ALEUTIAN ISLANDS NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

76-78

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

ALEUTIAN ISLANDS NATIONAL WILDLIFE REFUGE
Adak, Alaska

NARRATIVE REPORT
Calendar Years 1976, 1977, 1978

NATIONAL WILDLIFE REFUGE SYSTEM
Fish and Wildlife Service
U.S. DEPARTMENT OF THE INTERIOR

Personnel

1. John L. Martin, Refuge Manager, GS-12, EOD 3-28-76, PFT
2. Tom J. Early, Assistant Refuge Manager, GS-11, EOD 4-10-77, PFT
3. Kent F. Hall, Assistant Refuge Manager, GS-11, EOD 8-28-77, PFT
4. Alice D. Enay, Refuge Clerk, GS-5, EOD 3-28-77, PPT
5. Lorraine E. Craw, Clerk-Typist, GS-4, EOD 8-7-78, PPT

No photos for the remaining personnel.

6. Robert P. Schulmeister
   Assistant Refuge Manager, GS-7, EOD 2-26-78, PFT
   Biological Technician, GS-5, EOD 7-18-77 Reassigned 2-25-78,PFT
   Biological Technician, GS-5, EOD 4-10-77 Conv 7-17-77, TFT
   Biological Technician, GS-5, EOD 2-15-76 Term 10-18-76, TFT
7. George Putney, Vessel Master, WG-11, EOD 4-17-78, PPT
   Master Engineer, WG-11, EOD 1-1-76 Resign 3-25-77

Review and Approvals

Kent F. Hall
Submitted by Date

Area Office Date

Aleutian Islands
Refuge

Regional Office 8/27/79 Date

8. James T. Coffey, Marine Engineer, WG-10, EOD 10-8-78, PPT
   Maintenance Mechanic, WG-10, EOD 11-11-75 Transferred 10-7-78,PFT
9. Richard Algie Hasha, Laborer, WG-3, EOD 11-11-77,Career Seasonal
10. Susan Schulmeister, Biological Aid, GS-4, EOD 7-3-77
    Term 6-1-78, Temp Int
    Biological Technician, GS-4, EOD 10-22-78, Temp Int
11. Nina Mann, OJT, EOD 9-7-78, Part Time
12. David Wallen, Vessel Master, WG-11, EOD 4-10-77 Resign 1-30-78,PPT
    Engineer Mate, WG-10, EOD 3-21-77 Promotion 4-9-77, PPT
13. Glenn W. Elison, Assistant Refuge Manager, GS-7, EOD 9-2-76
    Transferred 2-26-78, PFT
14. Sandra L. Early, Biological Aid, GS-5, EOD 6-26-77 Term 3-11-78,
    Temp Int
15. Thomas Greer, Marine Engineer, WG-10, EOD 3-24-77 Resign 4-28-78
    PPT
16. Mary L. Marth, Clerk-Steno, GS-4, EOD 5-26-77 Resign 7-28-78,PPT
17. Thomas Keefe, Biological Technician, GS-5, EOD 4-2-78
    Term 8-23-78, TFT
18. Robert H. Day, Biological Technician, GS-5, EOD 5-15-78
    Term 9-1-78, TFT
    Biological Technician, GS-5, EOD 5-8-77 Term 9-8-77, TFT
19. Brian E. Lawhead, Biological Technician, GS-5, EOD 5-15-78
    Term 9-1-78, TFT
20. Elaine B. Rhode, Biological Technician, GS-5, EOD 5-15-78
    Term 9-1-78, TFT
21. Dennis Woolington, Biological Technician, GS-5, EOD 6-4-78
    Term 9-22-78, TFT
    Biological Technician, GS-5, EOD 5-10-77 Term 8-31-77, TFT
    Biological Technician, GS-5, EOD 4-28-76 Term 10-8-76, TFT
22. Dan Yparraguirre, Biological Technician, GS-5, EOD 6-4-78
    Term 9-22-78, TFT
23. Craig A. Beauduy, Biological Technician, GS-5, EOD 6-25-78
    Term 10-5-78, TFT
24. David Clemens, Marine Engineer, WG-10, EOD 5-7-78 Term 10-24-78,PPT
    Cook, WG-5, EOD 7-9-76 Term 11-5-76, PPT
25. Mary Clemens, Cook Seaman, WG-5, EOD 5-7-78 Term 10-24-78, PPT
26. Mark Turpen, YACC, EOD 8-11-78 Resign 9-15-78
27. Scott Edwards, YACC, EOD 9-18-78 Resign 12-29-78
28. Thane Humphrey, YACC, EOD 11-12-78
29. David Moffatt, YACC, EOD 11-12-78
30. Donald Putugook, YACC, EOD 11-12-78
31. Mark Stevens, YACC, 11-12-78

32. Vernon Byrd, Refuge Manager, GS-9, EOD 5-73 Resign 3-17-77, PFT
33. Abbey Cooley, Clerk-Typist, GS-3, EOD 10-10-76 Resign 3-18-77, TFT
34. Portia O'dell, Refuge Clerk, GS-5, EOD 4-2-76 Resign 4-8-77, PPT
35. Mike Spindler, Bio Tech, GS-5, EOD 4-17-77 Term 5-16-77, TFT
    Bio Tech, GS-5, EOD 4-18-76 Term 10-7-76, TFT
36. Orville Johnson, Laborer, WG-3, EOD 3-27-77 Term 5-19-77,Temp Int
37. Loren Viers, Bio Tech, GS-5, EOD 4-17-77 Term 5-31-77, TFT
    Bio Tech, GS-5, EOD 4-22-76 Term 10-15-76, TFT
38. Mark Snigaroff, Laborer, WG-1, EOD 5-8-77 Term 8-17-77, TFT
    Laborer, WG-1, EOD 5-7-76 Term 8-13-76, TFT
39. George Hall, Laborer, WG-3, EOD 10-8-76 Resign 8-16-77, TFT
    Laborer, WG-3, EOD 1-3-76 Term 2-28-76, Temp Appt
40. Theodore Tobish, Bio Tech, GS-5, EOD 6-26-77 Term 8-19-77, TFT
    Bio Tech, GS-5, EOD 5-3-76 Term 8-25-76, TFT
41. Karl Haflinger, Bio Tech, GS-5, EOD 6-26-77 Term 8-19-77, TFT
42. Jeff Boyer, OJT, EOD 6-15-77 Term 8-22-77, Temp Int
43. Innokenty Golodoff, Laborer, WG-3, EOD 5-1-77 Term 8-23-77
    Temp Appt, TFT
44. Ralph Prokopeuff, Laborer, WG-3, EOD 7-1-77 Term 8-23-77,TFT
45. Eric Knutsen, Bio Tech, GS-3, EOD 5-10-77 Term 8-26-77,TFT
    Bio Tech, GS-3, EOD 5-3-76 Term 8-25-76, TFT
46. Teresa Blakeslee, Student Aid, EOD 6-2-77 Term 8-26-77,Temp Int
47. William Henry, Bio Tech, GS-5, EOD 7-8-77 Term 9-8-77, TFT
48. Jonathan Shannon, Bio Tech, GS-4, EOD 5-10-77 Term 9-16-77 TFT
    Bio Tech, GS-4, EOD 5-7-76 Term 9-10-76, TFT
49. Al Eishens, OJT, EOD 11-7-76 Term 9-12-77, PPT
50. Linda Hoven, Cook Seaman, WG-8, EOD 4-1-77 Term 9-30-77,
    Excepted Appt
51. Nancy Coffey, Laborer, WG-2, EOD 10-31-77 Term 11-29-77, TFT
52. Lewis Sisk, Janitor, WG-1, EOD 4-5-76 Term 6-23-76, TFT
    Janitor, WG-1 EOD 2-2-76 Term 3-3-76, TFT
53. Stewart Beaubien, Cook Deckhand, WG-5, EOD 3-14-76 Term 6-18-76
    TFT
54. Lahoma Shannon, Admin Clerk, GS-6, EOD 4-3-75 Resign 8-13-76,PPT
55. John Trapp, Assistant Refuge Manager, GS-7, EOD 5-9-76
    Resign 8-29-76, PPT
    Bio Tech, GS-5, EOD 7-16-74 Promotion 5-8-76, PPT
56. Dave Kelleyhouse, Bio Tech, GS-5, EOD 4-18-76 Term 9-8-76, TFT
57. Bill Rodstrum, Bio Tech, GS-5, EOD 4-14-76 Term 12-14-76, TFT

TABLE OF CONTENTS

Breathtaking beauty appears when the sun is able to burn off the clouds. Semisopochnoi Island. Early

I. GENERAL

A. Introduction

The Aleutian Islands National Wildlife Refuge encompasses all of the Aleutian Islands except the first eight islands west of the Alaska Peninsula. The remaining 200 plus islands form an arc, extending 1,100 miles between the North Pacific Ocean and the Bering Sea. Although the International Date Line jogs to the west to include all of the Aleutian Islands and military bases for time convenience sake, the 180° meridian actually severs the chain near Amchitka Island creating the easternmost and westernmost points in the United States.

B. Climatic and Habitat Conditions

The Aleutian Islands have the dubious distinction of spawning and enduring some of the world's worst weather. The maritime climate maintains relatively moderate winters and cool summers. The mean temperatures range from 30°F in the winter to 50°F in the summer. Maximum temperature at Adak for 1978 was 61°F on August 22 and the minimum was 14°F on March 8. However, skies are persistently overcast, dropping an average of 68

inches of precipitation per year which includes 98 inches of snow. Snow accumulation on the ground seldom exceeds 1 foot at the lower elevations due to temperatures. Measurable precipitation falls an average of 230 days per year as recorded by the scattered weather stations, but probably every day at some place within the chain. The mean annual wind speed of 4 stations is 19 knots per hour, but gusts in excess of 100 knots are not uncommon. In 1978 wind speeds at Adak exceeded 50 knots on 81 days, 60 knots on 44 days, 70 knots on 19 days, 80 knots on 6 days and 90 knots on 3 days. A real smoker passed through on October 25, 1977 which pegged the needle on a 120 knot anemometer.

Needless to say the flora and fauna of the Aleutians are hardy out of necessity. Pelagic birds spend most of their lives on the oceans, going to land only to nest. The oceans supply an abundant food supply for everything from the millions of sea birds and marine mammals, to wintering waterfowl and the introduced arctic foxes. The resident rock ptarmigan derives its name from inhabiting rocky wind swept locations where food is less likely to be snow covered.

That weather may have an adverse effect on wildlife is mostly theoretical, due mainly to a lack of information, but is evidenced by the fact of the number of vagrant bird species apparently blown off course during migration. Also, extensive snow cover probably limits food for some island resident species until a thawing temperature or a rain storm melts the snow.

C. Land Acquisition

1. Fee Title - Not applicable.

2. Easements - Not applicable.

3. Other

The following refuge lands have been approved for interim conveyance to village corporations under the Alaska Native Claims Settlement Act. Legal descriptions are on file in the refuge office.

On August 24, 1978, approximately 1,205 acres of islands, rocks and pinnacles in seven townships near Umnak Island were conveyed to the Chaluka Corporation, Nikolski, Alaska 99638.

On November 29, 1978 approximately 66,165 acres of Atka and Amlia Islands in ten townships were conveyed to the Atxam Corporation, Atka Rural Branch, Atka, Alaska 99502.

Another 10,833 acres of refuge lands consisting of the Baby Islands, Unalga Island, Rootok Island and other small islands near Akutan Island have been selected by the Akutan Corporation and are expected to be approved for conveyance.

D. System Status

1. Objectives

The Aleutian Islands National Wildlife Refuge was established in 1913 "as a preserve and breeding ground for native birds, for the propagation of reindeer and furbearing animals and for the encouragement and development of the fisheries." These objectives have been refined over the years to conform with current Service objectives to preserve the wildlife and habitat in a natural state. The introduction of fox and rats to most of the islands and caribou or reindeer to 2 islands where no land mammals are indigenous and the aftermath of World War II make preservation in a true natural state an almost insurmountable goal.

Not quite the "Guns of Navarone", World War II debris litters many of the islands, and is sometimes scenic. Kiska Island. Early

Most Native wildlife populations in the Aleutians appear to be healthy, but have undoubtedly been affected by the introduction of rats, fox, caribou and reindeer in ways we either don't understand or haven't been able to measure. The Aleutian Canada goose is an endangered species whose demise can be related to the presence of the exotic fox on nearly every island. The Refuge is attempting to re-establish breeding populations of Aleutian Canada geese on several of their former nesting islands. The objective is to establish self-sustaining populations on 3 different islands.

2. Funding

The funding pattern for the Aleutian Islands National Wildlife Refuge is:

	1976	1977	1978	1979
1210	330,000	192,000	231,500	364,000
1220	22,000	45,000	51,500	51,500
1240	14,000	17,000	17,000	20,000
1400	174,000	222,000	242,500	307,000
TOTAL	540,000	476,000	542,000	742,500

In 1977 the refuge received an extra $45,000 which was not annual work planned. In 1978, $50,000 of "mad money" was received at the end of the year.

Costs of operating in the Aleutians is extremely expensive. Vessel operations eat up over $200,000 per year. The cost of materials or labor is over three times that charged in Seattle.

In FY 1979 the refuge received $1,781,000 of BLHP money for a new headquarters complex and a new vessel.

The staff has gradually increased from an acting refuge manager and one assistant and maintenance man to a present ceiling of 7 permanent full time positions.

II. CONSTRUCTION AND MAINTENANCE

A. Construction

A new headquarters/office/shop complex to be built at Adak has been approved under BLHP funding. This facility is sorely

needed to accommodate the rapidly expanding thrust of the refuge programs. The current facility is, among other things, too small and literally pregnant with safety hazards. Nearly every storm reveals a new crack in the walls or leak in the ceiling. In all honesty, its doubtful that the present office will remain functional until the new office is ready in approximately two years. The dilemna is obvious.

The refuge office . . . Adak Island. Hall

and housing complex. All buildings are "hand me down" remodeled trailers from Atomic Energy Commission days on Amchitka Island. Adak Island. Hall

In addition, BLHP funding will provide new housing for refuge employees. We are presently understaffed to meet refuge needs but can not bring on more people because of housing shortage.

A larger vessel will also be acquired with BLHP funding. The present refuge vessel, Aleutian Tern, is too small to meet program needs. We are planning on acquiring a vessel in excess of 100' LOA.

The R/V Aleutian Tern. The heart of refuge operations among a chain of islands 1,100 miles long is a boat. The Tern, a converted 65' Navy PT boat, is too small for year around use. Early

Construction work at Amchitka involves mainly pens and facilities for the geese. Projects completed include a 3 acre pen complex at Bridge Creek for goose acclimatization and isolation prior to release, a half acre winter pen, incubation room and brooder room. All pens must be roofed with "chicken wire" to protect the geese from eagles.

B. Maintenance

Just the thought of maintenance of existing facilities causes

excedrin headaches. Of ten major buildings located on Adak and Amchitka, and totalling over 25,000 square feet of roof, only two have no leaks, but they are in need of other repairs. The major culprit is wind, which seems to seek out the faults of design and age. Repairs made one day have actually been blown away the next.

At Adak, we have an agreement with the Navy Public Works Department for maintenance and repair work, but the work is generally low quality and a week late. We now have an agreement with a contractor (moon lighting Navy personnel) which has proved to be satisfactory.

All maintenance work at Amchitka is done force account and generally amounts to putting on bandaids that usually don't last.

C. Wildfire

Nothing to report.

III. HABITAT MANAGEMENT

A. Croplands

Nothing to report.

B. Grasslands

Nothing to report

C. Wetlands

Some islands have many freshwater "potholes", areas locally resembling the prairie pothole country. A few wetlands have excellent aquatic growth and support good populations of waterfowl, but overall we know very little about them.

D. Forestlands

Nothing to report.

E. Other Habitat

All upland on the Aleutian Islands is identified and maintained as tundra, consisting of several distinct community types. The Elymus and Elymus Umbel communities produce lush, usually dense,

vegetation. Waist to shoulder high stands of both are common. Most other vegetation consists of low growing plants and shrubs such as lichens and tundraberry which range from thin coverings on rocks to thick spongy growths up to several feet thick.

Crowberry or tundraberry (Empetrum nigrum). An important plant throughout the island community, both for erosion control and wildlife food. Adak Island. Early

The only habitat manipulations being considered relate to the military buildings and debris left from World War II. Congress initiated an island by island study in 1975, conducted by the Corps of Engineers, to determine the feasibility of an intensive Aleutian Islands cleanup. The project revealed thousands of buildings and structures located on 22 islands. Total cleanup cost is estimated at over $100 million and would affect thousands of acres of tundra. Our opinion is that while it would be nice to eliminate all the unsightly junk, the cleanup effort would destroy more habitat than improving it. A recent study concerning revegetating disturbed sites in the Aleutian Islands shows some promise however. (See Section VI. A.)

A World War II mat runway. It was cluttered with obstacles prior to abandonment to insure the enemy could not use it. Tanaga Island. Early

F. Wilderness and Special Areas

No decision has been made on the Aleutian Islands Wilderness Proposal.

Agattu and Buldir Islands have been designated as Research Natural Areas.

Archeological investigations have revealed numerous sites located throughout the chain. Preservation of these sites will undoubtedly have an effect on some biological studies.

Kiska has been nominated for designation as a National Historic Site, since it is one of only two islands or locations of the United States occupied by a foreign military force during World War II. Attu is being considered for the same designation. Designation does not require preservation of any artifacts or structures which could prove to be a headache as well as costly.

Bogoslof Island has been designated a Registered National Historic Landmark because of its unique volcanic formation characteristics. The island first appeared with three volcanoes in 1796. New and larger cones appeared in 1883, 1906 and 1907. The 1907 cone McCulloch Peak was destroyed by explosion late in the year leaving a hot steaming lagoon. Smaller eruptions have occurred within the lagoon in 1910, 1926 and 1931.

G. Easements for Waterfowl Management

Nothing to report.

IV. WILDLIFE

A. Endangered and/or Threatened Species

The Aleutian Canada goose has been designated an endangered species. According to historic records these geese traditionally nested throughout the western two thirds of the Aleutian chain. Today only tiny Buldir Island has a wild breeding population of these birds.

The demise of the Aleutian Canada goose is directly related to the introduction of foxes to the island ecosystem where no native land mammals exist. Buldir was spared the fox introduction, probably because the island lacks a good harbor and the beaches are steep and rocky, making landing not only difficult but dangerous as well.

Typical wild Aleutian Canada goose nest. Buldir Island. Early

Much of the refuge effort is directed at restoring the goose to 3 former nesting areas. The work can be divided into:

1) Study the goose on Buldir
2) Eradicate foxes from target "release"islands
3) Propagate geese
4) Release geese.

In 1976, 59 foxes were removed from Alaid/Nizki and Agattu Islands. Follow up work in 1977 and 1978 indicated that Alaid/Nizki Island(s) are fox-free. However, Agattu still had one set of fox tracks present at the end of 1977 and 1978. Besides using traps and rifles, in 1977 we received permission to set out M-44's. So far, we have not taken a fox with an M-44. In any case, we will continue to try to eliminate foxes on Agattu. Hopefully, only foxes of one sex are left. The last fox has been very difficult to get.

In 1977, we initiated a trapping effort on Kanaga Island. After trapping parts of the island we estimated over 700 foxes inhabitat Kanaga. The refuge does not have (without poisons) the resources to eliminate foxes from this island. For 2 years trapping permits were issued to private trappers in hopes they could knock the population down. However, Kanaga's remoteness and the Aleutian weather make travel to and from the island difficult. No one has been able to trap the island as yet.

The 3 year breeding biology study of the Aleutian Canada goose was finished in 1976. In addition, 134 geese were banded on Buldir that year.

Thirty eggs were taken from wild nests and transported to Amchitka from Buldir via the R/V Aleutian Tern. Twenty-six goslings were successfully raised by Forrest Lee, NPWRC, and refuge staff, from the eggs. This was the start of the Amchitka propagation effort. Fifty-five and ninety-five goslings were raised at Amchitka in 1977 and 1978, respectively. The breeders are kept at Amchitka all year while the young are kept for 1 year and then released. Geese raised at Patuxent and Northern Prairie WRC's are shipped to Amchitka for acclimatization before release.

During 1977, an inventory technique for estimating the number of breeding pairs of geese was established. The procedure involved stratified random sampling and setting up permanent plots to monitor trends. The 1977 estimate was 175 breeding pairs. The plots will be surveyed in 1979 and every 3 years hence.

Amchitka is serviced by chartering a Reeve Aleutian Airways DC-6 or Lockheed Electra from Adak about every month to six weeks. Adak Island. Martin

Seasonal Bio-Techs Dan Yparraguirre and Dennis Woolington moving into their summer home on Agattu, where they monitored and collected data during the 1978 Aleutian Canada goose release. Agattu Island. Early

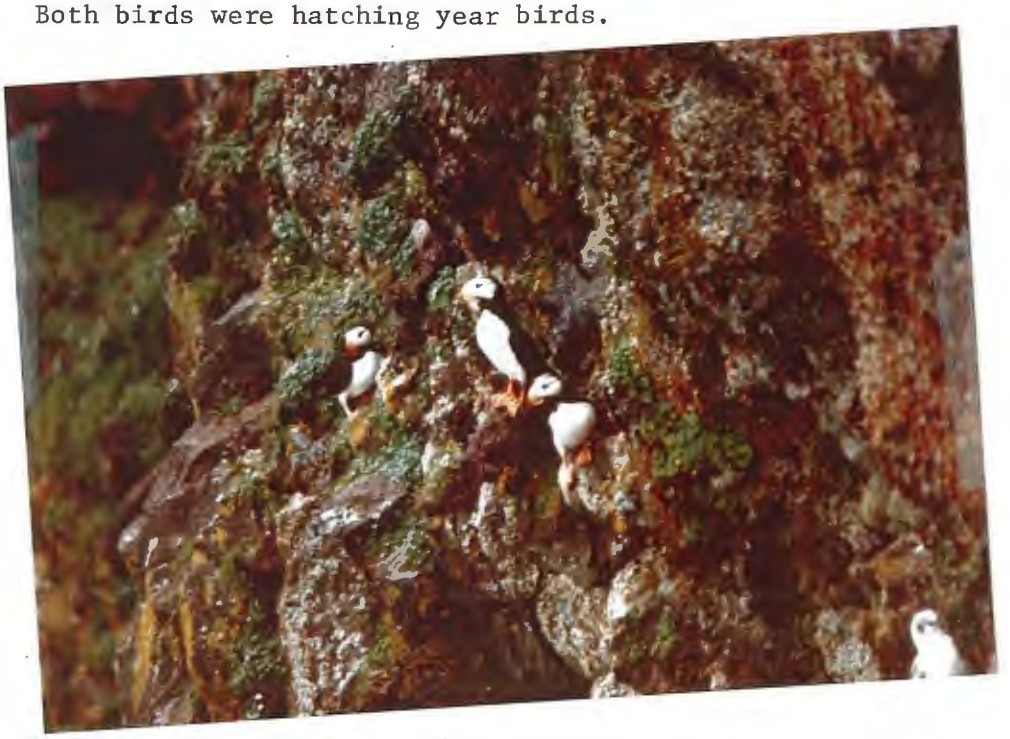
Refuge Manager Martin with Aleutian Canada goose on Buldir Island. Byrd

In 1978 our first major release occurred. One hundred and thirty-nine geese were released on Agattu. Of these, 22 were wild "guide" birds. Hopefully, they will lead the propagated geese to their wintering ground in California. However, only 13 "guide" birds appeared in California. The other geese apparently stayed at Agattu until late October and then dispersed. Hopefully, some will return in the spring of 1979.

B. Migratory Birds

The Aleutian Islands are important to migratory birds both from a breeding standpoint and a migrational standpoint. Some ornithologists consider the Aleutians as a "melting pot" for species from both continents. Although North American birds are most abundant, some Asiatic species have been found to visit and/or breed regularly on some islands. The list of North American records is increasing every year probably due more to more intensive investigation than increased incidence. Results of a cooperative study with the University of Alaska on Shemya Island to monitor species and abundance, is presented in Section VI. A.

An average of about 300 waterfowl have been banded each year for several years on Adak and Amchitka. Most of the recoveries have been local from Adak, indicating the possibility of a non-migratory population, since wintering waterfowl are locally abundant on Adak and other islands. However, several other returns dispute the theory. A female Greater Scaup banded on Amchitka on September 17, 1977 was recovered twenty-four days later in Japan and a drake Aleutian Common Teal banded on Adak on September 7, 1977 was recovered two months later in Siberia! Both birds were hatching year birds.



Horned Puffins on Agattu Island cliff. Early

The Aleutian Islands are probably best known for the abundance and diversity of pelagic or sea birds. Starting in 1977, the summer field season is devoted to an island by island wildlife investigation, as well as sampling bird populations found on the high seas. Island investigation includes circumnavigation to locate and census pelagic bird colonies and establishing permanent census plots in select colonies to monitor trends in breeding populations at three to five year intervals. Alaid, Nizki, Kiska, Tanadak and Little Kiska were completely surveyed in 1978, and Kanaga, Bobrof, Gareloi, Semisopochnoi, and all of the thirteen islands known collectively as the Delarof Islands in 1977. A limited amount of work was also accomplished on Agattu and Buldir Islands in 1978. A detailed report of all data is on file in the refuge office. Highlights follow.

Assistant Manager Hall censusing nesting Black-legged Kittiwakes and Murre sp. on permanent plot delineated on Agattu Island. Early

Circumnavigation is achieved using a thirteen foot Zodiac with outboard motor. At least two individuals are required, one to drive and one to observe and record. Support is furnished by the 65 foot refuge vessel R/V Aleutian Tern, which is in constant line of sight or radio communication with the Zodiac in case of emergencies. The Tern also provides transportation of personnel and equipment among the islands.

One of the Zodiacs used during island circumnavigation for wildlife surveys. Early

One of the most significant discoveries of 1978 was made on Kiska Island. A population of Least and Crested Auklets nesting in the talus of Kiska volcano at Sirius Point is estimated to exceed 1.4 million birds. Its probably the largest breeding colony of auklets in the world. The census technique involved counting birds on randomly selected 10 square meter plots on the approximately 1.35 million m^2 colony. Fox were found to be denning right among the auklets, taking advantage of the feast available. Piles of young auklets could be found near most of the dens - an apparent food cache for the winter. The effect of the fox on the auklet population is unknown, but is undoubtedly significant.

Field camp at Sirius Point on Kiska Island. A random series of permanent census plots was established in the auklet colony. Early

Another survey technique is employed on the open ocean. Navigation between islands is accomplished by straight line, compass heading auto pilot techniques in the Tern. All birds observed for a ten minute time period while boat is underway are recorded by species, distance from boat out to 300 meters, and activity (sitting, flying, feeding etc.). Each ten minute census period is followed by a ten minute non-census period. Data is recorded on Pelagic Transect forms for each census period. Location is entered to the nearest minute by latitude and longitude on each form at the beginning of each census period. The highest bird densities were found in areas of upwellings or near large bird colonies. Mean density from a total of 93 transects in 1978 was 76.7 birds per km^2. The highest recorded count was made in 1977 while circumnavigating Semisopochnoi Island. A total of 24,460 birds of which 14,545 were auklet species, was counted in one ten minute transect. Common names of species recorded on transect work follows.

Tufted Puffin	Northern Fulmar
Horned Puffin	Albatross sp.
Auklet sp.	Murrelet sp.
Glaucous-winged Gull	Kittiwake sp.
Murre sp.	Phalarope sp.
Cormorant sp.	Common Loon
Tern sp.	Shearwater sp.
Pigeon Guillemot	Jaeger sp.

The forms used for pelagic boat transects and permanent breeding colony plots have been developed to allow easy transfer to and storage of data on computers. We hope to use Automatic Data Processing for retrieving and analyzing the information gathered. We are also photographing all permanent plots and/or colonial breeding colonies with a high resolution camera. This will facilitate a more accurate census as well as indicate major changes in habitat use.

Reduced composite photo of Aga Cove, Agattu Island, sea bird nesting colony. Black-legged Kittiwakes and Common Murres are most abundant species. Early

Many cathedral like sea caves host a number of cliff nesting birds. Kiska Island. Early

Island by island migratory bird population estimates for 1977 totaled just over 826,000 birds for all islands. Island populations ranged from 36 on Twin Island to 651,002 on Bobrof Island. Auklet species accounted for 87.6% of the total, while all species of waterfowl combined amounted to only .1%.

Total number of migratory birds tallied during 1978 on the five islands completely surveyed was approximately 1.52 million. Again auklet species accounted for the bulk of the birds.

A short sleeve shirt day! Breaking camp on Agattu Island. Early

C. Mammals and Non-Migratory Birds and Others

1. Game Mammals

The Adak caribou herd appears to be in a healthy condition. A pre-season population of about 250 animals has been sustaining a harvest level of 75-100 animals per year. The normal regulatory hunting year opens August 10 and closes March 31 with a limit of 2 caribou. Even with this liberal hunting season, the danger of overpopulation on Adak is very real, since there are no natural predators and the terrain is rugged enough to weed out all but the most dedicated hunters.

Atka Island has a population of reindeer that are essentially wild. The native Aleuts of Atka village, population about 90 people, harvest a few animals for subsistence, but it's doubtful that the reindeer population is being controlled within the ecological limits.

The village of Atka, in cooperation with the Aleutian Pribilof Association and the Institute of Northern Agricultural Research, has been issued a Special Use Permit to conduct a feasibility study of herding reindeer on Atka. The plan involves the participation of the native people of Atka in a commercial meat operation. The project has merit from a management standpoint since we hopefully will be able to get a "better handle" on some of the dynamics of the population.

A study is currently being planned for Adak which hopefully will also provide some specific information about these herbivore populations. We know virtually nothing about specific caribou population dynamics, year around food habits or the short and long term effects on the indigenous flora and fauna.

Arctic fox are considered to be both small game and fur bearing animals by the Alaska Department of Fish and Game. As explained in section IV. A. the introduction of fox to most of the Aleutian Islands has been devastating to some species. Short range plans include elimination of the fox on a few selected islands. Long range plans may require elimination on all islands in order to ensure the preservation of the Aleutian ecosystem and its abundant bird life.

2. Other Mammals

An abundance of marine mammals find the weather and remoteness of the Aleutian Islands to their liking. Northern Stellar Sea Lions, harbor seals and sea otters use the islands as both breeding and hauling grounds. Killer and minke whales and harbor and Dall porpoises are also quite common in the surrounding waters. The main thrust of marine mammal work is censusing to obtain baseline population figures.

There is currently no harvest of pinnipeds or sea otters except for subsistence purposes by the natives. A considerable amount of historical data about sea otters indicates several colonies within the entire population is at carrying capacity, consequently a limited harvest has been proposed in portions of the Rat Islands and Andreanof Islands. Sea otters are presently under the jurisdiction of the Fish and Wildlife Service while pinnipeds are managed by the National Marine Fisheries Service. Marine mammal harvest in Alaska is contingent upon approval of the State's management plans for these species, at which time management authority will be returned to the State Department of Fish and Game.

Table 1. presents data for sea otter counts obtained from our surface surveys in 1977 and 1978. The comparable counts from 1959 and 1965 were made from the air.

A total of 9,892 Stellar sea lions and 695 harbor seals were recorded during the 1977 surveys. In 1978, 23,786 Stellar sea lions and 877 harbor seals were tallied.

3. Resident Birds

Bald eagles have been found in relatively small numbers on most of the islands surveyed during the summer field season. Active eyries as well as adult and juvenile birds are recorded. A total of 177 and 48 Bald Eagles were counted during the 1977 and 1978 field seasons respectively.

Adak appears to be a major wintering area for Bald Eagles in the Aleutian Islands. The dumpground and trash compactor are the major feeding and roosting hangouts. Upwards of several hundred eagles can occasionally be seen at these locations throughout the winter. When the breeding and nesting season approaches the "flocks" disappear, at least some apparently returning to other islands, since eagle sightings are not that common on Adak during the summer.

The eagle concentration at Adak is impressive to most people stationed here or visiting, but other people consider them a nuisance. About 50 eagles fell victims of powerline electrocutions in 1978, which not only results in dead birds, but occasionally dead circuits to homes or offices until transformers can be repaired or replaced. The Navy installed modifications to many favorite perching areas in December 1978 following our recommendations. Hopefully this will alleviate both problems.

Some waterfowl hunters also have little good to say about the eagles. Dead or crippled ducks that cannot be retrieved immediately usually become an easy meal for an eagle.

Song sparrows, winter wrens and gray crowned rosey finches are considered to be beach birds. Permanent beach bird survey routes were established on several islands this summer. Basically all birds are recorded by species on a preselected beach. These surveys are intended to provide trend data for these species at various locations. A 1/2 mile beach on Little Kiska Island was inhabited by 80 winter wrens, 33 song sparrows and 2 gray crowned rosey finches in 1978.

Table 1. Counts and densities of sea otters for selected islands (after Kenyon 1969).

Island	Counts of Adult Otters 1959	1965	1977-78	Square Miles of Habitat	Otters Estimated Per Square Mile of Habitat 1959	1965	1977-78
Andreanof Islands							
Kanaga	1822	1054	1527	95	26	15	21
Bobrof	57	32	60	2	38	26	40
Delarof Group							
Gareloi	41	83	100	9	8	12	15
Unalga	51	16	108	8	10	3	18
Kavalga	275	155	234				
Ogliuga	112	144	122				
Skagul-Tag-Ugidak	281	46	64	52	22	10	13
Gramp Rock	134	32	33				
Ilak	49		73				
Ulak	352	107	153	20			
Amatignak	102	70	105				
Rat Islands							
Semisopochnoi	393	203	238	32	16	8	10
Kiska-Little Kiska-Tanadak & Tanadak Pass	1127	1137	1374	78	19	19	23
TOTAL	4796	3079	4191		$\bar{X}$ = 21	13	20

Inland bird transects have been established to survey rock ptarmigan and lapland longspurs. The route is preselected along a compass heading and birds within a 400 foot wide strip are recorded. Again the intent is to provide trend data.

4. Other Animal Life

One of the establishing directives for the refuge is the enhancement of the fisheries. To date very little has been attempted, funded or accomplished. The most obvious fishery to work on is salmon since they enter into refuge waters to spawn. Most islands surveyed, having an adequate stream flow, have a pink salmon run. For some unknown reason even numbered years produce larger runs than odd numbered years. Red and silver salmon have also been observed in a few watersheds. Freshwater streams are abundant throughout the Aleutian chain. Many runs were probably eliminated by overfishing and lack of control in years gone by. The potential for developing or reestablishing salmon runs seems almost limitless.

Refuge booth manned by Assistant Managers Hall and Early during an Adak Labor Day Festival in 1977. Martin

V. INTERPRETATION AND RECREATION

A. Information and Interpretation

1. On-Refuge

Most of the people who live on or visit the Aleutian Islands are active military personnel and their dependents. The population of the three military bases at Adak, Shemya and Attu totals about 6,000. The native Aleut villages at Atka, Akutan and Nikolski have a combined resident population of about 500.

The military bases offer a unique situation to present the Service and environmental messages. The normal tours of duty for military personnel are one year for those unaccompanied by dependents and two years for those accompanied. Essentially this means that the population is constantly changing, with two to three thousand new people every year. The general attitude of the majority is they have been sent to the end of

the world. Upon arrival, the natural world becomes a part of everyday life. Flocks of bald eagles and curious sea otters swimming in the ocean along roads, stimulate many questions about wildlife and the outdoors. The audience is captive and hungry for information.

At Adak all newly arrived military personnel are required to attend an orientation indoctrination lecture. The lectures are held every two weeks. This year, we have been allotted a time slot which allows us to present some history, restrictions and general information of the refuge as well as a more positive perspective of life in the Aleutians. In addition, many social, professional and school functions request our participation, and we are providing specimens and exhibits in the local museum, which is administered by the Adak Civic League.

These efforts are merely tapping the tip of the ice berg from an interpretive standpoint. A new headquarters office at Adak with visitor contact station is on the drawing boards. The potential for indoor and outdoor exhibits and trails is challenging. The Adak school, with over 600 students, has expressed an interest in environmental education information. The Adak Naval Base and Shemya Air Force Base have local TV and radio production capabilities. Also, we have made virtually no effort at all in establishing interpretive rapport with the other two military bases or native villages.

Assistant Manager Early explaining the details of duck banding. Martin

2. Off-Refuge

Essentially all of our interpretive work is on refuge with the exception of an occasional article submitted for publication in Anchorage newspapers and/or magazines. The entire local publication, Adak Eagles Call, was devoted to wildlife during 1978 National Wildlife Week. Our staff "kicked off" the week with a local one hour television production involving the Adak premiere of Chain of Life - The Aleutian Islands movie, an interview by the journalist and a phone jamming question and answer period.

B. Recreation

1. Wildlife Oriented

Hunting and fishing seasons run concurrently with Alaska Department of Fish and Game regulations for this area of the state. The entire refuge is open to sport fishing but very little if any occurrs on uninhabited islands. Primary interest centers on pink salmon and dolly vardon. Many ambitious fisher persons hike to the roadless south side of Adak Island to enjoy unspoiled stream fishing away from the crowds.

Only a few islands are open to hunting. Caribou, ptarmigan and waterfowl are the only fair game, of which caribou are found only on Adak. Seasons are generally long with liberal limits, factors related more to accessibility or availability than to the abundance of game. Only the diehard nimrods are usually found in the field after the first few weeks.

A fox trapping season was opened in October of 1977 and continued through June 30, 1978. We required a refuge Special Use Permit in addition to a State trapping license. Refuge permits were free and unlimited in number. About 25 permits were issued mainly to military personnel on Adak for Adak and a few adjacent islands. All trapping was done on Adak, due to transportation problems caused mainly by the unpredictable weather. Another 18 permits were issued to the natives of Atka for non village lands.

From a management standpoint, objectives of the fox season were not reached. We were hoping to get some fox "control" work done on Kanaga Island.

Wildlife photography is a popular non-consumptive sport - at least on Adak. Sea otters and Bald Eagles are favorite subjects, probably because they are almost domestically cooperative, abundant and something different to show and tell the folks back home about.

A Public Use Inventory Plan was written and initiated in September. At present, surveys are conducted only on Adak, but the plan includes visiting all inhabited islands for short periods several times a year.

2. Non-Wildlife Oriented

Cross country skiing is catching on at Adak. The Community Education program offered several beginners classes with good turnouts. Most of the participants started for the exercise and as a cure for "cabin fever."

A small local area has been designated for snowmobile use to satisfy a demand on Adak. To our knowledge there are no snowmobiles on any other islands nor will any use be permitted.

C. Enforcement

Enforcement efforts are limited to Adak. We hear through the grapevine about problems on the other two military bases, but surprise visits are difficult to arrange and carryout. Hopefully an interpretive effort will help in having locals police their own.

Major problems at Adak involve salmon snagging, off road vehicling and, collection of sea otter skins and eagle feathers and parts. Violations are "pink slipped" and submitted to the SAC in Anchorage for prosecution or referral to the State. News travels fast in the military, as violators are often reprimanded by their Commanding Officer as well.

One of the ORV trails on Adak. Publicity and enforcement have virtually eliminated off road travel, but the scars remain. Adak Island. Martin

VI. OTHER ITEMS

A. Field Investigations

1. Recovery of Damaged Tundra Vegetation in the Central Aleutian Islands

   Cooperators-University of Tennessee under contract with the Department of Energy. Current progress indicates that introduced species could be maintained only at great cost and intense fertilization programs. The use of native Elymus mollis, American dunegrass, as a recovery species shows great promise by vegetative methods.

2. A Special Use Permit has been issued to the Atka Native Village to study the feasibility of herding the reindeer on the island. Cooperators include the Aleutian Pribilof Association and the Northern Agricultural Research Center. The plan involves a range study and recruiting a laplander to train the locals in the art of reindeer husbandry.

3. Sea Otter Research - Attu Island. Investigators are from the National Fish and Wildlife Laboratory of the U.S. Fish and Wildlife Service. At present there are very few otters on Attu. The project objectives include the documentation of community changes with sea otter population growth. We have not as yet received a report of this years findings.

4. We are also providing specimens of eagles and sea otters to the National Fish and Wildlife Health Laboratory for necropsy. Although we knew the eagles died from electrocution, we wanted to determine the general health of the population, particularly with respect to pesticides. Of seven eagles autopsied, all had good to excellent deposits of fat and were determined to be in good physical condition. Pesticide residues were isolated in all specimens in what was determined to be insignificant concentrations as related to general health. Mean concentrations were:

	Carcass	Brain
DDE	0.487 ppm	0.056 ppm
PCB	1.771 ppm	0.116 ppm

Only one sea otter was fully autopsied. It was diagnosed as having an ulcerative gastritis with numerous petechiae (pin point hemorrhages) in the stomach.

5. A Migratory Bird Study of the Western Aleutians is under cooperative agreement with the University of Alaska. Two University of Alaska biologists spend several months at Shemya during migration periods, observing and collecting birds. The results have been fascinating as well as significant scientifically. The following five species were collected at Shemya and are new North American records 1) Gray Bunting (Emberiza variabilis) 2) Red-breasted Flycatcher (Ficedula parva) 3) Oriental Greenfinch (Carduelis sinica) 4) Little Bunting Embiriza pusilla) 5) Sooty Flycatcher (Muscicapa sibiria).

6. We cooperated with a request from the Rocky Mountain Health Laboratory, Hamilton, Montana, to collect ticks found on birds or in bird colonies during the summer. They routinely screen ticks from various areas of the northwestern United States for arboviruses that may be of importance to the health of man. We collected only three ticks (Ixodes uriae) from the auklet (Aethia sp.) colony on Buldir. Results were negative but the sample is too small to draw any conclusions.

7. An ongoing study entitled "Population Dynamics of the Aleutian Common Teal (Anas Crecca nimia) at Adak and Amchitka Islands" was initiated in 1977. Objectives include determination of 1) base populations 2) hunting mortality and 3) inter island movements.

8. "Rock Ptarmigan Nutrition on Amchitka Island" was a refuge management study completed in 1977. Objectives were to 1) determine dietary constituents over a 12 month period 2) determine nutritional quality of dietary foods 3) determine if feeding is selective for high quality nutritional foods and 4) measure sample of small and large intestine and ceaca length and compare with data from other areas for possible diet quality correlation. We are still awaiting a final report from the principal investigator.

9. We provided a number of fox skulls, obtained from fox control work during 1977, to a graduate student at the University of Alaska. His thesis is entitled "Morphological Variation Among Arctic Foxes, Alopex lagopus, in Alaska and adjacent Regions." Hopefully the origin of the Attu foxes can be determined from this study. The foxes on Attu are believed to be indigenous and may be an important part of the Attu ecosystem.

10. Christmas Bird Counts were conducted on Adak and Amchitka Islands during 1977 and 1978. Results follow:

	1977		1978	
Species	Adak	Amchitka	Adak	Amchitka
Common Loon		1	2	
Arctic Loon	1	3		
Red-throated Loon			2	
Red-necked Grebe	1		2	
Horned Grebe	8	3	2	
Eared Grebe		3		
Pelagic Cormorant	40	237	121	69
Emporer Goose	200	924		35
Mallard	3	231	47	484
Pintail		161		35
Aleutian Common Teal	25	328	97	252
Greater Scaup	433	64	270	57
Common Goldeneye	101	69	55	97
Bufflehead	13	33	6	45
Oldsquaw	183	19	309	
Harlequin	94	665	223	497
Smew				1

Species	1977 Adak	1977 Amchitka	1978 Adak	1978 Amchitka
Common Eider	90	13	2	
White-winged Scoter		1		
Common Merganser		1		
Goosander		2		
Red-breasted Merganser	10	1		9
Bald Eagle Adult	42	20	45	8
Bald Eagle Immature	63	18	112	8
Peregrine Falcon		7		1
Rock ptarmigan		6	20	23
Black Oystercatcher		23	2	37
Rock Sandpiper	10	34	8	18
Black-legged Kittiwake			2	
Glaucous-winged Gull	193	141	261	459
Common Murre	8			
Marbled Murrelet			6	
Ancient Murrelet	2	2		
Tufted Puffin	1			
Crested Auklet	1			
Pigeon Guillemot		2	4	
Snowy Owl		3		
Raven	117		80	
Winter Wren		2	2	6
Gray Crowned Rosey Finch	65	15	28	67
Common Redpoll	16			
Hoary Redpoll		31		
Song Sparrow	6		2	
Snow Bunting	78			113

B. Cooperative Programs

1. A conflict, relative to commercial crabbing and processing, has developed between the refuge and the U.S. Navy at Adak. In the past, the Navy, acting within a complicated agreement, has issued a permit to allow a commercial crab processing boat to tie up to an abandoned pier in Finger Bay. The processing involves discharge of crab waste into Finger Bay. Approximately 750,000 pounds of live weight crab was processed by the boat in the winter of 1978.

The Navy has done little to monitor or enforce stipulations of the permit in the past other than to maintain security. Refuge personnel observed the operation this year and it was obvious that the discharge of waste provisions were not being adhered to.

The processing boats have applied to the Navy for access to Finger Bay again in 1979. The Navy is under no further obligation. Considering the facts, we decided that the Navy had no authority to issue such a permit since it did not involve military matters. This interpretation has been upheld by the Solicitor's office in Washington, D.C. The matter is currently being "worked out" at that level. Regardless of the outcome, the processors will definitely be required to clean up their act.

2. The Alaska Historical Aircraft Society is becoming very concerned about insuring protection of downed WW II aircraft in the Aleutian Islands. Apparently the motion picture industry and other interests are also eyeing these aircraft. We issued a Special Use Permit to the Society for survey purposes. The question of ownership has yet to be resolved.

World War II PV-1 Naval Patrol plane on Agattu Island. The Alaska Historical Aircraft Society is attempting to preserve all unclaimed WW II downed aircraft on the Aleutian Islands.

3. We have utilized the YACC program on Adak and Amchitka. Two local youths worked at Adak as "go fers." The first from August through September, the second from September through December. Four others, from Anchorage and Fairbanks, began working at Amchitka in November to assist with construction and maintenance projects. So far the pros outweigh the cons.

The YACC crew at Amchitka unloading a new 100 KW generator from a U.S. Coast Guard C-130. Schulmeister

4. We have also cooperated with the local school in providing on the job training for one high school student. We provide the work, up to 10 hours per week, and the school pays the wages. The student is interested and enthusiastic which makes supervision much easier.

OJT high school student, Nina Mann, photographing sea bird colony composites. Cox

5. A Special Use Permit was issued to the University of Alaska to study the geophysics of Kiska Island. There is an active volcano on this island. We have not received a report of findings.

C. Items of Interest

1. Alice Enay received her 30 year service pin.

2. Robert Schulmeister received a Special Achievement award for his work on Amchitka.

3. The refuge movie Chain of Life - The Aleutian Islands took first place in the Outdoor Writers Association of America competition.

4. Early and Schulmeister attended the refuge academy at Beckley, West Virginia.

5. Lars Äby,a Swedish freelance photographer under contract

with the Swedish Broadcasting Company, was issued a Special Use Permit by the Area Office to photograph a documentary on the sea otter. All photography was done at Adak.

6. A group of about 30 Japanese WW II veterans and/or veteran relatives chartered a cruiser to visit and pay respects to the dead on Kiska Island and Attu Island during July, 1978. They were accompanied by the Public Affairs Officer of the Anchorage Area Office.

7. Lael Morgan, an editor of Alaska Magazine, was issued a Special Use Permit by the Area Office, to travel, collect photographs and information to prepare an Alaska Geographic issue about the Aleutian Islands.

8. Credits - This report was written by Kent Hall, edited by John Martin and typed by Lorraine Craw.

D. Safety

Safety meetings were scheduled for but not always held the first Monday of the month. Topics presented include - Use of Fire Extinguishers, Safe Lifting Techniques, Winter Driving and a Safety IQ quiz. We had no major accidents during the year.

The Navy has been very cooperative in providing medical supplies and training for Amchitka personnel as well as sending personnel on the charters as needed for emergencies.