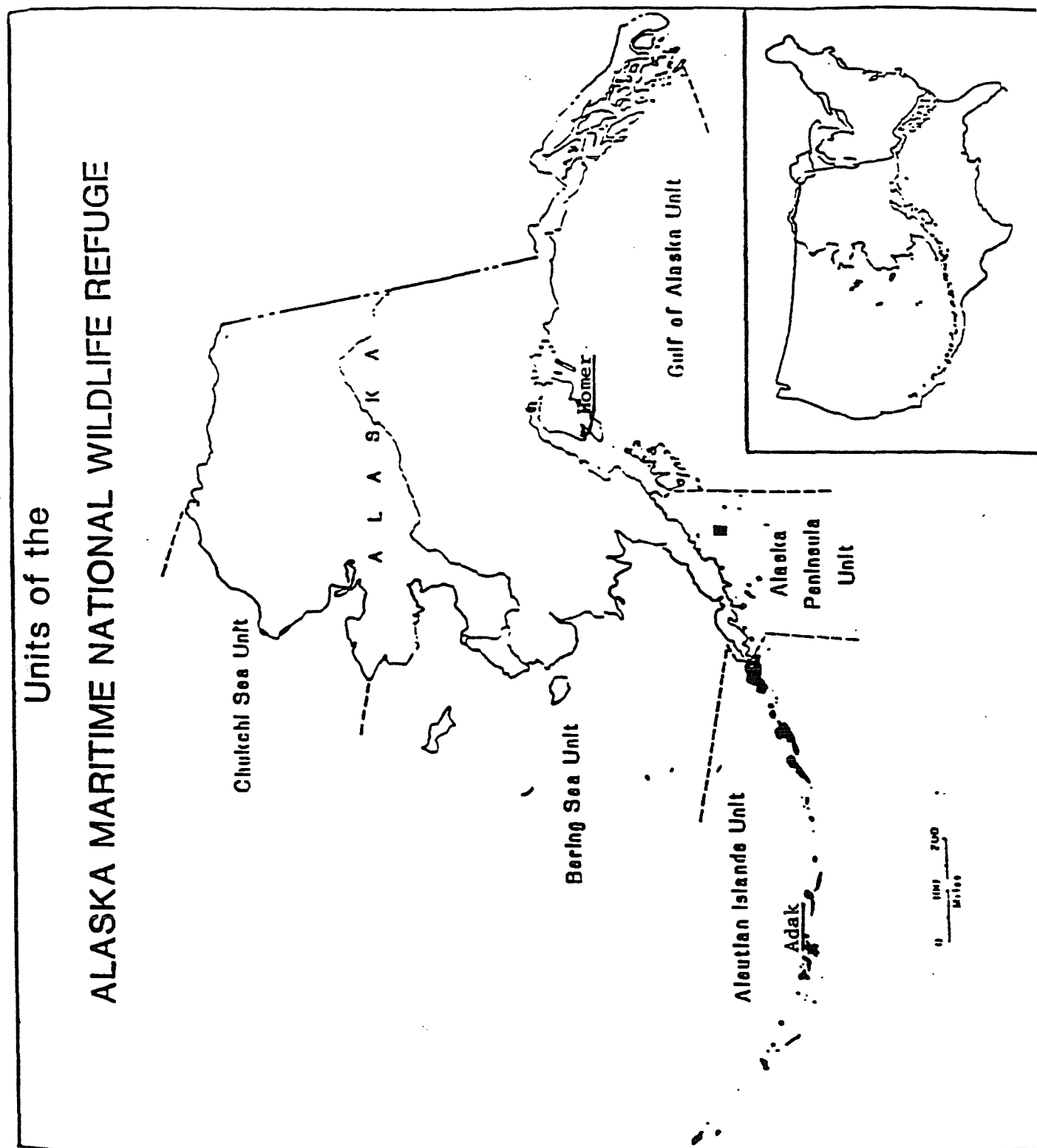
Shawn E. Hann 7/1/96
Regional Office Approval Date

US FISH & WILDLIFE SERVICE--ALASKA



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



INTRODUCTION

Alaska Maritime National Wildlife Refuge

The Alaska Maritime National Wildlife Refuge was created by the Alaska National Interest Lands Conservation Act (ANILCA) in 1980. The purposes for which it was established were: 1) to conserve fish and wildlife populations and habitats in their natural diversity; 2) fulfill international fish and wildlife treaty obligations; 3) provide opportunities for continued subsistence uses by local residents; 4) provide a program of national and international scientific research on marine resources; and 5) 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 along most of the coast of Alaska and extends from Forrester Island in Southeast Alaska along the Gulf of Alaska to the end of the Aleutian Islands and northward to the Icy Cape area southwest of 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 is divided into five units which includes all former refuges and some other federal lands/waters within those designated units.

The Gulf of Alaska Unit comprises about 800,000 acres and extends over 800 miles 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 is the only one which supports forest habitat on the Maritime Refuge. Spruce-hemlock forests are the dominant plant community on nearly all the islands east of 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. About 420,000 acres of submerged lands around Afognak Island and Kodiak Island are managed as part of the refuge.

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.

The Aleutian Islands Unit comprises about 3.9 million acres in southwestern Alaska and extends over 1,100 miles from Unimak Island to Attu Island. The chain of islands is 20-60 miles wide with a maximum elevation of 9,400 feet above sea level. The unit includes over 200 mostly treeless islands, islets, and rocks. Some islands are wave-cut platforms, less than 600 feet above sea level, while other islands are intensely glaciated mountainous islands as high as 3,000 feet above sea level. The islands are divided into seven island groups: Krenitzen Islands, Fox Islands, Islands of the Four Mountains, Andreanof Islands, Delarof Islands, Rat Islands, and the Near Islands.

The Bering Sea Unit extends over 600 miles and comprises about 1.4 million acres. It includes far-flung islands and headlands between the Aleutian Islands and the Bering Strait. The topography within this unit varies from small sandy islands to large volcanic islands. These areas provide habitat for nesting seabirds, as well as haul-out and rookery areas for marine mammals. This unit is divided into five different groups: 1) Hagemeister Island; 2) Pribilof Islands; 3) St. Matthew Island group; 4) Sand Islands; and 5) the Norton Sound islands and capes.

The Chukchi Sea Unit extends nearly 500 miles from west of Point Barrow to just north of the Bering Strait and comprises nearly 300,000 acres. Unlike other units in the

refuge, this one includes sizeable acreages of mainland areas. Topography varies from low, sandy barrier islands in the Arctic Ocean to high, rocky spires in the western Brooks Range. This unit includes the former Chamisso National Wildlife Refuge which was established in 1912.

Homer, Alaska is the refuge headquarters, as well as the home port for the motor vessel *Tiglax*. The vessel was commissioned in 1987 and services the needs of the Alaska Maritime National Wildlife Refuge biological program, 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 to accomplish work on Refuge lands. This arrangement resulted in too many compromises in safety, and efficient and effective accomplishment of our mission. At least three of the boats chartered in the past now lay in "Davey Jone's locker."

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A. HIGHLIGHTS

- Refuge Clerk Fellows selected for GS-5 Accounting Technician position. (Section E.1)
- Deputy Refuge Manager Blenden accepts project leader position at Des Lacs NWR, North Dakota. (Section E.1)
- New visitor center real estate deal closes in June. (Section C.1)
- Refuge Manager Martin attends symposium in China. (Section J.3)
- Radioactive contaminants discovered at Cape Thompson. (Section I.4)
- Outdoor Recreation Planner (ORP) Sue Matthews leaves for new job as Manager of Tetlin NWR in Tok. (Section E.1)
- Supv. Wildlife Biologist (SWB) Nysewander resigned to accept a position with the Washington Dept. of Wildlife. (Sec. E.1)
- SWB Byrd officially assumed his new duties. (Section E.1)
- Wildlife Biologist (WB) Nishimoto accepted a Refuge Manager position at Midway. (Sec. E.1)
- WB Slater entered on duty in November as Gulf of Alaska biologist. (Sec. E.1)
- Pribilof Islands brochure wins the Director's Award for Take Pride in America. (Section H.1)
- Development at St. George in the Pribilof Islands will challenge refuge monitoring and interpretive programs. (Section D.6)

- Refuge received four Challenge Grants. (Section H.1)
- 10% design phase of Visitor Center continues. (Section D.3)
- Togiak NWR assumed Hagemeister Island reindeer "controversy". (Section F.1)
- Fox eradication program requested use of M-44's. (Section G.15)
- New DRM arrived on December 28. (Section E.1)

B. CLIMATIC CONDITIONS

Month	Avg Temp (°F)	Min Temp (°F)	Max Temp (°F)	Precip. (inches)	Precip Dev. (inches)
JAN	28	11	45	4.33	+2.68
FEB	21	0	36	1.15	-0.78
MAR	28	-6	46	3.76	+2.48
APR	37	18	54	0.49	-0.82
MAY	43	26	63	0.33	-0.7
JUN	52	38	66	0.45	-0.6
JUL	55	44	70	1.36	-0.11
AUG	54	39	64	2.63	+0.27
SEP	43	23	58	1.06	-1.8
OCT	36	17	54	0.83	-2.45
NOV	32	12	49	4.50	+1.59
DEC	24	5	46	2.56	-0.02

January was significantly warmer than normal (+7° of the

average). September was cooler than normal and was the second driest September on record for Homer. November weather brought the first snow for the '92-'93 winter.

C. LAND ACQUISITION

3. Other

New Visitor Center - Homer

Acquisition of the new headquarters site began in February when Deputy Regional Director Allen signed all of the purchase agreements during the week of February 2-6. However, Bay Realty of Homer caused a stir when they published an ad in the Homer News announcing their successful completion of land acquisition for the visitor center. The Regional Office and the Refuge had already agreed to delay any announcement on the land acquisition, until closer to closing, which was two months away. As a result, Tom Kizzia of the Anchorage Daily News decided that his story couldn't wait. His article "New Attractions: Peeking at Puffins" was on the front page of the "Metro" section on Feb. 18. The article included praise from the Chamber of Commerce and criticism from the Audubon Society for funding of visitor services over fox eradication.

The new refuge headquarters and visitor center site, which included 60.5 acres, was purchased for a million dollars, after more than a year of effort by the Regional realty staff, in particular Bob Rice. The acquisition was an impressive accomplishment by realty, because 32 different owners or owner groups and 78 parcels of land wereinvolved. The land acquired for the new center fronts on the Sterling Highway, for easy visitor access and includes coastal forest, willow/grass lands, tidewater slough, barrier beach berm, and ocean frontage, which will be used for interpretive and environmental education trails and activities.



Aerial view of the planned new headquarters and visitor center site. (PB)

Bogoslof Island - Aleutian Islands

In July, commercial airline pilots had reported volcanic activity around Bogoslof Island, but clouds prevented anyone from seeing what had happened. When the *Tiglax* went by on August 23rd they found a new addition to Bogoslof Island sticking up out of the ocean. The dome was 600 feet high and spewing steam and sulphur. It will be interesting to see how soon seabirds colonize it.

D. PLANNING

2. Management Plan

Exxon Valdez Oil Spill Restoration

Refuge Manager (RM) Martin submitted oil restoration projects through the oil spill office in Anchorage and through the Kodiak Island Borough process. He also spoke with the Kenai Borough Assembly about the same.

Proposed Refuge Headquarters and Visitor Center

Planning for the new headquarters took up much of the year. The Service had received \$3.4 million to buy a site and design the facilities. As the year began, the Refuge was in the process of finalizing the site acquisition, writing a contract for design of the visitor center/office building and initiating the in-house design of the support buildings.

The Refuge hosted a contracting workshop on January 22-23 in Homer to gain insight on the statement of work for the visitor center/office contract. A National Park Service's (NPS) Harpers Ferry Design Center architect, a NPS Denver Service Center contracting officer, a U.S. Forest Service project manager, and an Army Corps of Engineers Outdoor Recreation Planner were on-hand for the meeting and readily shared their expertise. Regional Office personnel in attendance included: George Constantino (RW), Winston Jacobson (CGS), Dave Patterson (RW), Carolyn Shelton (EN), Bruce Sherwood (EN), Paul Schrooten (EN), and Art Wemmerus (RW). Refuge Manager (RM) Martin attended the meeting along with ORP Benson, as well as Bill Kent (ORP-Kenai NWR).

The meeting resulted in several changes to the contract format and changes in the core team staffing levels. John Harris (EN) replaced Bruce Sherwood (EN) as the project manager to allow for a full time project manager as suggested by the attendees.

Refuge staff completed their review of the draft contract by

February.

RM Martin, DRM Blenden, ORP Benson, WB Sowls, and RA Fellows met in April with Paul Schrooten, architect Harland Anderson, and Resource Program Specialist (ARW-AM) Art Wemmerus for two days to resolve the Refuge requirements for the support facilities, maintenance, warehouse, and bunkhouse, to be designed inhouse by engineering. Jim Frates (Kenai NWR) and Bob Schulmeister (Izembek NWR) also lent their assistance to a day of these meetings. Schrooten, Benson, and Martin visited the support facilities site which would be across the street from the office and visitor center. A questionnaire to further define needs was distributed to all Refuge staff.

The headquarters site acquisition of 60 acres for \$1 million dollars was completed in June. The site is located on the main road in the center of Homer and includes a saltwater slough, ocean beach berm, a willow wetland and a piece of coastal forest. Regional head cartographer Doug Vandegraft, Denver Service Center surveyor Pat Carol, and Washington, D.C. cartographer Warren Wilcox toured the property in July.

In July, ORP Benson, Chief of CGS Jacobson, PM Harris, RA Anderson and Regional Interpretive Specialist Shelton flew to Seattle for two successful days of negotiating the design contract. A contract was signed with the Portico Group of Seattle for \$330,000 for the first phase (10%) of design of the visitor center and offices. A sub-consultant to Portico, Aldrich/Pears of Vancouver, B.C. would do the exhibit design.

Design began in July with a week long series of activities in Homer. The project kick-off meeting was attended by 10 Portico people as well as Deputy Regional Director Dave Allen, Harris, Schrooten, Shelton, and refuge personnel. Additional meetings were held with the city manager, public works director, Chairman of the Planning Commission, the fire chief, and the Pratt Museum.

Five of the Portico team with RM Martin, ORP Benson, PM Harris, I&R Spec. Shelton and BT Don Dragoo did a two day field trip to refuge lands in the Barren Islands to expose the designers to the refuge and its "story". The group visited a seabird colony of 50,000 seabirds on Nord Island and went

ashore on East Amatuli Island to visit a storm-petrel research camp, a puffin rookery, and storm-petrel colony.

Lead designers for the new visitor center, Becca Hanson (Portico) and Phil Aldrich (Aldrich/Pears) presented their preliminary "10% conceptual design" in a Regional Office briefing in November. ORP Benson, RM Martin, Regional Director Stieglitz, Deputy Regional Director Allen, Assistant Regional Director Gould, and other Regional Office staff involved in the project, including Art Wemmerus, Rudy Berus, John Harris, Paul Schrooten, and Winston Jacobsen attended.

Hanson and Aldrich also met with FWS Research Division's John Piatt to "pick his brain" on ways to interpret pelagic seabird research. They also toured the *Tiġla* with First Mate Bell. A replica of the *Tiġla* bridge may be incorporated into one of the exhibits for the new center.

Hanson returned to Homer in December to present the preliminary 10% conceptual design to several key groups: the refuge staff, the project's citizens' advisory committee and the Veteran's Memorial Committee. John Harris, Paul Schrooten, and Chief of Engineering Rudy Berus also came to Homer for the two day series of meetings. The staff had many concerns relating to space arrangements in the office and the visitor center. Most of the staff submitted written comments by the end of the review period.

3. Public Participation

Public involvement in planning for the new headquarters went on all year. Numerous small meetings, a public scoping meeting for the environmental assessment, and three meetings of the project's citizens' working group were held this year. The citizens' working group is made up of a cross section of the community including representatives of the city, the borough, local environmental education organizations, fishermen, the schools and business interests.

On April 8, RM Martin, ORP Benson, and Paul Schrooten (Regional Landscape Architect) held meetings with City of Homer Planning Department, the Veteran's Memorial Committee, and the Homer Parks Commission exploring possibilities for

mutual cooperation on development of the new visitor center site. The proposed Veteran's Memorial, a city park and proposed city trails are contiguous to the site.

In May, two Homer residents challenged the city's exchange of land to facilitate acquisition of the headquarters site. It was the first negative word heard on the project. The residents were negative on centers in general, but were particularly concerned that the environmental assessment, in order to be site specific, was planned for after the site was purchased.

The completion of the land purchase in June touched off a round of public participation activities. Press releases were carried in the Anchorage Daily News, The Homer News, The Homer Tribune, and on Channel 11 (Anchorage television station).

Project Manager John Harris, Harland Anderson, and Paul Schrooten came to Homer for a public meeting (attended by 25 people), a Citizen's Working Group meeting, and a meeting with Alaska Dept. Fish & Game. The purpose was to take comments prior to initiating design and to scope the issues for the project's environmental assessment. Although the refuge staff "trolled" for controversy with "bait" such as the live bird exhibit and closing an ORV play area on Beluga Slough, no negative comment surfaced at any of these meetings.

Other meetings held during this year included talks to the Homer Rotary Club and the Homer Chamber of Commerce, briefings for boards of the Kachemak Heritage Land Trust and the Center for Alaskan Coastal Studies, a talk to a Homer Junior High Class and additional meetings with the city planner, the fire chief and the director of public works.

4. Compliance with Environmental and Cultural Resource Mandates

a. *Amchitka Contaminants*

On May 27, RM Martin met with the Regional Director concerning the Navy's pull-out from Amchitka Island. The Navy plans to completely deactivate their new \$110 million dollar radar facility, but will leave the site in an easily reactivated state for 5 years and then decide whether to demobilize and cancel our Memorandum of Understanding. This meeting was followed on the 28th by his meeting with the Regional Director, the Navy, and Assistant Regional Director of Refuges and Wildlife on the Navy's plans for Amchitka. RM Martin sent letters in June to the Navy, EPA, ADEC and DOE to set a date for a mult-agency meeting on Amchitka contaminants.

b. *Cape Thompson*

On Labor Day the Anchorage Daily News had a headline concerning atomic waste left at Cape Thompson. After thinking that the buried waste was on a Navy withdrawal, it was later determined to be on Native selected refuge lands. RM Martin met with Associate Manager Constantino on September 21 to discuss the work contingency plan and public involvement plans that had been developed.

On September 22, RM Martin attended the Alaska Dept. of Environmental Conservation's (ADEC) "Hazardous Substance Spill Technology Review Council" meeting. During that meeting, he took part in a teleconference with Department of Energy (DOE) personnel. The DOE had the lead for the cleanup, since the Atomic Energy Commission (AEC) was responsible for the initial project. RM Martin and Everett Robinson-Wilson (Regional Chief of Environmental Contaminants) took part in another conference call on Friday, September 25. The following week was filled with individual calls to different people reiterating the Service's position. Several draft letters, inter-service agreements, and contingency plans were instituted. Warning signs were designed and shipped to Selawik Refuge, as was a post hole auger, since they were the closest to the area.

Weekly tele-conferences for planning of Cape Thompson clean-up efforts were covered by RM Martin and ADRM Nation. The Department of Energy (DOE), Alaska Department of Environmental Conservation, Alaska Department of Health and Human Services, held weekly discussions about public involvement and education, status of DOE's letter to the State and the Service representatives to describe what the project would entail and how they would fund activities. Project plans for operations, sampling, safety and health, communications, waste management, restoration, and impact assessment were being worked on by DOE. A series of public education meetings were planned to be held in the North Slope villages during early December.

Weekly tele-conferences continued about Project Chariot at Cape Thompson. An MOU was drafted between the Service and DOE for funding. The funding will go towards hiring a temporary biologist to do the Environmental Assessment (EA) for the Cape Thompson work.

E. ADMINISTRATION

1. Personnel

PERMANENT FULL-TIME:

Edgar Bailey	Wildlife Biologist	GS-11	10/01/81-pres
Alvin Bayer	Ship Operator	WG-12	06/06/86-pres
Kevin Bell	Ship Oper. 1st Mate	WG-11	07/08/87-pres
Laurie Benson	Outdoor Rec. Planner	GS-9	07/17/88-pres
Mike Blenden	Dep. Refuge Manager	GS-12	02/27/89- 8/28/92
G. Vernon Byrd	Superv. Wildl. Biol.	GS-12	09/23/92-pres
Crispin Dippel	Wildlife Biol. (Term)	GS-9	11/13/89- 4/04/92
Trina Fellows	Accounting Tech.	GS-4	11/28/83-pres
Carol Hagglund	Budget Assistant	GS-7	08/21/83-pres
Jean Kutty	Clerk-Typist	GS-3	09/09/91- 6/14/92
John Martin	Refuge Manager	GM-13	12/21/81-pres
Gary Montoya	Dep. Refuge Manager	GS-12	12/27/92-pres
Eric Nelson	Marine Machine Mech.	WG-10	02/21/89-pres
Michael Nishimoto	Wildlife Biologist	GS-11	03/15/84- 5/02/92

David Nysewander	Superv. Wildl. Biol.	GS-12	09/28/86- 5/15/92
B. Leslie Slater	Wildlife Biologist	GS-11	11/16/92-pres
Katherine Smith	Ofc-Auto Clerk	GS-4	06/01/92-pres
Arthur Sowls	Wildlife Biologist	GS-11	09/28/86-pres

PERMANENT INTERMITTENT:

Ira Bailey	Relief Ship Operator	WG-11	06/25/89-pres
Lisa Climo	Biol. (Science) Tech.	GS-6	02/09/92-pres
Ivan Davies	Marine Machin. Mech.	WG-10	03/25/90-pres
Don Dragoo	Biological Tech.	GS-7	05/27/87-pres
Marcia Macone	Cook/Deckhand	WG-8	08/08/88-pres
Gregory Snegden	Deckhand	WG-5	06/01/89-pres
Robert Ward	Cook (Deckhand)	WG-8	04/19/92-pres

TEMPORARY:

Joel Cooper	Biological Tech	GS-5	05/17/92-pres
Belinda Dragoo	Biological Tech	GS-5	04/29/89-pres
William Dunne	Park Ranger	GS-5	05/20/91-pres
Rebecca Howard	Biological Tech	GS-3	06/07/91- 9/22/92
John Jamieson	Deckhand	WG-5	05/04/91-pres
Susan Matthews	Outdoor Rec. Planner	GS-9	04/01/91- 9/09/92
Cynthia Newton	Biological Aide	GS-3	06/07/91- 4/04/92
William Noomah	Training Instructor	GS-7	06/08/92- 8/07/92
Jeffrey Wraley	Laborer	WG-2	05/19/91-pres

VOLUNTEERS AND STUDENT CONSERVATION ASSOCIATION (SCA):

Lucille Brown	Semidi Islands, SCA	06/08/92- 08/31/92
Tom Dempsey	Visitor Center, SCA	05/30/92- 09/30/92
Lynn Denlinger	Cape Thompson, Ref. Vol.	06/29/91- 07/20/91

Kent Gundseth	Pribilof Islands, SCA	05/15/92- 09/15/92
Beverly Hatfield	Visitor Center, SCA	06/01/92- 09/01/92
John Hatfield	Visitor Center, SCA	06/01/92- 09/01/92
Gisela Kalxydorff	Pribilof Islands, Ref. Vol.	07/04/92- 08/08/92
Jean Kutty	Pribilof Islands, SCA	06/10/92- 08/25/92
Brian Lance	Pribilof Islands, Ref. Vol.	07/10/92- 08/13/92
Gail Parsons	Visitor Center, Ref. Vol.	07/10/92- 09/30/92
Dave Roseneau	Cape Lisburne, Ref. Vol.	07/16/92- 08/12/92
Melissa Sanders	Pribilof Islands, SCA	05/15/92- 08/27/92
William Stahl	Semidi Islands, SCA	06/01/92- 08/24/92
Lee Wood	Homer Office, SCA	10/28/91- 03/16/92
Mike Zicus	Semidi Islands, Ref. Vol.	06/03/92- 06/20/92

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 the Aleutian Islands Unit section. The staffing pattern for the Homer office is presented in Table 1.

Lisa Climo started work as a permanent intermittent Biological Technician GS-5 in February. This position had been vacant since Sue Schulmeister resigned.

WB Dippel was selected in March as the Assistant Refuge Manager for Tern Island in the Hawaiian Islands Complex. He left on April 6.

WB Nishimoto was selected as the Refuge Manager for Midway Atoll NWR in March. He left in April.

SWB Nysewander accepted a seabird and waterfowl project leader position for the State of Washington in March. He left in April.

Deputy Refuge Manager (DRM) Blenden accepted the Project Leader position at Des Lacs National Wildlife Refuge in North Dakota in June. He reported for work there on September 6th.

WB Byrd was detailed to Homer in June from the Aleutian Islands Unit in Adak to write the final reports on the oil spill studies conducted in 1989-1991 by refuge personnel. He was eventually selected as the Supervisory Wildlife Biologist and officially moved to Homer as of September 1.

BT Don Dragoo was temporarily promoted to Wildlife Biologist GS-9 in June, to supervise the oil spill restoration crew in the Barren Islands until a term position could be filled for this function.

Office Automation Clerk, Jean Kutty, was converted to fill a vacant permanent-intermittent position. She then signed up as a volunteer with the Student Conservation Association and joined the St. Paul seabird monitoring crew this summer.

The OFC-AUTO position vacated by J. Kutty was filled by Kathy Smith, who reported to work on June 1st as a temporary hire. She was converted to permanent full-time on July 13.

Leslie Slater was selected as the Gulf of Alaska Unit Biologist in July. She reported to work on November 15.

Biological Technician (BT) Becky Howard and SCA Volunteers Lucy Brown and Bill Stahl completed their appointments in September after spending the summer working on the murre survey in the Barren Islands. They did a fine job.

Leslie Kerr, Chief of Planning for the Region, accepted a 30-day detail as the Deputy Refuge Manager. She arrived in Homer on September 28th. She completed her detail on October 23.

Mary Lynn Nation served in a 60-day detail as Acting Deputy Refuge Manager during November and December. Nation completed her 60-day detail as part of the Women's Executive Leadership

(WEL) program.

RM Martin announced selection of the new Deputy Refuge Manager in November. Gary Montoya, former Refuge Manager of the Ouray NWR, arrived from Vernal, Utah on December 30.

Table 1. Staffing Pattern, Fiscal Years 1988 to 1992

	<u>Full-Time</u>	<u>Permanent</u> <u>Part-Time/</u> <u>Intermittent</u>	<u>Temporary</u>	<u>Total</u> <u>FTE</u>
FY92	13	7	9	19.10
FY91	15	6	15	28.88
FY90	13	5	11	28.00
FY89	13	3	21	25.77
FY88	13	3	4	15.20

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.

Table 2. Alaska Maritime Refuge Funding, FY 1988 to FY 1992
(thousands).

	<u>FY92</u>	<u>FY91</u>	<u>FY90</u>	<u>FY89</u>	<u>FY88</u>
1260	2,087.0	1,715.7	1,392.3	1,544.0	1,395.6
1113*	206.0	206.0	206.0	330.0	340.0
8610	--	14.0	26.6	15.9	17.7
1971	14.7	181.0	121.7	60.0	--
5390	--	14.3	55.0	--	--
1975	--	--	--	11.4	69.5
6850	--	--	--	--	0.2
4650	206.0	--	--	--	--
6320	45.0	--	--	--	--
TOTAL	2,558.7	2,131.0	1,801.6	1,961.3	1,823.0

*Includes 1400 and 1480 funds.

The Alaska Maritime National Wildlife Refuge was moved to its new headquarters at 2355 Kachemak Bay Drive in Homer, near the airport. A total of \$51,000/year (which includes utilities, snow and refuse removal) was paid for approximately 4,850 square feet of office space. An additional 2,400 square feet of warehouse and shop, located beneath the visitor center, was leased at the rate of \$1,214/month. The bunkhouse, located at 509 Sterling Highway above the visitor center, consisted of 4-bedrooms and 3 bathrooms (2,400 sq. ft.). The Refuge paid \$7,000 for five months for the bunkhouse (that cost included all utilities).

The Refuge continued to wrestle with the loss of fox eradication project funds. This project was a top priority within the Refuge and the Region, but did not get any significant monetary support again. A limited program was conducted this year, including eradication on two islands and re-checks on nine other islands, at the expense of staff training, equipment maintenance, and printing of Refuge brochures.

6. Safety

A significant number of safety items were accomplished on the *Tiglax* including: replacing medical supplies, repairing and calibrating oxygen and toxic gas monitors, replacing of carbon monoxide sensor, sealing a leaky exhaust manifolds, replacement of batteries for Class B EPIRB's, replacing all batteries in the survival suit and life ring lights, replacement of three fire extinguishers, water tested all survival suits, installed an automatic temperature activated halon extinguisher system in paint/gasoline lockers, had all general and bilge alarms checked, checked all smoke detectors and fire alarms, checked all PFD's for serviceability, had life rafts checked and repaired, and had the U.S. Coast Guard conduct a safety inspection of the vessel.

Captain Bayer sprained his ankle in June while the *Tiglax* was in dry dock in Bellingham, Washington. However, he did not think it was that bad until they were out at sea. The boat had to stop in Ketchikan to have a refrigerator repaired, so he decided to have his ankle looked at by a doctor. No major problems were sustained.

In June, SCA volunteer Melissa Sanders broke a tooth when the bungee cord she was using to secure a load on the back of her 4-wheeler ATV on St. Paul Island (Pribilof Islands), slipped off the rack and hit her in the mouth. She was flown in to Anchorage to get a temporary cap for her tooth, until such time that it could be permanently capped. Office of Workman's Compensation Plan (OWCP) took care of the expenses in both of these accidents.

At the end of July, WB Sowls hurt his knee while landing a skiff at Cape Lisburne. In August he had to have surgery, which was covered by OWCP. After his injury while at Cape Lisburne, he had to hobble around on crutches for 10 days doing bird surveys, until his flight left. During that same time, his helper had broken her ankle, which was in a cast, a couple of days prior to her traveling to Cape Lisburne. The Refuge would like to say "Thanks" to Safety Manager Linda White for her help with the administrative aspect of this situation.

Safety meetings were conducted randomly. WB Nishimoto conducted a safety meeting on bears in February. As part of the meeting, he talked about electric fences and how they were used to deter bears at Cape Thompson. However, there were no direct observations of bears coming in contact with the fence. Although, after the fence was installed, the number of bear sightings decreased significantly.

All permanent and seasonal staff members needing updates received CPR training on May 26, and first aid training on May 27. Training was provided by Emergency Response Educators. They did an excellent job of providing high quality training.

Bio Tech Climo, Boating Safety Instructor, presented a class on boating safety in early May. First Mate Bell (*M/V Tiglax*) presented a boating safety class in June.

All permanent and seasonal staff members needing updates received CPR training and first aid training in May. This training was provided by a local vendor, Emergency Response Educators, who have provided extremely high quality training. Training was repeated as more seasonals came on- board.

SWB Byrd provided radio training in June to the Research field crews headed out to the field on the *Tiglax*.

7. Technical Assistance

The Refuge submitted comments to the Western Alaska Ecological Services (WAES) office in Anchorage and other agencies on a number and variety of activities occurring near Refuge lands. Some of these activities included: log transfer facilities around Afognak Island, the Lease Sale Proposal 149 for oil exploration in the Shelikof Strait and Lower Cook Inlet, and bison management on Popof Island. WB Slater photo-documented existing fill containment structures at the base of Homer Spit as requested by the Service's WAES office. Pictures will be used for responding to the Corps of Engineers for re-permitting the wall under Section 404 of the Clean Water Act.

SWB Nysewander revised a draft of the banding work on the Semidi Islands population of Aleutian Canada geese.

SWB Byrd participated in a biological evaluation at the Yukon Delta NWR, during a station review.

Biologist Slater reviewed project proposals for the National Park Service and for biological studies in Prince William Sound relating to the Exxon Valdez oil spill.

Laurie Daniels, a biologist from the National Park Service, came to Homer in early July and consulted with WB Byrd about methods for monitoring seabird populations and productivity. The Park Service was interested in having a methods coordination meeting this fall. The agency interaction should make data more comparable and move us closer to our goal of a consolidated effort to monitor seabirds in Alaska.

SWB Byrd and contractor Eric Knudtson completed the first draft of the report on the effects of the *Exxon Valdez* oil spill on murre.

Most of the staff met in Homer with personnel from Marine and Coastal Bird Management, Research, and Enhancement in the annual coordination meeting among regional seabird biologists.

F. HABITAT MANAGEMENT

6. Other Habitats

Oil Spill Monitoring

RM Martin and SWB Nysewander met with the Regional Director and staff in March in Anchorage concerning options for replacement of the principal investigator for the murre damage assessment and restoration projects. This became somewhat of an issue with the knowledge that both SWB Nysewander and WB Dippel were leaving the refuge this spring.

7. Grazing

Hagemeister Island

Jack Gusak, owner of the reindeer herd on the island, reported

that there were many dead animals and deep snow on the island in April. It was well known for years that the herd was too large, and attempts to get Mr. Gusak to remove more animals were unsuccessful. Arrangements were made by the Togiak NWR for an aerial survey to verify the severity of the situation. On April 29, Togiak NWR notified us of an apparent reindeer "die-off" after they were able to do an aerial survey.

In view of the working relationship Togiak NWR has with the village of Togiak and their proximity to Hagemeister Island, Associate Manager Constantino transferred management of the reindeer problem to the Togiak NWR staff in May. DRM Blenden assisted Refuge Manager Archibeque by providing background into the problem and a list of contacts of the agencies involved. We wished them luck and were hopeful that their contacts in the community of Togiak would pay off into an agreement which would finally result in the proper management of reindeer on the island. RM Martin prepared a response in December to a request from the Togiak Traditional Council for the Alaska Maritime NWR to take over the management of the Togiak reindeer. The Refuge's response was that the Togiak NWR had responsibility for the reindeer management. **Thanks Aaron and crew!!**

DRM Blenden was interviewed in May by a reporter from the Bristol Bay Times regarding the Hagemeister reindeer problem.

10. Pest Control

Sowls completed challenge grant proposals for a rat prevention program and reindeer management plans on the Pribilof Islands in December.

G. WILDLIFE

1. Wildlife Diversity

ORP Matthews had a significant role in the statewide Biodiversity Conference in Anchorage on March 24-26, including serving as a member of the planning committee, moderating a panel, facilitating two round-table discussions, and presenting a paper on biodiversity education. The conference

was well attended with over 200 participants.

Biological Technicians Becky Howard and Joel Cooper completed the bibliography of "gray literature" on neotropical birds.

5. Shorebirds, Gulls, Terns and Allied Species



Red-legged kittiwake with young. (AS)

The following manuscripts were completed by SWB Byrd while on leave: whiskered auklet for Birding Magazine's A Closer Look; red-legged kittiwake - a species account for The Birds of North America; and Response of Native Birds to Removal of Introduced Arctic Fox at Nizki/Alaid Island was submitted to the Wildlife Society Bulletin.

7. Other Migratory Birds

ORP Benson gained brief notoriety in the "serious" birding world, when a Cassin's finch appeared at her bird feeder in February. It was only the second recorded sighting of this species in Alaska, which brought down the president of the "Alaska 200 Club."

15. Animal Control

WB Bailey put the finishing touches on his manuscript reviewing the history of fox introductions on Alaskan islands in July.



Both the white and the blue color phases of the Arctic fox are present on the Pribilof Islands, but the white phase is uncommon. (AS)

SWB Byrd met with writer George Laycock in July to discuss the impacts of exotic animals introduced on refuge lands.

RM Martin attended a meeting on March 2 with the Region 7 ARW, AM, MBM Chief, and Paul O'Neil (ADC) concerning the use of M-44's and/or Compound 1080 for Arctic fox eradication on islands. The ARW said they would try to get someone to head up the process to learn how to move this paperwork through the Regional and Washington offices. On March 5, RM Martin was in Juneau to give a talk to the Audubon Society on fox eradication and the effect of budget cuts on the program. In November, RM Martin coordinated discussions of the M-44 approval process with Everett Robinson-Wilson (Chief of Contaminants) and wrote a memo to the Associate Manager outlining the process that was needed with Animal and Plant Health Inspection Service.

Alaska Peninsula Unit WB Ed Bailey updated and revised a manuscript on use of red foxes as biological control agents for alien Arctic foxes. The manuscript, previously accepted by Canadian Field Naturalist, now reflects latest visits to Adugak and Ulak islands.

WB Bailey reviewed papers from the Anchorage Library and edited a second proof of Resource Publication 191 and provided additional 1992 field data and new literature citations. This publication, entitled *Introduction of foxes to Alaskan Islands - History, Effects on Avifauna, and Eradication*, documents the introduction of red and Arctic foxes on over 450 islands, beginning with Attu in 1750. The devastating effects on nesting seabirds, waterfowl, and other island birds are discussed, along with efforts to remove alien predators.

H. PUBLIC USE



A large puffin greets the more than 13,000 people to the Homer visitor center. (PB)

1. General

This was a year of significant change in our public use program. A new interim visitor center was created and opened to the public in May, the Pribilof Nature Day Camp was begun for Aleut children of St. George and St. Paul Islands, and land acquisition was completed and design work begun on the new 15,000 square foot visitor center (see the discussion under the planning section). In September, Outdoor Recreation Planner Sue Matthews left to become the new refuge manager of the Tetlin Refuge leaving a big legacy and a big hole in the public use program.

WB Byrd was interviewed in July by Tom Melham, senior writer, National Geographic Society about the Aleutian Canada goose recovery program. Mr. Melham had just returned from the western Aleutians where he participated in the goose translocation.

Fourteen permits were issued for the following activities in the Gulf of Alaska Unit (number issued): oil spill related activities (2), commercial set net fishing (4), commercial guided hunts and hunter transport (1), cattle grazing (1), charter vessel operation in refuge waters (3), helicopter access (1), and northern sea lion study (2).

Two permits were issued for the following activities in the Alaska Peninsula Unit (number issued): cattle grazing (1) and operation and maintenance of seismic stations (1).

Two permits were issued for the following activities in the Chukchi Sea Unit (number issued): commercial guided hunts (1) and biological survey by Department of Energy (1).

2. Outdoor Classrooms - Students

The refuge's environmental education program more than doubled over 1991 to serve about 700 students. The growth can be attributed to more staff and a bigger visitor center that could finally handle at least a small class.

Much of the activity took place during various schools' "Seaweeks" in April and June. PR Dunne gave presentations to

approximately 500 students during this period including a three day series of presentations to every class at Paul Banks Elementary. Other presentations were to Anchorage schools, which continue to flock to Homer in the spring for marine education.

Nine students from the Alaska Correspondence School and parents and staff, came to Homer in July on a field trip. ORP Matthews provided an introduction to the visitor center, a slide show on seabirds, and an activity on bird adaptations. This is the second year we have had these students and it is a great mix of kids.

M/V *Tiglax*'s First Mate Kevin Bell gave his annual program on the Aleutians to all fourth grade classes at the intermediate school. This is the third year Bell has shared his enthusiasm for that part of the refuge with the fourth graders. After two days of classroom introduction to the Aleutians, the Service and the *Tiglax*, approximately 80 kids got to actually visit the *Tiglax*. Assisting Bell with the tour were Acting Deputy Refuge Manager Kerr, BT Climo, and AT Fellows.

The refuge participated in Seldovia's first Seaweeek at their K-12 school. Benson flew across the Bay in October to do programs with all grade levels on marine pollution and birds. The "Feeding Frenzy" game was a big hit.

PR Willy Dunne taught a course on "Wildlife at Risk in Cook Inlet" to the participants in the oil spill wildlife rescue course offered by the Cook Inlet REACT Committee. Interest in oil spill response remains high three years after the spill.

ORP Matthews presented programs on marine birds and marine mammals to three different Elderhostel groups. Senior citizens come from all over the nation for these week long programs sponsored by the Homer branch of the University.

A new program for the refuge was the Pribilof Nature Camp funded by a challenge cost share agreement between the Service, the Nature Conservancy and the cities, Native corporations and traditional governments on both islands. With so many cooperators, a great deal of coordination was necessary. The refuge supplied an experienced environmental

educator, school teacher Bill Noomah of Homer to instruct the camps. Wendy Noomah signed on as a volunteer. The local entities supplied transportation, housing, food, a local instructor, and materials and supplies.

Two weeks of day camps were held on St. Paul and two weeks on St. George for the Aleut children of those islands. About 40 children participated. The camps were a good start but not an unqualified success. It is difficult for an off-island person to be accepted and new programs are suspect. The refuge headquarters is located more than 1000 miles from the Pribilofs and refuge presence has been minimal. The intent of the camp was to help prepare Aleut children for the decisions they would need to make in the future concerning the welfare of the wildlife on their islands. Over three million birds nest on the two islands. Also, the refuge hoped to forge better working relationships with the adults. Progress was made on both of these goals and all entities agreed to work together for next year's camp.

6. Interpretive Exhibits/Demonstrations

Interim Visitor Center

In April, we moved from our old rented refuge headquarters to two different rented buildings, one to house the interim visitor center. Visitor center space more than doubled to 2400 square feet and with it the program. Visitation doubled over 1991 to 13,000 visitors, in spite of the late grand opening (July 15). This increase was due to the new, highly visible location on the Sterling Highway and the greatly expanded space that allowed us to offer more. Daily visitation peaked in late July at nearly 300 visitors. Fortunately our volunteer staff increased to three and PR Dunne started his summer season several months early.

Prior to the move-in date, ORP Matthews, ORP Benson, and PR Dunne, with advice from former Tetlin Refuge ORP Lee Westenburg planned where the new walls should go creating exhibit areas, a small AV room, a sales area and offices and work space. Contracts were let for reception desks, murals to be painted on the walls, cliff ledges to be built for our

seabird mounts, xerox machine, fax machine, signs and computer equipment. The eagle nest built by the 4-H kids last fall was mounted on a tree trunk in front of the coastal forest mural. Painting and exhibit construction was still going on long after the center opened the first of May. This was a low budget operation as the refuge anticipated that this center would be replaced by the new one within three or four years. All design was done inhouse and all exhibit construction except for the wall murals.

By July, the center was sufficiently completed to allow for an open house on July 16. About 150 people came through our doors between 4 and 8 P.M., including all the marine tour (boat) operators. Visitation soared to about 300 a day partially due to the 50th anniversary of the Alaska Highway which drew more travelers to Alaska. Visitor center hours were extended to 8 p.m., and a full daily schedule of activities were added including a bird walk, visit to an active bald eagle nest and evening programs of slide shows, movies or videos.

In contrast to increases in visitation, our twice weekly summer children's programs were not as well attended as last year. We also had less attendance at evening programs which may be because they were moved to the center from their 1991 location on the Homer Spit where most of the campers are. Daily bird walks on the spit were always attended, even in pouring rain, but the numbers were always relatively small (2-12 people). The daily bald eagle program was the most popular. Audubon's bald eagle movie was followed by a naturalist accompanied visit to an active nest one mile from the center. Our naturalist would set up a spotting scope and share information about the nest and eagles in general.

It was necessary to shut the visitor center down September 10 when all seasonals and ORP Matthews had left. However, at least 50 people a day pulled into the lot and gathered brochures from the entrance of the locked center in the first few weeks of closure. In addition, many locals called requesting film viewings for visiting relatives, home schoolers wanted help, and schools requested programs. The problem with success is the demand and expectations it creates.

7. Other Interpretive Programs

ORP Matthews played a significant role in the first statewide Biodiversity Conference held in Anchorage in March and attended by more than 200 participants. Matthews presented a paper on biodiversity in education, served on the planning committee, moderated a panel, and facilitated two round-table discussions.

The refuge's naturalist on the ferry program continued for it's third successful year. Park Ranger Willy Dunne provided refuge presentations, wildlife watching help, and a lending library of wildlife materials on trips to Kodiak and Dutch Harbor beginning on May 31. This ferry route passes by five refuges and stops at three ports where refuges are headquartered.

The first Dutch Harbor trip was a special commemorative of the 50th anniversary of the Japanese bombing of Dutch Harbor in World War II. Dunne was joined by National Park Service historians who taped interviews with the numerous Aleutian campaign veterans on-board the ferry. Dunne conducted a total of 21 programs on this trip, including slide shows, interpretive walks at village stops, tidepool explorations, and bird walks, with a cumulative attendance of 520 people. The ferry remained in Dutch Harbor for three days of remembrances.

Supervisory wildlife biologist Vern Byrd and ORP Benson gave the keynote address to the annual meeting of the Center for Alaskan Coastal Studies. Byrd talked about the refuge's work on the Barren Islands since the oil spill while Benson talked about the refuge as a whole.

9. Fishing

RM Martin spoke to a host of local fishing news radio show in May to get a "plug" in for National Fishing Week. He also contacted the Kenai Borough's director of National Fishing Week and made plans to provide State Parks with National Fishing Week information.

11. Wildlife Observation

ORP Matthews helped develop and participated in a one-day joint training session in May with the Kenai Fjords National Park for the marine tour boat operators in Seward. Guest speakers covered sessions on seabirds, the Refuge and Park, whales, invertebrates, salmon and sea lions.

Wildlife watching continued to increase at refuge units in both Homer and Seward as more boats and tour boat operators got into the business. Also, Alaska tourism continued to increase at about 7% per year. Approximately 50,000 people participated in marine wildlife viewing from boats on waters adjacent to refuge islands. Land tours on the Pribilof Islands remained stable at about 700 visitors.

Approximately 300 visitors took part in refuge led bird walks or eagle viewing.

18. Cooperating Associations

Alaska Natural History Association

The Alaska Natural History Association (ANHA) outlet activity increased dramatically with the move to the new visitor center. Sales space increased five fold and took on a more professional look with display cabinets, a sales counter and a cash register. Visitors were offered a much wider range of products. Sales doubled to \$12,500. Refuge volunteer Gail Parsons was hired by ANHA to close out the books for the year.

I. EQUIPMENT AND FACILITIES

4. Equipment Utilization and Replacement

Time was spent with the local National Marine Fisheries Service (NMFS) agent to familiarize him with the Munson work boat which Fish and Wildlife transferred to NMFS in April.

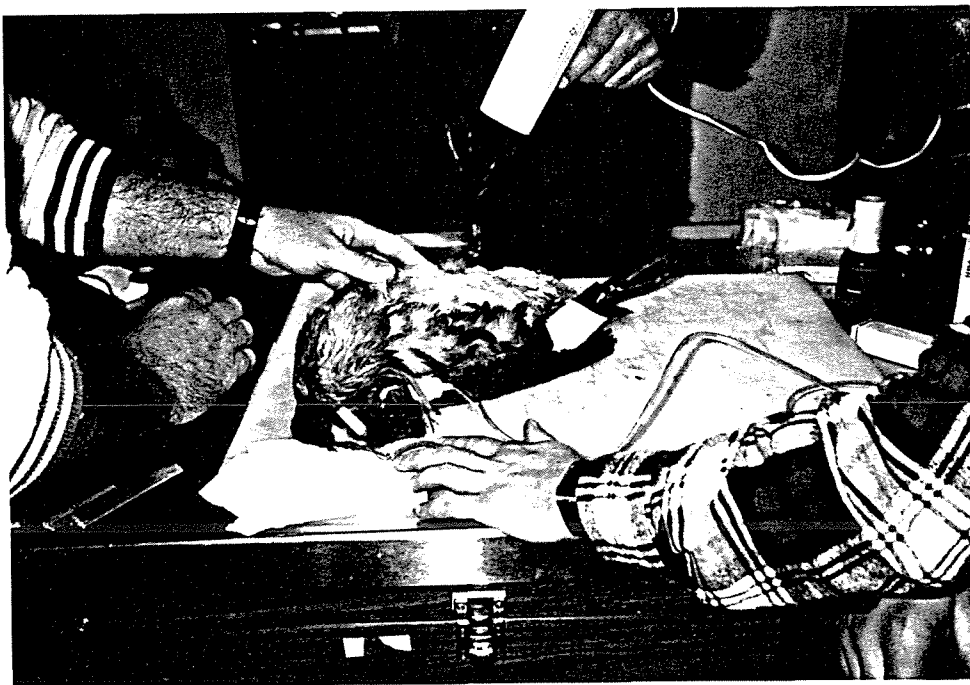
8. Other

a. *M/V Tiġlaġ* Operations

RM Martin and Capt. Bayer worked together in January preparing schedules for this field season. Capt. Bayer revised the vessel's schedule to reflect a \$67,000 cut in funding. This reduced the vessel's field season to 71 days.

The *M/V Tiġlaġ* left Bellingham, Washington on May 6th. Progress however was hindered by a series of small problems. Cook/Deckhand Macone had to be left off at Cambell River, British Columbia to travel to a family emergency back east. It made another unscheduled stop in Ketchikan so Captain Bayer could have an ankle problem looked at and repairs made to a leaky refrigerator. It finally arrived in Homer on May 13th. On May 22nd the boat was loaded with field gear and equipment and left on the morning of May 23rd for the western Aleutians.

The entire *Tiġlaġ* crew was given "On-the-Spot" awards by Associate Manager Constantino after he had been on the vessel during the Aleutian Canada goose transplant project.



You're in good hands--biologists tried to nurse this injured Aleutian Canada Goose back to health. (KB)

M/V *Tiġla* arrived in Homer (home port) on September 5 after completing the FY92 cruise, and took on fuel and secured the vessel. Deckhands Greg Snedgen and John Jamieson were laid off for the season on September 6 and 10, respectively. Marcia Macone was laid off for the season on September 24. Al Bayer, Eric Nelson and Kevin Bell all took annual leave during September. Snedgen traveled to Izembek NWR on September 20 to assist the maintenance man with numerous maintenance duties and stayed until late October. Vessel Captain Al Bayer wrote letters to Canadian Pilots Associates in reference to pilotage waiver and contacted numerous vendors in reference to electronic repairs, welding and plumbing. Bayer also contacted MCI shipyard in reference to blue line drawings and warranty work.

Captain Bayer wrote letters of sea time in October for numerous crew members and sent National Weather Service the last of the weather observations from aboard the *Tiġla*. The crew reported short-tailed albatross sightings to the Adak office.

The vessel crew assisted in Cape Thompson radioactive contamination warning, logistics and personnel preparedness in October.

Tiġla Captain Bayer met with the Homer Harbormaster to discuss an all-government dock in the small boat harbor. The City of Homer is promoting the idea of one float to be constructed and used only by the U.S. Fish and Wildlife Service (Service), the U.S. Coast Guard, and the Alaska Department of Fish and Game. They were working on a Memorandum of Understanding.

Tiġla Skipper Al Bayer attended Advanced Marine Fire training in North Bend, Washington.

First Mate Kevin Bell attended a Regional Small Boat Safety Policy meeting in Anchorage.

Eric Nelson, an Emergency Medical Technician with the Homer Volunteer Fire Department, coordinated the use of the *Tiġla* to conduct training exercises for Homer Fire Department. Eight new volunteer fire fighters were instructed in fire

fighting, using the *Tiġla* as a mock fire scene. The *Tiġla* was blacked out and trainees were required to search the vessel to find the fire, which was located in the engine room. To make the exercise more realistic, Nelson charged the fire hoses with air for realism, since water could not be used inside the *Tiġla*. The HVFD was pleased with the exercise and the obstacles the *Tiġla* presented to trainees.

Eric Nelson looked at all of the refuge's outboard motors. Repairs and maintenance were performed on the ship's hot water heating system boiler (the heating system boiler was dismantled and cleaned since it shut-down twice during high winds); a new microwave oven was rewired and installed; the ship's salt water pressure tank and new mounting system were installed. A heat supply radiator was replaced, requiring the removal and rebuilding of two wall lockers. Numerous hydraulic leaks on the forward crane and anchor windlass were repaired.

Interior painted areas were prepped and re-painted.

Inflatable boats (skiffs) were transported to Anchorage by truck for repair.

Capt. Bayer has been looking into the possibilities of cow ticks, from seabirds, spreading lyme disease.

Both 25-person inflatable life rafts were inspected per USCG requirements. An NTSB report on a ship reported a problem with C.J. Elliot life rafts. The rafts had an inherent defect in the construction of the outer hard shell. The shell pinched the painter and prevented the raft from inflating. Elliot has designed a new shell to prevent this from happening. The *Tiġla* had the new style shell installed.

A fire inspector was aboard the *Tiġla* and tested all portable, semi-portable, and fixed fire extinguishing systems. All high pressure vessels, scuba air tanks and SCBA tanks were visually inspected. The medical oxygen tanks were also inspected.

Captain Bayer submitted a report on the eruption of Bogoslof Island to the U.S. Geological Survey and the Region 7

Public relations.



Bogoslof Island and its new cinder dome created during July eruption. (KB)

Capt. Bayer submitted a repair contract to perform a major rebuild on both main and both auxiliary diesel engines.

Capt. Bayer began investigating the possibilities of installing a small trawl system aboard the *Tiġlaġ*, that would provide the capabilities of towing the Isaac Kidd and similar small trawl nets.

J. OTHER ITEMS

1. Cooperative Programs

A brochure on the Pribilof Islands that was a challenge grant project involving the Nature Conservancy, the Division of Tourism, the cities of St. Paul and St. George, and the Tanaq and Tanadgusix native corporations won the Director's Award for Take Pride in America.

ORP Benson learned that she would have three of her five challenge grant projects funded. Approved projects included: the Naturalist on the State Ferry; the Pribilof Nature Day Camp; and the Kachemak Bay Shorebird Festival in cooperation with WAES. Partners on these projects included the Homer Chamber of Commerce, Alaska Marine Highway Ferry System, Pribilof Islands school system, Tanadgusix (TDX) Native Corp., the Tanaq Native Corp, and the Traditional Council.

Pribilof Islands Nature Camp

In April, ORP Matthews initiated meetings about the nature day camp on the Pribilof Islands, which included meeting with representatives from the city governments (St. Paul and St. George), the Native tribal councils and corporations, The Nature Conservancy, and even the National Oceanic and Atmospheric Administration (NOAA)-National Marine Fisheries Service (NMFS). This project was a challenge grant project.

Matthews and Benson met with the Nature Conservancy's Steve Planchon for debriefing on the Pribilof nature camp. The Nature Conservancy was one of the challenge grant partners on the project. Planchon pledged support for next year although the Conservancy's interest in the Pribilofs seems to be less intense than in previous years.

3. Items of Interest

Accounting Technician Fellows received her ten year certificate for working for the federal government.

On August 12, Martin presented Dave Nysewander, Supervisory Biologist, with a performance award for his work on the Exxon Oil Spill murre studies. Dave has since then left us and now works for the State of Washington wildlife department.

RM Martin attended a symposium on refuge management in Shixing, China. He presented talks on subsistence, tundra management, and special management areas. Presentations were given by 10 Americans and by 9 Chinese Refuge Managers. After hearing the Chinese talk about lack of funds, outside pressure on reserve resources, lack of manpower, etc., he decided he could have been listening to a project leader's meeting in the

U.S.!

On August 17, Mt. Spurr volcano erupted spewing ash and excitement on the visitors to the Kenai Peninsula. Within 16 hours from eruption start, examples of ash from Spurr and Redoubt were on the visitor center desk with explanations of the differences in the content and crystal formations in the ash. Visitation decreased slightly as travelers were impeded by the ash.

Laborer Wraley assisted Realty staff in placing the *M/V Prey* on the state ferry *Tustemena* on its way to Kodiak where it will work on assessment of Afognak Joint Ventures land for possible purchase.

On September 18, RM Martin met with Joel Kaplan and Eric Hammerling from the Fish and Wildlife Foundation. Martin discussed funding shortfalls in vessel operations, biological programs, and public information efforts.

On September 28, Martin met with Bob Putz of the Conservation Foundation. Putz was given a tour of the *Tiglax* by first mate Kevin Bell.

Budget Assistant (BA) Hagglund and Accounting Technician (AT) Fellows received On-the-Spot Awards for their great performance in the year-end closeout. Refuge funds were expended to within .04% (four hundredths of a percent!) of the fund target.

Benson attended the regional environmental education training session at Birch Wood Camp.

RM Martin made several trips to the Regional Office in conjunction with planning for the new visitor center and consultations with Associate Manager Constantino on budget matters for FY93 in November.

RM Martin met with Realty on the Land Protection Plan effort and 1410(12)(b) village under-selections in November.

Benson attended the National Interpreters Workshop put on by the National Association for Interpretation in San Francisco.

RM Martin provided information to the Inspector General in December concerning a VIP tour that occurred in 1990.

RM Martin continued working on the Exotic Species section of the Refuge Manual.

ORP Benson completed her annual narrative for ANHA in preparation for the statewide ANHA annual meeting on Dec. 7-9.

4. Credits

This report was written by Gary Montoya, Art Sowls, Leslie Slater, Poppy Benson, Ed Bailey, Vern Byrd, and Mike Blenden. It was edited by John Martin. It was finalized and bound by Suzy Alexander. Photographs were by Art Sowls (AS), Poppy Benson (PB), and Kevin Bell (KB).

K. FEEDBACK

One of the biggest disappointments is the lack of support for field personnel to attend professional meetings. The Service has continually said that they support employees attending and enhancing their knowledge by belonging to professional organizations that directly relate to their jobs. However, when it comes down to allowing these employees to attend these meetings, there is a different story. For instance, four days before the Pacific Seabird Group meeting on January 13-18, WB Sowls was told that his travel to the meeting would not be paid for by the Service, which up to that point he understood that it would be. He was told that he would only be granted administrative leave and that he had to provide his own transportation. If he had been told this in the beginning, he could have purchased a cheaper airlines ticket (Super Saver) earlier. Now he was "stuck" with having to purchase a much more expensive ticket. SWB Nyeswander had also been granted administrative leave to attend the meeting, but he had not been "lead on" that his travel would be paid for by the Service. Another employee, WB Ed Bailey, was not granted administrative leave, even though he was already down there on home leave and was passing through that very city where the PSG meeting was being held. There is only one meeting that is

of a real benefit to seabird biologists on the west coast and that is the Pacific Seabird Group meeting. Since the Alaska Maritime NWR is primarily seabirds and therefore, the refuge biologists' background is primarily seabirds, the PSG meeting is the only professional meeting that is of any benefit to them. Why can't we send more than 1 or 2 biologists, since this is **the** seabird meeting? This meeting is where they learn the new technologies, what is currently going on in seabird management, and make some contacts with individuals for employment for the coming field season. It's not like we (this refuge) sends these biologists to a large number of professional meetings. The refuge's policy is to try and get them to one professional meeting a year. If the Refuge Manager feels like he has enough money to send someone to a professional meeting, then that should be the determining factor.

ALASKA PENINSULA UNIT
ALASKA MARITIME NATIONAL WILDLIFE REFUGE
Homer, Alaska

ANNUAL NARRATIVE REPORT
Calendar Year 1992

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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K. FEEDBACK

A. HIGHLIGHTS

- FWS Division of Research conducted studies on Midun Island in Sandman Reefs and at Suklik Island in the Semidi Islands.

B. CLIMATIC CONDITIONS

Table 1. Weather data for Cold Bay, Alaska in 1992.

Month	Avg Temp (°F)	Min Temp (°F)	Max Temp (°F)	Precip. (inches)	Precip Dev. (inches)
JAN	29.1	24.6	33.6	1.57	-1.13
FEB	25.4	20.9	29.9	0.68	-1.59
MAR	29.9	24.7	35.0	1.22	-1.09
APR	33.1	28.2	38.0	0.26	-1.69
MAY	40.3	33.7	46.9	0.54	-1.93
JUN	48.0	42.8	53.2	3.27	+1.11
JUL	49.9	46.2	53.5	2.36	-0.14
AUG	50.6	46.6	54.6	2.86	-0.84
SEP	45.8	39.7	51.8	2.21	-1.56
OCT	38.9	34.8	43.0	2.59	-1.70
NOV	33.0	28.0	37.9	4.42	+0.38
DEC	32.4	28.0	36.7	6.20	+3.35

Cold Bay provided the only long-term weather records available for the south side of the Alaska Peninsula (indicated above). In 1992, the annual mean temperature at Cold Bay was 37.6°F, which was 0.9°F below average. Mean temperatures were above normal every month, except February when -5°F was recorded. The warmest reading was 60°F in August. Annual mean precipitation (28.75 inches) was 7.25 inches below average in

1992, ranging from only 0.26 inches in July to nearly 7 inches in December.

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.

D. PLANNING

5. Research and Investigations

74500 APU-9201 Using Puffins to Monitor Pollock and Marine Food Webs in the Gulf of Alaska

Eleven puffin colonies were visited for studies of chick diets in 1992 using the U.S. Fish and Wildlife Service research vessel M/V *Tiġlaġ* between 16 July and 5 September. Field camps with two persons per camp were established on Suklik (Semidi) Island and Midun Island in mid-July, and camps were picked up in late August to early September. Personnel in the camps collected puffin chick meals, and measured puffin feeding rates throughout the chick-rearing periods on those islands. Other colonies were visited in August for brief 1-2 day collections of chick meals, and shipboard surveys of seabird abundance and distribution at sea were conducted en route between islands. The field camp personnel consisted of four volunteers. John Piatt was assisted on the *Tiġlaġ* by seven people.

Colonies were sampled in the area between Umnak Island (Aleutians) in the west and the Semidi Islands in the east. Islands from which chick meal samples were obtained included

Anangula, Aiktak, Egg, Puffin, Midun, Brother, Ugaiushak, Hydra, and Suklik islands. A total of 2,107 chick meal "loads" were collected from burrow entrances, for a total of about 6,000-8,000 individual prey items. Meals were composed of about eight major prey types, although some 30-40 different prey species were collected and preserved (specimens are now being analyzed).



Horned puffin. (AS)

In contrast to last year, and more similar to previous years, pollock were again fairly abundant in the diets of puffins, especially in the eastern Aleutian Islands (60-90%). Other common prey included sandlance, capelin, euphausiids, prowfish, and cod. The number of burrows occupied by chicks varied considerably between sites, and was generally quite low compared to 1991. This suggests that breeding phenology was considerably earlier in 1992 than in 1991, and we had difficulty obtaining adequate chick meal samples in many colonies -- especially along the Alaska Peninsula. It appeared that breeding may have been completed or birds abandoned early at Hall Island (Shumagins), and the Olga Islands in Dolgoi Harbor appeared to be abandoned.

E. ADMINISTRATION1. Personnel

{See Homer Office section}

4. Volunteer Program

{See Homer Office section}

5. Funding

{See Homer Office section}

F. HABITAT MANAGEMENT7. Grazing

Cattle remain on two islands with refuge lands, but no inspection was made on either island in 1992. Still no vegetative surveys have occurred to denote change after the removal of cattle on Caton, Simeonof, and Chernabura six years ago.

G. WILDLIFE2. Endangered and/or Threatened Species*Aleutian Canada Goose Pair Surveys in the Semidi Islands*

During the period June 7-19, a seven-person field crew including Roy Lowe (Oregon Coastal Refuges) and Michael Zicus (Minnesota Dept. of Wildlife) as well as other Service personnel, travelled aboard the chartered M/V *Kittiwake II* and surveyed the Semidi Islands for Aleutian goose nests. The survey resulted in 28 nests found, including 22 nests on Kiliktagik Island and 6 nests on Anowik Island. The Anowik nests are the first recorded for that location, indicating strong natural pioneering from Kiliktagik. Goose nesting

habitat on Kiliktagik is densely occupied and in one instance, two active nests were separated by only 36 meters.

Kateekuk Island appears to have the best potential for additional expansion, but searching the island by foot revealed no evidence of goose nesting. We also surveyed parts of Chowiet Island by foot, as well as Suklik and Aghiyuk Islands from the boat, all with negative results.

The major vegetation types were mapped for Kiliktagik and Anowik Islands.

H. PUBLIC USE

1. General

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.

J. OTHER ITEMS

4. Credits

This report was compiled by Edgar Bailey. John Piatt, Division of Research in Anchorage, provided the information on puffin diet studies. Report was edited by Gary Montoya and Vernon Byrd.

ALEUTIAN ISLANDS UNIT
ALASKA MARITIME NATIONAL WILDLIFE REFUGE

Adak, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1992

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

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 marine 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 Krenitzén 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° F. Strong winds, sometimes approaching 100 m.p.h., can induce very cold wind chill factors.

The AIU provides unique nesting habitat for several million seabirds, the threatened 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' seabird population 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, prompting National Marine Fisheries Service to classify them in April 1990 as "threatened". 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, Steller sea lion, and Aleutian shield fern are the five endangered/threatened 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. Reintroduced goose populations are developing on Agattu, Nizki-Alaid, and Little Kiska 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 over 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 1750s 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 American 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 eighth 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 entrepreneurs 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...

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K. FEEDBACKL. APPENDICESM. INFORMATION PACKET

A. HIGHLIGHTS

Snowfall totaled 122 inches, 18% above normal.

Twenty-nine earthquakes in an eleven day period kept the Adak population jumpy.

Personnel changes included the transfer of our reknowned Aleutian biologist G. Vernon Byrd to the Alaska Maritime Refuge Headquarters in Homer, AK to assume the duties of Supervisory Biologist of all Refuge units. Other people departing included, Maintenance Worker Tom Morey and Administrative Technician Dorothy Wheeler and one new hire, Administrative Technician Debbie Jones.

Norway rats were found caching least auklets at Sirius Point, Kiska Island.

Several interesting research projects were initiated or are ongoing throughout the AIU.

Successful Aleutian Canada goose translocation of 132 birds to Alaid-Nizki and Little Kiska islands.

Extended winter Emperor goose surveys initiated on Amchitka and Shemya islands along with oiled-beach surveys.

A female elephant seal was observed on Buldir Island. This is a record extension for the AIU.

Caribou harvest still high (198); however, the proposed "scale-down" of the Naval Air Station causes concern of over-population by the herd.

Having a new Outdoor Recreation Planner on board along with excellent Student Conservation Association Resource Assistants and local volunteers created a demand for visitation and information.

Information outreach program is expanded with special programs initiated on Adak and Shemya.

Adak branch of Alaska Natural History Association gross sales for FY92 totaled \$39,100.

New boat transferred to AIU from Alaska Maritime Headquarters.

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 1992 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 1992, they received 28.7 inches of rain compared to 45.3 inches at Adak. Rainfall and the number of days of measurable precipitation were about the same each year. Snowfall totaled 17 inches more than in 1991 (Table 1). Overall, all months were cooler in 1992 than in 1991.

Total precipitation for 1992 on Adak was about 5.3 inches below 1991's; however, both years averaged 22% below normal (Table 2). Snowfall in 1992 was 122.3 inches, 18% above normal. Above average amounts of snow occurred in January, March, November, and December, with all other months being below average. Maximum and minimum temperatures were similar between years.

Near blizzard conditions occurred several times during the year but never caused an "Alpha" condition - complete close-down of majority of NAS activities. Storm winds in November and December forced the cancellation of the daily Reeve Aleutian Airline flights on several occasions.

Earthquakes are a monthly occurrence and residents soon learn to "roll with the punch" and go on about their business. Major rockers measured 5.8, 6.6, and 5.4 (January), 5.9 (August), and 5.6 (November). The period from September 29 to October 9 won the Grand Prize, producing 35 rockers measuring from 4.0 to 6.6 (Table 3). We would not be surprised to find a new island approximately 80 miles SW of Adak.

Several reports of volcanic activity were received throughout the year. Activity at Bogoslof Island occurred most of July, producing extensive plumes of steam and ash and may have added a couple of acres to the island.

An unusual thunder and lightning storm took place on March 26. The Naval Weather Service stated that such storms are not uncommon; however, they normally happen at very high altitudes and we just don't hear or see them.

Table 1. 1992 Shemya, Alaska, weather summary with comparisons to 1991.

	<u>Inches of precipitation</u>		<u>Inches of snow</u>		<u>Days of measurable precipitation</u>		<u>Maximum</u>		<u>Minimum</u>		<u>Average</u>
	<u>1991</u>	<u>1992</u>	<u>1991</u>	<u>1992</u>	<u>1991</u>	<u>1992</u>	<u>1991</u>	<u>1992</u>	<u>1991</u>	<u>1992</u>	<u>1992</u>
JAN	2.91	2.35	8.7	22.5	25	20	42	36	22	18	31
FEB	2.26	2.07	10.7	17.3	19	19	41	39	23	24	30
MAR	2.50	1.98	16.9	16.1	25	22	42	37	27	24	34
APR	1.23	1.08	7.6	0.8	22	17	44	43	28	23	38
MAY	2.06	0.68	1.2*	1.1	20	17	46	45	35	31	40
JUN	2.27	1.05	0.0	0.0	13	16	54	50	36	38	44
JUL	4.89	2.41	0.0	0.0	23	16	54	53	42	42	51
AUG	2.60	3.51	0.0	0.0	19	19	55	54	40	42	51
SEP	3.34	4.52	0.0	0.0	19	21	55	54	41	38	48
OCT	2.42	2.77	0.0	T	23	23	50	50	37	34	44
NOV	3.24	2.92	2.9	14.7	26	24	45	44	28	19	40
DEC	2.64	2.92	23.2	15.5	28	25	40	42	24	21	37

Total: 32.36 28.69 71.2* 88.0 262 239

Extremes:

Dates:

55 54 22 18
8/28 8/22 1/16 1/9

* Incomplete data

Table 2. 1992 Adak, Alaska, weather summary with comparisons to 1991.

	Inches of precipitation			Inches of snow			Days of measurable precipitation		Degrees Fahrenheit					NORM
	1991	1992	NORM	1991	1992	NORM	1991	1992	Maximum		Minimum			
									1991	1992	1991	1992		
JAN	10.87	2.23	6.11	5.2	19.5	17.5	31	24	47	41	13	15	32	
FEB	0.66	4.58	4.75	10.8	5.1	19.2	17	20	45	44	9	21	31	
MAR	4.71	1.85	5.85	22.3	39.4	20.1	27	28	50	42	24	19	35	
APR	2.69	1.34	4.50	12.8	3.1	9.9	22	20	47	48	23	23	37	
MAY	3.51	1.51	4.10	0.4	0.5	2.1	26	13	50	53	27	30	41	
JUN	3.48	5.40	3.17	T	0.0	T	16	23	58	54	32	37	46	
JUL	2.76	3.21	2.98	0.0	0.0	0.0	18	16	60	59	42	36	51	
AUG	2.93	3.42	4.15	0.0	0.0	T	19	21	69	61	44	34	52	
SEP	7.25	6.30	5.36	0.0	0.0	0.1	24	26	59	61	30	30	45	
OCT	4.64	6.80	6.61	T	1.2	1.9	22	28	52	58	28	30	42	
NOV	4.46	4.46	8.17	6.0	20.1	12.4	23	27	46	49	20	24	39	
DEC	2.69	4.24	7.33	30.5	33.4	20.1	31	29	45	48	18	16	37	
Totals:	50.65	45.34	63.08	88.0	122.3	103.3	276	275						
Extremes:									69	61	9	15		
Dates:									8/28	8/09	2/13	1/10		

Table 3. Adak earthquakes, September 29-October 7, 1992.*

<u>DATE</u>	<u>TIME</u>	<u>MAGNITUDE</u>	<u>LOCATION</u>
09/29/92	6:28 pm	6.0	90 miles WSW of Adak
	8:34 pm	6.6	75 miles SW of Adak
	8:49 pm	4.6	85 miles SW of Adak
	8:56 pm	4.8	90 miles WSW of Adak
	9:03 pm	4.9	85 miles WSW of Adak
	9:47 pm	5.1	80 miles WSW of Adak
	10:24 pm	5.0	80 miles SW of Adak
	10:31 pm	4.1	80 miles SW of Adak
	11:35 pm	4.7	80 miles WSW of Adak
09/30/92	12:43 am	5.9	85 miles SW of Adak
	12:59 am	5.3	90 miles SW of Adak
	1:05 am	4.9	80 miles WSW of Adak
	1:36 am	4.0	75 miles SW of Adak
	3:41 am	4.5	80 miles SW of Adak
	7:47 am	4.7	85 miles WSW of Adak
	2:28 pm	5.1	80 miles SW of Adak
	3:39 pm	4.7	90 miles SW of Adak
	8:03 pm	6.0	80 miles SW of Adak
	9:23 pm	4.0	85 miles SW of Adak
	9:39 pm	4.1	105 miles WSW of Adak
	11:26 pm	4.3	90 miles SW of Adak
10/01/92	7:37 am	4.7	80 miles SW of Adak
	4:24 pm	4.2	60 miles SW of Adak
	10:05 pm	4.7	75 miles SW of Adak
10/02/92	8:29 am	4.4	85 miles SW of Adak
10/03/92	12:59 pm	4.3	85 miles SW of Adak
10/06/92	6:15 am	5.1	70 miles SW of Adak
	8:19 am	5.1	70 miles SW of Adak
10/07/92	7:12 am	4.5	80 miles WSW of Adak
10/08/92	7:35 am	5.7	65 miles SW of Adak
	10:43 am	4.5	80 miles SW of Adak
	3:42 pm	4.6	80 miles SW of Adak
	4:11 pm	4.7	85 miles WSW of Adak
10/09/92	3:17 am	5.3	35 miles SSW of Adak
	5:42 am	4.5	95 miles WSW of Adak

* Source: National Earthquake Information Center, Denver, Colorado



A summer rain squall passes over Clam Lagoon. (LG)

D. PLANNING

2. Management Plans

Work on Clam Lagoon Auto Tour Route continues. Three platforms were constructed and binocular spotting scopes installed. Unfortunately, the eye pieces on the scope near Candlestick Bridge were sand blasted during a storm shortly after installation. This is an area where sand blows frequently so some means of protection must be devised or the scope will be relocated.

Members of the local Ducks Unlimited Chapter helped construct six new duck blinds at strategic locations around Clam Lagoon just prior to the duck season. Some minor changes may be required to make hunters in the blinds less visible, but all in all the new blinds were a tremendous improvement.

Funding for both the Clam Lagoon Auto Tour and the new blinds is a combination of Department of Defense Legacy Resource Management Program funds, USFWS Challenge Grant, and matching funds from Alaska Department of Fish and Game and Ducks Unlimited.

5. Research and Investigations

Behavioral Ecology of Sea Otters at Amchitka I., Alaska.

University of Minnesota and U.C. Santa Cruz

The research program is designed to test a number of hypotheses concerning how the status of sea otter populations influences a broad range of ecological parameters. The diet, activity patterns, movements, agonistic interactions, survival and reproduction of otters on Amchitka Island are being documented, including how these parameters vary between age and sex classes. Amchitka Island is probably unique in having an otter population which has been stable, apparently at equilibrium with the island's food resources, for several decades. Radio telemetry is being used to compare the above mentioned parameters between the high density, equilibrium otter population at Amchitka and the expanding populations found elsewhere. Data on expanding populations already exist for Attu Island, Kodiak Island, Prince William Sound, and the California otter populations, all of which are expanding at different rates. Such individual-level comparisons between populations of differing status have not been made for any carnivore species and will be of broad interest to ecologists. Furthermore, the work will provide an empirical basis for assessing the status of otter populations, which will be valuable in developing conservation and management plans for otters throughout their range. Researchers arrived at Amchitka aboard the Alpha Helix in July 1992, and will be on



A new scope equipped viewing platform at Clam Lagoon. (LG)



Prior to implanting the radio transmitter, the sea otter provides its life history for the biologists: age, sex, weight, etc. (DB)



After surgically implanting the radio transmitter, the otter provides the biologist with a blood sample, a tooth and flippers for the attachment of identification tags. (DB

Amchitka until spring 1994. The project is being conducted jointly by University of Minnesota and U.C. Santa Cruz. It is supported by the National Science Foundation and U.S. Fish and Wildlife Service.

Phenology of Relationships Between Herring Gull and Lesser Black-Backed Gull Complex.

Richard Bradbury, Dept. of Zoology, Edward Gray Institute of Field Ornithology, England

WB Williams collected blood samples from red-legged kittiwakes for analysis by Dr. Bradbury. Samples will be used as outgroups to the Herring Gull/Lesser Black-backed Gull Complex and also to investigate genetic phylogeny of Larus spp.

Taxonomy of the Blue Mussel (*Mytilus edulis*) Using DNA Techniques.

Dr. Thomas Suchanek, U of C, Davis, California

WB Williams and WB Byrd collected mussels for Dr. Suchanek along Adak's northern coast. Samples were collected in protected and exposed wave action. The Adak samples will be used in conjunction with samples along the entire western coast to investigate the taxonomic status of blue mussels.

Sexual Selection Behavior in Least Auklets at Buldir Island.

Drs. Ian Jones and Fiona Hunter, University of Cambridge, England (extracted from a manuscript submitted to Nature)

The least auklet is a socially monogamous, sexually monomorphic seabird in which both sexes contribute to parental care. During the breeding season, least auklets of both sexes have red bills, white facial plumes, and a knob-like bill ornament. Two related species, the whiskered auklet and the crested auklet, have conspicuous forehead-crests composed of black forward-curving feathers, an ornamental trait unlike any expressed in least auklets. Auklet ornaments are displayed during courtship encounters at breeding colonies and mate choice follows from the performance of stereotyped sexual displays by both members of courting pairs. Experiments have shown that the facial plumes and bill coloration of the least auklet, and the forehead-crest of the crested auklet, are favored by mating preferences.

We investigated whether a mating preference for crests preceded the evolution of this ornament in Aethia auklets, consistent with the sensory exploitation hypothesis. Elaborate epigamic traits are supposed to evolve by sensory exploitation through the following mechanism: 1) a mating

preference arises due to sensory biases outside the context of sexual selection, then later, 2) mutation results in a display trait that can "exploit" the pre-existing preference, and subsequently, 3) the trait is favored by sexual selection involving the preference. Lack of a crest is the primitive state among auklets, and crests apparently evolved after the least auklet branch of the tree. Thus a crest-preference by least auklets would indicate that the preference pre-dated the evolution of the ornament.

To test whether least auklets might possess such a preference, we performed a manipulative experiment using three realistic male models. By manipulating least auklet models rather than live birds, we controlled for two factors that could confound a mate choice experiment: 1) intra-sexual competition and 2) behavior changes in a manipulated live bird. We compared the attractiveness of models with a natural crest-less appearance to the same models presented with a 25 mm long artificial crest on the forehead (forehead-crests). To examine whether a preference acts specifically on Aethia forehead-crests, or alternatively on any similar novel ornament, we also measured the response to the same artificial crests attached to the center of the breast (breast-crests). The breast is a focus of attention because breast plumage color signals dominance status. Least auklets approached models as in natural courtship encounters, performing four types of courtship display. This species exhibits sexual indistinguishability; males and females perform courtship displays to individuals of unknown sex and to male models. Fifty-one (8%) of the auklets that responded were of known sex, either because they were color-marked individuals which had been sexed previously by behavior, or because they exhibited sex-specific behavior while under observation. To ensure that no individual's response was scored more than once, models were moved frequently among display rocks throughout the immense auklet colony at Buldir; at a study plot with more than 100 color-marked individuals, none responded more than once.

Least auklets were strongly attracted to models with forehead-crests, and showed less response to models without a crest. Overall, 18% of 632 approaching birds performed a sexual display. In our experiments, the sample of known-male responses showed a similar pattern to the overall sample: they were significantly more likely to perform one or more sexual displays to the forehead-crest models compared to the crest-less models, and they approached for a longer duration. Female responses were qualitatively similar, but the effect was not significant for the small sample of known-females. In experiments on crested auklets in which the sexes are easily distinguishable in the field, both sexes showed a preference for longer crests (based on similar sexual displays).

Our experiment showed that least auklets exhibit a mating

preference for a forehead-crest, as it appears in two other Aethia species, refuting an alternative role for this ornament--that it functions for species recognition. The available evidence fulfills the three criteria for this preference, pre-dating the evolution of the crest in Aethia because: 1) the phylogeny of Aethia indicates that lack of a crest is the primitive state, 2) mating preferences favor naturally occurring crests in the crested auklet, and 3) least auklets have a mating preference for crests, although they exhibit the ancestral state of lacking a crest. These results are not consistent with sexual selection models that involve a coevolution of preferences and ornamental traits because strictly interpreted, these models imply that preferences and ornaments evolve simultaneously. However, evolution of a display trait by sensory exploitation does not preclude that its expression is favored at the present time by other sources of selection, such as the ornament serving as a viability indicator. Our study provides the first evidence that an elaborate feather ornament in birds has evolved due to sexual selection for sensory exploitation.

Bill Shape as a Method of Sexing Crested Auklets

Dr. Ian Jones, Univ. of Cambridge, England (extracted from a manuscript submitted to Wilson's Bulletin)

Crested auklets are monomorphic and previously thought to be impossible to sex without observing mating rituals or internal investigation. Dr. Jones.

Dr. Jones evaluated a sexing technique for crested auklets (Aethia cristatella). Bedard and Sealy (1984) reported sexual differences in external measurements of this species, but a sexing technique based on external appearance has not been published for any member of the genus Aethia. Nevertheless, observation of color-banded crested auklets at nesting colonies has led several researchers to tentatively identify the sex of some individuals by behavior. For example, individuals exhibiting an advertising display in which all feathers on the nape and hindneck are erected and the head is brought into a vertical position during a trumpeting vocal display have been assumed to be males. These putative males are highly aggressive and attack other displaying individuals and other male-like birds that approach them. In contrast, female-like individuals do not exhibit the trumpeting display, are attracted to male-like individuals, are socially subordinate to these putative males, and rarely engage in aggressive behavior. Furthermore, courting pairs show stereotyped behavior in which the putative female adopts a crouched posture and nibbles at the bill of the putative male. These supposed males and females differ in bill shape, as do specimens of known sex that have been examined (R.H. Day, personal communication; N.B. Konyukhov, personal

communication; I.L. Jones, personal observations). Putative males tend to have a bill that appears deeper than its length, their culmen is strongly de-curved, and the tip of the upper mandible overlaps the lower mandible to form a distinct hook; putative females tend to have bills that appear longer than their maximum depth, have an almost straight culmen, and lack the hooked bill tip.

Methods: To obtain a sample of known-sex individuals for measurement, he collected 27 adult crested auklets and salvaged an additional 9 fresh carcasses that had been predated by glaucous-winged gulls at a large auklet colony at Buldir Island, Aleutian Islands, Alaska during May and June, 1992. Before measurement, each specimen was held in a natural posture and the sex inferred using the bill shape characteristics described above. Then he measured bill depth, culmen length, rictal plate height, tarsus length, crest length, and plume length to the nearest 0.1 mm using calipers, and flattened wing length to the nearest 1 mm using a wing rule.

Results and Discussion: Males and females differed significantly for four of the external measurements, bill depth, culmen length, mean plume length and wing length, with the bill depth and culmen length showing the greatest sexual dimorphism.

Among the 15 male and 21 female crested auklets collected at Buldir, he used observed bill shape characteristics to estimate the sex of 33 specimens; the remaining 3 specimens (8%) were judged to be unsexable because their bill shape was of intermediate appearance. Among the specimens sexed by bill shape, the correct sex was inferred in all except one individual. An additional ten museum specimens (6 males and 4 females) were sexed correctly, while one museum specimen was judged to be intermediate in bill shape. Thus bill shape differed sufficiently between the sexes to allow sex to be inferred for 91% of individuals, and the method proved correct for 98% of the individuals that were sexed using this method. The bill shape characteristics were readily apparent in birds observed with binoculars at a distance of 10-15 m at the colony. Of 47 color-marked individuals whose sex was estimated more than once during observations at the study plot at Buldir, sex determinations based on bill shape were consistent for all but one individual (98%), indicating that this technique is repeatable. All sub-adults (two-year-olds, identified by their extensively worn remiges) observed or captured at Buldir had female-like bills, indicating that bill shape is not useful for determining the sex of young birds. However, these results confirm that readily observable bill shape characteristics can be used to identify the sex of adult crested auklets with a high degree of reliability. The typical bill shapes of males and females can with practice be

used to identify about 90% of adults seen well in the field.

Crested auklets may thus be the only alcid species in which males and females can easily be distinguished in the field by observation of external morphology. This may prove valuable for understanding sexual differences in behavior of this unusual species. For example, 11 marked individuals that were seen performing the trumpeting display were independently judged to have a male bill shape, confirming earlier suggestions that this display is restricted to males. It is likely that the hooked bill shape of male crested auklets is favored by intra-sexual selection because of its use in fights between males for access to mates and nest sites.

Pelagic Distribution of Auklets in the Aleutian Islands

Dr. George Hunt, Univ. of Calif., Davis

Dr. Hunt is conducting a multi-year study to relate seabird distribution to physiographic features and prey-base distribution in the Bering Sea around auklet colonies. Data from seabird transects is combined with physiographic features and environmental variables (e.g., water temperature, salinity, shelves, and barriers), along with measures of prey resources from biosonic work to create a picture which explains why auklets are distributed in certain locations during the breeding season.

Avifaunal Remains in an Aleut Midden Site

Dr. Doug Siegel-Causey, Univ. of Kansas, Lawrence

Dr. Siegel-Causey is an expert in identification of bird bones and is investigating the historic relative abundance of some seabirds from remains in ambient Aleut midden (garbage dump) sites. Dr. Siegel-Causey has determined that some species such as red-legged kittiwake, Aleutian Canada goose, and short-tailed albatross were once more widespread than their current limited distribution. Dr. Siegel-Causey's work will help researchers better understand factors which could be influencing distribution of past and present migratory birds.

Measurements of Aleutian Avifauna

Dr. Jay Pittocelli, Am. Museum of Nat. History, New York

Dr. Pittocelli is involved with making collections of Aleutian avifauna for museum specimens and providing data on morphometrics of little studied species.

Summer Distribution of Avifauna on Attu Island

Attours tour group



Many hours were spent washing debris from the Little Kiska midden site to collect bird and fish bones for species identification. The resulting excavation produced numerous ivory/bone artifacts as well as a whale rib showing indications of work preparatory to obtaining bone slabs for other bone tools/projectile points. (EVK)



For many years now, expert birders have annually visited Attu to document all avifauna. Attu is renowned for its diversity of bird life from both the North American and especially the Asian continent. Through the years, birders have documented many species new to North America, in addition to collecting a useful data base on more common species against which changes can be evaluated.

Harlequin Duck in the Aleutian Is.

Doug Chadwick, freelance writer, National Geographic Magazine

Mr. Chadwick visited the Aleutians to investigate the winter biology for part of a book he is writing on harlequin ducks in North America.

E. ADMINISTRATION

1. Personnel

1. Daniel L. Boone, Refuge Manager, GS-12, PFT
2. Evan V. Klett, Refuge Operations Specialist, GS-11, PFT
3. G. Vernon Byrd, Wildlife Biologist, GS-11, PFT
(transferred 9/06/92)
4. Laura M. Greffenius, Outdoor Recreation Planner, GS-9, PFT
5. Dorothy G. Wheeler, Administrative Technician, GS-5, PFT
(LWOP 9/20/92)
6. Deborah C. Jones, Administrative Technician, GS-5, PFT
(EOD 9/06/92)
7. Melita K. Bradford, Clerk-typist, GS-3, PFT
8. Thomas R. Morey, Maintenance Worker, WG-8, PFT (retired
11/07/92)
9. Jeffrey W. Lewis, Maintenance Worker, WG-5, PI (converted
to WG-8, PFT, 11/15/92)
10. Jeffrey C. Williams, Biological Technician, GS-7, PI

Seasonals

1. Gregory L. Thomson, Biological Technician, GS-6, PI,
5/01/92- 10/31/92
2. Geoffrey S. Beyersdorf, Biological Technician, GS-6, PI,
5/14/92-8/21/92
3. Julian B. Fischer, Biological Technician, GS-5, PI,
6/11/92-10/18/92
4. Joseph Meehan, Biological Technician, GS-5, PI, EOD
10/22/92
5. Andrew Durand, Biological Technician, GS-5, PI, EOD
12/28/92

Volunteers

1. Andrew Durand, SCA Biological Aide, 1/06/92-8/02/92

2. Hugh Knechtel, SCA Biological Aide, 4/06/92-9/06/92
3. Thomas Staudt, SCA Biological Aide, 4/28/92-9/07/92
4. Angela Palmer, SCA Biological Aide, 5/13/92-9/05/92
5. Mariana Tamayo, SCA Resource Assistant, 2/18/92-5/15/92
6. Leah R. Gerber, SCA Resource Assistant, 5/28/92-9/05/92
7. Sigrid Schmalzer, SCA Resource Assistant, 9/03/92-12/15/92
8. Jason T. Eslick, Biological Aide, 7/21/92-8/19/92
9. James Schneeweis, Minnesota Department of Natural Resources, 6/29/92-7/26/92
10. Ian Jones, Biological Research, 5/07/92-8/08/92
11. Fiona Hunter, Biological Research, 5/01/92-8/08/92
12. Douglas Siegel-Causey, Archaeological Research, 7/28/92-8/16/92
13. Christine Lefevre, Archaeological Research, 7/28/92-8/16/92
14. Steven Loring, Smithsonian, 7/28/92-8/16/92
15. Joseph Meehan, Local Volunteer, 12/18/91-10/21/92
16. Lisa Scharf, Local Volunteer, 2/10/91-Present
17. Darin Bacon, Local Volunteer, 9/01/92-9/30/92
18. Colleen Burt, Local Volunteer, 2/29/92-9/19/92
19. Linda Haschart, Local Volunteer, 3/01/92-3/28/92
20. Cheri Hutchins, Local Volunteer, 3/19/92-Present
21. John Hutchins, Local Volunteer, 3/19/92-4/12/92
22. Michelle Lavoie, Local Volunteer, 9/10/92-11/04/92
23. Stephanie McNee, Local Volunteer, 8/01/92-8/31/92
24. Sean Sanderson, Local Volunteer, 5/31/92-8/9/92
25. Paula Shook, Local Volunteer, 1/21/92-2/03/92
26. Rob Spindle, Local Volunteer, 6/24/92-8/23/92
27. Marsha Tarwater, Local Volunteer, 1/25/92-Present
28. Linda Wilkinson, Local Volunteer, 7/25/92-8/30/92
29. Janice Smullen, Local Volunteer, 10/01/92-12/02/92
30. Timothy Fitzgerald, Local Volunteer, 9/30/92-12/02/92
31. Mary Jo Adams, Local Volunteer, 11/18/92-Present
32. Dan Smullen, Local Volunteer, 11/01/92-11/30/92
33. Bryan Jones, Local Volunteer, 10/03/92-11/21/92

Alaska Natural History Association

1. Lisa Scharf, Information Clerk, EOD 10/16/92
2. Daniel Smullen, Student Trainee, EOD 10/05/92

The number of volunteers, particularly local volunteers, increased dramatically from 1991. This is due in large part to the interesting, active public use and environmental education program being conducted by ORP Laura Greffenius.

Sad, but true! WB Vernon Byrd transferred to the Homer office in September as the Supervisory Biologist for AMNWR. Dave Nyeswander, the former Supervisory Biologist, resigned in the spring and Vern was detailed to Homer to finish the Exxon



Dan Boone, Mel Bradford (EVK)



Van Klett (LG)



Jeff Williams (AD)



Laura Greffenius (JM)



Debbie Jones (EVK)



Jeff Lewis (LG)



Rob Lewis and Peet (AP)



Lisa Scharf (LG)



(L-R/T-B) Jeff, Greg, Van, Hugh, Doug, Christine,
Marcia (cook) Geoff, Tom, Jim, Julian, Debbie, Angela (JW)



Tom and Donna Morey (LG)



Joe Meehan and Dan Smullen (LG)

Valdez Oil Spill Report over the summer. He was then selected to fill the position permanently. Vern is sorely missed in the Aleutians, but it was a good move for him and his family plus he is still involved in many of the same issues and is only a phone call away.

BT Jeff Williams has been temporarily promoted to Wildlife Biologist until a permanent biologist is selected. This provides Jeff with the experience as a Wildlife Biologist with no additional cost to the government.

MW Tom Morey retired November 7, 1992 after 20 years of government service. Tom and his wife, Donna, move to Ottawa, Kansas to be near family. We wish them well in retirement.

MW Jeff Lewis was selected to fill the WG-8 MW position. However, this left the WG-5 MW position vacant and with budgets as they are, it seems unlikely the position will be filled until FY-94.

Awards

WB Vern Byrd and BT Jeff Williams both received Level 5 Performance Ratings. RM Dan Boone, ORP Laura Greffenius, AT Dorothy Wheeler, and MW Jeff Lewis all received Level 4 Performance Ratings. All recipients of superior performance ratings were duly recognized, presented with certificates, and received cash awards. Obviously the Aleutians attract top notch people; the weather is sometimes less than ideal, but the work is always challenging and extremely interesting and nearly everyone contributes 110%.

In February, Dorothy Wheeler received a well deserved Special Service Award. The award was based on her exemplary performance during the extended vacancy of the Outdoor Recreation Planner position and the Clerk-Typist position.

Associate Manager, George Constantino was so impressed with the efficiency of the Aleutian Canada goose translocation that he provided the crew with an On-The-Spot-Award. Jeff Williams, Julian Fischer, and Geoff Beyersdorf received monetary awards; appropriate gifts were purchased for volunteers Jim Schneeweis and Hugh Knechtel.

5. Funding

AIU received \$235,000 at the end of FY-92 from the Department of Defense Legacy Resource Management Program. This program was established by Congress in 1990 in recognition of the role that DOD plays in natural and cultural resource management on the 25 million acres of land under its jurisdiction. Since nearly half of Adak Island is jointly managed by the USFWS and the Navy as a Naval Air Station, Adak was eligible for Legacy

funds.

The purpose of the Legacy Program is to promote, manage, research, conserve, and restore biological, geophysical and historical resources. This is accomplished through management, monitoring, recreation and public education programs. On Adak, several projects have been identified that will be undertaken over the next two years. These include waterfowl monitoring surveys, an Aleutian green-winged teal breeding study, seabird productivity and monitoring work, neotropical bird surveys, anadromous fish surveys and caribou collaring, productivity and population surveys. An inventory will also be conducted for the endangered Aleutian shield fern.

6. Safety

Refuge Operations Specialist Klett served as station safety officer during 1992. Eight structured safety meetings were held and eleven movies/videos were shown. Topics included winter driving tactics, drunk driving, use of seat belts, CPR and first aid, proper wearing of flotation and survival suits, defensive driving and highway safety, office safety, and fire safety in office and homes.

A variety of safety training was taken by refuge personnel during the year. Ten permanent, seasonal, and volunteer employees were certified for CPR and basic first aid. A week long spring training session for field personnel included viewing U.S. Coast Guard cold weather/cold water survival films, actual use of personal flotation and survival suits in the small boat harbor and the local swimming pool, use of compass and maps, the care and use of outboard motors and inflatable boats, radio operation and communication procedures.

MW Lewis completed a four day "Train the Trainer" workshop and received his boating safety instructor certificate. All personnel scheduled to use inflatable boats received 40 hours of instruction and certification as inflatable boat operators. We spent a lot of time with hands on boating practice with stress on safe operation, paying attention to weather reports and radio procedures.

All field personnel were given 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 and new EPIRB's. The old first aid kits were checked and old, outdated, contaminated medications/compresses replaced.



Jeff Lewis explains the finer points of donning a survival suit while in the water. (EVK)



Push! Push! Hop-in!! An easy departure from the beach -- no surf rolling in. (EVK)

Two radios were assigned to each AIU field camp in 1992. 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.

Due to the remote locations of our field camps, all field personnel received briefings 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 as with the M/V Tiglax. Weather conditions could isolate field camps for days; they are no place for an accident to occur.

7. Technical Assistance

In February, Officer Curt Bedingfield of the Alaska State Troopers, Wildlife Protection Division, was invited to Adak to speak with the local Conservation Team. Transportation from Kodiak to Adak and back was provided by the U.S. Coast Guard logistic flight. Officer Bedingfield discussed a variety of wildlife enforcement issues with the team. Unfortunately, the return flight was diverted to Anchorage because of Kodiak's weather, but the Service paid for the extra expense of Officer Bedingfield spending a night in Anchorage.

WB Byrd accompanied Doug Chadwick, a free-lance writer/photographer, to Shemya in February. Mr. Chadwick is on contract to the National Geographic Society and was gathering information for an article about harlequin ducks.

In February, RM Boone participated in "Operation Whiteout". This was a sting operation involving illegal take of walrus for ivory and exchange of the ivory for drugs, primarily marijuana.

RM Boone discussed the placement of a microwave repeater facility on Sedanka Island with Sue Schulmeister (Realty) on several occasions; the repeater was to improve communications for MARCO Fisheries, Inc.

WB Byrd consulted with Dick Merrick and Tom Loughlin, NMFS researchers, regarding access to Steller sea lion rookeries on Ugamak and Amchitka. Their research involves satellite tagging and monitoring of movements. In addition, NMFS provided AIU with \$5K to cover the cost of collection and shipment of sea lion scat. Refuge staff collected approximately 300 lbs. of sea lion scat from a number of islands in the Aleutians; NMFS was slightly overwhelmed with the quantity!

The refuge staff provided considerable assistance to Marine

Mammals Management personnel from Anchorage when they were in the Aleutians conducting a sea otter survey. Several staff members participated in ground counts in conjunction with simultaneous aerial counts in an effort validate and calibrate the aerial counts.

BT Williams provided Dr. George Hunt with maps and information regarding feeding and staging areas for seabirds near Buldir and Kiska.

WB Byrd and BT Williams collected approximately 30 purple mussels and shipped them frozen to Dr. Suchanek, University of California at Davis.

Several staff members talked with Attours representatives and met with them in Adak on their way to Attu. They had some difficulty getting to Attu because of weather, but following their arrival the trip went well. A total of 45 people, including Attour's staff, were birding on Attu from May 10-24 and 68 people from May 24 to June 7.

A SUP had been issued to Dr. Daniel Guthrie of Claremont Colleges in 1991 for the purpose of collecting algae on Attu, Shemya, and Adak. Dr. Guthrie was part of the 1992 Attours group; he did go to Attu and collected algae, but did not have the time to collect at Adak and Shemya - possibly 1993.

Dr. Bill Jacobs from EPA in Washington D.C. and Mark Collinge from ADC in Olympia, WA spent two weeks aboard the M/V Tiglax in June. The idea was to show them the Aleutians and the problems with removing introduced foxes; in return, it was hoped they could assist us with permits for M-44s and re-registration of Compound 1080. They both got a good look at our program in the western Aleutians and were enthusiastic about fox removal. We have been in contact with Dr. Jacobs several times and he has provided guidance and assistance on M-44s. Unfortunately, ADC, or more likely Department of Agriculture, has decided the reopening of the Compound 1080 case may not be in their best interest. They have essentially told Mark Collinge that Compound 1080 is "off limits".

Dr. Jacobs has also done extensive work in rat control, primarily in urban areas, and discussions with him were most enlightening. He thought eradication on islands like Shemya might be possible using several different poisons and techniques and a lot of diligence. He did not hold out much hope for an island the size of Kiska, although control might be a possibility.

John and Kiku Hanes spent about three weeks aboard the M/V Tiglax traveling from Shemya to Homer. The Hanes are influential fund raisers on the Washington, D.C. scene and

friends of former Regional Director Bob Putz. The idea was to show them some of the interesting programs on Alaska Maritime NWR, and particularly in the Aleutians, in an effort to gain more support and advocacy group. It was also hoped that a trust fund might be established from which operational funds for the new Homer visitors' center might be drawn. The Hanes appeared to have a wonderful time and were very gracious; they did have a meeting with Director Turner upon their return to the Washington, D.C. area.

Pat Holmes, a fisheries biologist for ADF&G in Kodiak, conducted a pink salmon survey on Atka. Although the quantity available and the demand for pink salmon probably make processing for human consumption cost prohibitive, there is a potential bait fish market. Apparently pot fishermen - cod and crab - are interested in a bait source closer to their fishing grounds, specifically pink salmon from Atka. However, this would require a change in the regulations, as it is currently illegal to use salmon for bait.

RM Boone accompanied Dr. James Estes, FWS Research University of California at Santa Cruz, and his crew on R/V Alpha Helix to Amchitka. Dr. Estes and his research associates were beginning a sea otter research project designed to test a number of hypotheses regarding how otter population influences ecological parameters such as diet, activity patterns, movements, agonistic interactions, survival, and reproduction. Amchitka is of particular interest because the sea otter population is stable and apparently at equilibrium with food resources. These data will be compared with similar data from expanding populations at Attu, Kodiak, Prince William Sound, and California.

On July 9, 1992, Dick Rugen, a Natural Resources Specialist with the Western Naval Facility Engineering Command, brought Kent Livezey by the office for an introduction. Kent will be in a similar position, but will be stationed in Silverdale, WA rather than San Bruno, CA. This proved to be a very fruitful meeting; when a considerable sum of Legacy Program money unexpectedly became available, Mr. Livezey remembered Adak. Natural resource projects on Adak were in the amount of \$235K through the Legacy Program (see Section E 5. Funding, also).

RM Boone met with Katherine Grimnes of the Ounalashka Corporation in Unalaska.

RM Boone and ORP Greffenius met with Marty Murray of the Ounalashka Corporation in Unalaska.

Tom Melham of the National Geographic Society spent two weeks aboard the M/V Tiglax in early August. He was on assignment in Alaska collecting information about wildlife refuges and

looking at projects funded by National Geographic - Ian Jones' project on Buldir. Mr. Melham also found the other seabird work being conducted at Buldir interesting and he was particularly interested in the Aleutian Canada goose program.

An archeological crew was transported aboard the M/V Tiglax from Adak to Little Kiska and back during August; the crew consisted of Dr. Doug Siegel-Causey, University of Kansas, Dr. Steve Loring, Smithsonian Institute, Christine Lefevre, Museum national d'Histoire naturelle and Debra Corbett, FWS Archaeologist R-7. While on Little Kiska, they excavated a midden site and as usual found lots of interesting artifacts. One in particular was a whale rib that had been scorched by fire; in addition, there was a worn or chipped ring around the rib where it was apparently being cut in two.

RM Boone spent August 17-21, 1992 in the Homer office with Mike Blenden developing the FY93 budget proposal and updating the RNIS program. This was just prior to Mike leaving for his new position as P/L of the Des Lacs NWR Complex in North Dakota.

RM Boone attended a meeting in September at Elmendorf AFB regarding contaminants cleanup on Adak. Several years ago Adak experienced a massive underground oil spill; this coupled PCBs, asbestos, and WWII era contaminants gave Adak the dubious distinction of qualifying for Super Fund cleanup dollars.

On this same trip, RM Boone met with an environmental representative for Shemya AFB regarding eradication of rats from Shemya. The Air Force is interested, but is unable to provide funding; funding through the Legacy Program will be explored in 1993.

On October 7, 1992, RM Boone attended a meeting hosted by Alaska Maritime NWR in Homer. EPA, DOE, COE, U.S. Navy, and Western Alaska Ecological Services met with refuge staff regarding environmental cleanup activities on Amchitka; COE will have the lead in this effort.

On October 14, 1992, RM Boone attended a briefing by the U.S. Air Force at Elmendorf AFB regarding cleanup efforts on Shemya AFB. Obviously the military and Department of Defense have undergone an environmental awakening! They are suddenly more than willing to make amends for their past sins and indiscretions; well, better late than never.

RM Boone and BT Jeff Williams attended the biologist meeting in Homer on November 11, 1992; FY93 funding and projects were discussed, as well as organization of the Homer biological staff. Jeff has been detailed to the vacant Wildlife

Biologist position (Adak) since June.

RM Boone attended the Project Leaders' Meeting in Anchorage from November 17-20, 1992; funding, or the lack thereof, was the major topic of discussion.

RM Boone participated in the ranking and selection of guides for exclusive guiding areas on Kenai, Kodiak, and Alaska Maritime NWRs. The process was relatively easy for Kenai and Alaska Maritime, but was a monumental undertaking for Kodiak. Two full weeks, November 30 through December 11, 1992, had been set aside to accomplish this task and it was barely adequate; had the panel not been willing to donate a few evenings, it would not have been completed on time.

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. 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. Refuge management efforts include orienting military development away from 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 and Amchitka, are cooperative and sensitive to our suggestions.

6. Other Habitats

Beach Oil Surveys: Emperor goose surveys at Shemya and Amchitka in January and February produced birds with obvious oily heads. In an effort to determine if this was a serious problem, we initiated surveys of the beaches on these two islands, recording all oil observed and the quantity and condition (i.e., large or small spot on rock, tar ball, gooey mess). Records were also kept on any oiled birds or mammals sighted or found dead on the beach. Preliminary results indicated that there may be a chronic, widespread problem with oil contamination.

Sections of selected beaches on Shemya, Amchitka, and Adak would be checked for the presence of oil while conducting winter emperor goose surveys. Beach surveys would also be established on other islands with established field camps during the summer months.



Oil contamination ranges from small patches on the beach...



...to large quantities above the high tide line. (DB)



Monofilament drift nets catch more than fish -- in
this case an ancient murrelet. (EVK)

No gross contamination was found. As expected, those islands with active military bases (Shemya, Amchitka, and Adak) had more contamination than unoccupied islands. Kiska Island fell somewhere in between, probably due to the number of fishing boats that worked around this large island. Kiska Harbor hosted from one to four fishing boats at any one time during the summer months.

Beach Debris Surveys: General information on any significant debris was recorded during the oil surveys.

7. Grazing

Two grazing operations continue under Special Use Permits. The \$100.00 administration fee is working well. Milt Holmes has been involved, off and on, with cattle and sheep grazing at Chernofski Harbor, Unalaska Island since the 1950s. He has been under FWS permit since 1983. Gene Maynard has been running cattle on the north portion of Umnak Island since 1988.

10. Pest Control

WB Byrd and RM Boone discovered a potentially devastating problem to native avifauna, specifically auklets, when they visited the Sirius Point colony on Kiska Island. While investigating the colony, WB Byrd discovered a single rat cache which contained twenty-three auklets. There is an estimated two million auklets nesting on Sirius Point and rat sign is extremely abundant. If a rat kills and caches twenty-three rats in one location, in addition to other sites, and if there are thousands upon thousands of rats, the combined effect could be significant at the largest auklet colony in the Aleutians. Rats increased in abundance at Kiska after foxes were removed in 1987. Once foxes were gone, it appears rats responded dramatically.

Rats were also observed on Little Kiska Island located a short distance from Kiska. It is suspected that rats recently made the invasion because storm-petrels are still present on Little Kiska and both species do not coexist. Perhaps rats came ashore on driftwood or other items after increases in abundance at Kiska. In any case, there is currently no effective method of removing rats from islands over a few hundred acres. This reinforces the need to protect the few rat free islands of the world from introductions which destroy native avifauna.



A part of the least auklet cache found on Sirius Point, Kiska Island. Until now, we had not realized that our Norway rats were storing auklets over the summer for winter use. (VB)

12. Wilderness and Special Areas

The Alaska National Interest Lands Conservation Act (ANILCA) designated approximately 2.3 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).

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

<u>Area</u>	<u>Designation</u>
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

Not surprisingly, the diversity of breeding animals is low in the Aleutians due to low terrestrial habitat diversity. Nevertheless, the islands provide breeding sites for a diverse suite of marine taxa, and there is relatively high species richness within the migrant avifauna because of the juxtaposition of the islands and the mainlands of Asia and North America. Indeed, the Aleutian Islands were classified as an "International Biosphere Reserve" because of the high diversity of breeding marine birds and mammals (i.e., 26 species of seabirds, 4 species of marine mammals).

Although the breeding terrestrial fauna is not characterized by high species diversity, several endemic forms occur, and at least two species (i.e., rock ptarmigan and winter wren) include multiple unique subspecies within the refuge.

Spring migrant birds are monitored on the refuge annually by a commercial birding tour, "Attours" at Attu Island, and refuge field crews record all species seen at field camps in the western Aleutians and at Adak. In 1992, 34 species that are extremely unusual were recorded in the Aleutians (Table 4).

2. Endangered and Threatened Species

a. Aleutian Canada goose. In 1992, recovery program tasks included pair surveys at two locations where we are trying to reestablish breeding populations, translocation of geese from Buldir to selected release sites, habitat surveys of fox-free islands to assess their potential to support geese, and banding of geese at the remnant breeding site of Chagulak.

Translocation of wild geese from Buldir to Nizki and Little Kiska islands. (Excerpts from Williams, J.C. 1993. Banding, translocation monitoring of Aleutian Canada geese in 1992. U.S. Fish and Wildlife Service Report, AMNWR 93/11, 23pp.) Translocation of wild Aleutian Canada geese (Branta canadensis leucopareia) is a major component of the Aleutian Canada goose recovery plan. Recently, the Aleutian Canada goose was downlisted from endangered to threatened status, due in part to previous translocation efforts. Most translocation work has been concentrated in the Near Island Group (Nizki-Alaid and Agattu islands) at the western end of the Aleutian Island chain where bald eagles (Haliaeetus leucocephalus) are absent. To the east bald eagles have proven to be a serious deterrent to the reestablishment of geese on Little Kiska and Amchitka islands.



Brambling -- Adak. (EVK)



Aleutian Canada geese were transplanted to Little Kiska again this year. (AP)



Associate Manager George Constantino on Buldir Island, ready to follow the hounds and catch those geese!!! (LG)

In 1992, personnel of the Aleutian Islands Unit of the Alaska Maritime National Wildlife Refuge translocated 132 Aleutian Canada geese from Buldir I. to Nizki and Little Kiska islands. At Nizki I., 23 female goslings were translocated along with male goslings and adult geese. Female goslings pair with a mate on the wintering grounds and return to the island where they learned to first fly; thus these females represent a potential recruitment of 23 breeding pairs in 2 years when they reach an age when they could breed. The Nizki I. nesting population is nearly self-sustaining and comprised at least 34 breeding pairs in 1992.

At Little Kiska I., the small breeding population was bolstered by the translocation of 29 female goslings accompanied by male goslings and adults. Bald eagles did not prove to be much of a problem as in past years. Heavy fog blanketed the island for much of August and probably allowed geese to escape detection by eagles. In addition, the Recovery team recommended releasing fewer birds than in past years to avoid attracting eagles. This strategy along with favorable weather was successful as there were no documented instances of predation by eagles on translocated geese.

Pair survey at Nizki Island. (Excerpts from Thomson, G. and Staudt, T., 1993.) U.S. Fish and Wildlife Service personnel were present on Nizki and Alaid islands from 31 May-11 August, 1992. Objectives during our stay were to: map nesting, feeding and brood-rearing habitat of Aleutian Canada geese (Branta canadensis leucopareia); conduct a census of all nests on both islands; record observations of non-breeding geese to estimate total numbers present; and to read codes on previously banded geese. The tall grass or Elymus/umbel community, suitable to nesting and brood-rearing, was confined to coastal fringe and drainages. We found 34 goose nests on both islands (27 on Nizki and 7 on Alaid) and estimated 41% of nests were also present in 1991. Goose nesting was relatively early and peaked 12-17 June. Mean clutch size was 5.52 eggs per nest. Overall nesting success was 91% and at least 76% of all eggs hatched. Mean brood size was 4.2 goslings per brood and decreased throughout the summer. We estimated 162 adult geese were present on both islands and that approximately 130 goslings were produced. Translocation of 71 wild-caught birds from Buldir brought the population up to about 363 geese for the fall migration. We read 1 band code on a live bird and recovered 4 from carcasses.

Table 4. Sighting of rare and accidental species in the Aleutian Islands in 1992.

Species	Locations Observed
Arctic loon	Adak, Attu
Short-tailed albatross	Buldir
Mottled petrel	Nizki
Brant	Nizki
White-fronted goose	Nizki
Gargany	Buldir
Common pochard	Buldir
Tufted duck	Buldir, Adak
Black-tailed gull	Buldir
Slaty-backed gull	Nizki, Buldir
Eurasian kestrel	Nizki, Buldir
Long-toed stint	Buldir, Adak
Temnick's stint	Buldir, Adak
Semi-palmated plover	Buldir, Adak
Mongolian plover	Buldir
Grey-tailed tattler	Buldir
Common sandpiper	Buldir
Wood sandpiper	Buldir
Bar-tailed godwit	Buldir, Adak
Yellow wagtail	Nizki, Buldir
Gray wagtail	Buldir
Yellow-eyed thrush	Buldir
Pallase reed-bunting	Buldir
Red-breasted flycatcher	Buldir
Siberian ruby-throat	Nizki
Common rosefinch	Buldir
Arctic warbler	Buldir
Hawfinch	Buldir
Brambling	Buldir, Adak
Oriental greenfinch	Buldir
Common redpoll	Nizki
Great egret	Amchitka
Bristle-thighed curlew	Adak

Pair survey and habitat enhancement at Little Kiska Island. (Excerpts from Palmer, A. and Klett, V. 1993.) Annual translocations of Aleutian Canada geese (Branta canadensis leucopareia) have been made from Buldir Island to Little Kiska Island since 1988. In 1992, spring and late summer surveys were conducted at Little Kiska Island to look for returning geese, to attempt to find evidence of nesting, and later, to monitor the fate of geese translocated to Little Kiska. Additionally, control and experimental plots were fertilized to test the feasibility of enhancing existing vegetative cover for geese.

During the spring survey (30 May-6 June), we found evidence of only one pair of nesting geese, and we estimated at least 51 geese, mostly birds too young to breed, were present. During the late summer survey (31 July-14 August), we discovered that the goose nest found in June was unsuccessful, but another previously undiscovered pair successfully produced four goslings. Sixty-one geese from Buldir were released on Little Kiska on 6-7 August, and there was no evidence of bald eagle (Haliaeetus leucocephalus) predation. Nevertheless, eagles probably killed one of the adult geese from the unsuccessful nest. We found the most geese used the western portion of Little Kiska for feeding and nesting.

In spring, three of six vegetation plots were fertilized with 20/20/10 at an application rate of 500 lbs per acre. Vegetation was classified and measured in twelve subplots in each of the six plots in late summer.

Nine major plant species occurred in all plots and were essentially the same height. They were: unidentified ferns, Carex spp., reedgrass (Calamagrostis canadensis), red fescue Festuca lucida, anemone (Anemone narcissiflora), cow parsnip Angelica lucida, reindeer moss (Cladina rangiferina), Sphagnum ssp., and crowberry (Empetrum nigrum). The percent composition of species was similar between fertilized and control plots in study sites 1 and 3, but substantial differences were recorded at site 2. Data gathered in 1992 will provide a base comparison in future years.

Habitat surveys for potential Aleutian Canada goose release sites. Surveys to delineate the extent of nesting cover and brood-rearing habitat were conducted on Nizki-Alaid, Kiska, Little Kiska, Bobrof, Igitkin, Umak and Little Tanaga. Field crews spent short visits on each island to crudely map the quality and quantity of cover and habitat to assist refuge staff in planning future recovery activities. A summary report of these findings is in draft stage and is still pending.

Banding of geese at Chagulak Island. (Excerpts from Boone, D. 1992.) A remnant population of Aleutian Canada geese (Branta canadensis leucopareia) was discovered on Chagulak Island in 1982 (Bailey and Trapp 1984). Nest surveys were conducted there in 1984 and again in 1990. From these data, the breeding population in 1990 was estimated to be no more than 25 pairs and the total population just over 100 birds (Byrd 1990). In an effort to learn more about migration routes and wintering areas, 20 geese were banded on Chagulak in August, 1984 (Deines et al. 1984). Geese banded at Chagulak have been resighted most consistently in the early winter in the vicinity of the East Bay

Municipal Utility District (Nunes Ranch) near El Sobrante, California; later in the winter they move into the San Joaquin Valley near Modesto, California (Springer unpub).

Most geese banded at Chagulak visit El Sobrante each year; the fall migration pattern involves an initial stop at Crescent City for some birds followed by stops at Colusa, El Sobrante, and Modesto (all in California) by most or all of the birds. None of the Chagulak banded birds have been seen at Crescent City in the spring, but one sighting near Portland, Oregon might suggest a spring migration route through the Willamette Valley may be a possibility. In an effort to increase resightings of geese that breed on Chagulak and thus learn more about their migration patterns and wintering areas, the recovery team recommended that a banding project be undertaken in 1992. High seas prevented landing on the majority of the island and only five birds were located and banded on that portion of the island that could be rechecked.

b. Steller sea lion. Refuge personnel collected sea lion scat at Nizki, Buldir, Ulak and Adak islands for scientists at the National Marine Mammal Laboratory who are studying food habits of these threatened animals.

Pups were counted on beaches where scat was collected.

In November 1991 we began periodic counts of sea lions at haul sites at Amchitka and Shemya islands incidental to emperor goose surveys at these islands. The objective is to determine the day-to-day and seasonal variability in use to determine the importance of haul sites in winter and to calibrate winter counts.

c. Short-tailed albatross. The only sighting of a short-tailed albatross in the Aleutian Islands in 1992 was a lone juvenile in August by Ian Jones and Fiona Hunter on M/V Tiglax. Over the past decade we have recorded 1 - 5 sightings almost annually.

d. Aleutian shield-fern. WB/BT Williams attended the Alaska Working Group on Rare Plants in November to consult with botanists regarding field work planned for 1993. Rob Lipkin, (Alaska Natural Heritage Program), Dave Murray (University of Alaska Fairbanks), and WB/BT Williams met to discuss which areas would be best to search for new populations of shield ferns on Adak. The upcoming work is funded by the U.S. Navy through their Legacy program.

3. Waterfowl

a. Emperor goose. In 1992, emperor goose work on the refuge focused on obtaining counts of birds within index areas, estimating adult:juvenile ratios and family group size, and resighting of neck-collared birds banded on the breeding and fall staging grounds of the Yukon Delta NWR. In addition, refuge staff specifically looked for any incidences of oiled Emperor geese as part of a study to determine the distribution of chronic low-level oiling in the Aleutians and it's possible effect on wildlife.

Most Emperor geese arrive on wintering grounds in mid-December and leave by early April (Fig. 1). At the Adak index area at Clam Lagoon, approximately 300 geese over winter, but larger numbers (600-700) are counted in index areas at Shemya and Amchitka. The percentage of juveniles recorded in Emperor goose flocks (8-10%) was lower this year at Shemya and Amchitka than in any previous year (Fig. 2).

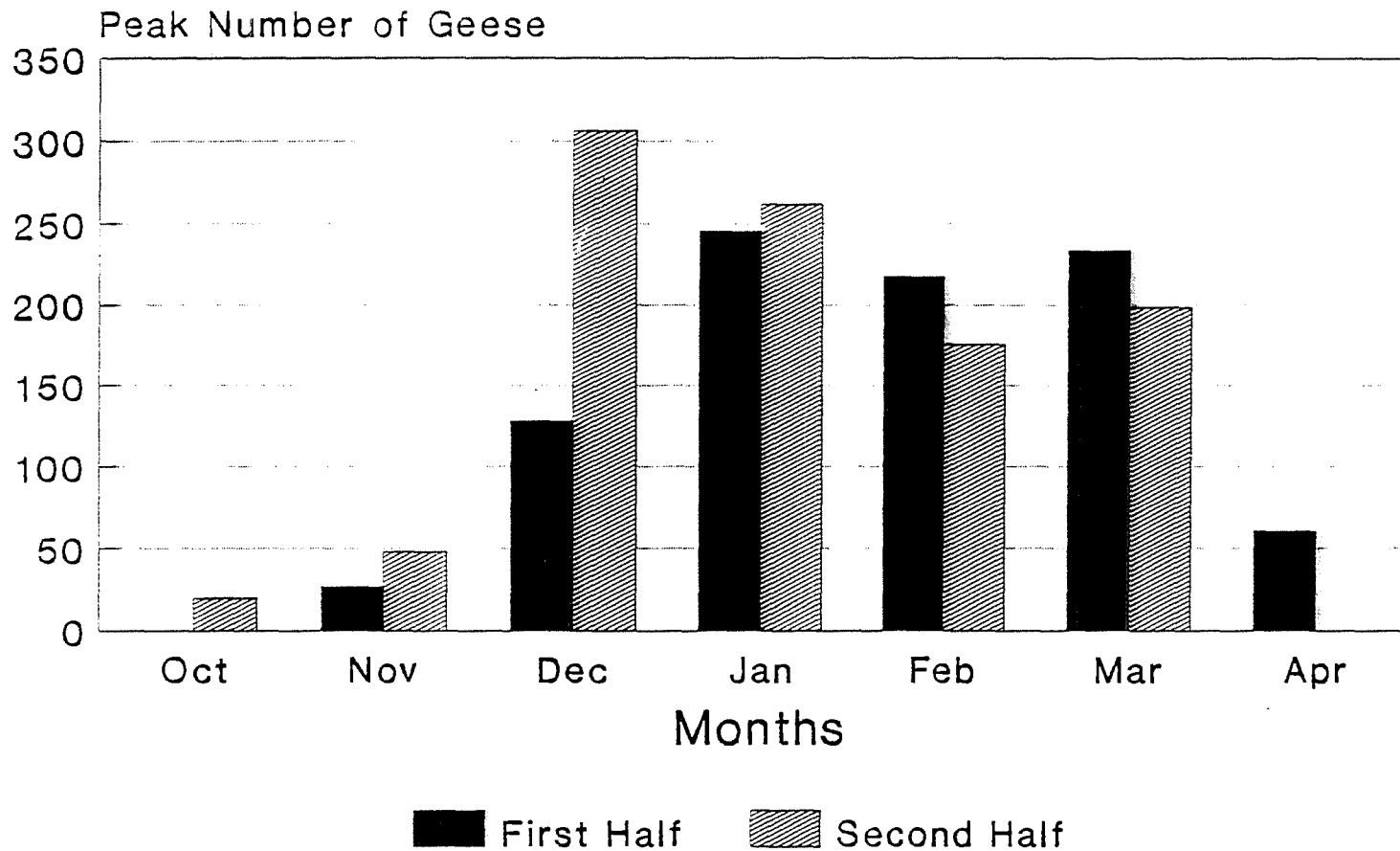
The mean number of juveniles in family groups declined over the winter at all sites suggesting either mortality of young or changes in family structure which caused some juveniles to become disassociated with adults. Marked geese were seen at all three islands and most had been seen at least one previous winter in the Aleutians. All were resighted at the same islands where they were previously seen suggesting a strong fidelity to specific wintering sites. One collared bird has been resighted annually since 1988 at Shemya.

Geese were seen at Shemya and Amchitka with oil on their feathers, and surveys of beaches indicated the presence of oil on rocks in, and just above, the intertidal zone. the distribution of low-level chronic oiling in the aleutians appears to be restricted to Shemya based on oil beach transects. The effect on Emperor geese could be significant because they forage and roost primarily in this habitat. Further surveys are planned as part of the on-going Refuge wintering waterfowl monitoring program.

b. Aleutian green-winged teal. WB/BT Williams and BT Thomson operated a hunter check station near Clam Lagoon on the opening weekend of waterfowl season and collected teal gizzards and proventriculi for analysis of food habits. Biological staff hope to continue the check station and compile several years' food habit data for comparison with data for North American green-winged teal. Measurements of culmen, tarsus, wing, tail and mass were recorded for all teal. In the future, morphometrics of Aleutian teal will also be compared to North American teal in hopes of further understanding differences and similarities between the subspecies.

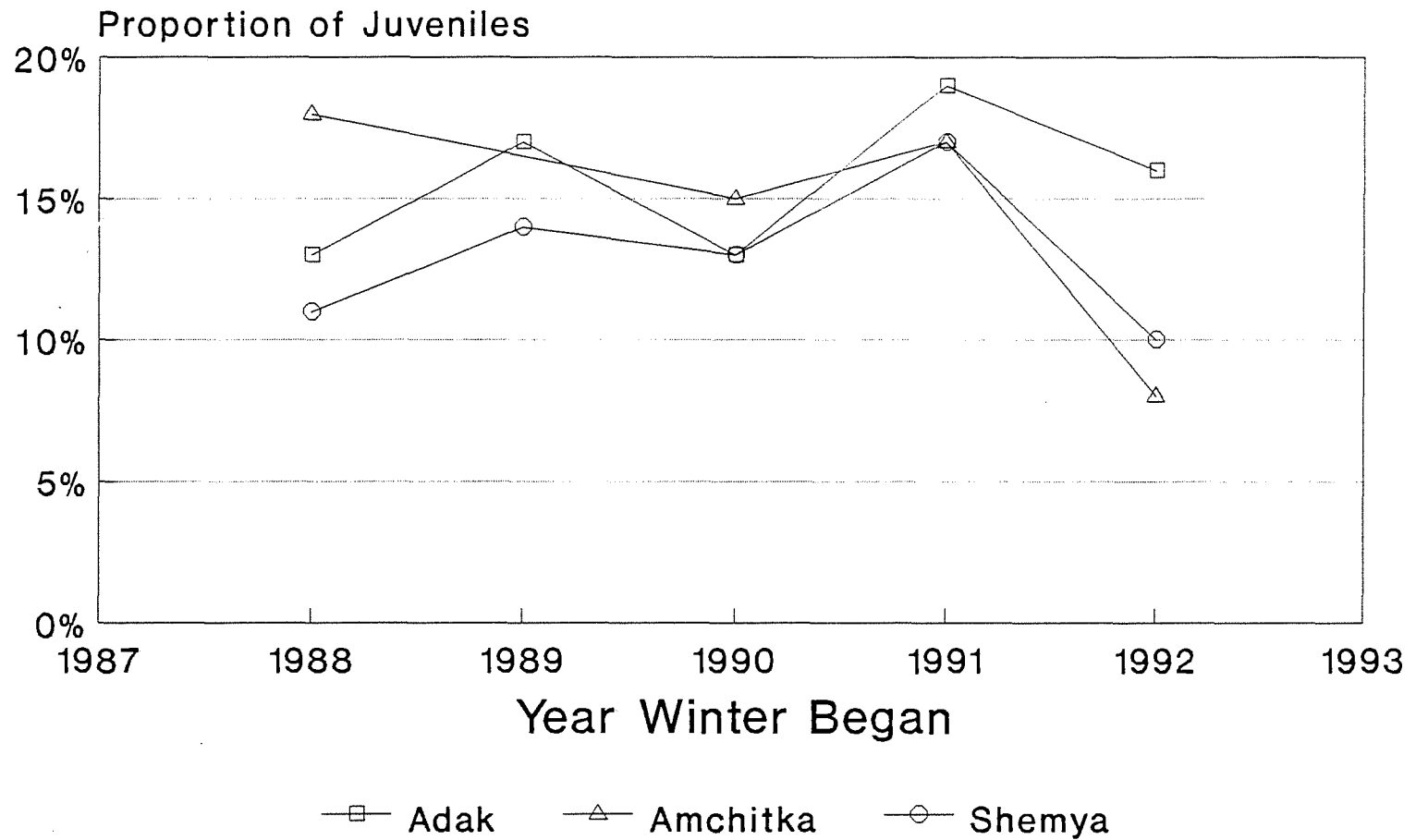
Relative Abundance of Emperor Geese in an index area at Adak I., 1992-93

Fig. 1. Relative Abundance of Emperor Geese at Adak



Emperor Goose Juvenile Proportions In the Aleutian Islands

Fig. 2. Percentage of Juvenile Emperor Geese in Aleutian Populations





BT's Williams and Thomson collected gizzards from green-wing teals at a hunter check station as part of a continuing food habit study initiated last year. (EVK)

c. Harlequin duck. (Abstracted from Byrd, G.V., Williams, J.C. and Durand, A. 1992. The Status of Harlequin Ducks in the Aleutian Islands, Alaska. Pages 14-33 in F. Cassirer [Ed.]). WB Byrd, WB/BT Williams and BT Durand summarized data from the wintering waterfowl monitoring program for a paper presented at a symposium in Idaho on harlequin duck status. The harlequin duck (Histrionicus histrionicus) has been specifically studied in the Aleutian Islands with information about the species having been obtained during widespread descriptive surveys of marine birds and during winter waterfowl surveys at three locations; Adak, Amchitka, and Shemya islands. Available data suggest that roughly 147,000 harlequins were present in the Aleutians during winter (November to May) in the early 1990's, fewer than published estimates by Palmer suggest (1 million). Only about 15,000 birds remain in summer, and breeding is doubtful based on lack of breeding habitat and absence of observations of broods. Data on trends suggest slight declines at Adak Island between 1983 and 1991. Harlequins primarily use unprotected marine waters within 100 m of islands, where they most frequently form flocks of 5 or fewer individuals. Males comprised 53% to 56% of the harlequins seen during winter surveys in 1991 and 1992 at Amchitka and Shemya islands. In contrast, females were more common than males (46%) at Adak. The Aleutian Islands are mostly within the Alaska Maritime National Wildlife Refuge; therefore, habitat destruction is not considered a major threat to harlequins. further, this isolated region contains few villages, so hunting and disturbance are minimal. Probably the most serious potential threat to harlequin ducks in the Aleutians is oil pollution in nearshore marine areas, an issue that needs further study.

d. Sea ducks. Several hundred thousand sea ducks winter in nearshore waters surrounding the Aleutian Islands, an 1,800 km-long island chain which provides ice-free habitat not available farther north in the Bering Sea in winter. although most of the Aleutians are within the Alaska Maritime National Wildlife Refuge, relatively few studies of diving ducks have been made. this is not surprising given the lack of observer access, especially in winter, to more than a few scattered settlements, and the relatively low priority placed upon diving ducks in the past. Nevertheless, periodic surveys at Adak, Amchitka and Shemya islands and general observations elsewhere provide a basis for describing species richness, relative abundance, and seasonal occurrence of sea ducks.

The recent realization that several species of eiders may have declined drastically, has demonstrated the need to monitor the status of sea ducks, at least at a level whereby large-scale trends could be detected.

All but one of the 16 extant species of sea ducks in North America occur in the Aleutian Islands, at least occasionally (Table 5). We subjectively estimate, based upon extrapolation from local counts, that sea ducks number in the hundred thousands in winter (November - March). Six species comprise most of the winter total. Only two species remain in summer to breed in the region. The following annotated list describes what is known about the six most common species of sea ducks in the Aleutian Islands.

Common Eider (Somateria mollissima). This is the most common breeding sea duck in the Aleutians. Predation by introduced foxes probably decimated eider breeding populations, but the species survived on fox-free offshore islets and at low levels on large islands with foxes. Following removal of foxes, eider breeding populations on several islands have increased substantially. Eiders nest primarily within the Elymus-umbel coastal plant community in the Aleutians. Most laying takes place from late May to mid-June. Average clutches range from 3.6 to 4.9.

In spite of observed increases of eider populations in response to restoration of nesting habitat, there is evidence of declines in eiders at several sites that may be attributed to competition for food with sea otters. Both eat sea urchins, and otters probably outcompete eiders. At Attu, common eiders were common nesters at Massacre Bay in the 1970's, but coinciding with an increase in sea otter populations in the area, eiders have declined substantially. Similar situations have been documented at Amchitka and Adak. In both cases nesting colonies of eiders have declined or disappeared as otter populations have increased. It remains to be seen if eider populations will decline at Nizki and Agattu as otter populations increase.

Data from Christmas Bird counts at Adak demonstrate the decline in common eiders there. There are few winter data from other locations (e.g., Shemya) that span a long enough period to provide information on winter trends.

Information on sex ratios in flocks of common eiders in winter has been obtained only recently. In 1991, the proportion of male eiders averaged 53% (range 45%-58%, n=15 surveys) at Shemya.

Recent data on flock sizes at Shemya indicate most eiders were in small groups in February 1992. Aggregations probably vary temporally and among locations, based upon general observations.

Oldsquaw (Clangula hyemalis). Most common in the eastern Aleutians, the species is also seen regularly in the central and western Aleutian in winter. It tends to occur farther offshore than common eiders and harlequins. Christmas count data at Adak have highly variable, and no trends are evident. Other survey data have not yet been analyzed for this or the other species below.

Black Scoter (Melanitta nigra). Probably more common in the eastern Aleutians, this scoter is found in relatively low numbers in the central and western Aleutians, perhaps because of high sea otter populations. Scoters, like common eiders, apparently eat sea urchins, and at Adak Christmas Bird Count data suggest the populations declined during the period of sea otter increases. Sex ratios and flock sizes have not been recorded for scoters.

Common Goldeneye (Bucephala clangula). This species tends to be found in more protected areas than the species discussed above. Goldeneyes also frequent unfrozen freshwater lakes in winter. Christmas Bird Count data from Adak suggest goldeneye numbers were low from the mid-1970's to the early 1980's, but have increased since that time. No effort has been made to record sex ratios or flock sizes of goldeneyes during winter surveys.

Red-breasted Merganser (Merqus serrator). Like common eider, red-breasted merganser breeds in the Aleutians, and may have been more widespread and common prior to the introduction of fox. There appears to be an influx of wintering birds in October, and numbers decline in May. Like goldeneyes, mergansers are most commonly seen in winter in protected bays. Christmas bird Count data at Adak suggest a pattern roughly similar to goldeneyes, but the boat count data are so highly variable that trends are difficult to detect.

There is very little hunting of sea ducks in the Aleutians. Certainly a few birds are taken around the few villages, and there is a minor amount of sport hunting at Unalaska and Adak, but my subjective impression is that relatively few sea ducks are taken.

Nearshore waters in the Aleutians are subject to chronic oil pollution, due to shipwrecks, other accidental spills and probably illegal bilge pumping. Scattered small patches of oil on beaches are evidence of this problem. the impact of this marine pollution on sea ducks is not known. Large oil spills are also possible in this region, since large tanker traffic between the western United States and Asia passes the Aleutians.

Introduced foxes remain on most large islands in the Aleutians, and these predators affect nesting ducks (e.g., eiders and mergansers). It is unknown how they have influenced roosting winter ducks. As pointed out above, competition with sea otters for food by at least eiders and scoters, may limit these sea ducks.

Table 5. Status of sea ducks occurring in the Aleutian Islands.

Species	Relative Abundance	Seasonal Occurrence
Common Eider	10000s	Resident
King Eider	1000s	Winter
Spectacled Eider	----	No recent records
Steller's Eider	1000s	Winter
Harlequin Duck	10000s	Winter, non-breeders summer
Oldsquaw	10000s	Winter
Black Scoter	10000s	Winter
Surf Scoter	100s	Winter
White-winged Scoter	1000s	Winter
Common Goldeneye	10000s	Winter
Barrow's Goldeneye	10s	Winter
Bufflehead	1000s	Winter
Smew	10s	Migrant, winter
Hooded Merganser	10s	Migrant
Common Merganser	1000s	Winter
Red-breasted Merganser	10000s	Local breeder, winter

5. Shorebirds, Gulls, Terns, and Allied Species

a. Storm-petrels. Work on storm-petrels in 1992 consisted of monitoring reproductive success of fork-tailed and Leach's storm-petrels on pre-established plots. Burrows within plots were checked in late June, well into incubation, by feeling under birds for the presence of eggs. Birds were then identified by call or, only if they did not call, by removing the bird from the burrow. This was the fourth continuous year we have monitored reproductive success on the same plots. Additionally, we have comparative data on the same plots from 1976. Eggs were laid in 43% - 66% of all burrows with chambers from 1976 - 1991 with 1976 the lowest and 1989 the highest. In 1992, mean reproductive success (total number of chicks and eggs still alive at last check/total with eggs) was about 74% for both species.

Artificial nest boxes installed in previous years appear to be readily accepted by petrels. The boxes are roughly 4" X 4" X 16" in length with a 1.5" diameter hole for an entrance. In subsequent years, these nest boxes should make productivity checks less stressful on the birds and burrows. There has been a high rate of use by storm-petrels in boxes that were previously established and we believe that storm-petrels will readily accept the nest structures.

b. Glaucous-winged gulls. WB/BT Williams and Volunteer Knechtel monitored 209 nests along a beach transect at Buldir I. Nesting success (number of nests with eggs/total number of nests) was 0.77. Clutch size was normal (mean=2.35 eggs per nest, SD=0.76, n=160). Overall reproductive success was low, about 0.22 (number of eggs/total chicks fledged).

c. Ledge-nesters. 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 1988-1992 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.

Periodic counts of kittiwakes and murres on plots at Agattu and Buldir suggest populations have increased since the mid-to-late 1970's. 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.

Black-legged kittiwake productivity was modest at Buldir and for red-legged kittiwakes. Productivity of thick-billed murres at Buldir was modest. Data has not been analyzed yet, but will be summarized in a pending report on monitoring activities.

Results of red-legged kittiwake banding and resighting efforts at Buldir continue to indicate high adult survivorship and a high degree of nest site fidelity for this species. We banded 40 red-legged kittiwakes and 50 black-legged kittiwakes during 1992. Primary estimates indicate that adult survival could be as high as 0.90 from one year to the next.

WB Byrd and WB/BT Williams prepared a paper on red-legged kittiwake biology to be published by the American Ornithologist's Union and Academy of Natural Sciences which summarized previously unpublished refuge data, original research by refuge personnel and previously published information into one species account.



A fork-tailed storm petrel, one of the tube noses - Buldir. (JW)



Jeff Williams and Julian Fischer prepare to check red-legged kittiwake nests for young. (TS)



The extension mirror is used to check kittiwake nests
on cliff faces that cannot be observed from above...
Yep, here's one!!! (TS)



d. Crevice-nesters. Refuge staff have monitored reproductive success for five species of crevice-nesting seabirds at Buldir I. for several years. Observations were conducted incidentally to other studies. Nevertheless, we began locating nests in late May or June, early in the incubation period, and marked nest sites for subsequent visits. The fates of eggs and chicks were determined by checking sites at 5-8 day intervals up to the time a chick fledged. Fledging success was variable among species and between years, but ranged from 53-100% and averaged 75% in most years 1976-1991.

WB Byrd and WB/BT Williams planned a field season which examined the breeding biology of whiskered auklet in detail. They summarized the results of their findings in a paper submitted to the Academy of Natural Sciences and American Ornithologists Union for their Birds of North America project. The project is an update of Bent's 1909 Life Histories and attempts to incorporate and synthesize all data on the species learned to date.

6. Raptors

a. Bald eagles. RB Byrd and WB/BT Williams continued a program of eagle age classification using a system which allows observers to accurately identify eagles to within one year. Weekly surveys which tried to age all eagles around Adak were conducted primarily in fall, winter, and into spring. During winter, after leaving nesting territories, eagles concentrate around the Navy's landfill operation where food is abundant. During winters 1990 and 1991 (Oct. - March) the population contained about 17% - 20% juveniles (birds of the year), which was similar to data collected over three winters in the early 1980's. Data from 1992 has not been analyzed as yet, but preliminary results indicate similar percentages. The amazingly consistent proportion of juveniles suggests a saturated breeding population with a fairly constant summer environment.

Refuge staff monitored the occupancy of nests along the northeast coast of Adak. Occupancy rates were similar to previous years. Results of several years work are being compiled into a summary report to be produced later.

b. Injured eagles. Eleven bald eagles were found electrocuted during the year. The number of eagles electrocuted annually has continued to decline since 1978 when data were first collected.

WB/BT Williams was very busy this fall and winter responding to injured eagle cases. We shipped a record number of eagles to the Arctic Animal Hospital in Anchorage. Dr. Jim Scott is extremely willing to voluntarily care for any injured eagles we send him.



This immature bald eagle lost his footing while attempting to land on the red light and hung himself between the pole and radio antenna. He was in good shape when released -- and hopefully, a smarter bird.
(U.S. Navy photo)

In addition to the birds sent to Anchorage, WB/BT Williams provided overnight care for about 10 other eagles by feeding them or administering an electrolyte solution.

The injured eagle "Adak" at the Sitka Raptor Rehabilitation Center was diagnosed as never being able to fly again and will be placed in training to become one of the Center's educational birds along with another eagle and a short-eared owl. "Adak" received damage to the secondary flight feathers on the right wing and primaries on the left wing when she was electrocuted by a power pole in November 1990.

7. Other migratory birds

a. Christmas Count. The 1992 Christmas Bird Count was the 25th at Adak and was conducted on December 27 by 20 participants. Nearly 3,098 birds of 34 species were counted.

b. Breeding Bird Survey. The Adak Breeding Bird Survey was conducted in June by Volunteer Angela Palmer and BT Julian Fischer. Twenty-five species were recorded, the most common species being Lapland longspur, glaucous-winged gull, and marbled murrelet.

c. Neotropical Migrants. BT Fischer consolidated all refuge annotated lists and species accounts to compile a list of all "gray literature." this list was used to compile species lists of all birds on all islands as part of the Neotropical Bird Initiative which is interested in Neotropical migrants. Although the refuge does not have any true Neotropical migrants, we broadened our definition to include all passerines. This was a formidable task to extract data, xerox reports and create summary lists. As it turns out, the Aleutian Islands unit has accrued a wealth of information over the last 20 years and probably is ahead of other refuges in monitoring migrants.

Passerine density transects were conducted on a number of islands to contract against a refuge database. Staff on Nizki, Little Kiska, Igitkin, Little Tanaga and Umak set up new transects or reran old ones.

8. Game Mammals

a. Caribou. (Excerpts from Boone, D., Byrd, G.V. and Williams, J.C. 1991. Annual Report on caribou management at Adak Island, Alaska. U.S. Fish and Wildlife Service Report.)

Caribou (Rangifer tarandus) were introduced to Adak Island in 1958 and 1959 as a ready source of food in the event that a national emergency cut off the regular food supply to the

military and to provide sport hunting opportunities for local residents. A Caribou Management Cooperative Agreement was developed by the U.S. Navy (Adak), U.S. Fish and Wildlife Service, and Alaska Department of Fish and Game. It was recognized from the outset that the absence of natural predators, the abundance of apparently excellent habitat, and the mild climate created conditions favorable for the herd to increase beyond the capacity of local hunters to control. The first hunting season (August 15-25) was conducted in 1964. The initial population objective was to maintain the herd of 200-250 with an annual harvest of 50 animals. Over the years both the herd and the harvest have increased beyond the original objective. At present, the pre-hunting season population is between 450-550 and the annual harvest about 200.

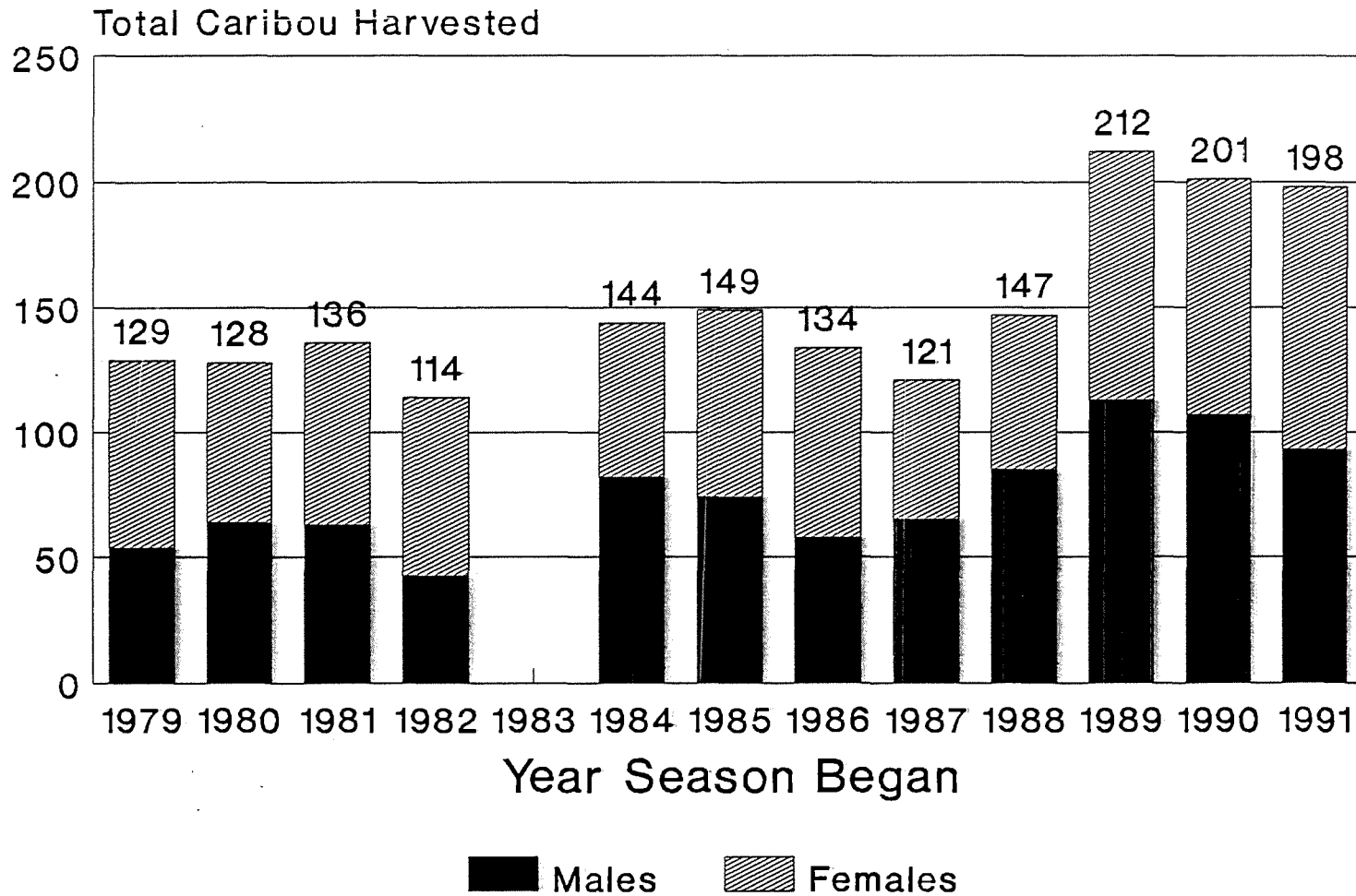
Hunter Success. During the 1991-92 hunting season (September 1991 - March 1992), 198 caribou were harvested; 93 (47%) bulls and 105 (53%) cows (Fig. 3). Interest in caribou hunting continues to increase with a record of 403 permits issued; 350 (87%) were returned. Resident hunters outnumbered non-resident hunters 4:1. Hunter success was 48%, based on the number of hunters that actually hunted and returned their permit; 62 hunters killed two caribou and 74 killed one. There was little difference this year in time spent afield by successful hunters (5.7 days) compared to unsuccessful hunters (5.6 days). The harvest was even more concentrated in the September - November period than in past years with over 84% of the kill during this period.

Recent changes in the world power structure and the resulting reductions in national defense expenditures are being felt by the Naval community on Adak. Adak is an expensive facility to operate and maintain; plus, its location is no longer of the strategic importance it once was. "Scale-down" is underway; the questions are "how far?" and "how fast?". Indications are that reductions in personnel will occur gradually over the next several years with the possibility that assignments to Adak may become unaccompanied after 1995 or 1996. Should unaccompanied tours become a reality, there would be a dramatic impact on management of the Adak caribou herd. The number of potential hunters would decline significantly and with limited ways of utilizing the meat, interest in sport hunting would likely decline as well. Some trophy hunting would undoubtedly continue, but annual production would almost certainly exceed annual harvest.

We have been concerned for some time that the herd may have already exceeded the hunters' capacity to control its growth. However, harvest and survey data this year were somewhat reassuring; these data indicate that the pre-hunt population (August 1991) was approximately 450. It is our recommendation and intent to continue to maximize the caribou harvest on Adak.

Caribou Harvest at Adak

Figure 3. Caribou harvest by sex on Adak Island, Alaska 1979-1991.



Closed Season 1983

It seems only prudent, in light of a probable reduction in hunters, to forestall any expansion of the herd as long as possible. Some thought should be given to the possibility that population control or total removal may be required sometime in the not too distant future.

9. Marine Mammals

a. Whales. Although not technically "on" the refuge, an effort was begun to systematically record data on whale sightings from the M/V Tiglax. Captain Alvin Bayer and First Officer Kevin Bell logged every sighting anyone aboard made from the vessel in 1992. Information was recorded on approximate size of animals, exact locations, and number of animals in groups.

Usually one or more whales are found grounded in the Aleutians each year, but in 1992 none were reported.

b. Sea otters. Numbers of sea otters continue to increase in the Semichi Island group, the last group in the chain where otters have not recolonized since their decimation by Russian fur hunters in the 18th and 19th centuries. Previous surveys at Shemya documented no more than 1-2 otters around the circumference of the island. Surveys in 1992 found 10-20 animals present and rafts of 100+ animals were seen in early January. It will be extremely interesting to note changes in the nearshore community as otters reoccupy the island. Sea otters are keystone species in the community because they forage heavily on sea urchins. As the density of otters increases, grazing pressure of urchins on kelp should decrease. This will allow more kelp beds to become established which in turn facilitates a different community structure.

Tony DeGange (USFWS) conducted an aerial census of sea otters along the Aleutian Chain in May and refuge staff assisted by ground-truthing aerial estimates. Staff counted all otters along designated sections of coastline on Adak. Ground-truthing will be used to estimate a correction factor for aerial estimates.

Dr. James Estes (UCSC) is coordinating research on sea otters at Amchitka by investigating their diet, activity patterns, movements, agonistic interactions, reproduction and survival. Radio telemetry from subcutaneous implants is being used to help track otters. Data collected will, hopefully, be used to develop conservation and management plans for otters throughout their range.



A female elephant seal wandered ashore on Buldir Island this past summer. This is a new site record for the Aleutians. Previously, they had been recorded (three times) only on Uganak Island in the eastern-end of the Aleutian Chain. (JW)

c. Pinnipedia. Refuge staff collected nearly 300 lbs of sea lion scat from rookeries to send to the National Marine Mammal Laboratory. Although a smelly job, the scat will provide critical information on food habits to researchers investigating causes of the catastrophic decline in sea lion abundance. Food habits are determined mostly by identification of otoliths (fish ear bones) which are not digested and are identifiable to species. Good luck to those fortunate few technicians doing the primary sorting!

WB Byrd and RM Boone coordinated support for two aerial surveys of sea lion rookeries and haulouts by NMFS personnel Dick Merrick and Tom Laughlin. Dick also was involved in placing satellite transmitters on sea lions at Ugamak Island to help investigate winter distribution, dispersal and foraging activities in an effort to better understand causes for recent declines.

11. Fishery Resources

Salmon on Adak are a popular resource used by many of the military residents. There are no data on estimated sport fishing harvest, but new data through 1991 are summarized below:

Adak-Kagalaska Islands Estimated Personal Use
Salmon Catch 1988-91

<u>Year</u>	<u>Permits Issued</u>	<u>Permits Returned</u>	<u>Percent Returned</u>	<u>Estimated Catch</u>			
				<u>Sockeye</u>	<u>Coho</u>	<u>Pinks</u>	<u>Total</u>
1988	43	29	67.4	503	23	150	676
1989	64	47	73.3	382	0	117	499
1990	61	29	47.5	800	47	41	888
1991	37	31	86.5	281	6	34	321

14. Scientific Collection

The Refuge has an active salvage program to collect and distribute dead animals to interested museums and institutions. About 38 species were salvaged in 1992 and WB/BT Williams contacted individuals wanting specimens to arrange for shipment. In addition, a few birds were collected to assist with refuge research projects.

Common Name	Scientific Name	Number Specimens	Collected(C) Salvaged(S)
Short-eared owl	<u>Asio flammeus</u>	2	S
Steller's eider	<u>Polystica stelleri</u>	1	S
Glaucous-winged gull	<u>Larus glaucescens</u>	1	S
Fork-tailed storm-petrel	<u>Oceanodroma furcata</u>	2	S
Crested auklet	<u>Aethia crisatella</u>	1	S
Whiskered auklet	<u>Aethia pygmaea</u>	3	S
Pacific lesser golden plover	<u>Pluvialis dominica</u>	1	S
Common raven	<u>Corvus corax</u>	2	S
Bald eagle	<u>Haliaeetus leucocephalus</u>	24	S
Red-legged kittiwake	<u>Rissa brevirostris</u>	1	S
Crested auklet	<u>Aethia crisatella</u>	27	C
Least auklet	<u>Aethia pusilla</u>	5	C

15. Animal Control

Introduced arctic foxes have devastated ground nesting birds in the Aleutian Islands. A program to remove foxes from selected islands has been underway for years. The process is to intensively trap an island for a season, and then recheck the island the following spring to determine if any animals are left. If fox sign is detected, trapping continues until all the animals have been taken. In 1992, rechecks were made at Ulak, Amatignak, Uliaga, Adugak, Carlisle and Little Tanaga, and initial efforts were made to remove foxes from two islands, Ugamak and Bobrof. The following annotated list provides results.

Mark Collinge (USADC) and Bill Jacobs (EPA) traveled aboard M/V Tiglax to better understand fox trapping efforts to restore native avifauna in the Aleutians. Both Mark and Bill are helping with the label change of M-44's in Alaska to give fox trappers another option besides mechanical traps on large islands which are too expansive to efficiently eradicate non-native arctic fox.

Carlisle. In May 1992, one days was spent checking Carlisle for signs of foxes. It seemed clear that no foxes remained following trapping efforts in 1990.

Amatignak and Ulak. Refuge personnel spent time on both islands to check for evidence of remnant foxes following eradication efforts in 1991. Like Carlisle, it appears no foxes remain on the islands.

Uliaga and Adugak. Both islands were study sites to evaluate the effectiveness of using sterilized red fox to eradicate arctic fox. The red fox outcompete and exclude arctic fox from resources, but cannot effectively reproduce. It appears a few red fox may be left, but they are all old and will soon die, establishing yet another fox-free island for native avifauna.

Little Tanaga. We set 67 traps (22 live, 31 snares, 14 leg-hold) at eight areas on the island: West Scripps Bay, East Scripps Bay, Narrows Bay, Chisak Bay, Midden Site, Azamis Cove, Piper Cove, and the Interior trail. Seven fox were removed from traps during the summer, four of which were caught in traps left over the winter. These included two that were killed in leg-hold sets at the Midden, and one each in live traps at East Scripps Bay and Narrows Bay. During the summer of 1992, two males and a female were killed in live traps at Narrows Bay on June 22 and July 9, and at East Scripps Bay on July 7. fox sign was detected on five different occasions early in the season, but decreased as more foxes were caught. At least one fox remained on the island as of September 1. All three foxes taken in summer 1992 were probably one-year-olds.

Twenty-seven species of birds were seen at Little Tanaga in June and July. The three most abundant species were lapland longspur, song sparrow and rock ptarmigan. Rock sandpipers were quite common, being seen every day along beaches.

Bobrof. WB Bailey set up camp on the island prepared to trap foxes, but it appears the fox have died out naturally because of the islands small size and spare resources.

Ugamak. WB Bailey set up camp on Ugamak in mid-summer and began the process of removing foxes from yet another island. By summer's end a total of 58 foxes have been removed. A follow-up check is planned for 1993.

16. Marking and Banding

Refuge personnel captured and banded 132 Aleutian Canada geese on Buldir Island. All were translocated to either Nizki-Alaid or Little Kiska islands in August. WB/BT Williams color banded 40 red-legged kittiwakes and 50 black-legged kittiwakes during the summer on Buldir. The objective is to estimate average annual adult survival rates through resightings in subsequent years, which 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. Capture rate was higher than other years because we used a 14ft fishing pole with a noose on the end which allowed us to approach many birds before they became alarmed.

H. PUBLIC USE

1. General

With the aid of refuge staff and Student Conservation Association (SCA) Volunteers, ORP Laura Greffenius (arrived December 1991) started getting public use programs underway in January.

The Visitor Center remained open on weekends all year. Monthly visitation was:

January	442
February	627
March	572
April	825
May	754
June	1118
July	778
August	952
September	742
October	630
November	560
December	<u>391</u>
Total	8391

This comes to over 2500 more people coming into the Fish and Wildlife Center than in 1991.

Monthly activities at the Fish and Wildlife Center included Adak NAS "Blue Card/Firearms Safety" lectures (856 people) and orientation lectures for new arrivals on Adak (286).

We also hosted meetings of the NAS Search and Rescue Team and Ducks Unlimited, and provided classroom space for Construction Battalion training sessions. The University of Alaska used our facilities during the spring and fall semesters for its "Alaska Mammals" course, with several guest lectures by refuge staff. Other community organizations occasionally held programs in our presentation room.

The variety and extent of our information and environmental education programs could not have been accomplished without the contributions of time and enthusiasm by Student Conservation Association Resource Assistants. In January, Amy Prosser completed a three-month internship and provided a great start to getting the public contact programs rolling once again. From February to May, Mariana Tamayo intrigued visitors with her Columbian accent, and her love for kids kept her occupied with many programs. Leah Gerber started the Nature Day Camp during the summertime. She loved going on trips with the kids, and also became involved in our busy



Amy Prosser assists BT Williams
tube-feed an injured bald eagle. (LG)



Mariana Tamayo makes a hard sale at
the FWS/ANAHA booth at Spring Fling. (LG)



BT Williams, with the assistance of our local
Navy TV station, presented a short story
on bald eagle rehabilitation. (EVK)

summer fieldwork schedule. During September through December, Sigrid Schmalzer continued the popular kids' programs and did a great job carrying out her duties. Leah compiled an Environmental Education Resources Reference for the Aleutian Islands Unit. It is a valuable contribution which teachers and future staff will utilize. Sigrid wrote up her curricula in detail to create Adak Environmental Education Programs, Fall 1992. None of these special environmental education programs could have been carried out if it had not been for these fine workers who brought with them their enthusiasm, plus an eagerness to learn and teach.

Many thanks are also extended to our community Volunteers who assisted us with answering questions at the front counter, selling ANHA items, leading interpretive walks, and helping out with all facets of the operation. The staff is grateful to all those who donated their time and skills to this refuge.

Another successful means of advertising our programs and keeping local residents informed has been the local radio and television station. Interviews included the topics of eagle rehabilitation, why the Blue Card session is important for hikers, and hunting regulations. During the summer, Leah Gerber was chosen as "Person of the Week", and her Nature Day Camp was featured.

2. Outdoor Classrooms - Students

It was easy to lose count of the number of kids participating in our environmental education programs during this year because we were so busy! Presentations were given to students at local schools, at the Fish and Wildlife Center, and on field trips. We also conducted a summertime kids' "Nature Day Camp", which extended to Saturdays during the fall. Other community groups also benefitted from our programs, since our outreach efforts included Camp Funtime, Child Development Center (preschool), Family Home Care, Scouts, and a group of homeschool children.

In January, the Fish and Wildlife Center hosted four 9th graders participating in "Career Day" at the high school. All were interested in biology and the outdoors, and learned firsthand about the work we do here by talking to everyone on the staff.

In February, we fulfilled requests from teachers, whose classes participated in the 1993 Goose Calendar Contest. This included classroom activities with 131 middle school students and a field trip to Clam Lagoon with eight artistic 2nd graders. Several of the younger children were impressed enough with seeing emperor geese that they earned an Honorable Mention in the contest.



Leah Gerber with a few of her Nature Day
Camp kids at Lake Betty Stream. (LG)



Sigrid Schmalzer conducting environmental
education games with a group of wee-ones. (LG)

In April, the theme for National Wildlife Week was Endangered Species. Bald eagles are a popular topic, and we had many requests for viewing "A Home for Pearl". A total of 118 elementary students and preschool kids came to the Visitor Center.

Many teachers wanted to bring their classes to view our displays while taking part in Sea Week activities during May. We gave talks and led activities for 186 students, who are always excited about a field trip here.

A popular end-of-school year trip for the high school kids is a hike to the Hot Springs at the Lake Andy Seawall. The geology class learned about this special place on Adak.

During the summer months, SCA Resource Assistant Leah Gerber led a highly successful Nature Day Camp for preschool age kids and older "Junior Naturalists". Each group of 10 kids met once a week for 11 weeks. They ventured out on field trips nearly every week, enjoying valuable educational experiences.

The summertime activities became so popular that we had requests to continue a similar program in the fall. SCA Resource Assistant Sigrid Schmalzer started a Saturday "Kids Explore Adak" group of 10 3rd through 5th graders. Meeting from September to December, they could still take part in numerous explorations outdoors.

The thousands of pink salmon spawning at Finger Bay in September were an intriguing sight for 94 7th and 10th graders, who learned some fish biology.

In October, 48 8th graders went to Palisades Beach to view intertidal life and learn about oceans and tides. A group of 57 6th graders viewed feeding harbor seals at Candlestick Bridge. Their teachers combined their science lessons with a creative writing assignment about their experiences.

The Fish and Wildlife Service SCA Volunteers were an integral part of Camp Funtime. During the spring, several special programs were planned for this afterschool childcare program. In June, 50 kids came to the Visitor Center. Beginning in September, our environmental education activities for 40-50 kids became part of their regular weekly schedule.

Through our programs, we have been able to reach a wide range of age groups, including preschoolers. During March, April, and May, regular visits and special activities were planned for the kids at the Child Development Center. In June, a group of 30 youngsters came to the Visitor Center. Beginning in September, a group of 10 preschoolers met weekly at the Visitor Center.

The open curriculum of homeschool children provides a unique opportunity to offer a separate session to these kids for an eager and enthusiastic bunch of learners. Occasional field trips during the spring and summer became a weekly occurrence during the fall. About 12 kids took part in similar activities at the Saturday group.

Girl Scouts wanted help with badges and learning about Adak. Over 80 kids and adults came to the Visitor Center or went on a field trip to Palisades Beach.

3. Outdoor Classrooms - Teachers

The refuge provided environmental education materials to teachers. Items were distributed locally on Adak, and sent to Atka, Nikolski, and Unalaska schools. A joint agreement with the Izembek NWR Refuge Manager has made Akutan School the responsibility of their office, since that Native village is in the same school district as Cold Bay.

By advertising and promoting the Goose Calendar Contest, National Wildlife Week, and Sea Week, teachers often requested our assistance for curriculum materials and borrowed videos for classroom use.

ORP Greffenius met several times with teachers to get input into our programs, discuss their needs, plan and coordinate field trips, and discuss ideas for future plans.

5. Interpretive Tour Routes

Plans for the Clam Lagoon Auto Tour Route progressed considerably during 1992. Funding for this project originated under the "America the Beautiful" program, Legacy Funds from the Department of Navy, plus a Challenge Cost Share with matching funds coming from Ducks Unlimited and State of Alaska Department of Fish and Game.

In the spring, \$5,000 worth of treated lumber was ordered for building duck blinds and viewing platforms. In May, the lumber was transported from Homer at an economical cost (free!) by M/V Tiglax. During the summer and fall, MW Lewis, with assistance from Ducks Unlimited volunteers, built three viewing platforms and six duck blinds.

Each platform is equipped with a high powered scope. The platforms along the Clam Lagoon roadside are in strategic locations for optimum wildlife viewing. Unfortunately, the "weatherproof" scope at the Candlestick Bridge platform could not withstand high winds mixed with a dose of sand. The sand blasting turned the eyepiece glass opaque, and the scope had to be returned to the manufacturer.

Plans were finalized for the topics of the 11 Clam Lagoon interpretive panels and their locations. Proposals were written for each panel to detail the interpretive message, artwork, and graphics. Visual Information Specialist Patti Gallagher in the Regional Office was a tremendous help along each step of the process. Once these panels are installed, the drive around Clam Lagoon will be a highly informative and educational experience for all residents and visitors.

6. Interpretive Exhibits/Demonstrations

The 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 8th 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, ANHA bookstore and technical assistance are a welcome relief from military duties and provide insight into an unusual area of a unique state.

In June, we received an outstanding eagle display from local taxidermist Jack Hodnik. The diorama depicts an adult and immature bald eagle with wings flared, fighting over a pink salmon. The realistic scene has impressed many visitors. Mr. Hodnik's donation to our Visitor Center is greatly appreciated.

In September, local resident Gary Seib donated a mounted rainbow trout, which he caught in Hart Stream. It's another addition to our displays which visitors will certainly enjoy.

The front entry bulletin board is changed once or twice a month to include informative displays relevant to the season. It's a way for us to educate those entering and exiting about wildlife identification, hunting or fishing regulations, protected species, and an array of other pertinent topics.

Community events provide a great opportunity for the FWS to educate the public by setting up an exhibit booth. We participated in the Spring Fling, Memorial Day weekend, Fall Fest, and Christmas Bazaar festivities with a combination FWS display and ANHA sales booth. At each of these day-long events, we talk to and answer questions for several hundred people, many of whom had never been to the Fish and Wildlife Center.



Jack Hodnick, a local school teacher, prepared two excellent displays for our Wildlife Center. One with arctic fox and the other with bald eagles. (EVK)



Our interpretive displays, particularly the WWII exhibits, were enjoyed by many who came to Adak for the 50th Anniversary WWII Commemorative weekend during August.

7. Other Interpretive Programs

Interpretive and environmental education programs beyond Adak were supported. We donated a selection of natural history books to the Shemya Air Force Base library and to the Attu Coast Guard LORAN Station. Informational materials (i.e., brochures and posters) were sent to the Native villages and to the other military facilities (Amchitka, Shemya, and Attu). Goose posters and other goose literature were sent to Native villages and the military bases.

Here on Adak, we scheduled a variety of special evening programs at the Visitor Center, and spoke about the FWS at meetings of other community organizations. The following list summarizes the topics and the numbers who attended:

- Welcome Aboard - Refuge orientation for the Civilian Wives Club (9)
- Life on a Remote Aleutian Island: Population 2 (21 and 14; two groups)
- Aleutian Archaeology (19)
- Puffins (40)
- Oil and Wildlife (7)
- The Vanishing Steller Sea Lion: Why Are Their Populations Declining? (18)
- Sea Otters (13)
- Fly Fishing on Adak (14)
- WWII movies to VIPs of Maritime Defense Zone (MARDEZ)
- Kids Teach Adak - Parents' Night (50)
- Christmas Bird Count - Learn the Birds (16)

In April, ORP Greffenius went to Shemya on the Coast Guard flight for an overnight visit. An evening slide presentation there brought in 35 people and many questions. The residents of that remote Air Force base are very interested in our work and in finding out what we really do out here in the Aleutians.

Interpretive hikes offered by SCA Volunteers and local volunteer Cheri Hutchins were a great benefit to our programs. We announced these trips several times in the spring, during June, July, and August, and several times until November. Attendance averaged from 3 to 14 for wildflower identification, Palisades Beach intertidal explorations, bird watching, and longer hikes to Shagak Bay. These outdoor activities are appreciated by families and individuals who like exploring with a group of others and asking questions of their naturalist guide.

April Clean-up Day was a success. Sixteen participants assigned to different trails and popular roadside areas outside of town all pitched in to pick up litter.

8. Hunting

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

The Adak waterfowl and caribou hunts are monitored closely, given the high interest in the community. 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, provided transportation on a limited basis to hunters using the south side of the island. This support is vital to the refuge's ability to manage the caribou herd.

The 1991-92 caribou season ended on March 31st. A total of 198 animals was taken, and 403 permits were issued during that season. The 1992-92 season began on September 1st.

Pre-season publicity of regulations and visible LE patrols may have contributed to no waterfowl violations.

9. Fishing

Both commercial and sport fishing are important activities in the Aleutians. Salmon, halibut, black bass, and 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 shore. Adak saltwater fishing is usually from the breakwater, a private boat, or NSGA's Kuluk Clipper. Stream and lake fishermen 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. Because there was only one law enforcement person on the staff (ROS Klett), who was mostly in the field during the summertime, patrols could not be carried out as often as desired. The Navy commands continue to assist in managing the fishery by posting some streams for fly-fishing only or as closed.

National Fishing Week was recognized during June. We celebrated with a variety of information and education programs, including articles on fishing topics in Adak's weekly newspaper, fish movies for the Weekend Film series, bulletin board displays, compilation of a fish identification notebook, distribution of a kids' fishing activity and coloring book, and a fishing trip for the Nature Day Camp kids (preschoolers and Junior Naturalists).

The first red salmon were reported to be running in late June, one indicator of the beginning of summer and enthusiasm for outdoor activity!

10. Trapping

The fox trapping season was from November 10, 1991 to February 28, 1992. Free refuge permits were issued to 15 trappers on Adak during the year. A few of the participants invest a serious amount of time in trapping, but for the most part, it is recreational trapping.

11. Wildlife Observations

Adak's 26th annual Christmas Bird Count was held December 27th. Twenty observers participated and found 32 species. The success of this year's count can be contributed to an unusual winter day of partially sunny skies, calm winds, and mild temperatures! Noteworthy observations included tufted ducks and mew gulls. The all day event was concluded with a potluck at the refuge bunkhouse to tally the day's results. Alaska Natural History Association paid participants' 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" has 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

ORVs were not a problem this past year. No incidents were reported by NAS Security.

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.

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

ROS Klett attended the 40 hour Refuge Law Enforcement Officer refresher training session in Marana, Arizona in March. As in the past, while some speakers/topics left room for improvement, most speakers and the superior facilities made this a very worthwhile effort. All refuge officers underwent 12 hours of transition instruction in the proper use of the .40 caliber Smith and Wesson semiautomatic. ROS Klett received his new semiautomatic in June.

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, ORVs) 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.

The Navy's volunteer natural resource patrol, reestablished last year, was a great help to us. With an anticipated record salmon run, a proliferation of off-road vehicles and target shooting in unauthorized areas, one part-time refuge officer is stretched to monitor Adak's 5,000+ population for resource violations. We are pleased to have the help of these additional people. Training sessions for this group were provided by ROS Klett and State Trooper Curt Bedingfield, Kodiak, AK. These volunteers made hundreds of field contacts, which kept violations from occurring.

Routine law enforcement patrols included trips to Shagak Bay, Finger Bay, Lake Andrew and Clam Lagoon checking caribou/duck hunters and fishermen. Two citations were issued.

During February, March, September, and October, ROS Klett 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 hunter success.

Weekend checks of waterfowl hunters occurred after the season opened on October 8th. Pre-season publicity of license, duck stamp, and steel shot requirements plus visible patrols contributed to compliance with these regulations.

ROS Klett was detailed to Yukon Delta NWR, Bethel, Alaska for the period April 26-May 8 to assist in manning a law enforcement camp between the Native villages of Chefnak and Nightmute. Our primary duty was to contact all spring waterfowl hunters we encountered in the immediate area for compliance with the Yukon Delta Goose Management Plan and specifically the taking of emperor geese. The natives in the Delta were not pleased at having the camp in operation. The day we were scheduled to fly into Chefnak, the Bethel office received word from the village elders that if or when the plane arrived, they would not allow anyone or any supplies or equipment to be unloaded. This standoff, plus information provided by spring emperor goose survey flights (entire area adjacent to our proposed camp site was still iced in and no emperors were present), caused the postponement of the law enforcement effort into the second week of May. ROS Klett departed Bethel on April 30 for Adak.

RM Boone assisted the Service Law Enforcement Division with the February "ivory for drugs" takedown in Anchorage. Firsthand experience was received in serving search warrants and searching outbuildings for contraband.

18. Cooperating Associations

The Adak Branch of the Alaska Natural History Association had a very successful and productive year. Gross revenue for FY92 totalled \$39,100, an increase of \$9,000 from the previous fiscal year.

Since the beginning of 1992, we expanded the Visitor Center hours to include weekends, increased the number of special programs in the evenings and on weekends, had booths at community fairs, and publicized the ANHA sales outlet in Adak's weekly newspaper. Our Volunteer program also expanded to include local people who assist us part-time and interns who work for three to four months. In addition, our Fish and Wildlife staff helped out countless hours at the front counter, answering questions and making sales. All of these factors have benefitted this outlet tremendously by contributing to increased ANHA sales.

In a military community such as Adak, there are few places to purchase natural history books and other related items. Our ANHA sales outlet is a highly welcomed part of the community. Cooperating association sales increase visitors' appreciation of the refuge and their understanding of conservation issues.

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.

ATs Wheeler and Jones, plus CT Bradford, all provided enthusiasm and helpfulness at the front counter, which contributed greatly to a smooth running ANHA operation throughout the year.

During 1992, we expanded our inventory to include new items, and restocked items which had not been reordered for quite some time. The book, The Aleutians, fortunately is now back in print, as this title naturally sells very well here. The Adak Map and Outdoor Recreation Guide was updated and revised to improve its accuracy, as this is the only topographic map available to island residents. We are also stocking more T-shirt designs, which are always a popular seller.

During FY92, over 90% of the ANHA budget was spent on educational expenses. About half of these expenses went towards funding Student Conservation Association (SCA) Volunteers with matching funds from the U.S. Fish and Wildlife Service. SCA interns conduct environmental education programs, perform overall support tasks for our information and education services, and are a great help handling ANHA sales and stocking inventory. The SCA program is highly beneficial to our operations, and with inevitable government cutbacks, we will continue to use ANHA funds to bring SCA Volunteers here.

Additional educational expenses were used to purchase numerous library books, including environmental education materials. Also, we bought new videos to provide more variety for our weekend film series. Donations of ANHA items were sent to schools in Aleutian Native villages, given to the local library and schools, sent to personnel on other military bases in the Aleutians, and many items were given as appreciation gifts to the numerous Volunteers who contribute their time and effort to our biology and education programs.

As the Adak Branch continued to grow, it became apparent that assistance in managing the sales outlet operations was increasingly needed. In October, we hired a part-time Information Clerk II, Lisa Scharf. Her artistic talents, managerial skills, and friendly nature while talking with customers are great assets to our ANHA operations.

Also in October, ANHA hired a local high school senior, Dan Smullen, as a Student Trainee. As part of an on-the-job training program, Dan works two hours after school each day. He helps out all staff members, doing a diversity of tasks, and with his friendly nature, he is a real pleasure to have around the office.

During this year, we realized the potential for more growth in Adak's ANHA Branch, providing the impetus for many new projects. A source of money via the Department of Navy's Legacy Funds became available to us. These funds are to be used for projects pertaining to natural, historical, and cultural resources on naval facilities. An amount of \$10,000 was transferred to the ANHA Central Office, with many exciting possibilities. Since we receive many requests for a book specifically about Adak, preliminary work was underway late in 1992 to plan and develop such a unique publication.

I. EQUIPMENT AND FACILITIES

1. New Construction

This year's maintenance projects included the design, construction and installation of four (4) 6'x12' viewing platforms at Clam Lagoon as part of the new self-guiding auto tour route. Eleven (11) interpretive signs will also be permanently mounted along the route. This project should be completed by late next summer.

After designing the platforms MW Lewis ordered the treated lumber and other building materials from Homer, AK, to be delivered by FWS M/V Tiglax on its spring stop at Adak.

The platforms were constructed in the carpenter shop then hauled out to each of the sites where the Refuge's front-end loader was used to set them in place.

Working with Ducks Unlimited, six (6) duck blinds were prefabricated at the Refuge and hauled to Clam Lagoon for installation at various locations.

To facilitate maintenance of the Refuge's outboard motors, MW Lewis constructed a new test tank which enables higher rpm-load tests in the shop before sending them to the nearest harbor for bay tests, this tank also takes up less space in the auto shop.

The Headquarter's Library acquired a new look with the construction of a free-standing wall-length desks with hanging bookshelves above, enabling more efficient use of the Library by our volunteers and Refuge staff. The materials were acquired through the Navy Self-Help program costing the Refuge only labor.

A forty-gallon water tank was built to support summer field personnel on Buldir Island. The crew now spends fewer hours collecting water and enjoys running water in the field cabin.

2. Rehabilitation

The Dodge pickup on Amchitka seems to be going through quite a few parts -- starter, alternator solenoid, windshield wiper motor, headlamps, etc. This might have something to do with the sea otter research folks backing it into the ocean while launching a boat.

With parts from Navy Exchange and help from the maintenance group of Amchitka this truck will live on...barely.

3. Major Maintenance

The Refuge's JCB front-end loader received new injectors, hydraulic hoses, front arm hydraulic seals and battery and then was put back into service.

The Headquarters furnace received a replacement circulation pump and bearings on the air handler motor.

The hot water heater in Quarters #1 sprung a leak, flooding the kitchen, the day that MW Lewis was scheduled to fly to Seward, AK to participate in watercraft instructor training. A temporary fix, by switching the hot water heater with the one from Quarters #5B, was performed until a replacement arrived on Island.

The Refuge's Bunkhouse garbage disposal wiring acquired a short, the problem was located and new wiring was spliced in.

All the Refuge vehicles received their scheduled tune-up/maintenance and the rear wheel bearings were replaced on the Jeep Cherokee; steering coupler on the Dodge pick-up; and new tires were put on the Jeep Cherokee and the Chevy Blazer.

4. Equipment Utilization and Replacement

The home office, Homer, AK transported their twenty-five foot Boston Whaler (Frontier Model) to us in May via the M/V Tiglax. The boat was cleaned from bow to stern, 120hp Johnson engines remounted, and new installations included a new charging system, a 35amp alternator system (replacing the 3-9amp alternator) enabling full equipment usage even if one of the engines goes down and radar.

The boat was then put in use, covering over 1,000 miles around Adak and other islands to the east during the summer.

5. Communications Systems

Tim Miller, Region 7 Telecommunication Manager, installed and programmed a Trillium Panther 1032 system at Refuge Headquarters giving us access to FTS 2000. All the Staff was very appreciative of the new phone system.

New computer desks were assembled at Refuge Headquarters. The Refuge also received new laser printers which were quickly put into operation.

A new fire alarm system box was installed by the Navy's Alarm Shop.



The FWS vessel Chuchiigix being delivered to Adak. (EVK)

J. OTHER ITEMS

1. Cooperative Programs

A right-of-way permit was issued by our Regional Realty Office for a microwave repeater site on Sedanka Island, in the eastern Aleutians. The facility was requested by GCI Communication Corporation to establish a reliable communication link between a Marco Alaska Management fish processing vessel in Udagak Bay, Unalaska Island, and the Interior Telephone Company office in Unalaska. ROS Klett and WB Byrd reviewed the application and provided information to complete a statement of compliance and a section 7 evaluation of the site.

ROS Klett served as a member of the WWII Commemorative Committee for Adak Naval Air Station. Commemoration activities included the establishment of a WWII era tent city, conducted tours of historic sites facilities, formal dedications of the restored WWII chapel and the newly renovated museum, and a banquet with Rear Admiral James Russell (retired) as guest speaker. Admiral Russell was commander of the first PBV squadron stationed on Adak in 1943.

3. Items of Interest

In late March, 1991, we were contacted by Mr. Jack Hodnik, local school teacher and taxidermist, regarding the mounting of an adult and immature bald eagle for display in the Visitor Center. We agreed, as he had previously mounted two arctic fox for display and did a fine job. The completed project was delivered in June, a very fine piece of work. Now we just need a place to properly display it.

The AIU became operational once more with the loan of AMNWR's 25-foot Boston Whaler, the Chuchiigix. The vessel was shipped out from Homer on the M/V Tiglax and was immediately checked out, serviced, and put to work on nearby seabird surveys and our fox trapping program.

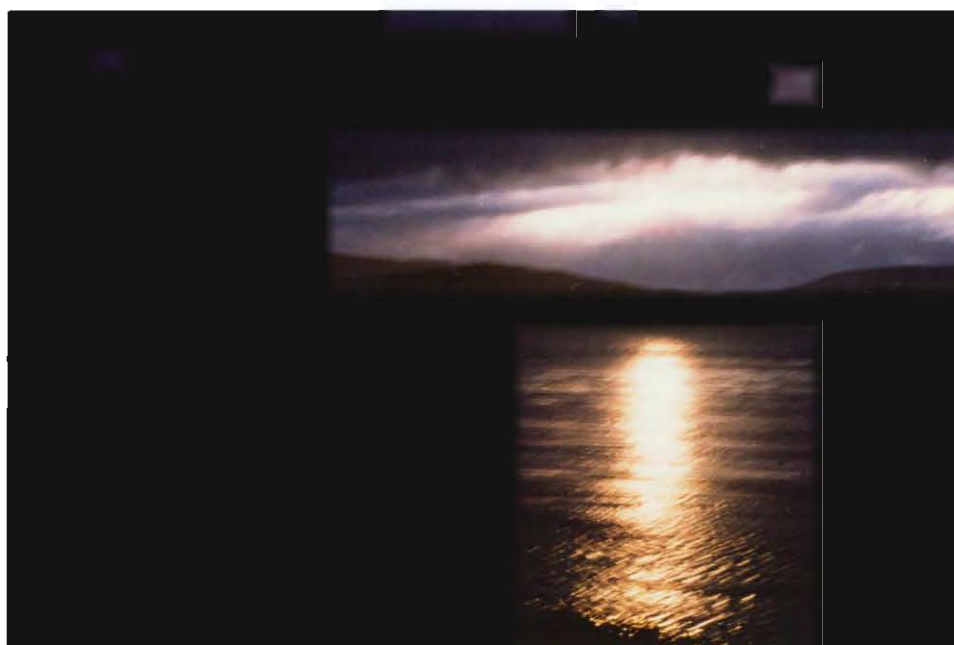
The AMNWR had the privilege of hosting two very pleasant volunteers during June: Mr. John Hanes (a member of the Hanes Underwear family) and his wife Kiku. Mr. Hanes is a past member of the Student Conservation Association Board of Directors, and both are involved with several environmental conservation organizations. These wonderful people spent two weeks in the Aleutians and were a joy to work with. They quickly became experts in Zodiac travel and the collection of sea lion scat.

4. Credits

The 1992 Narrative Report was authored by the following:

- Introduction: Dan Boone
- A. Highlights: Van Klett
- B. Climatic Conditions: Van Klett
- D. Planning: Dan Boone and Jeff Williams (Section 5)
- E. Administration: Dan Boone and Van Klett (Section 6)
- F. Habitat Management: Van Klett
- G. Wildlife: Jeff Williams
- H. Public Use: Laura Greffenius and Van Klett (Section 17)
- I. Equipment and Facilities: Jeff Lewis
- J. Other Items: Van Klett

Word processing, computer entry, and collating of text was accomplished by Mel Bradford and Debbie Jones. Final editing was provided by Daniel Boone.



As the sun slowly sets over Kiska Harbor, we bid a fond
farewell to the Aleutians for another year... (EVK)

BERING SEA UNIT
ALASKA MARITIME NATIONAL WILDLIFE REFUGE
Homer, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1992

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

INTRODUCTION

Bering Sea Unit

Alaska Maritime National Wildlife Refuge

The Alaska Maritime National Wildlife Refuge was created by the Alaska National Interest Lands Conservation Act (ANILCA) in 1980. The purposes for which it was established were: 1) to conserve fish and wildlife populations and habitats in their natural diversity; 2) fulfill international fish and wildlife treaty obligations; 3) provide opportunities for continued subsistence uses by local residents; 4) provide a program of national and international scientific research on marine resources; and 5) 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 along most of the coast of Alaska and extends from Forrester Island in Southeast Alaska along the Gulf of Alaska to the end of the Aleutian Islands and northward to the Icy Cape area southwest of 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 is divided into five units which include all former refuges and some other federal lands/waters within those designated units.

The Bering Sea Unit extends over 600 miles and comprises about 1.4 million acres. It includes far-flung islands and headlands between the Aleutian Islands and the Bering Strait. The topography within this unit varies from small sandy islands to large volcanic islands. These areas provide habitat for nesting seabirds, as well as haul-out and rookery areas for marine mammals. This unit is divided into five different groups: 1) Hagemeister Island; 2) Pribilof Islands; 3) St. Matthew Island group; 4) Sand Islands; and 5) the Norton Sound islands and capes.

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- Received Challenge Grant for rat prevention. (Sec. F.10)
- Pribilof Nature Camp funded through Challenge Grant.
(Sec. H.1)

B. CLIMATIC CONDITIONS

Month	Avg Temp (°F)	Min Temp (°F)	Max Temp (°F)	Precip. (inches)	Precip Dev. (inches)
JAN	24.6	18.8	30.4	1.18	-0.60
FEB	25.1	21.3	28.9	1.81	+0.53
MAR	20.7	15.5	25.9	1.05	-0.21
APR	27.8	23.1	32.5	0.08	-1.13
MAY	33.5	28.0	39.0	0.88	-0.35
JUN	42.4	37.6	47.1	2.51	+1.27
JUL	45.8	41.5	50.1	2.80	+0.78
AUG	47.7	43.8	51.6	5.12	+2.05
SEP	42.2	36.4	48.0	3.50	+0.98
OCT	37.3	33.9	40.6	2.89	+0.04
NOV	30.9	26.8	35.0	2.51	+0.02
DEC	27.0	22.7	31.3	2.72	+0.96

D. PLANNING

6. Other

On March 6, RM Martin met with Steve Zimmerman and Brad Hansen of the National Marine Fisheries Service to discuss changes to the Memorandum of Understanding (MOU) on joint programs on the Pribilof Islands. For some reason or another, the Refuge has not been an official member of the Joint Management Board regarding the Pribilofs. RM Martin was concerned about this since the refuge had some major concerns about what kind of activities occurred on and around the Pribilofs and how those activities affected the seabirds on and around the islands.

The City of St. George and Tanaq Corporation informed Bering Sea Unit's WB Art Sowls that it was planning to build new roads, a new hotel, and visitor trails, etc., in anticipation of a tourist boom at St. George Island. A new airport is nearing completion and a harbor was opened just two years ago. Located near the airport, a major seabird colony of about 2.5 million birds, has had only approximately 50 tourists per year. The planned developments could greatly affect visitation of refuge lands on the island. These changes will challenge our monitoring and interpretive programs.

E. ADMINISTRATION

2. Youth Programs

The City of St. Paul selected three high school students to work with the Service on the refuge's seabird monitoring studies on St. Paul. This project was funded through the Challenge Grant program.

F. HABITAT MANAGEMENT

10. Pest Control

Due to WB Sowls excellent proposal, the Refuge received a

challenge grant to train Pribilovians in techniques for rat introduction prevention and control in cooperation with the Dept. of Agriculture's Animal Damage Control. With new harbors having recently been built at both St. George and St. Paul Islands, the danger of rat infestation is very real. Rats could decimate seabird populations, transmit diseases to fur seals and other marine mammals, and effect endemic small mammal, such as the Pribilof shrew. The Pribilof shrew is only found on St. Paul Island and nowhere else. The Pribilofs have about 3 million nesting seabirds and over 800,000 northern fur seals. They are some of the most important islands in the northern hemisphere for wildlife, especially seabirds and marine mammals.



Animal Damage Control agent Paul O'Neil gives a lecture to students on the dangers of rat infestation to the Pribilof Islands as part of a workshop conducted by the refuge. (AS)

G. WILDLIFE

5. Shorebirds, Gulls, Terns and Allied Species

Seabird Surveys in the Pribilofs

WB Sowls, BT Climo, and BT Dragoo met with Ian Jones, a noted

researcher on auklets, and Fowler, Irons and Mendenhall of Migratory Bird Management (MBM) to coordinate auklet study methods. This year we will begin a color banding effort to get survival data on auklets at St. Paul and St. George Islands. Pribilof SCA volunteers Melisa Sanders and Kent Sundseth arrived in Homer for training and departed with the rest of our crew for the Pribilof Islands on June 1. BT Belinda Dragoo began a GS-6 appointment and led the St. George crew.



SCA volunteer Kent Sundseth helped band Pribilof red-legged kittiwakes. (AS)

WB Art Sows and camp leaders BT Lisa Climo and BT Belinda Dragoo departed for field camps on the Pribilof Islands on June 1st. They trained SCA volunteers Jean Kutty, Kent Sundseth, and Melisa Sanders and set up camps at St. Paul and St. George to monitor seabirds. The objectives during the summer of 1992 were: 1) to survey population and productivity index plots for kittiwakes and murres; 2) to band kittiwakes and auklets for adult survival rate studies; and 3) to

incorporate local Aleut young people into the monitoring program as biological assistants (at St. Paul).

Regular monitoring of cliff-nesting seabirds proceeded well, with routine observations of a total of 47 red-faced cormorant nests, 644 black-legged and 305 red-legged kittiwake nests; 527 thick-billed and 251 common murre sites.



Birds and nests were counted several times on large cliff face plots in 1992 for monitoring population changes. This one is on St. George Island. (AS)

It appeared that 1992 was an "early" year phenologically, with a few kittiwake eggs already laid by the time of our arrival. The first thick-billed murre eggs were seen as early as June 5. A high percentage of the kittiwakes appeared to be nesting with the black-legged kittiwakes having mostly 2-egg clutches. This indicated productivity could be above average, if there was sufficient food to raise chicks.

The young people who worked with FWS biologists were enthusiastic and learned to make systematic observations quickly. At St. Paul we worked with high school students as part of a challenge grant proposal. By the end of the June,

both students were working completely independent on some days.

Out of 28 red-legged kittiwakes banded last summer, 23 were re-sighted in June on St. George Island. This indicated a minimum survival rate of 85%. An additional 27 red-legged and 6 black-legged kittiwakes were banded at St. George.

At St. Paul, a lot of emphasis was place on re-sighting of color-banded least auklets for survival data in June. Of 238 least auklets banded in 1988 and 1989, 91 re-sightings had already been made by the end of June. These data suggested a much higher survival rate than the 75% cited in the literature for least auklets.

In August, BT Climo, B. Dragoo and SCA volunteers returned from St. Paul and St. George Island after a full field season of seabird monitoring. At St. Paul both black and red-legged kittiwakes had a poor reproductive year. At St. George both kittiwake species did moderately well. Murres at both islands had about average reproductive success. Counts of seabird populations were successfully completed on both islands for the first time since 1989.

On August 31, SWB Byrd and WB Sowls met with Russian scientists Dr. Alexander Golovkin and Dr. Mikle Flint, who conducted oceanographic and seabird investigations around the Pribilof Islands this summer. Options for a cooperative joint publication and future field activities were discussed.

July is the beginning of the fog season in southwest Alaska, and it lived up to its billing in 1992. BT Belinda Dragoo and her crew had a terrible time trying to survey population index plots at higher elevations on St. George, but due to hard work and persistence they had been able to get 3 replicate counts in all areas but one by the end of the month. At St. Paul, BT Climo and her crew, also fought the fog, but plots were at lower elevations on this island, so the crew was able to get at least 5 replicates. The target for both islands was 5-7 replicate counts so that we could confidently (90%) detect changes in numbers of murres and kittiwakes, as small as 20% between years.



Thick-billed murres. (AS)

WB Sowls worked on St. Matthew data from 1991 and Cape Lisburne data from 1992.

BT Climo and BT Dragoo summarized data from 1992 seabird work in the Pribilofs.

Bio-Tech B. Dragoo finished a draft of the St. George Island seabird monitoring report. Population levels of thick-billed murres, black-legged and red-legged kittiwakes appear to be stabilizing at a lower level after some disturbing declines since 1976. Common murre populations appear to have remained relatively stable and northern fulmars may be increasing in numbers.



Northern fulmars, a species related to albatross, appear to be increasing in numbers on the Pribilof Islands.

Bio-Tech Climo finished a draft of the St. Paul Island seabird monitoring report. Like at St. George, population levels of species, other than northern fulmars, are lower than levels in the mid-1970's.

DRM Blenden discussed raven depredations on nesting seabirds in the Pribilofs with Larry Mercurief. The city of St. Paul is concerned that the few ravens on the island are making significant in-roads in the seabird populations. The refuge agreed that they were undoubtedly eating young seabirds and their eggs, but there was doubt as to their significant impact on seabird populations, at least to this point in time.

H. PUBLIC USE

1. General

Outdoor Recreation Planner (ORP) Matthews coordinated preparation for the Pribilof Islands nature day camp. Meetings of the Camp Advisory Committee established needs, concerns, and solutions to creating a project like this for

the first time. Bill Noomah was hired as the Service Coordinator and Pachee Malanvansky was hired by the Traditional Council as the Islands Coordinator. ORP Matthews and Noomah made a pre-planning trip to both St. Paul and St. George to meet the Island Coordinator, establish other local contacts, check on facilities and arrangements, and settle last minute details.

The first Pribilof Islands nature day camp started on St. George Island on July 5 when Homer teacher Bill Noomah arrived on St. George with his wife Wendy and daughter Clara (18 months). The family settled into island life and all three helped conduct daily activities for 10 to 12 children. A Campfire Program was simultaneously going on, so the two were combined to produce a well-rounded presentation of nature and recreation to very enthusiastic kids. The Noomahs then moved over to St. Paul Island and had just as much success with the 30 kids who attended camp on St. Paul Island for the last two weeks of July.

The camp started July 5th on St. George and ran through July 17. It then ran from July 20-31 on St. Paul. Television channel CNN did a story on the camp, as well as seabird scientific research being conducted on the islands.

CHUKCHI SEA UNIT
ALASKA MARITIME NATIONAL WILDLIFE REFUGE
Homer, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1992

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 murrens 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. Other terrestrial mammals that occur in the unit include grizzly bear, musk ox, wolverine, marmot, moose, Dall sheep and caribou. Thousands of caribou from the Western Arctic Caribou Herd congregate near Cape Lisburne and Cape Thompson in a summer post-calving aggregation.

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K. FEEDBACK

A. HIGHLIGHTS

- Radioactive wastes found on refuge lands at Cape Thompson. (Section D.4)
- Seabird monitoring done at Cape Lisburne, for the first time since 1987. (Section G.5)
- Regional Office biologists continue seabird monitoring program on Little Diomed Island. (Section G.5)

B. CLIMATIC CONDITIONS

Data from the National Weather Service at Kotzebue probably best represents weather conditions for the Chukchi Unit. In 1992 there were average monthly air temperatures were colder than average for nine months, at the average for one, and only warmer for two.

Table 1. Temperatures at Kotzebue in 1992.

<u>Month</u>	<u>Average Temp. ($^{\circ}$F)</u>	<u>Departure from Average ($^{\circ}$F)</u>
Jan	1.2	4.2
Feb	-8.7	-2.6
Mar	-4.9	-4.3
Apr	9.3	-3.0
May	23.2	-8.4
Jun	43.8	.0
Jul	57.6	4.7
Aug	49.9	-2.0
Sep	32.3	-9.7
Oct	18.8	-4.0
Nov	6.5	-1.3
Dec	-4.1	-3.2

E. ADMINISTRATION

1. Personnel

{See Homer office section}

5. Funding

{See Homer office section}

F. Habitat Management

6. Other Habitats



Refuge lands surrounds Cape Lisburne U.S. Air Force base. The base once held 110-120 people; now there are only 7-10 permanent employee's.

The Cape Lisburne subunit of the refuge surrounds the U.S. Air Force (USAF) 711th Aircraft and Control Warning Squadron radar installation and associated airstrip. Just a few kilometers

west of the airstrip there is an Air Force quarry site that is just inside the Refuge boundary and is just a few kilometers from the start of the seabird nesting cliffs. Blasting activities are conducted to obtain rip rap to help repair the surf-damaged, eroding USAF runway. In 1992, permit compliance of the U.S. Army Corps of Engineers (USACE) blasting activities at the quarry site and disturbance to seabirds near the eastern terminus of the colony were monitored. Also observation of the effects of aircraft activities near the nesting cliffs were observed.



The Air Force maintains a quarry located just inside refuge boundaries. Riprap rock is used to maintain the airport runway which is constantly eroding into the sea. (AS)

The USAF has complied with refuge permit conditions by: 1) relocating all quarry activities to the extreme east end of the cliff area; 2) removing previous haul roads from west of the quarry site and restoring the beach to its approximate previous contour; 3) surveying and marking the USAF/Refuge boundary; and 4) limiting blast size to minimize disturbance.

Observations of the two blasts done in 1992 showed that many seabirds were flushed from the cliffs, but almost all were

non-breeding birds or off-duty mates not on nest sites. Still, some egg loss of murres can be contributed to the quarry activities. Populations of murres, the species most likely to be effected by the blasting, have shown population increases on plots set-up to monitor quarry activities in 1987. Aircraft were also observed to flush birds from cliffs, but to a far lesser degree than quarry activities. Additional permit restrictions are being considered for the 1993 permit.

Approval for a Cape Lisburne seabird monitoring project in cooperation with the Minerals Management Service was finally received and preparations were hastily made to do the work. WB Sowls worked with volunteers Dave Roseneau and Lyn Denlinger to gather information on seabird population trends and disturbance of aircraft and quarry blasting activities at Cape Lisburne. Field gear was delivered to the U.S. Air Force (USAF) at Elmendorf AFB for transport to Cape Lisburne. The USAF cooperation of transport of field gear saved hundreds of dollars in air freight costs.

G. WILDLIFE

5. Shorebirds, Gulls, Terns and Allied Species

Refuge staff conducted seabird monitoring at Cape Lisburne between July 16 and August 12, 1992. Species monitored were thick-billed murres (Uria lomvia), common murres (U. aalge) and black-legged kittiwakes (Rissa tridactyla). Seabird populations at Cape Thompson have been monitored intermittently since 1976, comprising one of the oldest quantitative data sets on seabirds in Alaska. Cape Lisburne had not been monitored since 1987, and 1992 represented the twelfth year data were collected. Fourteen boat plots first established in 1976 were counted for monitoring long-term population changes. An additional eight land plots, established in 1987 to monitor quarry blasting effects on seabirds from a nearby quarry site of the U.S. Air Force, were also counted and an additional six new land plots were established.



A parasitic jaeger scavenges on a dead murre below the cliffs of Cape Lisburne. Large numbers of all three species of jaeger migrate to Cape Lisburne.

A seabird monitoring program was continued in 1992 on Little Diomed Island by biologist Ada Fowler of the FWS Region 7 Office, Migratory Birds Division. Although Little Diomed is not part of the Alaska Maritime Refuge, seabird monitoring efforts here are valuable to the Refuge in contributing to our knowledge of Bering/Chukchi Sea ecosystem dynamics, and for comparisons with sites being monitored within the refuge.

Species being monitored on Little Diomed included least and crested auklets (*Aethia pusilla* and *A. cristatella*), black-legged kittiwakes, and common and thick-billed murres. In addition to establishing population and productivity monitoring plots for the above species, population counts of all seabirds on Little Diomed Island and Fairway Rock were conducted from a boat.

Cape Lisburne Black-legged Kittiwakes

Populations. At Cape Lisburne, on Census Plots 65, 66, 70,

and 72, historical information shows numbers of birds rose from 867 in 1977 to 978 in 1979 (+11%). In 1981, only 597 individuals were counted on the same plots, but in 1983, 1985, and 1986, numbers jumped to 1,044, 1,176 and 1,553 birds, respectively (+33% over the four year interval, +28% between 1977-1979 and 1983-1986 mean values, and +44% from 1977 to 1986). Only 784 individuals were present on these same plots in 1992 (10% below 1977 numbers and 51% below 1987 numbers). However, data still suggest kittiwakes may have increased at the colony after 1981 (excluding 1981 data, the trend remains significant; Table 6, $r^2 = 0.54$, $p < 0.05$ —compared to $r^2 = 0.78$, $p < 0.01$ in 1987). Nests were not counted on Census Plots 65, 66, 70, and 72 in 1992 because of weather and time constraints. However, historical data indicate numbers of nests decreased on the same plots from 847 to 543 during 1977-1981 (-36%), then increased to 899 by 1986 (only +6%), and then declined again to 643 in 1987 (-24% below the 1977 number). On Census Plots 74-76, where nests were counted in 1992, numbers increased from 174 structures to 354 structures between 1976 and 1987 (+51%), and then declined slightly to 334 nests in 1992 (+48% since 1976, but -6% compared to 1987 numbers).

Productivity: The contents of 101 black-legged kittiwake nests were checked on 16 July, and no eggs had started to hatch. However, on 20 July, when 156 nests were examined, including all of the structures visited four days earlier, 3 newly hatched chicks, and 161 unpipped eggs were present. Forty-six small chicks and 94 eggs were found when 156 nests were checked at the same plots on 25 July, and 42 chicks and 31 eggs were found in 125 nests on 1 August. These data indicate hatching began about 19-20 July and peaked about 30-31 July.

Reproductive success of kittiwakes was poor in 1992. Just before hatching started about 19-20 July, nests contained about 1.1 ($n = 156$) and 1.3 ($n = 130$) eggs per nest and successful nest, respectively (see Table 7). However, by 8 August when hatching was estimated to be about 48% complete, nest contents had declined to about 0.3 ($n = 155$) and 1.0 ($n = 46$) eggs/chicks per nest and successful nest, respectively, and estimated productivity based on the number of live chicks in the nests was only 0.2 ($n = 155$) and 1.1 ($n = 25$) eggs/chicks per nest and successful nest, respectively.



Black-legged kittiwakes had very poor reproduction in 1992, probably due to lack of food. (AS)



Arctic cod are an important prey for Cape Lisburnes seabirds. Unusual water temperature patterns may have kept them away from Cape Lisburne in 1992 and caused poor reproductive success of kittiwakes. (AS)

Lack of food appears to have been a problem for kittiwakes in 1992. Of the ten kittiwake collected 3 were completely empty and the rest only had small amounts of arctic cod, polychaetes, crab, euphausids, or unidentified fish. Also green dropping were seen around kittiwake nest sites which indicates food stress.

Murres - Numbers rose from 15,675 to 25,858 individuals on a 12 common plot counted during 1977-1987 (+39%), and from 14,100 to 23,428 birds on a 10-plot subset of the same plots counted during 1976-1987 (+40%), and then declined to 24,884 (-4 %) and 22,112 (-4%) birds, respectively, in the same sample areas by 1992. These data indicate the combined population of common and thick-billed murres increased at the colony between the late 1970's and the early 1990's (see Figure __). Despite the majority of census data still consisting of only single counts of birds, the trend shown in Figure 12 has become highly significant with the addition of 1992 data (Table 4, $r^2 = 0.75$, $p < 0.01$ compared to $r^2 = 0.66$, $p < 0.05$ in 1987).

Of 19 thick-billed murres collected 6 had empty stomachs, the rest had one or more food items consisting of: arctic cod (4), sculpin (1), euphausids (6) and unidentified fish (3).

6. Raptors

For the first time in the twelve years of monitoring at Cape Lisburne, a pair of apparently nesting peregrine falcons (Falco peregrinus) were observed. A pair of defensive adults, were seen on First Beach several times. On July 25, the male was flying above the beach and the female was seen laying down with only her head showing on a grassy ledge about one-third of the way down the cliff, where both were "kekking." The mute-stained ledge and behavior suggested they were attempting to nest. On August 12, a recently fledged young falcon was observed near the runway, suggesting that the peregrines may have successfully fledged a young bird.

14. Scientific Collections

Refuge staff collected 19 thick-billed murres, 10 common

murre and 10 black-legged kittiwakes at Cape Lisburne for food habits studies.

H. PUBLIC USE

Table 2. *Special use permits issued, 1992.*

<u>Permittee</u>	<u>Location</u>	<u>Purpose</u>
Phil Driver	Cape Thompson/Lisburne	Guiding - Big Game Hunting

8. Hunting

Hunting guide Phil Driver was issued a permit in 1992 for hunting on Cape Thompson and Cape Lisburne refuge lands.

J. OTHER ITEMS

4. Credits

This report was written and typed by Art Sowls and Gary Montoya. It was edited by Vernon Byrd.

GULF OF ALASKA UNIT
ALASKA MARITIME NATIONAL WILDLIFE REFUGE
Homer, Alaska

ANNUAL NARRATIVE REPORT
Calendar Year 1992

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

INTRODUCTION

Gulf of Alaska Unit
Alaska Maritime National Wildlife Refuge

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 is the only one which supports forest habitat on the Maritime Refuge. Spruce-hemlock forests are the dominant plant community on nearly all the islands outside of 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. Submerged lands under the jurisdiction of the refuge also occur around Afognak and some waters of Kodiak Island.

Seabird colonies in this unit are probably the most visited of any in the State. Unlike most other 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.

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H. PUBLIC USE

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

I. EQUIPMENT AND FACILITIES

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

J. OTHER ITEMS

1. Cooperative Programs.....Nothing to report
2. Other Economic Uses.....Nothing to report

3. Items of Interest.....Nothing to report
4. Credit.....GAU-8

K. FEEDBACK

A. HIGHLIGHTS

- Wildlife Biologist Mike Nishimoto transferred to the Midway Atoll National Wildlife Refuge.
- Wildlife Biologist Leslie Slater enters on duty on November 15, 1992.

B. CLIMATIC CONDITIONS

Because of the widespread nature of the Gulf of Alaska Unit, which stretches over five degrees of longitude and 18 degrees of latitude, it is difficult to state specific weather conditions for a given site. Weather conditions will be described below when they are pertinent to the discussion of a specific topic.

D. PLANNING4. Compliance with Environmental and Cultural Resource Mandates

Western Alaska Ecological Services personnel were involved with two permit requests on the Gulf of Alaska Unit. One dealt with a modification of a permit to place a seawater intake line and pump in Gibson Cove, near Kodiak. An existing fisheries reduction plant (owned by Kodiak Reduction, Incorporated) was being moved, and therefore, required rerouting of the pipe currently in use.

The second permit involved the relocation of a structure. The Lash Corporation was interested in removing an existing pile-supported dock which had, over the years, provided protection to juvenile red king crab. The permittee proposed that the replacement dock be constructed of fill which would not provide protection needed by the crabs. The most recent word on this proposal was that it was not being pursued due to financial constraints.

5. Research and Investigations

AMNWR GAU-9201- "Seabird Population Monitoring, Middleton Island, Alaska, Summer 1992"

Personnel of the Alaska Fish and Wildlife Research Center (AFWRC) conducted studies of seabirds on Middleton Island during April-July 1992. Those participating in the project included Scott Hatch (Project Leader), Bay Roberts (Wildlife Biologist), Jennifer Gervais (Biological Technician), and five volunteers, Phyllis Benham, Verena Day, Herb Benham, Robert Day, and Aimee Boulanger.

The objectives of the field work on Middleton were: 1) to estimate the annual survival rate of banded black-legged kittiwakes; 2) to census the populations of kittiwakes, common and thick-billed murres, pelagic cormorants, and rhinoceros auklets; 3) to quantify the nest attendance patterns and breeding phenology of glaucous-winged gulls; and 4) to assess the productivity of kittiwakes and cormorants in 1992.

Objectives 1, 2, and 3 were accomplished during an extended visit to the island from 4 May through 20 June. Resighting of banded kittiwakes indicated an over-winter survival rate of approximately 93% (the final estimate has not yet been computed). This was similar to the survival rates observed in the previous four years. Gull laying chronology and nest attendance were monitored with observations made every other day from mid-May through mid-June. Island-wide populations of cormorants, kittiwakes, and murres were censused between 15-20 June and replicate counts of all three species on index plots were made concurrently with the whole-island census to provide a comparative dataset using these alternative methods. The population of rhinoceros auklets seems to have increased substantially in recent years; the number of burrow entrances in one subcolony increased from fewer than 50 to more than 900 between 1978 and 1992.

A brief visit to the island was made on 29-30 July to assess the productivity of cormorants and kittiwakes. Of particular interest was the total failure of black-legged kittiwakes to raise young in 1992, which continues a pattern of chronic failure by kittiwakes at this site. Kittiwakes have now had

total or near-total failure in eight of the last ten years on Middleton (mean productivity of 0.156 young/nest in 13 years since 1978).

AMNWR GAU-9202 - "Concurrent Surveys of Prey Abundance and Piscivorous Seabirds in Lower Cook Inlet"

In a study funded in part by the Minerals Management Service, staff from the Alaska Fish and Wildlife Research Center, Anchorage, conducted surveys of marine birds in lower Cook Inlet. Surveys for seabirds and their prey (using hydro-acoustics) were conducted from the *M/V Tiglax* between 10-15 July. Personnel for this survey included Alexander Kitaiskiy, Matt Corbett, Thomas Van Pelt, Laird Henkel, Verena Day, Stephanie Bergenthal, John Piatt (Project Leader), Martha Brown, Breck Tyler, and Jay Pitocchelli. Owing to persistent good weather, they were able to survey continuously throughout this period. Surveys were run in a grid around the Barren Islands, at distances of up to about 50 km in every direction from the islands. A total of 415 transects were completed, comprising about 1250 km of straight-line distance surveyed. Continuous records of seabird abundance on the sea surface, plankton and fish abundance below the surface, sea surface temperature and surface salinity were obtained for each transect. In addition, three CTD (conductivity, temperature, depth) lines including 22 stations were run to characterize the water column in lower Cook Inlet. Two zooplankton tows were also conducted at seven stations.

Data collected on these surveys are presently being analyzed. In brief, it appears that marine waters in lower Cook Inlet are well mixed by tides and currents, and the predominant species in open waters are surface-feeding, planktivorous species like fork-tailed storm-petrels and northern fulmars. In coastal waters along the Kenai Peninsula and near Shuyak Island, waters were stratified and appeared to provide suitable habitat for pelagic fishes, and a variety of piscivorous species including murrelets, puffins, marbled murrelets, shearwaters and kittiwakes. Several very large aggregations of shearwaters were observed near the Barren and Shuyak Islands, where they fed with other marine birds and humpback whales.

AMNWR GAU-9203- "St. Lazaria and Forrester Island NWR Baseline Investigations"

Deborah Rudis (Southeast Alaska Ecological Services office) and Ron Britton (Division of Environmental Contaminants) visited St. Lazaria Island on 24-25 July to collect soil samples to determine baseline levels of contaminants. Contamination may exist as a result of former military occupation during World War II. Collection sites were chosen randomly from areas of probable contamination: 10 locations on the western half of the island and 5 on the eastern half. The most desirable collection sites were those which were low-lying where drainage could occur and were comprised of finely-textured soils. Composite soil samples were obtained by collecting three or more "grabs" from each site to total at least 10 grams.

Samples were sent to an independent laboratory for metal content analysis by ICP scan and organic analysis for aromatic hydrocarbons (results were due in January 1993). The laboratory results will be discussed in a technical report to address contaminant levels and their implications to the seabirds nesting on St. Lazaria.

University of Washington (Barren Islands) - A crew of four full-time University of Washington personnel maintained a field camp on East Amatuli Island from 1 July to 16 September. The primary objectives were to monitor the burrow occupancy, phenology, reproductive success, and chick growth rates of fork-tailed storm-petrels and tufted puffins. In addition, an experiment of supplemental feeding of fork-tailed storm-petrels was continued from 1990 and 1991. Data on activity and phenology of common murre and glaucous-winged gulls were also gathered. Incidental observations of other seabird species, raptors, and marine mammals were recorded.

Three times during the season, the crew searched marked storm-petrel burrows in six traditionally monitored plots for the presence of adults, eggs, or chicks. All chicks found were weighed and measured every three days until fledging. Identification of previously banded adults was recorded and bands were attached to all unbanded adults and fledging chicks in the monitored burrows.

To minimize abandonment, tufted puffin burrows were selected for study when chicks were at least one week old. Puffin burrow density and activity were measured in the study areas as well as in four transects. Chicks were weighed and measured every 5-7 days through the remainder of the season. Chick food samples were collected during five days of the rearing period by temporarily screening burrow entrances to deny adults access.

Common murre attendance and nesting phenology were quantified by counting adults at cliffs and by counting eggs and chicks in a study plot on East Amatuli Light Rock. Glaucous-winged gull reproductive activity was estimated by counting nests, eggs, and chicks at the colony on Gull Ridge, and by counting adults and juveniles on a specific beach.

In general, fork-tailed storm-petrels and tufted puffins appeared to fledge normal numbers of chicks although growth rates were slower than in the late 1970's and early 1980's. Measures of murre success were lower than those of the 1970's and early 1980's.

E. ADMINISTRATION

1. Personnel

{See Homer office section}

G. WILDLIFE5. Shorebirds, Gulls, Terns and Allied Species*Seabird Monitoring Barren Islands*

Oil spill restoration studies in 1992 focused on murres in the Barren Islands. The seasonal crew was led by Biological Technician (BT) Don Dragoo who hurriedly hired and trained the following personnel: BT's Bill Stahl and Becky Howard and SCA volunteers Joel Cooper and Lucy Brown. This crew left for the Barrens on July 1 where they tried to use video time-lapse cameras to gather information on murres in areas difficult to visit frequently. The inclement weather led to a lot of work on building waterproof housings and mounting structures. The *M/V Kittiwake II* was awarded contracts to support FWS operations in the Barren Islands.

BT Dragoo and his crew spent July working in the Chiswell Islands and in the Barren Islands, as part of a murre monitoring project for the oil spill restoration efforts. Joe Meehan of the Kenai Fjords National Park accompanied our crew during Chiswell surveys. Murres in the Chiswells had just begun to settle down on nesting areas when counts were made July 11-14. This nesting phenology was slightly later than normal. In comparison, murres in the Barren Islands had reached a laying peak by the end of July! Late settling on nesting areas did not bode well for high success. Murres in the Barrens seemed to respond more drastically to the oil spill than other populations we monitored.

BT Dragoo and crew returned to the Barren Islands in early August and continued the murre monitoring project. The murres had finally settled down consistently enough to be counted and, in spite of several days of stormy weather, five replicate counts of plots were done. One total count of murres on Nord Island and East Amatuli Light Rock was also accomplished. Murre productivity studies were continued on Nord Island as well. Common murres had still been incubating eggs as of 25 August. Black-legged kittiwakes had a successful breeding season. Their recently fledged chicks were commonly seen near Nord and East Amatuli Islands in late August. One newly-fledged pigeon guillemot chick was seen

near Nord Island as well. The word from the Univ. of Washington camp at East Amatuli was that puffins and fork-tailed storm petrels did fairly well this year.

BT D. Dragoo, BT B. Dragoo, BT Cooper, and WB Bailey made the final trip of the season to the Barren Islands in mid-September. WB Bailey and BT Cooper checked much of Ushagat Island for fox sign and recovery of birds such as ptarmigan. No evidence of foxes was found in areas checked. Unfortunately, no ptarmigan were detected either. Raptors were particularly prevalent: harriers, peregrines, bald eagles, sharp-shinned hawks, red-tailed hawk, and short-eared owl. No Harlan's hawks were seen this trip, although 6 nests had been noted in 1988. River otter sign was plentiful, but only two sea otters were noted. A trace of oil was seen on one beach. Only 1 song sparrow, and no finches or buntings were seen.

Time-lapse cameras were retrieved from Nord Island in the Barrens. Observations indicated most murres had departed by September 22. Reproductive success was apparently poor again this year.

H. PUBLIC USE

1. General

Two special use permits were issued during May, one for cinematography in Afognak Island waters and one set-net fishing site on Noisy Island (adjoining Kodiak Island).

17. Law Enforcement

Although we hear of violations or possible violations occurring on the refuge, due to the distances and costs associated with traveling, it is very hard to even check these reports out. Most of the reports we get are from the Afognak Island area, in which the Service has ownership of the waters around the island. Special use permits are required for all commercial activities occurring within

those waters i.e. charter boats, guided hunting and fishing, anchoring of houseboats, landing of charter aircraft, etc. The refuge tries to coordinate with the Kodiak NWR, which has a boat that works around Kodiak and Afognak islands during the summer. No funding is provided to the refuge for any enforcement work.

J. OTHER ITEMS

4. Credit

This report was written by Leslie Slater and Gary Montoya. It was reviewed by Vern Byrd.

Enjoying Alaskan Seabirds

Alaska is one of the world's richest marine bird areas. More than 50 million seabirds from around the North Pacific come to Alaska every summer to breed and raise their young along its rugged coastline. Millions more fly to Alaska in the summer just to feed in its rich coastal waters.

Seabirds are important indicators of the health of the oceans. Pollution and other environmental changes often are first detected by observing the health of marine birds.

Alaska offers the opportunity to see many interesting species, often nesting in colonies of thousands or even millions of birds.

Most seabirds nest in large colonies composed of several different species. Colonies are usually on offshore islands and rocks which are free of mammalian predators. Colonies on the mainland are primarily on coastal cliffs isolated from predators.

Different species use slightly different nesting and feeding strategies. Some species (storm-petrels, ancient murrelets, Cassin's auklets, rhinoceros auklets, and whiskered auklets) come and go from the colony only at night. They nest in holes or cracks. Rarely would daytime visitors even be aware of their presence.

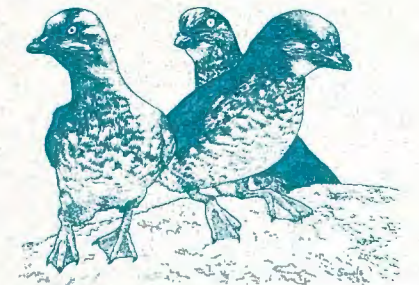
Seabird Viewing Areas

Boat tours out of Seward, Whittier, Kodiak, Valdez, Homer, Sitka, and Glacier Bay are the most popular way to view seabirds. Tours are also available of the spectacular colonies on the Pribilof Islands. Seabird and wildlife viewing charter trips can be arranged in most coastal communities.

Riding the state ferries also provides an excellent opportunity to see marine birds and mammals. Ferries run in southeast Alaska, Prince William Sound, and between Homer, Kodiak, Seward, and Dutch Harbor.



Seabird Nest Sites



Most of Alaska's seabird colonies are part of the Alaska Maritime National Wildlife Refuge. For further information, contact:

Refuge Manager
Alaska Maritime National Wildlife Refuge
2355 Kachemak Bay Drive
Homer, Alaska 99603
(907) 235-6546

This brochure was produced by the U.S. Fish and Wildlife Service in cooperation with the Pacific Seabird Group and The Nature Conservancy of Alaska.

Printing courtesy of Chevron, USA.

Cover Photo: Kim Heacox/The Nature Conservancy of Alaska

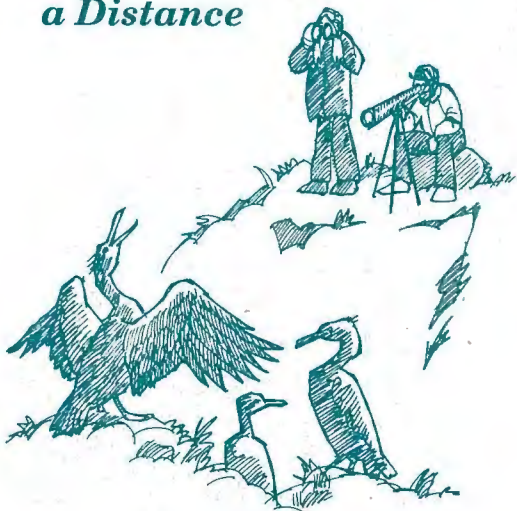


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Seabirds and You

You can help maintain our fascinating and diverse seabird populations by observing the following guidelines:

1. Observe from a Distance



Use binoculars and spotting scopes to view seabirds from a distance. You will see better, observe natural behaviors, and prevent disturbance.

How close is too close? When you interfere with a bird's normal behavior! Approach nesting seabirds quietly and slowly. Do not make sudden movements. If the birds raise their heads, stand up slightly off of the nest, call more frequently, or exhibit other signs of alarm, you are too close and should slowly back off.

2. Know the Regulations

Before approaching closely or landing on any seabird island, be sure it is permitted by the land owner. Many are wildlife sanctuaries, which may be closed to human access.

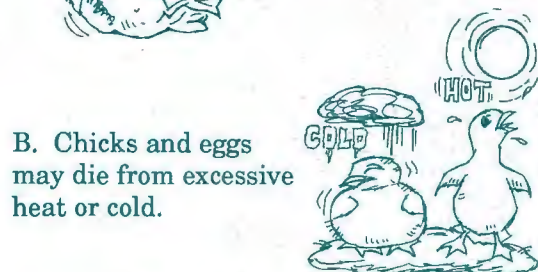
3. Give Nesters a Chance



Yelling, blasting boat horns, and buzzing cliffs by plane to "see the birds fly" are all activities harmful to seabirds. If nesting birds are flushed, especially in large colonies:



A. Eggs and chicks are often knocked out of nests.



B. Chicks and eggs may die from excessive heat or cold.



C. Predators, especially gulls, will eat unguarded eggs and chicks.

D. Nests can be abandoned.

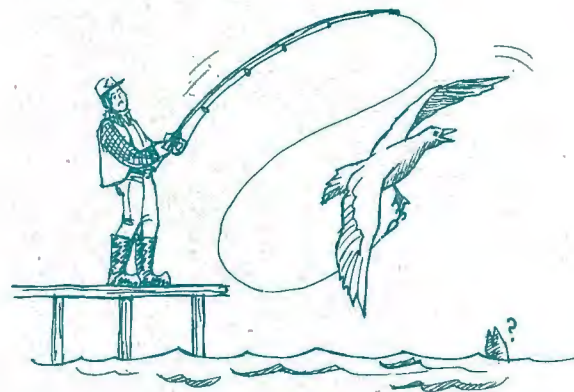


4. Watch Your Step, Leave Pets Behind



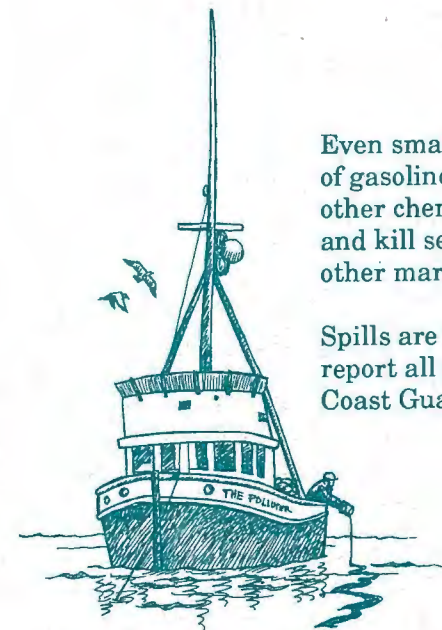
Some species nest in burrows dug into the ground. Walking in burrow nesting areas can collapse seabird homes and cause long-term erosion. Dogs and cats destroy nests and chase birds.

5. Release Hooked Birds



Occasionally seabirds will get hooked on fishermen's lines. If this happens, carefully bring the bird in and remove the hook. If tightly lodged, cut the line as close to the hook as possible. It will eventually rust away and the bird may survive.

6. Prevent Spills



Even small amounts of gasoline, oil, and other chemicals harm and kill seabirds and other marine life.

Spills are illegal, report all spills to the Coast Guard.

7. Take It With You

Birds, fish, and marine mammals are often caught by and die in discarded net scraps, fishing lines, and other garbage. Seabirds eat plastic particles from trash they apparently mistake for food. Dumping any plastics at sea is illegal under federal law. Dispose of all plastics and other garbage at approved disposal sites on shore.





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

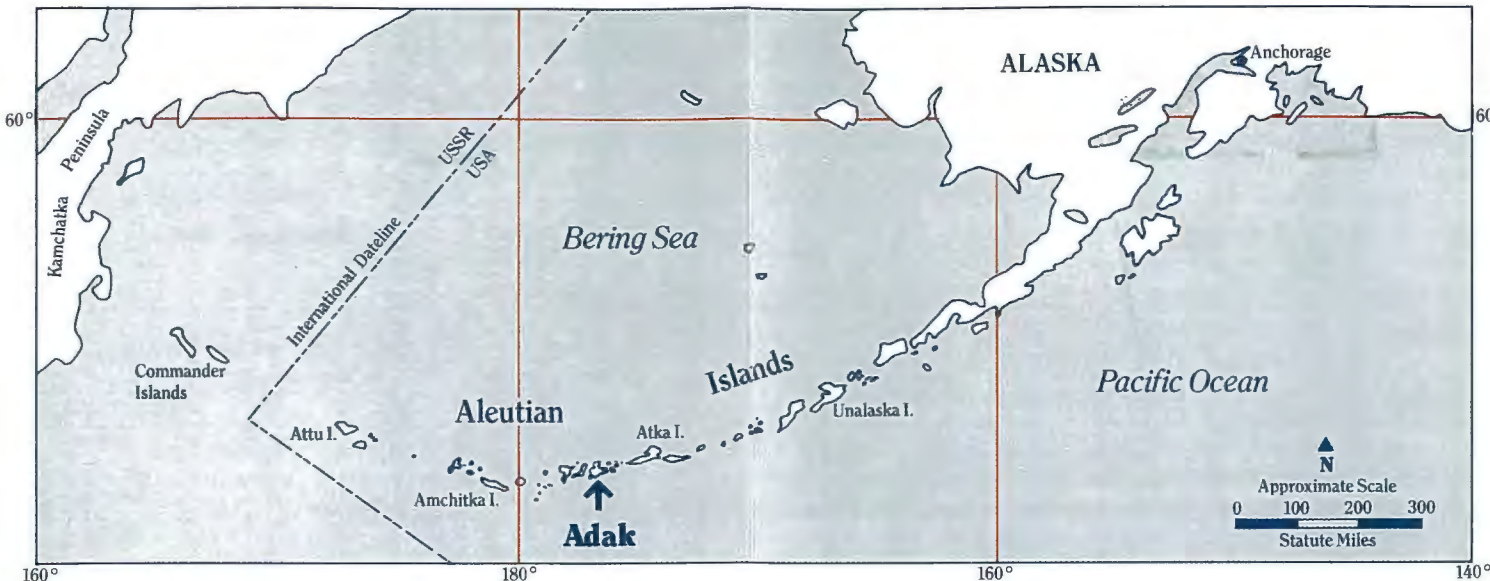
• Common Raven	nwsta	..	..	..	..	..	..	..	..	..	..
• Winter Wren	s	..	..	..	..	..	..	..	..	..	..

THRUSHES

Northern Wheatear	ta	..	..	..	..	..	..	..	..	..	..
X Dusky Thrush	t	..	..	..	..	..	..	..	..	..	..

WAGTAILS & PIPITS

X Black-backed Wagtail	s	..	..	..	..	..	..	..	..	..	..
Water Pipit	t	..	..	..	..	..	..	..	..	..	..



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

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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!

	— Common.
	— Uncommon.
	— Rare. May not be seen every year.
	— Casual. Not present every year but records too numerous to show individually.
	— Accidental record.

_____ **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 Skua **nwbst**
 • Aleutian Tern **nwbst**

_____	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.])

Funding for production of this checklist was provided by a grant from the State of Alaska, Division of Tourism.

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
Gyr Falcon	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