

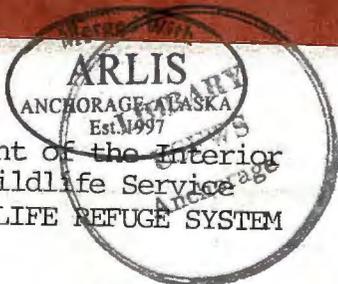
KODIAK NATIONAL WILDLIFE REFUGE

Kodiak, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1989

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



US FISH & WILDLIFE SERVICE--ALASKA
3 4982 00021254 7

REVIEW AND APPROVALS

KODIAK NATIONAL WILDLIFE REFUGE

Kodiak, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1989

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Refuge Manager Date Associate Manager Date

Paul R. Schmidt _____
Regional Office Approval Date

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US FISH & WILDLIFE SERVICE--ALASKA

INTRODUCTION

The Kodiak National Wildlife Refuge was established by Executive Order 8657 on August 19, 1941 "for the purpose of protecting the natural feeding and breeding range of brown bear and other wildlife on Uganik and Kodiak Island, Alaska" (Figure 1). A one mile wide shoreline strip remained open to the public land laws, resulting in numerous small coastal inholdings. In 1958 the one mile shoreline strip was closed to the public land laws and two large peninsulas were removed from the refuge so that they might be opened to livestock grazing by Public Land Order 1634. No leases have ever been let on these areas and in 1982 as part of mitigation for construction of the Terror Lake Hydroelectric Project in the refuge one of these peninsulas (Shearwater) was permanently closed to livestock entry.

In 1980 the Alaska National Interest Lands Conservation Act added approximately 50,000 acres of land on Afognak and Ban Islands to the refuge, bringing the total acreage to approximately 1.865 million acres. Approximately 310,000 of these acres have been conveyed to Native ownership but are subject to refuge regulations as stipulated in the Alaska Native Claims Settlement Act section 22 (g) (Figure 2).

Overall the refuge encompasses roughly the southwestern two-thirds of Kodiak Island, all of Uganik Island (which lies off the northwest shore of Kodiak Island), and the Red Peaks and Ban Island area on the northwest side of Afognak Island. Habitats in the refuge include salt water estuaries, riparian zones, wet tundra, extensive brushlands, alpine areas, bare rock, permanent small glaciers and on the Afognak addition, Sitka spruce forest.

The refuge is host to six species of Pacific salmon/steelhead-rainbow trout and Dolly Varden whose spawning grounds are the relatively short, swift streams characteristic of the island. Approximately 200 breeding pairs of bald eagles nest on the refuge annually and a year round population of several hundred eagles gives Kodiak one of the highest numbers of bald eagle use days of any refuge in the system.

The combination of huge numbers of salmon, tremendous berry crops and productive alpine sedge fields on the island provide a virtually endless food supply for brown bears. Kodiak supports one of the highest density of brown bears in the world.

Although salmon, eagles, and bears are the most widely known inhabitants of the refuge, other species including Sitka black-tailed deer, red fox, beaver, river otter, tundra swan, and in near offshore waters, many species of marine mammals and sea birds are also found.

Several major management problems exist on the refuge. The most critical problem is the recent conversion of refuge to Native owned private land. Approximately 300,000 acres of some of refuge's best wildlife and fishery habitat have been selected by, or conveyed to, Native corporations under the provisions of the Alaska Native Claims Settlement Act. Although these lands remain subject to the rules that govern use and development of the refuge [Section 22 (g) Alaska Native Claims Settlement Act], administration of this section is unclear. The bottom line is that a significant proportion of the best bear, eagle, and fisheries habitat on the refuge is now privately owned.

If all the 1906 Native allotments on the refuge are implemented the refuge may end up with 15,000 acres on approximately 200 different sites within its boundary conveyed to private individuals, resulting in no refuge control over development on the sites.

The refuge and headquarters complex is five miles from municipal Kodiak approximately 25 air miles from the refuge boundary. Two Service aircraft and a 48 foot motor vessel provide the only transportation to the refuge. A field headquarters is maintained at the southern end of the refuge at Camp Island, Karluk Lake, which provides a base for field operations.

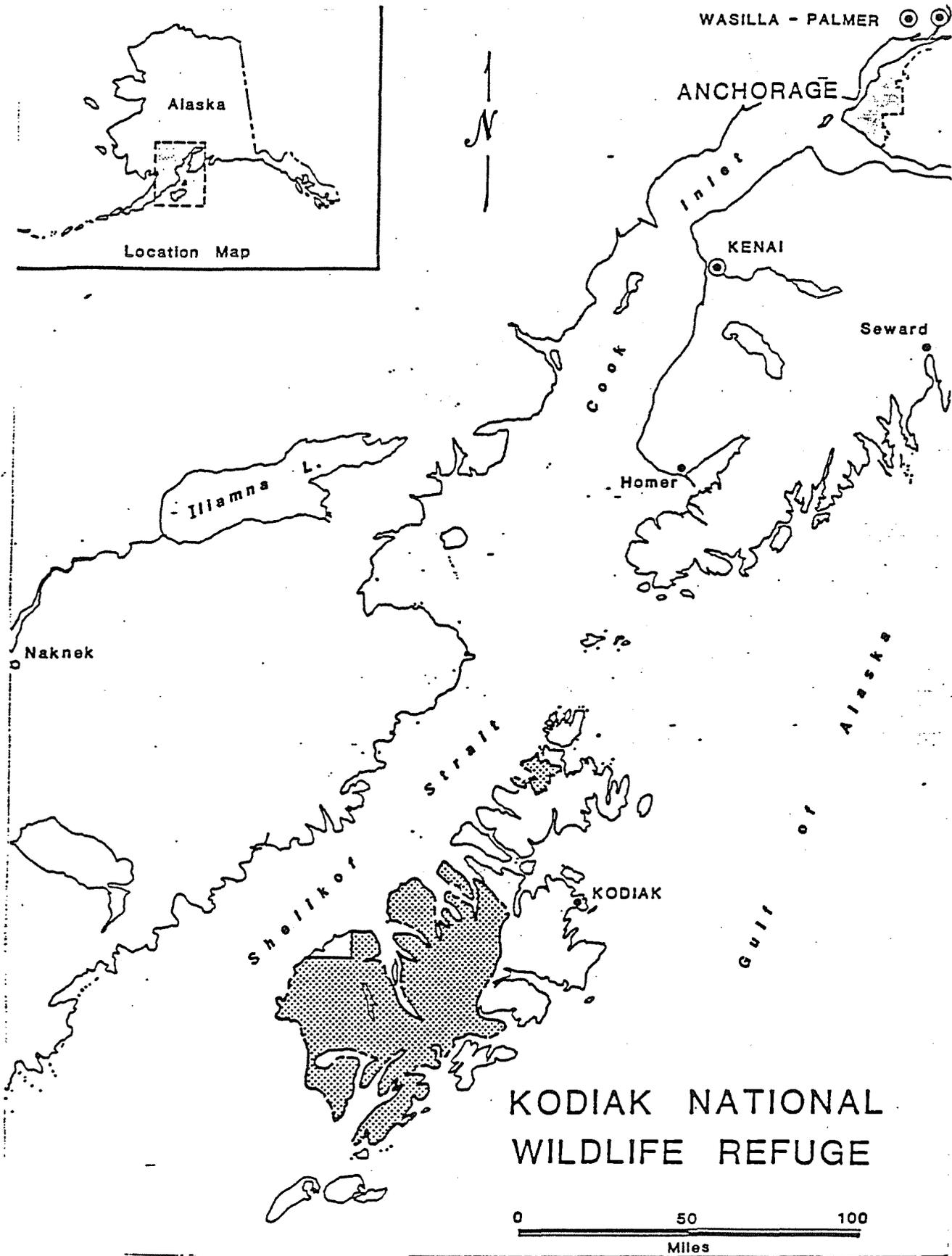
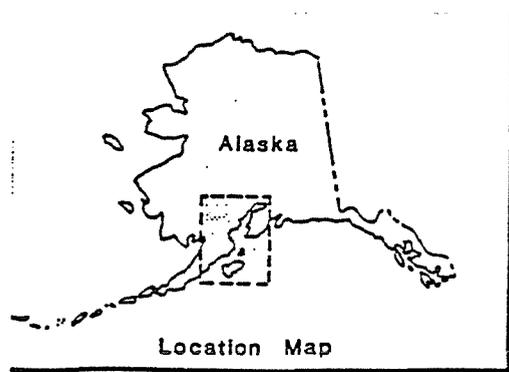


Figure 1

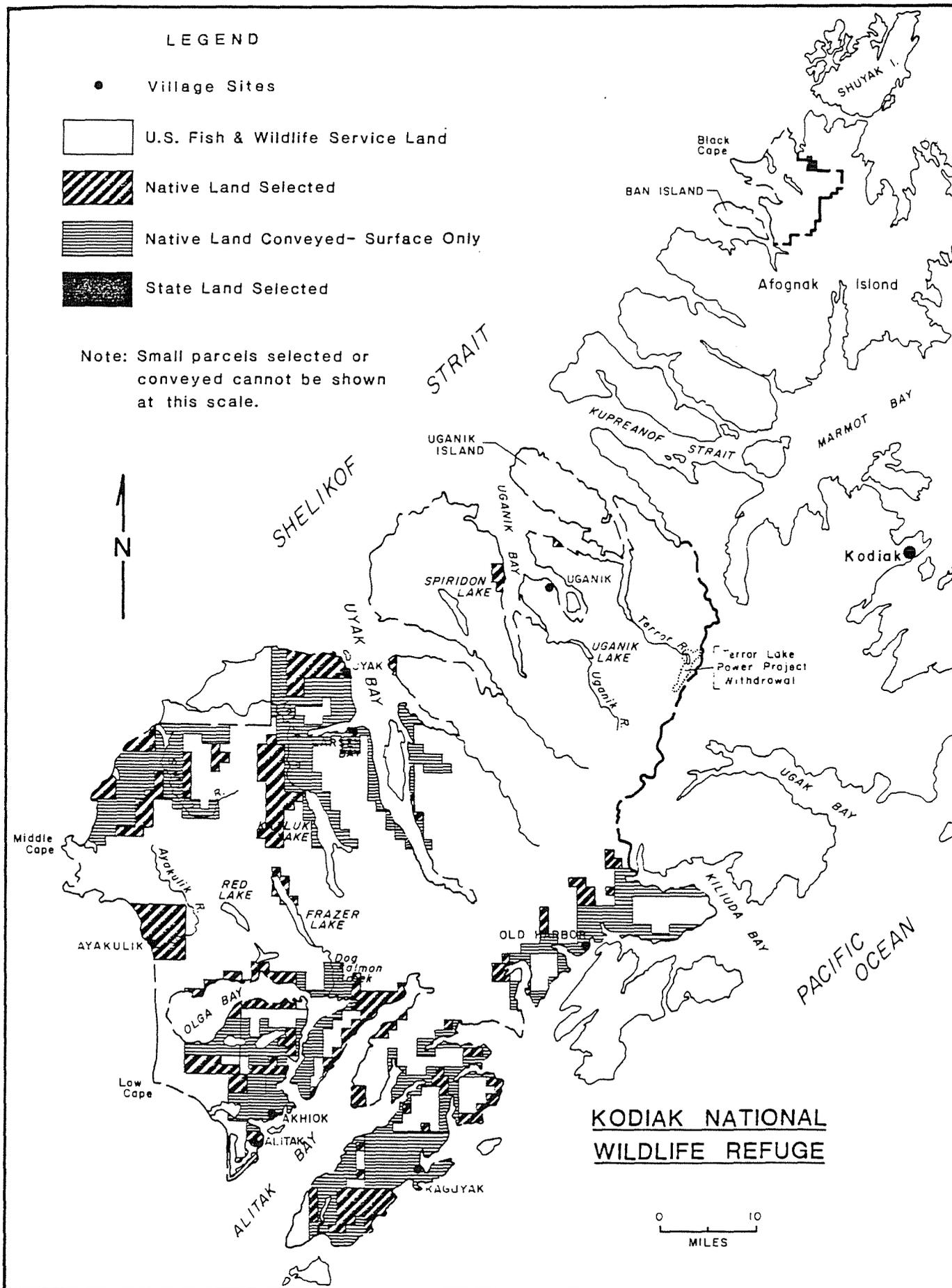


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A. HIGHLIGHTS

- Kodiak is affected by the Exxon Valdez oil spill in Prince William Sound. (Sec. J-3)
- Multi-million dollar commercial salmon fishery in Kodiak virtually shut down during the entire salmon season due to Exxon Valdez oil spill. (Sec. G-11)
- Record salmon escapements on some refuge streams. (Sec. G-11)

B. CLIMATIC CONDITIONS (Patterson)

A strong marine environment dominates the Kodiak weather pattern. The relatively warm Pacific Ocean provides the island with a mild climate year round with overcast skies and moderate temperatures being commonplace.

Normally winter weather consists of a series of low pressure storm systems moving through the area that are interrupted occasionally by an arctic high, which brings in a strong northwesterly wind clearing the sky and driving the temperature down. That is exactly what happened during the winter and early spring of 1989. However, for three days in January, we received an all time record low for Kodiak at -16 degrees. During this period the wind chill stayed down in the -40 degree range. Cold dry weather stayed with us through what is usually a wet, snowy time of the year. The result of this change in the normal pattern, put us 16 inches behind the average annual rainfall.

Dense marine fog blanketed the Island through much of May, June and July which often disrupted air travel for days at a time, both on the island and to and from Anchorage. Normally long warm days typify August and September, but not in 1989 rain, drizzle, and fog stayed with us throughout the summer. If it hadn't been for the warm temperatures and lack of snow, summer wouldn't have been any different than winter.

The season's first snow fell on October 16 which started winter off pretty much on schedule. Mixed snow, rain, drizzle and fog were the norm with temperatures almost normal and annual precipitation slightly below average (Table 1).

C. LAND ACQUISITION

1. Fee Title (Bellinger)

Region 7 of the Fish and Wildlife Service (FWS) received notice from Congress that \$125,000 was available for land acquisition purposes during fiscal year 1989. A decision was made to utilize this money to acquire inholdings on Kodiak Refuge and the properties listed below were purchased from the Native Corporation, Ayakulik Associates in late September:

- U.S. Survey 1912 which is a 6.4 acre tract located just south of Alpine Cove in Deadman's Bay.

Table 1
1989 Weather data summary

Month	Snowfall inches	Precip. inches	Precip. dept. from normal inches	Temperatures			Temp. dept. from normal
				Max	°F	Min	
January	18.2	2.53	-5.76	42		-16	-10.2
February	4.5	1.44	-4.85	45		10	3.5
March	5.7	3.61	- .45	50		10	.4
April	.6	4.3	- .71	55		26	1.4
May	-	2.02	-5.71	59		30	1.5
June	-	7.22	3.85	76		34	1.5
July	-	3.86	- .05	82		42	3.5
August	-	5.92	.71	75		42	2.3
September	-	6.1	-1.5	68		35	2.1
October	7.04	.5	-2.9	61		24	- .1
November	30.08	5.58	-1.09	49		13	-2.6
December	8.3	12.59	6.31	46		15	5.1
Totals	67.8	62.21	-12.2	59		22.08	.7

Data from the National Weather Service, Kodiak, Alaska.

- U.S. Survey 2068 which is a 7.39 acre tract located along the west side of Sulua Bay.
- U.S. Survey 2074 which is a 18.35 acre tract located along the west side of Sulua Bay.

These tracts represent the first acquisitions of numerous inholdings on Kodiak Refuge.

2. Easements

In 1989, John Merrick (Koniag, Inc.) cooperated with posting of easement right-of-way areas on Native conveyed lands of Karluk Lake and River.

D. PLANNING

1. Master Plan (Menke)

The Kodiak Refuge Comprehensive Conservation Plan was finalized in December 1987 when Regional Director Stieglitz signed the record of decision to the final document. During the past two years the refuge has been managed according to provisions in the plan. Some work on the wilderness proposal contained in the plan was completed during the year, and the proposal is expected to be ready for Congressional action in 1990.

2. Management Plan

A. Public Use Management Plan (Menke)

An active push for developing the Public Use Management Plan was initiated in 1988. Extensive public involvement related to the development of this plan was conducted through a series of mailings and meetings in 1989 (See Section D-3). Based on comments from the public, agencies, interest groups, and commercial users, five public use objectives, a public use goal and nine issues were established for further discussion in the plan.

The public use goal and objectives were discussed in workbooks and meetings which resulted in several changes. The goal for Kodiak's public use program is "to provide high quality fish and wildlife oriented recreation, interpretive and educational opportunities consistent with the refuge's resource oriented purposes". The five public use objectives established during the planning process are listed below:

1. To ensure that public use programs are compatible with the natural diversity of refuge resources and habitats.
2. To provide public use programs which minimize possible conflicts between and among subsistence, recreational, and commercial users.
3. To provide opportunities for fish and wildlife oriented recreation emphasizing short-term, low density public use.
4. To maintain access to and existing uses of the refuge for subsistence, recreation, and commercial users to the maximum extent possible consistent with refuge purposes. Maintaining traditional and non-motorized access to refuge lands for subsistence users and the general public is recognized as a priority.
5. To develop and maintain facilities for recreational users which are consistent with refuge public safety, natural diversity, and fish and wildlife management concerns. Emphasis will be on providing for fish and wildlife oriented recreation opportunities requiring minimal facility development and habitat alteration.

The public involvement phase of the planning process was completed in May 1989, with the following issues scheduled for evaluation in the plan:

1. Snowmachine use.
2. Pack animal use.
3. Access to sensitive wildlife concentration areas.
4. Unguided public use.
5. New activities in refuge permitted commercial cabins.
6. Guide and outfitter use.

7. Trail and campsite development.
8. Public use cabin development.
9. Inholdings.
10. Information and education programs.

An internal review draft of the public use plan addressing the issues and proposed management strategies was completed in December 1989. The plan outlines four management alternatives including a preferred alternative for addressing issues. Appendices to the plan contain environmental evaluations of most of the above issues and proposed regulations to implement the selected management alternative.



Assistant Manager Ryan at a public meeting held at Akhiok village to discuss refuge issues. (89-01) DM

B. Fishery Management Plan (Chatto)

During 1989 comments on the Refuge Fishery Management Plan were provided by the various divisions of the Alaska Department of Fish and Game (ADF&G). These comments were incorporated into the plan and a corrected draft was submitted to the Regional Office in April 1989 for review. A final revised draft was submitted to the Regional Office in September 1989.



Public Meetings on the development of the refuge
Public Use Management Plan were held in Kodiak
(Above), Anchorage, Larsen Bay, Akhiok, Karluk,
and Old Harbor (Below) in March and April.
(89-02, 89-03) DM





Refuge aircraft facilitate the many scheduling changes required for late winter village meetings. Karluk village is the location of this picture. (89-04) DM

3. Public Participation (Menke)

Nearly all public participation efforts in 1989 were focused on the development of the Public Use Management Plan. In February a summary of public use objectives and issues based on workbook responses was sent out to about 200 planning participants. In March a second planning workbook addressing different options for addressing public use issues was mailed out to plan participants. During March and April a series of meetings was held with key groups, individuals, villagers, and agencies with an interest in public use issues. Meetings were conducted with State of Alaska officials, The Kodiak Island Borough, commercial users, as well as public meetings in Kodiak, Anchorage, and the villages of Larsen Bay, Akhiok, Karluk, and Old Harbor.

Based on comments received at these meetings and written responses to the second public use planning workbook, an update was sent to all planning participants outlining four possible public use management alternatives. These alternatives were evaluated in selecting a preferred public use management strategy (See Sec. 2A).

5. Research and Investigations

Kodiak NR 89 - "Karluk Lake Sockeye Salmon Studies" Fish and Wildlife Service 81410-02 (Alaska Department of Fish and Game) (Chatto)

This project was initiated in 1978 by the ADF&G and in 1982 the Service and ADF&G entered into a Memorandum of Understanding for

cooperative studies on the restoration of Karluk Lake sockeye. In 1989 the project involved escapement counts, lake fertilization, smolt outmigrant sampling, and limnological and water quality analysis. The overall project results for 1989 are summarized below:

A. Karluk Sockeye Escapement and Harvest

Preliminary figures by ADF&G indicate that approximately 1,108,650 sockeye spawners were counted through the Karluk weir in 1989. This figure includes 35,320 early run sockeye (prior to July 15) and 763,325 late run fish. Overall both the early and late run desired escapement goals were met, but not by much considering there was virtually no harvest in 1989. This is the highest escapement into the Karluk system recorded since 1938. A harvest estimate of 3,480 sockeye was recorded in the Inner Karluk statistical harvest section giving a total run of approximately 1,112,130 fish.

B. Lake Fertilization

Alaska Department of Fish and Game initiated lake fertilization in 1986. Between June and August 1989 a total of 96 tons of fertilizer was applied to the lake surface by a commercial contractor using a Cessna 188 Ag-truck aircraft. One more year of fertilization in 1990 is projected for the project.

C. Karluk Sockeye Smolt Outmigration and Adult Coded Wire Recovery

In 1989 the ADF&G sampled 982 sockeye smolt migrating from Karluk Lake. Age 2-smolt comprised a majority (84.3%) of the fish with the remainder being 3-year (15.2%) and 1-year (0.5%) smolt. The mean condition factor for these smolt was 0.85 and there was no significant difference in length and weight from previous years' observations. Approximately 8,000 spawners of the Upper Thumb early run segment were examined for coded wire tags in 1989 and a total of 15 tags were recovered. These marked fish were from the 117,000 and 141,000 sockeye fry which were tagged and released during the Upper Thumb rehabilitation effort in 1984 and 1985, respectively.

D. Karluk Sockeye Early Run Escapement Distribution Evaluation

This project was conducted in 1987 and 1988 to determine if Upper Thumb River Stocks could be selectively harvested in the Karluk district. This sub-study indicated that they could not be harvested within the Inner Karluk section without adversely affecting other sub-stocks of the early Karluk run.

E. Karluk Sockeye Competitor/Predator Investigations

Field work on this project was completed in 1988 and a final report is still being compiled by the Fisheries Division of the Alaska Fish and Wildlife Research Center (AFWRC).

F. Sockeye-Stickleback Three Lake Food Study

This investigation was deleted from the overall studies due to a lack of funding and re-direction of priorities.

G. Hydroacoustic Estimates of Rearing Sockeye

Hydroacoustic estimates of rearing sockeye abundance have been done by ADF&G since 1983. A majority of these surveys are conducted in late summer (September) and although the overall estimates of juvenile fish (all species) in Karluk Lake are considered reliable, the ground truth analysis using net tows for composition is unreliable. In 1989 approximately 80 million juveniles were estimated for the lake environment but only four million of these fish could be effectively allocated as juvenile sockeye based on tow netting. The capture of juvenile sockeye in the pelagic areas of the lake is extremely difficult due to their depth and the avoidance due to lake clarity.

H. Limnological and Water Chemistry Analysis

Data on zooplankton density and abundance were obtained by ADF&G in 1989 at various stations through the lake in addition to water chemistry. This information is being analyzed by the Department's limnological laboratory in Soldotna. Results for 1989 are not yet available.

Kodiak NR 89 - "Frazer Lake Sockeye Salmon Studies Alaska Department of Fish and Game (Chatto)

In 1988 the ADF&G proposed to fertilize Frazer Lake in order to restore the sockeye salmon rearing base in the lake which has been decimated by a series of overescapements. An Environmental Assessment for the project was prepared by the FWS in conjunction with ADF&G. The assessment included a revised escapement goal from approximately 385,000 spawners down to a maximum of 200,000 fish. A Finding of No Significant Impact was declared and the project was initiated in 1988.

In 1989 the overall project involved escapement counts, lake fertilization, smolt outmigrant sampling and limnology/water chemistry analysis. The overall project results for 1989 are summarized below:

A. Frazer Lake Escapement

Preliminary figures by the ADF&G indicate that approximately 360,370 adult sockeye passed over the Frazer Lake fishway into the lake environment. Overall the escapement goal of 200,000 fish was exceeded by 80%. The implications of this

overescapement into the system are still being analyzed, and considering that a major effort is underway to restore the rearing base it is hoped that this will not further complicate matters. In 1989 the Frazer system experienced a record return with 55% of the return (6-year old fish) coming from a low brood year escapement in 1984. A harvest of 710,500 sockeye destined for the Frazer system was recorded which results in a total run of approximately 1,070,870 sockeye.

B. Lake Fertilization

A total of 75 tons of fertilizer was applied to the surface of Frazer Lake between June and August 1989 by a commercial contractor using a Cessna 188 Ag-truck aircraft. Three more years of fertilization are planned to complete the project.

C. Frazer Lake Smolt Studies

In 1989 ADF&G sampled 644 sockeye smolt migrating out of the lake at the Frazer fish passage facility. Preliminary data indicate that approximately 96.6% of the smolts were age-2 and 3.4 percent were age-1 fish. The adult composition of the run is estimated at 58% six-year-old fish and 33% five-year-old fish with minor amounts of three and four-year-old fish.

D. Hydroacoustic Estimates of Rearing Sockeye

Hydroacoustic estimates of rearing sockeye in Frazer Lake were conducted by ADF&G using the same methods as described for Karluk in a previous section. Sampling data for 1989 is still being analyzed by ADF&G's limnological lab.

E. Limnological and Water Chemistry Analysis

Data on zooplankton density and abundance plus water chemistry were obtained in 1989 at various sampling stations on the lake. The information is being analyzed by ADF&G lab and results are not yet available.

"Terror Lake Hydroelectric Project - Fisheries Studies" (74530-82-05) (Chatto)

Monitoring efforts of the Terror Lake Hydroelectric Project post-impact fishery studies continued in 1989. These studies are being conducted by ADF&G and Trihey and Associates (a private contractor). The annual meeting of the Projects "Fisheries Monitoring Group", of which the refuge is an integral part, was held in May 1989 where the status of the various fishery projects was reviewed. The Kodiak Electric Association reported during the meeting that they had done a rough assessment of preliminary water balance data and came to the conclusion there may be insufficient water available to add a third proposed generator to the Terror River project. The overall results of the major studies are summarized as follows:

A. Salmon Returns and Production, Spawning Distribution, and Pre-emergent Fry Survival in the Terror and Kizhuyak Rivers 1982-1988

This report is an interim report prepared by Trihey and Associates and summarizes information collected by the ADF&G from 1982 through 1989. The report provides an interim assessment of effects from the project on pink and chum salmon production in the Terror and Kizhuyak Rivers. The report indicates there has been an average annual increase in total returns of salmon for both systems but that the average return-per-spawners has decreased for both systems. The study also indicates that detailed knowledge of Terror River hydrology and salmon biology is needed before timely flow releases from Terror Lake can be established that optimize both salmon and power production. Changes in study design and methods were recommended to improve the validity of studies.

B. Intergravel and Surface Water Temperature

The 1989 report summarizes data collected by Trihey and Associates from November 1988 through October 1989. Results indicate there is very little temperature difference between surface and intergravel water temperatures at all monitored stations. Recommendations by the investigator were to discontinue the monitoring of the intergravel water temperatures because no significant differences are apparent and monitoring the surface temperature would be sufficient for project analyses. The members of the Fisheries Monitoring Group were polled by the Alaska Energy Authority and there was general consensus to discontinue this aspect of the study.

C. Pink and Chum Salmon Intergravel Spawning Success

A field report by the ADF&G for work conducted in March 1989 was received by the Fishery Monitoring Group in June 1989. The basic purpose of this study is to evaluate the effects of natural de-watering on natural pink and chum salmon redds and artificial redds. Results of the March 1989 sampling on both rivers were mixed with no definite relationship being established between live or dead eggs with depth.

Kodiak NR 89 - "A Habitat Analysis to Determine the Optimum Number of Ayakulik River Chinook Spawners Needed for Escapement" (Chatto)

This investigation was begun by the refuge in 1988 and completed in 1989. The objective was to determine a recommended adult chinook salmon escapement for the Ayakulik River based on available spawning habitat. A final report was completed in August 1989. Results of the investigation indicate a total of 7,820 adult chinook spawners is projected to be consistent with available habitat. Although this estimate is calculated only from available spawning area, it does compare favorably with the 1976-1988 average annual measured escapement of 7,600 spawners. A

recommended escapement level which encompasses this point estimate is being discussed with the ADF&G for Ayakulik.

Kodiak NR 89 - "Steelhead Trout Movements and Habitat Use in the Ayakulik/Red River System Southwest Kodiak Island" (74530-84-01)
(Chatto)

Results of this study are inconclusive due to a large percentage of tag loss on radio marked fish during the second year of tagging. Data indicate that the majority of tagged fish overwinter in deep glide habitat between river mile 9.5 and 14.0 on the mainstem Ayakulik. Spawning occurred in late April through May in pool riffle areas between river mile 3.5 and 6.5 on the East Fork Ayakulik, below the outlet of Red Lake in the lower mainstem riffle areas between river miles 6.5 and 9.0. The major impact of the sport fishery would be between river mile 6.5 and 10.0 from November to April.

Kodiak NR 89 - "Chinook Salmon Movements and Habitat Use in the Ayakulik/Red River System Southwest Kodiak Island" (74530-85-02)
(Chatto)

A final report on this project was completed in 1989. Results of the study indicate that Ayakulik River chinook would be most vulnerable to the sport fishery at the lagoon and between river mile 6.5 and 9.5 until the first week in July, after which only those fish which spawn in the lower river would be available to sport fishermen. Spawning area selection is dependent upon entry timing with those fish which spawn in the East Fork Ayakulik entering the system on or before June 18. This component of the run appears to support a site specific feeding area for brown bear during the month of July.

Kodiak NR 89 - "Coho Escapement Evaluation" (74530-88-02) (Chatto)

This investigation was initiated in late 1988 to develop a methodology for assessment of coho salmon escapements. The project was to be a cooperative effort with the Alaska Office of Fish and Wildlife Research and the ADF&G. Work completed in 1988-1989 was directed towards compiling 20 years of escapement and harvest data and categorizing the data on a computer data base. In addition, all literature life history information on coho salmon for the Kodiak area was compiled. Due to the re-direction of research emphasis and funding, this project was terminated in 1989. However, the refuge is in the process of re-designing the study and hoping for funding in fiscal year 1991.

Kodiak NR 89 - "Impacts of Construction and Post-construction Operation of the Terror Lake Hydroelectric Project on Brown Bears (Ursus arctos)" (74530-82-03) (Barnes)

Study accomplishments in 1989 resulted in the presentation of the following paper at the Eighth International Bear Conference (Victoria, British Columbia, Canada).

Smith, R.B., and L.J. Van Daele. 1990. Impacts of construction and operation of the Terror Lake hydroelectric project on brown bears on Kodiak Island, Alaska. Int. Conf. Bear Res. and Manage. 8:In Press.

Kodiak NR 89 - "Investigation of Habitat Use and Evaluation of Aerial Surveys of Brown Bear in Southwest Kodiak Island" (74530-83-02) (Barnes)

Study accomplishments in 1989 resulted in the presentation of the following two papers at the Eighth International Bear Conference (Victoria, British Columbia, Canada).

Barnes, V.G., Jr. 1990. The influence of salmon availability on movements and range of brown bears on southwest Kodiak Island. Int. Conf. Bear Res. and Manage. 8:In Press.

Van Daele, L.J., V.G. Barnes, Jr., and R.B. Smith. 1990. Denning characteristics of brown bears on Kodiak Island, Alaska. Int. Conf. Bear Res. and Manage. 8:In Press.

Kodiak NR 89 - "Estimation of Brown Bear Density on Kodiak Island" (74530-87-01) (Barnes)

This study was conducted in 1987-89 on both the south and north ends of the refuge. Data which was collected is being subjected to additional analyses to further examine sightability bias and incorporate new developments in mark/recapture work. A manuscript is in preparation.

Kodiak NR 89 - "Survival and Productivity of Female Brown Bears and Survivorship of Cubs on Kodiak Island, Alaska (72104-88-01) (Barnes)

This is a cooperative study involving the FWS, the ADF&G, and the Kodiak Brown Bear Research and Habitat Maintenance Trust. The objective is to study long-term productivity and survival of female brown bears by continued monitoring of animals radio-collared for other investigations. The sample consists of 156 subadult and adult females captured and radio-collared on Kodiak Island during 1982-1989.

In 1989 radio-tracking flights were conducted in spring and fall to determine status of females and survival of their offspring. During late June and early July, 32 females were recaptured and fitted with new collars and 7 new females were captured and radio-collared.

Fifteen (39%) of 38 eligible adult females emerged from their 1988-89 winter dens with new cub litters. Mean litter size was 2.2. Three females produced their first cub litters at a mean age of 6.3 years. Minimum mortality among newborn and yearling cubs during the year was 29% and 19%, respectively. Two cases of cub adoption, one involving new cubs and the other involving a yearling, were documented.

Seven adult females died between fall, 1988 and fall, 1989. The survival rate for 65 females monitored the entire year was 0.89.

Kodiak NR 89 - "Brown Bear/Human Interactions Associated with Deer Hunting on Kodiak Island" (74530-88-01) (Barnes)

Objectives of this study are to determine what components of the bear population are affected by deer hunting activity, determine activity patterns of bears influenced by deer hunting, and to quantify observations and attitudes of deer hunters. The study began in 1988.

Thirteen bears were captured and fitted with radio-collars in 1989, including 10 new captures and 3 that were recaptured for collar replacement. Composition of the 40 bears radio-collared in 1988 and 1989 is as follows: adult female - 28, subadult female - 2, adult male - 5, subadult male - 5. Aerial relocations of collared animals totalled 382 and 496 in 1988 and 1989, respectively. Relocations are in the process of being digitized for range analyses in the ARC/INFO computer system.

By fall 1989, 31 bears were alive with functional radio-collars. Mortalities to date include 3 adult females that died of natural causes and 2 subadult males that were taken by sport hunters.



Natural causes have accounted for nearly half of all mortalities among adult female brown bears marked in cooperation with State/Federal studies on Kodiak. This 13-year-old sow died overwinter in her den. (89-05) VB

Returns of deer hunter survey forms totalled 96 and 51 in 1988 and 1989, respectively. The lower number of returns in 1989

corroborates other information (air charter records, refuge interviews) indicating a reduced hunter effort in 1989. Preliminary summaries of responses show some similarities as well as differences between the two years. In both years, November was the most popular month, hunters averaged about 6 days afield and harvested an average of nearly 3 deer per hunter, and about half of the hunters observed at least one bear during their trip. In 1988, about 7% of the hunters encountered a bear(s) in a situation in which they felt threatened, but in 1989 that figure rose to 20%. Eleven percent of the hunters reported losing one or more deer to a bear in 1988, compared to 22% in 1989. Nevertheless, nearly half of the hunters (both years) indicated that bears were not a concern and several mentioned that observing bears added enjoyment to their hunt.

Kodiak NR 89 - "Seasonal Migration and Movements of Kodiak Island Bald Eagles" (74530-82-01) (Zwiefelhofer)

The 1989 study efforts focused on cataloguing color marker observations. A total of 14 color marked bald eagle observations were made during 1989. All observations occurred on the Kodiak Archipelago.

The study's final report is scheduled for completion during fiscal year 1990.

Kodiak NR 89 - "Habitat Utilization and Seasonal Distribution of Sitka Black-Tailed Deer on the Spiridon Peninsula, Kodiak Island, Alaska (74530-89-01) (Zwiefelhofer)

This study was initiated in 1989 to determine habitat preferences, seasonal distribution and winter food items of Sitka black-tailed deer. Efforts to place radio-collars on 25 deer in the study area by use of a net-gun fired from a blind or stalking were to commence in mid- to late January. Due to a personal injury of the principal investigator, extreme weather conditions, and other logistical problems, the collaring effort was delayed until March.

Unfortunately, the delay dramatically reduced the number of deer utilizing the beach areas and lower elevations the capture teams were set up to work. After 8 days of concentrated effort and no captures, the March collaring effort was abandoned.

Because of the failure of this capture effort and the interruption of planned work schedules by the Exxon Valdez oil spill a revision of study objectives and procedures became necessary. A decision to shift the emphasis of the study towards the identification and utilization of habitat types was made. Graduate student Selinger (principal investigator) and volunteer P. Bologna remained in the study area until mid-April.

A winter mortality survey of deer in the study area was conducted from March 11 to March 24. A total of 161 carcasses were recorded along 6 miles of coastline (Table 2). The mortality by age class included 98 fawns (61%), 6 yearlings (4%), 16 adults (10%), and 41 unknowns (25%). By using the mean median length of femurs and hind feet of known fawns for comparison, it appears that 27 (66%)

← 20%
Wou

of the 41 unknown age class mortalities were likely to have been fawns also. Femur marrow of all winter mortalities in the study area were found to be devoid of fat. The distances deer carcasses were found from the coast are reported in Table 3.

Table 2
1989 Deer winter mortality.

	Fawns	Yearlings	Adults	Unknowns
Male	42	2	13	--
Female	29	4	0	--
Unknown	27	--	3	41
Total	98 (61%)	6 (4%)	16 (10%)	41 (25%)
Total No. of Carcasses	161			

Table 3
Distance of deer carcasses from the coast.

	Distance			
	0-100m	100m-200m	200m-300m	> 300m
Number of Carcasses	63 (39%)	40 (25%)	18 (11%)	40 (25%)

Also during this late winter time period, 44 permanent pellet transects were established and pellet group samples taken. Browse clippings and measurements were also taken along these transect lines for future analysis.

On June 25 and 26, aerial (helicopter) capture and tagging of deer using a dart gun instead of ground capture was tested. This method was successful in placing radios on 5 adult female deer in the study area. The 5 deer are currently being aurally monitored on a 10 to 14 day cycle to determine seasonal distribution and habitat use.

Work planned for the 1990 field season includes collaring an additional 20 female deer, determination of habitat types, and cover type mapping of the study area.

Kodiak NR 89 - "Movement, Dispersal, and Life History of Sea Otters Near Kodiak Island, Alaska, and Relationships to Shell Fisheries (87200-210-02 and 03) (Patterson)

This project focuses on sea otter movements, home range size, foraging behavior, and food habits and their relationship to commercial shell fisheries. The study is being conducted by the AFWRC. Because of the oil spill there was little field work conducted in 1989 and no progress to report.



Graduate Student Selinger fits a radio-collar on a somewhat reluctant doe. (89-06) VB



Seasonal movements and habitat use by Sitka black-tailed deer are under study in the Chief Cove area at Spiridon Peninsula. (89-07) VB

6. Other (Chatto)

Several days in January and November 1989 were spent attending meetings of the Kodiak Regional Salmon Planning Team reviewing and editing Phase II of the Kodiak Regional Comprehensive Salmon Plan. This plan is a joint effort between the ADF&G, the Kodiak Regional Aquaculture Association, and the refuge.

E. ADMINISTRATION (Castonguay)

1. Personnel



Left to right - (Back) Hander, Ryan, Chatto, Menke, Patterson
(Front) Christian, Castonguay, Anderson, Barnes,
Rezabeck. (89-08) DM

Personnel

1. Jay R. Bellinger, Refuge Manager, GS-12, PFT, EOD 1/8/84
2. Kevin Ryan, Asst. Refuge Manager, GS-11, PFT, EOD 5/13/84,
Reassigned to Deer Flats NWR EOD 12/17/89
3. Kurt G. Becker, Wildlife Biologist/Pilot, GS-12, PFT, EOD 9/27/86,
Transferred to Forest Service in Idaho EOD 2/26/89
4. Donald A. Chatto, Fishery Biologist/Pilot, GS-12, PFT, EOD 3/12/81
5. James A. Patterson, Pilot, Permanent (Local Hire), PFT, EOD 6/7/89
6. David W. Menke, Outdoor Recreation Planner, GS-9, PFT, EOD 8/16/84
7. Dennis C. Zwiefelhofer, Wildlife Biologist/Boat Operator, GS-9,
PFT, EOD 5/78
8. Geraldine M. Castonguay, Refuge Clerk, GS-5, PFT, EOD 2/7/83
9. Sherry G. Christian, Clerk Typist, GS-3, PFT, EOD 11/7/88
10. Ronny D. Bowers, Maintenance Mechanic, WG-9, PFT, EOD 4/3/83
11. Rasmus G. Anderson, Jr., Laborer, WG-2, PPT, EOD 6/11/83
12. Catherine A. Rezabeck, Public Use Specialist, GS-7, Temporary
(Local Hire), EOD 4/18/88

13. Raymond F. Hander, Biological Technician, GS-5, Temporary (Local Hire) EOD 7/3/88
14. Jeffrey S. Selinger, Biological Technician, GS-5, Temporary (Local Hire) EOD 4/24/88-2/89 & 4/89-5/89
15. Paul A.X. Bologna, Biological Technician, GS-5, Temporary (Local Hire), EOD 5/1/89, Separated 7/6/89

Alaska Fish and Wildlife Research Center

16. Victor G. Barnes, Jr., Wildlife Biologist, GS-12, PFT, EOD 6/19/82
Volunteers

17. Paul A.X. Bologna, EOD 2/1/89, Separated 4/30/89
18. Robin McCoole, EOD 5/16/89, Separated 6/7/89
19. James Savage, EOD 5/31/89, Separated 9/19/89
20. Rosemary Bushong, EOD 6/6/89, Separated 7/3/89
21. Robert Harned, EOD 6/15/89, Separated 8/20/89
22. Kim Hollander, EOD 6/28/89, Separated 7/3/89
23. Lea Brant, EOD 6/28/89, Separated 7/3/89
24. Debbie Kahn, EOD 7/12/89, Separated 8/18/89
25. Christine Berkman, EOD 7/12/89, Separated 8/10/89
26. Jack Dean, EOD 7/18/89, Separated 8/1/89
27. Caroline Askew, EOD 8/11/89, Separated 9/29/89
28. Theresa Madigan, EOD 9/30/89, Separated 10/13/89
29. Mark Biddlecomb, EOD 12/19/89, Separated 12/27/89

Kurt Becker accepted a Wildlife Biologist position with the Forest Service in Idaho and departed Kodiak the end of February.

Paul Bologna was hired in May as a temporary biological technician to assist with the Exxon Valdez oil spill and bird identification in the morgue and separated in July.

James (Butch) Patterson was selected to fill the permanent local hire Pilot position starting June 7, after the Wildlife Biologist/Pilot position was vacant for three months.

Assistant Refuge Manager Ryan accepted the Refuge Manager position for Deer Flat National Wildlife Refuge in Idaho. We are very happy for Kevin, but he will be missed by all. However, a selection for a lateral reassignment of Dick Munoz from San Francisco Bay National Wildlife Refuge was made for arrival in late January of 1990.

Refuge Manager Bellinger received both a performance award for fiscal year 1988 and the employee of the region award for 1988 in January. Refuge Manager Bellinger also received a performance award for fiscal year 1989 in December.

Refuge Manager Bellinger, Refuge Clerk Castonguay, and Clerk Typist Christian each received Special Achievement Awards for their time and effort spent on the Exxon Valdez oil spill in December.



Refuge Manager Bellinger receiving one of four Special Achievement or Performance Awards present to him during 1989 (He must be doing something right!). (89-09) DM



Wildlife Biologist/Pilot Becker (89-10) DM



Refuge Clerk Castonguay (Above) and Clerk Typist Christian receive Special Achievement awards for their time and effort on the oil spill. (89-11, 89-12) DM



Table 4 shows on board strength for the last five years.

Table 4
Staffing 1985 to 1989

	(Number of employees)			Total FTE
	permanent full time	part time	temporary	
FY 1989	9	1	4	9.5*
FY 1988	9	1	3	9.5*
FY 1987	9	1	2	9.7
FY 1986	9	1	1	9.7
FY 1985	9	1	0	9.5

* Local hire appointments do not count toward full time equivalents.

4. Volunteer Program (Menke)

In 1989 volunteers donated a total of 5,852 hours of service to the refuge and the oil spill effort. The majority of volunteer efforts were related to oil spill activities (3,852 hours). Oil spill volunteers assisted with wildlife surveys and assessment, identified oil killed birds (more than 20,000 dead birds came through Kodiak morgue), set up and organized bird rehabilitation work, ran hundreds of errands and entered/organized computer data.

Listed below are some of the volunteers for 1989:

Paul Bologna reported for volunteer work in February to assist with the deer study at Chief Cove. Paul worked on this study with Jeff Selinger until mid-April and then started work on the oil spill.

Robin McCoolle reported on May 16 to assist Jeff Selinger with the continuing work on the deer study, however the pay for working on the oil spill was too tempting for her to stay with the deer study, and separated three weeks after starting her volunteer work on June 7.

Jim Savage reported on May 31 to assist where needed on the oil spill duties. His duties were to identify oiled birds at the local morgue and to pick up oiled birds on one of the vessels. He separated on September 19.

Rosemary Bushong arrived on June 6 to assist with seabird surveys aboard the MV Ursa Major. She had to separate earlier than expected, July 3, due to a family emergency.

Bob Harned arrived on June 15 to also assist with seabird surveys on the MV Ursa Major and departed on August 20.

Kim Hollander and Lea Brant assisted for 5 days in the morgue identifying oiled birds the latter part of June.

Debbie Kahn and Chris Berkman reported on July 12 from the Innoko Refuge to assist where needed on the oil spill. Debbie assisted on the sea bird surveys, and Chris assisted on the deer study for one week and then assisted in the bird morgue. Chris departed on August 10 and Debbie departed on August 18.

Jack Dean reported on July 18 to assist as oil spill monitor on one of the vessels for the oil spill and departed on August 1.

Caroline Askew reported on August 11 from the Selawik Refuge and assisted on seabird surveys and bird identification in the bird morgue. Caroline departed on September 29.

Theresa Madigan reported on September 30 to assist with seabird surveys on the MV Ursa Major and departed October 13.

Mark Biddlecomb reported on December 19 to assist with field duties on the deer study, unfortunately weather prevented them from making it to the field so he departed on December 27.

Thirty-five volunteers participated in refuge programs, twenty volunteers helped staff the visitor center on weekends. Other work accomplished by volunteers included:

1. Trail construction.
2. Winter seabird surveys.
3. Bear and fisheries research support.
4. Computer data analysis.
5. Cabin maintenance and repair.
6. Assistance with the refuge deer study.

Four volunteers including two well qualified professional carpenters completed modifications to two public use cabins. At one cabin a handicap access ramp, porch and pit toilet were constructed. Much needed repairs were also completed at the O'Malley public use cabin. Both projects were part of a \$4000 challenge grant. Kodiak Refuge may now have Alaska's only wilderness recreation cabin specifically modified for handicapped access.

Kodiak Refuge accomplishes a great deal of work which would otherwise go undone without volunteers. We look forward to continuing these programs in the future.

5. Funding (Bellinger)

Table 5 depicts Kodiak Refuge funding in thousands of dollars by programs for the last five fiscal years.

The total for fiscal year 1990 represents a reduction of two percent from the fiscal year 1989 budget. However, 528K is needed for salaries and fixed cost, 18K for Maintenance Management Systems equipment replacement and 91K for special studies.

Therefore, only 15% of our fiscal year 1990 budget is available for normal operations.

Table 5
Kodiak National Wildlife Refuge funding levels

Program	Fiscal Year				
	1986	1987	1988	1989	1990
WR-1260 (O&M)	536.0	620.0*	690.0**	666.0	655.0
WR-1260 (Large ARMM)	125.9	170.0			
FR-1300	104.0	100.0	100.0	90.0	79
EFS-1510		2.0			
YCC-1520	3.4				
Contaminants		1.0	25.0		
Totals	769.3	893.0	815.0	756.0	734.0

* A total of 98K were monies for one-time add-ons, therefore, did not become part of base funding. Actual base funding (520.3K) was down 3% and 10.6% from 1986 and 1985, respectively.

** A total of 152K are monies for one-time add-ons. Therefore actual base funding is 538K.

6. Safety (Patterson)

Only one lost time accident occurred in 1989. On October 12 Assistant Refuge Manager Kevin Ryan very nearly cut the end of his left thumb off while working at Camp Island on the Pan Abode rehabilitation project. The others in the work crew administered first aid, and using the HF radio called the Refuge. He was picked up in the refuge Super Cub and taken to town where a doctor reconstructed his thumb.

During the fall bear hunting season at Frazer Lake, a boating accident resulted in a loss of two lives on the refuge. The following is from Trooper A.B. Bennett's Missing Persons Report:

"On 11/12/89 at approximately 0930-1000 hrs five men and a dog departed in a 14 foot skiff from a cabin off the South West side of Frazer Lake heading towards Dog Salmon River. As it was passing within 200-300 yards of a small island off its left side the skiff capsized. Three of the occupants swam to shore. PAUL J. REYNOLDS and DONALD J. TRAVARELLI remained with the skiff. Travarelli's body was later recovered by the U.S. Coast Guard but Reynold's body was not found. Reynolds was not wearing a life vest when he entered the water."

Paul Reynolds hunted on Kodiak as a big game guide for many years. Harry Dodge, another guide, and his dog survived the swim to shore, and has since recovered from severe frostbite.

7. Technical Assistance (Chatto)

In 1989 the refuge processed a request by Nippon Hoso Kyoko, the Japanese Broadcasting Company, to conduct some fishery and wildlife filming on the refuge. The film crew was accompanied by several Japanese Fishery Scientists from the University of Hokkaido who were conducting work on Dolly Varden and Arctic char on the refuge. The refuge issued the company a special use permit and the refuge staff Fishery Biologist/Pilot Chatto accompanied the group in the field. The company is the sole public television station which produces non-commercial programs for use in Japan. During the 3 to 4 day stay the crew was able to film brown bear feeding on sockeye salmon, sockeye spawning, and sockeye/Arctic char interactions on the spawning grounds. In addition, fishery scientists from the University sampled for Dolly Varden and Arctic char in Karluk Lake to compare taxonomic characteristics of these fish with other Alaskan and Asian char.

As a result of the Exxon Valdez oil spill and anticipated impacts to the Kodiak Archipelago, the refuge Fishery Biologist/Pilot Chatto and Research Biologist Barnes along with another contract pilot and Biological Technician Selinger conducted a coast wide aerial marine mammal and seabird pre-impact survey between April 7-13. Approximately 2,500 miles of coastal shoreline were surveyed.

8. Other (Chatto)

Refuge personnel attended several meetings during the year dealing with fisheries management on the refuge. In the fall of 1988 the annual Kodiak Fisheries Advisory Board meeting was attended. Comments on the 1988-89 regulatory changes for commercial, sport, and subsistence fisheries were sent to the Regional Office. Also during the fall a brief (one day) fishery project leaders meeting given by Fishery Management Services was attended where refuge personnel gave a presentation on past and current fishery activities on the refuge. The 1989 annual report for refuge fisheries activities was completed and submitted to Fishery Management Services in November. Refuge special use permits were issued to the ADF&G - Fisheries Rehabilitation Enhancement and Development (FRED) Division for the continued fertilization of Karluk and Frazer Lakes during 1989. The objective of the projects is to restore the food base for rearing juvenile sockeye salmon (Sections D-5, 2-b, 3-b).

A special use permit was issued to the ADF&G for helicopter access to select salmon streams on the Kodiak and Alaska Peninsula/Becharof Refuges. The purpose was to sample for site specific instream data on the density of pink and chum salmon. This data will be used to measure the possible effects of overescapement for these species due to the commercial fishing closures which resulted from the Exxon Valdez oil spill.

A special use permit was issued to the ADF&G FRED Division for the taking of approximately 1,500 sockeye salmon smolt from Karluk Lake. The smolts were part of a barrier evaluation study of Spiridon Lake (Sec. D-5).

In 1989 all 114 of the refuge's anadromous fish stream drainages were ranked according to fishery values as part of the Alaska Submerged Lands Act report. This information was provided to the Service's work group who were preparing the Acquisition Priority System segment of the project.

In 1989 a cooperative agreement between the refuge and the ADF&G was drafted for the initiation of a floating salmon counting weir for the Uganik River on the refuge. The Uganik system is a glacial system which is difficult to aerial survey because of periodic high silt loads. This system hosts sockeye, pink, chum, and coho salmon. The weir is expected to be in place during the 1990 season and will greatly facilitate assessment and management of escapement for these species.



Humpy Creek, on the Aliulik Peninsula, sustains the largest pink salmon run on refuge, which in turn attracts high bear concentrations. (89-13) VB

F. HABITAT MANAGEMENT

1. General (Patterson)

The refuge is managed as de facto wilderness (73% of the refuge has been recommended for wilderness designation in the comprehensive conservation plan). Most of the habitats on Kodiak remain in an undisturbed state, the major exception being the

coastline, where in some sections considerable development has occurred.



The Aliulik Peninsula supports high numbers of black-tailed deer, brown bear, ptarmigan and waterfowl. Aiaktalik and Sitkinak Islands are in the background. (89-14) VB

6. Other Habitats (Chatto)

A. Lake Limnological Sampling

In 1989 the ADF&G conducted limnological sampling of Akalura and Spiridon Lakes on the refuge. The sampling data is still being analyzed by the ADF&G, therefore, lab results are not yet available. A hydroacoustic analysis of Akalura Lake in September 1989 indicated approximately 4.75 million juvenile fish were residing in the lake environment. Tow net catches to calibrate sockeye abundance in this estimate have not yet been analyzed to estimate total sockeye abundance.

B. Hidden Lake Coho Salmon Stocking

This program was begun in 1988 by ADF&G through an Environmental Assessment and Compatibility Determination by the Service. On June 28 approximately 250,000 juvenile 0-age coho salmon were planted in the lake. These fish are from the ADF&G's Kitoi Bay Hatchery on Afognak Island. The project is projected to be continued on an annual basis by ADF&G to enhance the sport, commercial, and subsistence fishery on the northwest side of Afognak Island.

C. Spiridon Lake Habitat Assessment

In 1989, the refuge received a request by ADF&G's FRED Division to begin stocking Spiridon Lake with 0-age sockeye salmon juveniles. Spiridon Lake is a large oligotrophic clear water lake on the west side of the refuge. The lake is barren of anadromous fish due to an impassible barrier below the lake outlet. The ADF&G proposes to stock the lake on an annual basis and harvest all returning sockeye in a terminal area fishery within Spiridon Bay.

In 1989 ADF&G, under permit from the refuge, carried out a test of sockeye smolt survival over the Spiridon Lake Falls using Karluk sockeye smolt. The estimated mortality for the test smolts was in excess of 20 percent. Current plans may involve construction of a downstream migrant by-pass system at the falls.

Originally ADF&G had proposed full scale stocking in the spring of 1990. The refuge has indicated there are several items which need to be addressed before an Environmental Assessment and Compatibility Determination can be done on the project. Among these are: 1) the need for a long-range goal for sockeye by the ADF&G since the objective harvest levels of the Regional Plan for sockeye have been met in recent years, thus so have the refuges and the need for additional enhancement is questionable in this light; 2) there is a need for a commercial harvest management plan for these returning fish that must be in place prior to project initiation in order to protect other Spiridon Bay wild salmon stocks which migrate and hold within the same terminal area; and 3) finally the refuge needs to know the extent of any construction and long-term human activity which may be associated with the project. If long-term human presence is anticipated a pre-project assessment or study of wildlife use (i.e. brown bear) may be necessary to determine compatibility.

9. Fire Management (Patterson)

During the June tagging operation, Research Biologist Barnes, Area Game Biologist Roger Smith from ADF&G, and Bud Lofstead from Kenai Air Service observed a grass fire, on the northeast bank of the Karluk River with three fisherman attempting to extinguish the blaze. The tagging crew assisted in controlling the fire. Apparently the fire started from the fishermen's camp fire. There were no structures threatened, no injuries occurred and only 3 to 5 acres burned.

On April 22, Assistant Refuge Manager Ryan and Fishery Biologist/Pilot Chatto departed Kodiak to observe a reported fire on the Aliulik Peninsula but the weather deteriorated enroute and they returned to town. The fire was extinguished with no injuries and no structures damaged.



This unprescribed grass and brush fire along the Karluk River was started by a party of chinook salmon fishermen. (89-15) VB

12. Wilderness and Special Areas (Menke)

There is currently no designated wilderness on Kodiak Refuge. The comprehensive conservation plan includes a 1.17 million acre wilderness proposal (73% of the refuge). The proposal is currently going through the Department of Interior and there may be Congressional action on this and other Alaska wilderness additions in 1990. The refuge also contains a 88,000 acre research natural area and four rivers designated for special river management according to the refuge comprehensive conservation plan. Although no specific management actions were proposed for these areas in 1989, wilderness values were considered in the selection of a preferred alternative in the refuge's public use management plan.

G. Wildlife

3. Waterfowl (Zwiefelhofer)

Waterfowl production on the Kodiak Refuge has historically been considered an inconsequential contribution to overall flyway populations. Species such as northern pintail, American wigeon, and gadwall that are declining in number along the Pacific Flyway, are known to nest on Kodiak. The amount of production by these and other duck species has not been quantified by brood surveys. The region is currently finalizing a standard operating procedure for production surveys on all Alaska refuges. Comparison and ranking of waterfowl production areas should be possible once these procedures are in place.



Scenic Zachar Bay on Kodiak Island's west side.
(89-16) VB



Kaiugnak Bay on the east side of Kodiak Island.
(89-17) VB

A portion of the refuge's prime wetland habitat along the Ayakulik River was to be surveyed for waterfowl production during the fiscal year 1989 field season but had to be postponed due to assessment activities associated with the T/V Exxon Valdez oil spill. Hopefully, fiscal year 1990 oil spill assessment activities will not preclude completion of the proposed production survey during the upcoming field season.

Collected Ayakulik production data would be statistically compared to other Alaskan production areas to assess the value of expanding production surveys to other refuge wetlands.

The annual refuge aerial tundra swan nesting surveys were not completed during fiscal year 1989, due to oil spill assessment activities. The surveys will be completed during fiscal year 1990 if not pre-empted again by oil spill assessment.

Arctic nesting geese populations have been on the decline over the past two decades. Various studies and surveys have been initiated in the primary breeding areas of western Alaska in hopes of determining possible causes of the decline and closely monitor population numbers. Emperors are one of the declining species of arctic geese and a small portion of this population winter on the Kodiak Archipelago. Womens Bay, along the Kodiak road system, has been identified as wintering habitat utilized by approximately 100 emperors in past years. Emperor geese were again present in 1989 with 123 observed in Womens Bay on March 29. Two neck-collared emperor geese were seen in Womens Bay on April 23 in a flock of 83 geese. One of these two collared emperors was seen in the same vicinity with 48 other emperors on December 10. Annual repeated sightings of the same collared geese or those marked in virtually the same locality indicates breeding ground sub-populations may also have some affinity for a particular wintering area.

Monthly aerial surveys of lagoons on Tugidak and Sitkinak Islands plus Sukhoi Lagoon on the south end of Kodiak Island were attempted during the period October 1988 to May 1989 to count wintering waterfowl numbers in these areas. Emperor geese were the main species of concern but all waterfowl observed were enumerated. Due primarily to adverse weather conditions, surveys were completed only during the months of November, December, and March. A summary of survey results is presented in Table 6.

4. Marsh and Water Birds (Zwiefelhofer)

A single Great Blue Heron was observed flying high over Womens Bay on February 1.

5. Shorebirds, Gulls, Terns, and Allied Species (Zwiefelhofer)

The annual wintering pelagic seabird and waterfowl survey was conducted between February 15 and 23 in Uganik and Uyak Bays. Survey transects in Kupreanof Strait, Whale Pass, and Marmot Bay were completed while enroute back to Kodiak.

Table 6
Tugidak Island, Sitkinak Island, and Sukhoi Lagoon surveys, Kodiak
Island Archipelago, Alaska

Tugidak Island			
Species	11/3/88	12/22/88	3/10/89
Tundra Swan	2	0	0
Emperor Goose	340	302	23
Mallard	390	128	243
American Wigeon	0	0	0
Greater Scaup	0	20	0
King Eider	0	3000	192
Black Scoter	0	13	170
Goldeneye sp.	20	0	13
Common Merganser	0	18	0
Unidentified Shorebird	200	0	0
Bald Eagle	0	0	4

Sitkinak Island			
Species	11/3/88	12/22/88	3/10/89
Tundra Swan	29	0	0
Emperor Goose	0	89	346
Green Winged Teal	20	0	0
Mallard	2310	1695	340
American Wigeon	0	0	79
Greater Scaup	0	20	0
King Eider	0	40	398
Stellers Eider	0	0	74
Black Scoter	0	0	47
White-winged Scoter	0	55	0
Goldeneye Sp.	20	71	145
Common Merganser	0	24	0
Red-Breasted Merganser	0	46	18
Merganser Sp.	65	0	0
Bald Eagle	0	0	1
Harbor Seal	0	0	40

Sukhoi Lagoon			
Species	11/3/88	12/22/88	3/10/89
Tundra Swan	35	0	0
Emperor Goose	0	0	0
Mallard	1000	1730	502
American Wigeon	0	0	40
King Eider	0	0	55
Stellers Eider	0	0	64
Goldeneye Sp.	0	17	30
Merganser Sp.	50	24	44
Bald Eagle	0	0	5
Harbor Seal	0	0	40



This immature King Eider is another common winter waterfowl species in the waters off Kodiak Island. (89-18) DM



Brant geese on Small Island outside Big Waterfall Bay on the northeast side of Afognak Island. (89-19) RH



Oldsquaw are the most common wintering waterfowl
in the bays adjacent to refuge lands. (89-20)
DM



Greater scaup are common wintering ducks around
Kodiak. (89-21) DM

The importance of the refuge's baseline data collection on Kodiak Island's wintering marine bird populations became evident with the grounding of the T/V Exxon Valdez and subsequent spill of nearly 11 million gallons of crude oil. Data collected during the February-March surveys enabled Service representatives to have up-to-date pre-spill species occurrence and densities in the Kodiak Archipelago.

Oil impact assessment surveys of marine birds and mammals were carried out during the period June 16 to October 10. Ongoing litigation with Exxon regarding spill mitigation has temporarily suppressed reporting of collected survey data. Survey results will be reported when this restraint has been lifted.

A report detailing marine bird and mammal surveys on Kodiak Island during 1979 to 1983 entitled "Marine Birds and Mammals Wintering in Selected Bays of Kodiak Island, Alaska: A Five-Year Study" was completed in November. Copies were distributed to coastal Alaskan refuges, local, state, and federal government agencies, plus other individuals with marine resource responsibilities and interests.

Fall seabird surveys were conducted in east and west side bays of Kodiak for the first time since 1983. Surveys were conducted from the last week in October (west side) to the first week in December (east side). Transects in Izhut Bay (Afognak Island) which had been done since 1979 were also completed. Analysis of historic data indicates that changes of most seabird populations are not likely to be detected unless surveys are conducted during the same period. Most species appear to be monitored best during the winter period but since we do have comparable data we felt that the effort was justified.

Abnormally high densities of crested auklets in the Whale Pass area between Kodiak and Afognak Islands were reported by local residents during the first two weeks of December. Numbers were estimated to be in the range of 10,000 to 20,000 birds. Marine bird surveys during mid-November indicated this species was just beginning to migrate into the area. Unusually stormy weather in early December is likely responsible for concentrating the auklets. Concentrations of crested auklets in this same area also occurred in 1979 and 1982.

6. Raptors (Zwiefelhofer)

Oil impact assessment of Kodiak Island Archipelago bald eagle production was carried out during the 1989 field season. Results of the surveys are currently part of damage litigation and will be reported at a later date.

Aircraft collision with raptors occurred on three different occasions in 1989. A bald eagle was struck and killed in Zachar Bay by an aircraft involved in the commercial herring fishery on May 18. The plane received extensive wing damage but was able to land safely. The village of Karluk, on Kodiak Island was the scene of two other raptor-aircraft incidents. On May 23 a light phase rough-legged hawk was struck by a plane owned by one of the local air taxi services. The injured hawk was recovered by the

villagers and sent in to Kodiak for treatment. Unfortunately, the bird sustained permanent wing damage and was transported to Dr. James Scott's Anchorage raptor care facility for the long recovery period. A local woman with all the proper permits has volunteered to take the hawk after its injuries have mended.

The second Karluk collision incident occurred on September 26 and involved the same air taxi service but a different aircraft. The immature golden eagle was struck by the aircraft's propeller and was still alive when brought into Kodiak but succumbed to its extensive injuries a short time later. In addition four dead bald eagles (not related to the oil spill) were turned into the refuge during 1989. Three of fatalities were due to unknown causes and one bird was electrocuted. An injured immature bald eagle was found in the Kodiak Harbor on January 11. The eagle was sent on to Dr. Scott for treatment and rehabilitation.

7. Other Migratory Birds (Zwiefelhofer)

Record low temperatures during the winter of 1989 decimated resident populations of small passerines, particularly winter wrens, golden-crowned kinglets, and brown creepers.

8. Game Mammals

A. Brown Bear (Barnes)

General

Despite increased aircraft and boat traffic associated with the Exxon Valdez oil spill, habitat conditions were good for brown bears during 1989. We are not aware of any animals contaminated by oil residues or bear mortalities associated with oil spill activities. Several incidents of helicopters harassing bears were reported, but there did not appear to be any cases of sustained harassment where bears would be significantly affected.

The oil spill led to the closure of most commercial fishery openings and unusually large salmon runs occurred in many streams. Bears took advantage of this situation and impressive concentrations were observed at places such as Humpy Creek, Connecticut Creek, Browns Lagoon, and Uyak, Spiridon and Zachar Rivers.

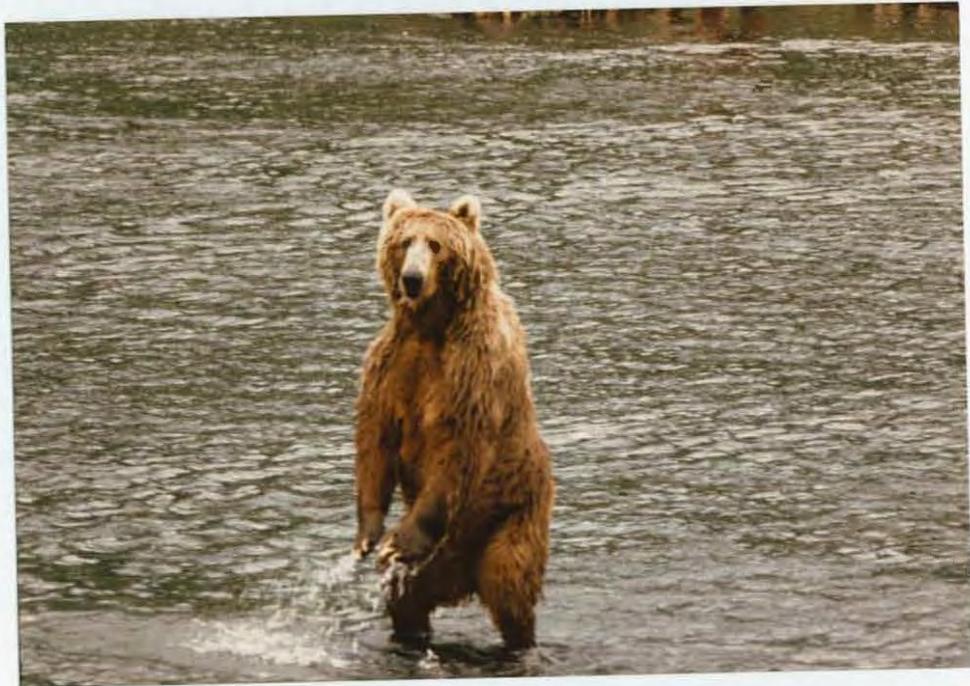
Observations on the bears secondary major food source, berries, indicated that in 1989 the crop appeared about average compared to previous years.

Surveys

Bear composition surveys of streams spanned the period of July 18 to August 12. Nine surveys were completed and 892 bears were classified. Peak counts on Sturgeon River (40) Connecticut Creek (40), and Pinnell Creek (28) were comparable to the 1982-88 averages of 42, 33, and 19, respectively. The bear concentration on Connecticut Creek



Typical bear families are comprised of a sow with two or three cubs. (89-22) DM



Female brown bear standing up to get a better look see. (89-23) DM

persisted much longer than normal (through September), probably because of the large numbers of late run sockeye in the Ayakulik River watershed.

Composition of 892 bears classified in 1989 was as follows: single - 46%, maternal female - 17%, newborn cubs - 6%, and the yearling/2-year class - 32%. Composition of new cubs was lower than normal and above average for older cubs. Yearly fluctuations in composition of juveniles is not uncommon. Composition of adults and subadults remained stable.

Mortality

Sport hunters harvested a total of 125 bears on the refuge in 1989 (Table 7); 90 and 35 animals were taken in the spring and fall seasons, respectively. Bears harvested on refuge land represented 72% of the total sport kill for Game Management Unit 8 (Kodiak Archipelago). Males accounted for 65% of the harvest on refuge land.

Twelve non-sport mortalities were reported as occurring on the refuge (Table 7). Four of the mortalities were Defense of Life or Property (DLP) kills, 4 were due to unknown causes, 3 were classed as natural mortalities, and 1 was a capture mortality. Not included in the total (12) were 3 cubs that had to be destroyed after the sow was killed as a DLP.

Table 7
Reported brown bear mortality on
Kodiak National Wildlife Refuge, 1980 to 1989

Year	Source			Total
	Sport	DLP*	Other**	
1980	101	5	1	107
1981	112	3	2	117
1982	108	7	3	118
1983	112	2	5	119
1984	131	4	3	138
1985	125	11	8	144
1986	121	12	8	141
1987	120	7	9	136
1988	128	3	6	137
1989	125	4	8	137
Average	118	6	5	129

* Defense of Life or Property.

** Includes accidental study deaths and mortality from natural or unknown causes.



A large Kodiak bear taken by a guided hunter. The spring hunt produced more "record book" bears than any previously recorded spring or fall hunt. (89-24) Photo by Andy Runyan

B. Mountain Goats (Patterson)

The annual aerial inventory survey conducted by the ADF&G recorded 270 mountain goats in the areas open to hunting. Poor weather and the lack of survey type airplanes available to the State prevented a more comprehensive count. However, the number of goats counted this year is larger than last year despite less than favorable survey conditions.

As in previous years, there continues to be some expansion of the population into the southern portion of the island. We have observed an ever increasing number of animals in both the Zachar and Uyak drainages. Overall the goat population appears to be stable.

Only 41 out of the 100 permit hunters went into the field this season with 27 goats being taken. The success rate of 66% is comparable to previous years.

C. Sitka Black-tail Deer (Patterson)

Due to the long stretch of unusually cold winter weather in 1989 the deer population appears to have suffered an above average winter kill. Despite this, hunter success remained at normal levels. However, less than half of the hunters participated this year. There were reports of poor hunting early in the season which may have been a result of unusually poor weather.



The current island population of Sitka black-tailed deer is estimated to be about 100,000 animals. (89-25, 89-26) DM



For the fourth year in a row, the refuge conducted a deer hunter survey on the west side of the island. Of the 79 hunters contacted most were successful with an average of 2.0 animals harvested (See Table 13).

D. Roosevelt Elk (Patterson)

Elk have not established themselves on Kodiak Island, but are present within the Ban Island and Afognak portions of the refuge. No firm numbers are available, but it is estimated that approximately 200 elk frequent the refuge. Composition counts of the entire Afognak herd, by the ADF&G show that the population wintered well. They counted 972 animals, with 26 calves per 100 cows, which is a normal calf/cow ratio.

One hundred eighty-nine elk were taken during the Afognak hunt, 36 from the herd that occupies the refuge. Local hunters confirmed harvesting 2 elk from Red Peak Lake in the Blue Fox drainage, which is on refuge land. Several other animals taken in the area may not actually have been shot within the refuge boundaries.



This cow elk, sporting a new ADF&G radio-collar, heads toward the Red Peaks (Afognak Island) area of the refuge. (89-27) VB

9. Marine Mammals (Menke)

Although conservation of marine mammals including sea otters, and sea lions is mentioned as a primary purpose of the refuge, all use by marine mammals occurs off refuge in ocean waters. A host of other marine mammals including the endangered (gray, humpback, sei, and finback whales) are found around Kodiak.



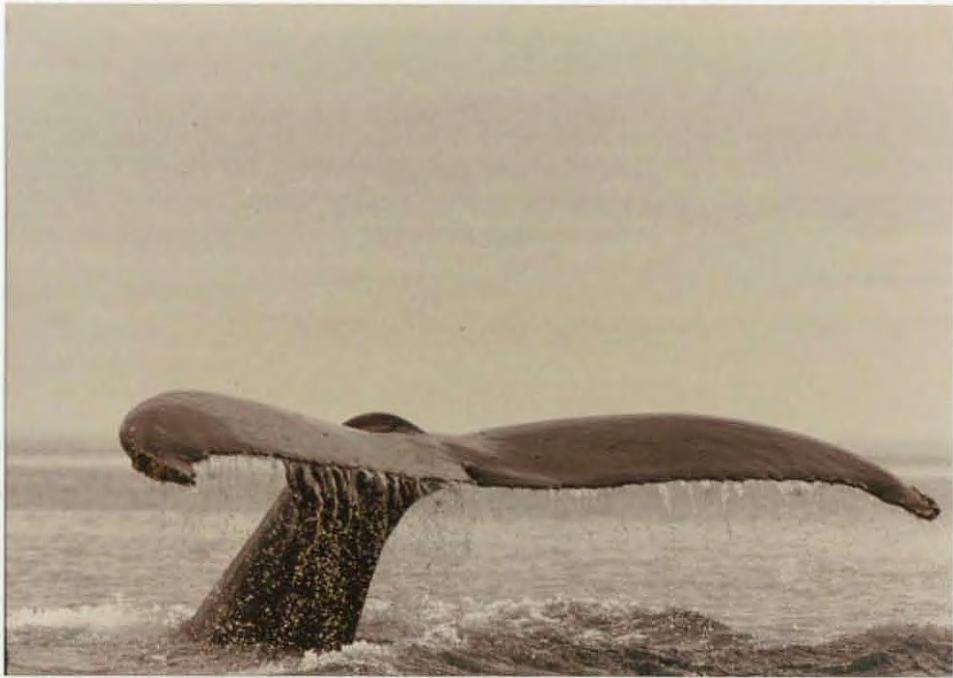
Steller's sea lion populations have declined in recent years although sightings in the Kodiak boat harbor have increased. Not all local residents have shown a concern for this decline. (89-28) DM

10. Other Resident Wildlife (Zwiefelhofer)

On February 18 the annual distribution survey of the refuge's feral reindeer population was conducted. All the western portions of the refuge known to have had historic reindeer usage were covered. A total of 173 reindeer were enumerated during the survey which compares with a total of 109 reindeer counted during a 1988 winter survey. Numbers of feral reindeer on the refuge have remained below 300 animals in the last decade.

11. Fishery Resources (Chatto)

There are 114 anadromous fish streams located on the refuge which contain spawning and rearing habitat for one or more of the five species of Pacific salmon plus rainbow trout, Dolly Varden, and Arctic char. These refuge fish populations and their habitat contribute to a multi-million dollar commercial fishery, numerous subsistence fisheries and a popular sport fishery within the Kodiak area. In addition, these salmon contribute a significant food source to dense populations of brown bear and bald eagles.



Humpback whales are often seen in the waters around Kodiak. (89-29, 89-30) DM



The refuge is managed "to conserve fish and wildlife populations and habitats in their natural diversity, provide for subsistence opportunities and ensure water quality and quantity necessary to maintain those habitats". To meet these mandates, the fishery program on the refuge is conducted in cooperation with the region's Fishery Services, Research and the various divisions of the ADF&G.

A major objective of the program is to conserve refuge fish populations and habitat by managing human use of fishery habitat and populations of the refuge in cooperation with the ADF&G.

A. The Commercial Fishery

In 1989 the multi-million dollar commercial salmon fishery in and around the Kodiak Archipelago was virtually shut down during the entire season due to the oil spill related contamination of various shoreline areas. The only area open during 1989 for prolonged commercial fishing was the ADF&G Olga Bay, Dog Salmon Flats, Akalura, and Upper Station sections of the Alitak Bay District on the south end of Kodiak Island. Two six-hour commercial openings were also held in the closed water portion of the Inner Karluk section in the Southwest District. Normally the refuge based stocks contribute to approximately 50-70 percent of the total harvest of natural stocks in the Kodiak area but in 1989 the harvest on natural stocks was almost exclusively refuge stocks (Figure 3). The only exception was a terminal cost recovery fishery at ADF&G Kitoi Bay Hatchery on Afognak Island. As indicated previously sections of the Alitak Bay District and the Inner Karluk section of the Southwest District were declared oil free and opened for commercial fishing. A total of approximately 1.5 million fish were harvested within both these areas with a majority (99%) of the fish being harvested in the Alitak Bay District by set gill-net gear (Table 8). The preliminary estimated ex-vessel value of this harvest was approximately 11.78 million dollars. This is for refuge based stocks and does not include the Kitoi Bay hatchery produced fish. As a comparison the ex-vessel value of salmon harvested in the Kodiak area in 1988 was approximately 94.0 million dollars. Table 8 indicates the probable estimated distribution of salmon catch and escapement if no oil spill had occurred.

B. The Sport Fishery

Sport fishing on refuge streams occurs in late May through July for chinook and sockeye salmon, rainbow trout, and char, then again in September through November for coho salmon, steelhead trout, and char. Although coho salmon and char are present in all major, and some minor, systems on the refuge, chinook salmon and steelhead are only known to be abundant in the Karluk and Ayakulik River systems. Smaller but more accessible chinook and steelhead populations also occur in the Dog Salmon River which drains Frazer Lake.

Figure 3. Commercial salmon harvest of Kodiak Area and refuge based salmon stocks 1981 to 1989.



Table 8
Preliminary estimates of total salmon escapement, catch
and run numbers by species for salmon returning to the
Kodiak area in 1989¹.

Species	Escapement	Actual		Distribution If No Spill Had Occurred		
		Catch	Run	Escapement	Catch ²	Run
Sockeye	3,169,149	1,289,536	4,458,685	1,935,000	2,523,685	4,458,685
Pink	19,997,499	183,236 ³	20,180,735	3,969,890	16,210,845	20,180,735
Chum	1,813,380	19,972	1,833,352	997,618	835,734	1,833,352
Coho	317,448	2,559	320,047	178,614	141,433	320,047
Chinook	26,080	106	26,186	21,335	4,851	26,186

¹ Source: Alaska Department of Fish and Game-Commercial Fish Division, Kodiak.

² Does not include additional 4,880 Chignik River sockeye which would have been caught in Cape Ivak fishery Pre-July 26 or any other interceptions.

³ Does not include Kitoi Bay hatchery fish.

Sport fishing catch for unguided anglers on the refuge is unknown for 1989. The sport fishing catch for guided anglers on the refuge is monitored through the special use permit process. Seventeen (70%) of the 24 guides responded to the deadline for reports on 1989 activities. Four of the 17 reported no activity on the refuge in 1989. Overall in 1989 sport fish guides used seven river systems: Uganik, Ayakulik, Dog Salmon/Frazer, Little River, Browns, Karluk, and Upper Station drainages for their activities. In addition, the beach areas in Uganik, Uyak, Halibut, Olga-Moser, Alitak and Kiliuda Bays were used in 1989. Due to a printing error in our report forms for 1989, only total catch information for 1989 is available. Previous years' data indicate that > 90 percent of the guided catch is released.



Olga Bay set-net fishery at the mouth of Upper Station Creek. (89-31) RH

Preliminary data from 70 percent of the guides indicate a total of 1,675 angler days were expended by guided sport fishermen from April through the first part of November 1989. Although fishermen caught all species of salmon, trout, and char, the highest number of any one species caught was Dolly Varden/Arctic char followed by sockeye salmon (Table 9).

A total of 9,873 Dolly Varden/Arctic char were caught in 1989. Catch of other species was 2,373 sockeye, 1,763 coho, 1,395 chinook, 1,199 rainbow trout, 884 pink, 241 steelhead, and 22 chum salmon. Catch per angler day for all species ranged from 2.6 to 14.3 throughout the season with an

Table 9
 Guided sport fish total catch ¹ for the Kodiak National Wildlife Refuge
 April to November 1989

Species	April	May	June	July	August	September	October	November	Total
Chinook	--	--	948	441	6	--	--	--	1395
Coho	--	--	--	1	608	914	239	1	1763
Chum	--	--	2	8	12	--	--	--	22
Pink	--	--	1	318	366	159	40	--	884
Sockeye	--	--	1224	492	448	209	--	--	2373
Dolly Varden/char	8	--	1088	2178	3753	2692	158	4	9873
Steelhead	--	--	97	49	15	12	68	--	241
Rainbow	--	--	327	445	230	184	11	2	1199
Total	8	--	3687	3932	5438	4170	516	7	17750
No. Angler Days ²	3	--	462	428	430	292	61	2	1675
Catch/Angler Day	2.6	--	8.0	9.2	12.6	14.3	8.5	3.5	10.5

¹ Angler days calculated by equating an angler visit as one angler day. No hour limit applied.

² Total catch only, includes fish caught and released.

overall rate of 10.5 fish/angler day (Table 9). In comparison, the overall catch-per-angler day for 1988 was 13.5 fish.

C. Salmon Escapement

In-season aerial index salmon escapement surveys were conducted on refuge streams for chum, coho, pink, and sockeye salmon during fiscal year 1989. Since a majority of the Kodiak area commercial fisheries were closed in 1989 due to the oil spill, it was possible to index entire returns of salmon into refuge streams instead of just escapement. A total of 92 of the refuge's 119 salmon streams were surveyed for salmon abundance and distribution in the four refuge fishery management units (Table 10). Twenty-one days of aerial survey and two days of foot survey time were dedicated to this effort in 1989. Multiple surveys on 322 miles of refuge spawning streams were completed in 1989. These surveys were coordinated with the ADF&G and the results of the refuge's and ADF&G's surveys were combined into one data base. As of this report escapement data for individual streams are still being compiled and finalized by ADF&G and the refuge.

Table 10
Summary of aerial and foot streams surveys conducted by the refuge in 1989 for salmon escapement on Kodiak National Wildlife Refuge.

	Management Unit				TOTAL
	A	B	C	D	
Number of Streams Surveyed	28	29	30	5	92
Number of Survey Days	8	10	3	2 (2)	23 (1)
Number of Miles Surveyed	92	176	52	2 (2)	322

1. Total number of survey days can reflect multiple unit surveys.
2. Foot surveys.

The 1989 stream specific salmon escapement data is still being finalized by the ADF&G and the refuge. Preliminary estimates of overall escapement for the entire Kodiak area are presented in Table 8. Stream specific data for those systems in the refuge with fish counting weirs are presented in Table 11.

In 1989 numerous salmon streams in the Kodiak area became saturated with spawning salmon. Some of the more important pink and chum streams in the Uyak, Spiridon, Zachar, Uganik, and Terror Bays on the west side of the refuge became overcrowded. Other systems such as Humpy and Deadman Rivers on the south end of the refuge also experienced large escapements. As an example south Uyak which has had an

Table 11
 Salmon Escapement on those refuge systems with fish weirs in 1989¹.

Weir Location	Dates		Salmon Species Enumerated					Total
	Installed	Removed	Kings	Reds	Coho	Pinks	Coho	
1. Karluk	5/22	9/16	10,484	1,108,646	21,852	109,880	129	1,250,991
2. Red River	5/31	8/31	15,432	768,101	8,242	45,655	100	837,530
3. Dog Salmon	6/6	9/6	156	362,007	5,668	315,559	4,690	688,080
4. Frazer Lake	6/19	8/10	85	360,373	0	516	0	360,974
5. Upper Station	5/31	9/12	4	286,288	5,319	754	1	292,366
6. Akalura	5/19	9/23	0	116,029	4,001	49,608	3	169,641

¹ Data Source: Alaska Department of Fish and Game.

annual average escapement index of 960,000 and 108,000 pink and chum salmon, respectively, had a combined indexed escapement in 1989 of approximately one million fish. Humpy River which has had an average annual index of approximately 209,000 pink spawners also had an escapement in 1989 of nearly one million fish. This was the only year on record where the escapement was the total return and is the only year in which fishery managers had the chance to determine actual returns per system without trying to allocate harvest to each system of origin. Both the ADF&G and the refuge intensified their aerial survey efforts in 1989 to collect as much data as possible.

In August the ADF&G commenced a study to investigate pink salmon spawning habitat and female egg retention in relation to over escapement on some streams. This study was part of the overall "Assessment of Pink and Chum Spawning Areas Outside Prince William Sound". This study was to address the concern about potential over escapement of pink and chum salmon and resultant loss in future production.

In addition to pink and chum salmon, late in 1989 study designs by the ADF&G were being drafted to address overescapement of nine major sockeye systems in the Kodiak area. Five of these sockeye systems are on the refuge.

Work on both of the above studies is expected to continue through 1990.



Over 837,530 salmon passed through the Ayakulik River weir in 1989. (89-32) VB

16. Marking and Banding (Zwiefelhofer)

There are five studies that depend on radio collared animals for data collection one deer, a Roosevelt elk and three brown bear projects. All the projects use observations and locations of radio tracked animals. This field season, personnel from ADF&G and the refuge staff working together installed 57 collars. They "tagged" 5 deer, 10 elk and 32 bears. All of the deer and elk that received radios are newly collared. In addition there are 2 males and 8 female bears in the Zachar study area that are newly collared. The remaining radios are on bears that needed to be recaptured in order to replace old and/or dead batteries.

H. PUBLIC USE1. General (Menke)

Public use on the refuge increased slightly to 22,400 visits and 185,184 activity hours in 1989 compared to 22,300 visits and 179,700 activity hours in 1988. These figures include both on refuge and visitor center use. The nearest point of refuge land is located about 20 miles from the headquarters which is close to the town of Kodiak. Table 12 summarizes public use levels for some of the major recreational activities for the past four years.

Table 12
Refuge public use for selected activities from 1986 to 1989.

Category	1986	1987	1988	1989
<u>Interpretive center</u>				
Visits	7719	9784	8681	8989
Activity Hours	3865	4851	4342	4495
<u>Environmental Education</u>				
Visits	1029	591	725	902
Activity Hours	1313	517	804	1397
<u>Deer Hunting</u>				
Visits	1375	1523	1661	1493
Activity Hours	52879	73645	77121	69404
<u>Sport Fishing</u>				
Visits	2430	2740	1970	2045
Activity Hours	30060	34480	32920	44920

More than 90 businesses and individuals currently have refuge permits or have expressed an interest in obtaining permits for the following categories of commercial use: big game guiding and

outfitting, sport fish guiding, recreation guiding, air taxi operations, and boat charters. Use levels for fishing guides and big game guide/ outfitting are documented in the following sections of this report. The refuge now has many more requests for both sport fish guiding and big game outfitting permits than the numbers specified in the refuge's comprehensive conservation plan (24 sport fish guides and 18 big game outfitters).

Two types of public use are recorded for the refuge. People stopping at the visitor center headquarters building, located about four miles from the town of Kodiak, spend an average of one-half hour viewing films and exhibits, obtaining leaflets, and asking questions about the refuge. Visits to the refuge proper involve chartering a small aircraft or boat to get to an activity site. Most visitors spend four to seven days on the refuge during hunting, fishing, or photography trips.

The refuge has more than 40 wildlife films, videos, and slide/tape programs which are available on loan to local school teachers and service clubs. Several new films and videos were added to the refuge "film library" this year. The refuge staff wrote scripts and selected slides for three new programs on Kodiak Island including: an orientation to Kodiak Refuge, Kodiak Birds, and Kodiak Wildflowers. Copies of these productions were donated to the city library and school system.

2. Outdoor Classrooms - Students (Rezabeck)

In 1989 the number of student visits increased to over 900 visits. These included student visits to the refuge visitor center as well as occasional classroom and field trip visits by refuge personnel.

Several mailings were made to all private and public school teachers in Kodiak. A mailing in late February included National Wildlife Week packets entitled "Predators, They're Part of the Picture". The second mailing occurred in early September and included a film list and announcement of the teacher inservice and credit course to be offered by the refuge staff. Another announcement encouraging participation in the one credit class was sent to all teachers in October.

The refuge participated in Science Fair judging on two occasions - one at the high school level and one at the elementary level. Videos of slide programs written in 1988 were produced in 1989. Those produced included "Orientation to Kodiak National Wildlife Refuge," "Plants of Kodiak Island," and "Birds of Kodiak Island." One other slide show, "Intertidal Life of Kodiak Island," is due to be produced in video format in early 1990. All of these videos as well as the rest of the refuge film library are available for loan by teachers and the general public.

3. Outdoor Classroom - Teachers (Rezabeck)

Public Use Specialist Rezabeck continued to network with environmental educators state-wide in 1989. She is an active member of the Alaska Natural Resource and Outdoor Education Association. In addition, she attended the National Association

of Marine Educators conference and a 4-H curriculum writing workshop in July. Up-to-date materials and information obtained in these ways is helpful with inservice and credit course presentations to teachers.

In March and November, 1989 the refuge offered a 1-credit course at the local college entitled "Natural Resource Activities for Elementary Teachers". A total of 19 teachers participated in these sessions. In April, 1989 a "Sharing Nature" workshop presented by Joseph Cornell was in part sponsored by the Alaska Natural History Association through the refuge. Sixty teachers and parents attended an enjoyable evening. A Kodiak Island School District teacher inservice covering four major natural resource curricula was presented to about 12 teachers in October, 1989.

4. Interpretive Foot Trails (Menke)

During the year, trail markers and signs were received for a short loop nature trail which will be located near the visitor center. We were contacted by two local scout troops who were interested in taking on this project, however, neither troop ended up clearing the trail or putting up signs. Some work was done on trail clearing by the refuge staff but was terminated with the onset of winter. A trail leaflet was written and all signs were mounted on posts. We expect to complete this project in the spring of 1990.

6. Interpretive Exhibits/Demonstrations (Menke)

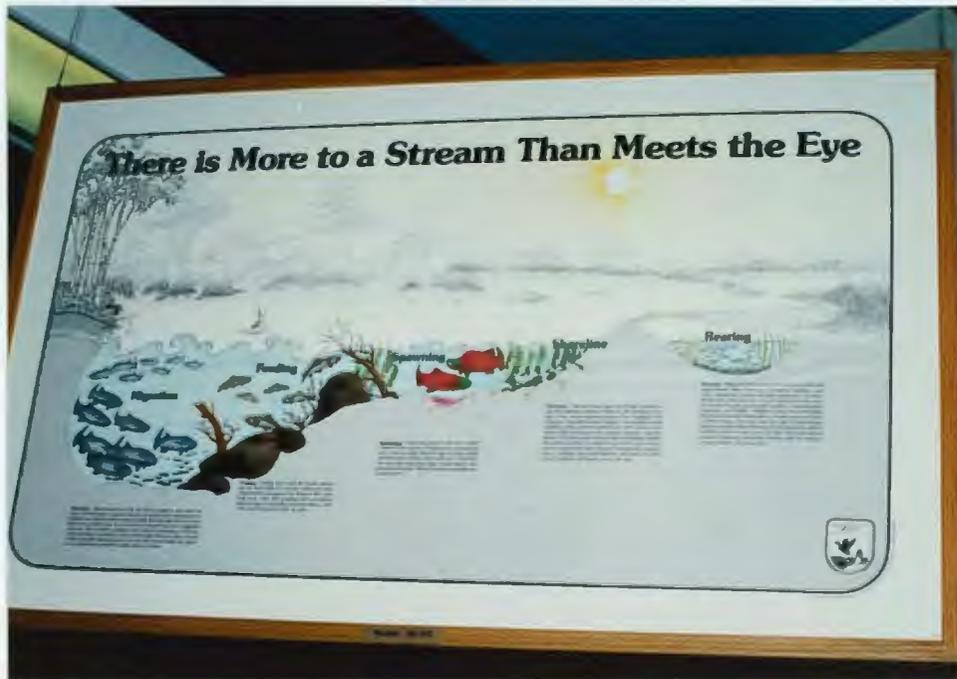
Use of the refuge visitor center increased slightly compared to 1988. Once again we were able to keep the visitor center open on weekend afternoons using volunteers. Use of the center during the summer months by off-island tourists accounts for much of the use. Although there were no tour ships this summer, tourists arriving via the airlines continued to increase. Two local tour operators use the visitor center as one stop on their scheduled rounds of Kodiak Island points of interest.

The refuge writes a monthly wildlife or refuge news column called "Bear Country" which is featured in the local newspaper. A series of temporary displays were put up in the center corresponding with the monthly news column topics. Topics featured in "Bear Country" included: Sitka Black-tailed Deer (January); Kodiak's Bald Eagles (February); Whales (March); Native Land Mammals on Kodiak (April); Intertidal Life Forms (May); Kodiak Wildflowers (June); Fishery Research on Kodiak (July); Traveling in Bear Country (August); Sea Otters and Management (September); Animals in the Winter (October); Kodiak's World War II History (November); Kodiak Birds (December).

Special temporary exhibits in the visitor center included: Kodiak Refuge Management (January), Kodiak's Bald Eagle's (February and March), High School Student Bird Posters (April and May), Tidepool Life (June), Salmon Research (July), Brown Bear Research (September to November), and Bird Identification (December).



This temporary bear management exhibit was one of several put up this year in the refuge visitor center. (89-33) DM



This attractive poster was one of several new items offered in the visitor center sales area this year. (89-34) DM



The new slide and card display rack in the visitor center was a vast improvement over the old rack. This fixture was designed by the refuge staff and fabricated by a local carpenter. (89-35) DM



This attractive exhibit is portable enough to send out to island villages. It features refuge purposes and we have several sets of photographs to go with it. (89-36) DM

The most popular exhibit in the visitor center is a large topographic relief map which identifies unique characteristics of Kodiak Island. Other displays feature information on natural and cultural history and refuge management.

A 15 minute video on Kodiak's wildlife is shown to visitors upon request. A variety of free literature from the refuge, ADF&G and Chamber of Commerce are provided to visitors. This year the refuge produced a Wildlife Viewing Guide to Kodiak's Road System funded by the Alaska Natural History Association. Plans were made to renovate the railing around the topographic map and provide a storage cabinet beneath map with access doors. Approximately 60 sales items are available in the sales area.

7. Other Interpretive Programs (Menke)

Regularly scheduled weekend wildlife films have proven a popular feature, attracting over 1700 visitors during 1989. The films are shown at 1:00, 2:00, and 3:00 p.m. both Saturdays and Sundays. The refuge owns more than 40 films and videos which are shown to requesting groups and mailed out to schools. Outdoor Recreation Planner Menke presented a program on waterfowl identification at the City Library prior to the start of hunting season.

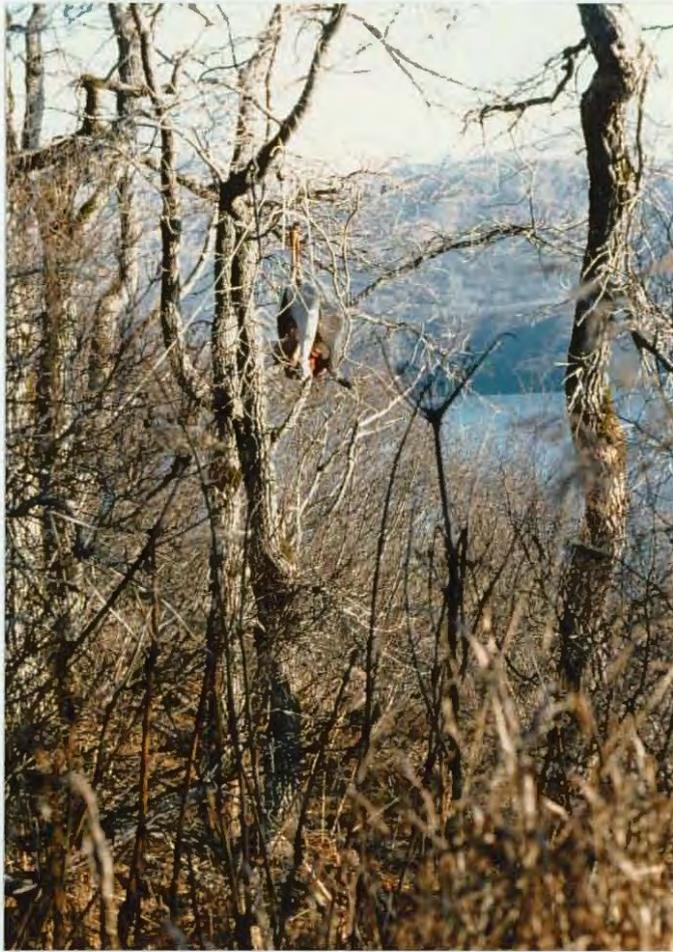
8. Hunting (Menke)

The entire refuge is open to hunting. Species hunted include brown bear, mountain goat, Sitka black-tailed deer, reindeer, Roosevelt elk, fox, ptarmigan, snowshoe hare, and waterfowl. Hunting seasons and regulations are set by the ADF&G.

Approximately 350 hunters used the refuge during the spring and fall bear hunts in 1989. Bear hunting on the refuge accounted for nearly 20,500 hours of public use. Fifteen big game guides have permits for hunting areas on the refuge.

Deer hunting use, both on and off-refuge, has increased in recent years although activity levels were down somewhat in 1989 due to widespread rumors of a massive winter kill last year. Deer hunter surveys, however, did not indicate any significant decline in hunter success. Liberal bag limits (five deer per hunter) and a five month-long hunting season, combined with Kodiak's high population of Sitka black-tailed deer, attract many hunters to the island. About 1,500 deer hunters spent 70,000 activity hours hunting on the refuge in 1989.

From mid-October through late November the refuge staff assisted by regional law enforcement personnel and ADF&G personnel conducted a law enforcement check and survey of deer hunters on the refuge. The enforcement patrol was conducted along the west coast of Kodiak from Viekola Bay to Uyak Bay using the refuge vessel Ursa Major. Objectives were to: (1) check all deer, bear, and waterfowl hunters for compliance with State laws and refuge regulations; (2) to develop a profile of refuge deer hunting by administering a survey to all hunters contacted in the field; and (3) to check public use and set-net cabins on refuge lands for general condition and illegal use. This was the second year that



Deer hunters who want to avoid sharing meat with bears are well advised to hang their meat at least 15 feet off the ground. (89-37) DM



Despite reports of a massive kill during the 1988/89 winter this group of 4 hunters had a very successful hunt the following fall. (18 deer total) (89-38) DM

hunters on the Spiridon Peninsula and Zachar Bay areas were also given a detailed survey as part of the bear/deer hunter study to determine if they were encountering problems with bears.

During the fall survey a total of 79 hunters in 21 parties were contacted. Residence information was obtained indicating that 5% of the hunters were from Kodiak, 82% were from other locations in Alaska, and 13% were from the "lower 48" states. One percent of the interviewed hunters were guides, 17% were with outfitters and 82% were neither guided or outfitted. Of the deer hunters contacted, 15% were based on boats and 85% had camps or used refuge cabins.

This is the fourth year that fall deer hunter checks have been conducted along the west coast of the refuge. A review of Table 13 shows that the hunting use statistics are fairly consistent year to year. The refuge plans to repeat this survey and deer hunter checks in 1990. Law enforcement violations and citations issued during the operation are noted in Sec. H-17.



Refuge Manager Jay Bellinger checking deer hunters at the Uganik Island public use cabin.
(89-39) DM

During 1989 several new "wrinkles" were added to the whole realm of providing big game hunting services on the refuge. In response to a State Supreme Court decision ending exclusive big game guide areas, activity levels for guiding and outfitting on Alaska refuges were frozen at 1988 levels this year. New licensing, permitting, and insurance requirements were also mandated by a new State law covering all types of commercial services related to big game hunting. As a result, only big game guides who had a history

Table 13
Comparison of data obtained from 1986-1989 deer hunter surveys.

	1986 Survey	1987 Survey	1988 Survey	1989 Survey
Hunters Contacted	89	117	186	79
Residence				
Kodiak	9%	9%	16%	5%
Other Alaska	88%	77%	66%	82%
Lower 48 States	2%	14%	18%	13%
Foreign Country	1%	--	--	--
Type of Hunt				
Guided	3%	6%	3%	1%
Outfitted	13%	9%	25%	17%
Unguided/Outfitted	83%	85%	72%	82%
Base Camp				
Boat	17%	20%	24%	15%
Land	83%	80%	76%	85%
Deer Harvested				
Males	64%	72%	74%	63%
Females	29%	26%	20%	26%
Fawns	6%	2%	6%	11%
<u>Averages</u>				
Deer Harvested/Hunter	2.1	1.9	2.2	2.0
Days Afield/Deer Harvested	2.0	2.5	2.2	2.4
Days Afield/Trip	5.3	5.9	6.2	5.9
Deer Observed/Hunter	40	34	50	38

of refuge use operated on the refuge in 1989. Only one outfitter qualified for a state license which allowed him to continue outfitting operations on the refuge. Under the new law, guides and outfitters are combined into a single category called big game guide/outfitters. All in all, twenty big game guide and outfitter permits were issued for hunting on refuge lands. Other commercial users including marine transporters and lodge/cabin owners have clients who use the refuge but are not required to obtain refuge special use permits.

Big game guide/outfitters are required to report use and harvest information as a condition of their permit. At the time of this report, this information is still being consolidated. The

majority of use on the refuge by transporter/outfitters was focused on the Uyak, Uganik, and Zachar Bay areas.

Less than 25 mountain goat hunters used the refuge during the past year. Most of the other hunting activity on the refuge including small game, upland game (i.e. ptarmigan), and duck hunting occurs while on deer or bear hunting trips.

9. Fishing (Menke)

Sport fishing is the most popular activity taking place on the refuge. This year, an estimated 2,050 fishermen participated in about 45,000 activity hours of freshwater fishing on the refuge. The most popular fishing locations on the refuge include the Ayakulik and Karluk drainages and Uganik Lake. The Karluk and Ayakulik systems support Kodiak's largest chinook salmon and steelhead runs. These three areas have well over half of the sport fishing pressure occurring on the refuge and Native conveyed 22(g) lands within the refuge boundary.

Interest in sport fish guiding has increased rapidly since 1983 when the refuge received its first permit requests. That year six sport fish guiding permits were issued; in 1984 nine permits were issued; in 1985-15; and in 1986-22. In 1987 the refuge reached the limit of 24 guides identified in the refuge comprehensive conservation plan. An additional 18 requests were received for refuge sport fish guiding permits over and above the 24 permits issued in 1989.

As a condition of the special use permit, guides are required to submit a report of their use and the number of fish caught and released by their clients. Most of the guided sport fishermen on the refuge are day users.

10. Trapping (Menke)

Ten trapping permits were issued for the 1988-1989 trapping season on the refuge. This should be considered a minimum number as undoubtedly a number of people trap without getting permits. Individuals with refuge special use permits reported harvesting 19 red fox, 8 beaver, and 16 river otter.

12. Other Wildlife Oriented Recreation (Menke)

Use of refuge recreation cabins for photography, sightseeing, and wildlife observation has been on the increase for several years. Because these recreational uses frequently occur in conjunction with hunting or fishing trips, the extent of photography and wildlife observation is difficult to document.

The refuge has nine public use cabins which are available to recreational users for a maximum stay of seven days per cabin per year. Use of most cabins is highest during the peak deer hunting and fishing periods. The South Frazer, Red Lake, and O'Malley cabins are beginning to receive heavy use by wildlife photographers from mid-June through the end of August.

The refuge cabin administration and maintenance program is estimated to require over 0.5 FTE year. The staff commitment to the cabin program includes maintenance, answering inquiries, handling reservations, and law enforcement.

17. Law Enforcement (Menke)

Three refuge employees have law enforcement authority: Refuge Manager Bellinger, Assistant Refuge Manager Ryan, and Outdoor Recreation Planner Menke. All refuge law enforcement officers attended the 40 hour refresher training at Marana, Arizona during the spring. Firearms qualification was completed in March (at the training session) and in October at the Kodiak Island Sportsmens Association firing range. Citations or law enforcement activities in 1989 are listed below:

1. One case of illegal possession of eagle talons was investigated and resolved this year. The talons had been removed from a decomposed carcass. A warning was issued to the individual in possession of the claws.
2. Two tickets were issued by a state officer to deer hunters on a boat. One hunter (a non-resident) did not have his hunting license in possession; the other hunter did not have deer harvest tags.
3. A commercial operator was cited on Alaska Maritime National Wildlife Refuge for use of facilities without a special use permit. The case is pending.
4. Three hunters were cited for illegal use of a set-net cabin.
5. Two hunters received warnings for use of a cabin on a refuge. These hunters were not cited because they were misdirected by a local air taxi operator.

In addition law enforcement efforts were conducted in 1989 to check sport fishermen and to ensure that sport fish guides under special use permit in the refuge were operating within permit conditions.

18. Cooperating Association (Rezabeck)

The Kodiak branch of Alaska Natural History Association had a successful year in 1989 generating a gross income of \$14,232 (up from 11,443 in 1988). Much of the income increase was due to the production of a refuge T-shirt which sold well. In addition, over 60 other educational items continue to be sold in the visitor center including books, slide sets, post cards, note cards, and posters.

Much of the "profit" generated by these sales provides funding for special educational projects. In 1989 the refuge was able to produce a new publication "Bear Country, A Wildlife Viewing Guide to Kodiak's Road System" with association funds in combination with a matching grant from the State of Alaska. This publication was free to the public and plans are to reprint it in 1990. A 1/2



Fall deer hunter surveys and law enforcement checks also give us a chance to observe bear behavior. This neat hole was excavated by a bear to investigate the contents of a commercial fishing site outbuilding. (89-40) DM

inch VCR unit for the visitor center auditorium was purchased with association funds. An interpretive plexiglass sign was produced for the popular bear exhibit in the visitor center. Finally, an attractive oak slide/card display unit was fabricated by a local carpenter using association funds.

I. EQUIPMENT AND FACILITIES

2. Rehabilitation (Patterson, Bellinger, Menke)

Brechan Enterprises, a local contractor, completed the six month rehabilitation of the refuge's triplex housing unit. Research Biologist Barnes and family reoccupied his home on March 27. This was the final unit that required rehabilitation at the triplex. Even with the major work completed, small adjustments and corrections will be required.

On September 25, members of the Regional Office and refuge staff started the Camp Island Pan Abode remodel and upgrade project at Karluk Lake. At the beginning we anticipated that this program could be completed before Thanksgiving. However, once construction started, the real magnitude of the effort began to reveal itself. New footers, supports and cross bracing were required under the building. New insulation, an air barrier, and plywood sheeting were also placed on the underside of the floor.

The inside was furred out, insulated, sheet rocked and textured. New cupboards, doors and windows were also installed. Throughout the fall, at one time or another, most staff members spent some time assisting the construction effort. By mid-November approaching winter forced the suspension of the project until next spring.

The refuge received a \$4000 challenge grant this year to make needed improvements to cabins. At the popular Uganik Lake cabin a handicapped railing, porch, and latrine were constructed from materials provided by the refuge and labor provided by two local volunteer carpenters. This cabin may be the first Alaskan wilderness cabin which has been specifically adapted for handicapped use. The O'Malley cabin was also renovated by volunteers who repaired the roof, fabricated a new door and repaired the pit latrine. At both cabins, accumulated garbage was hauled back to town. New mattresses were placed in all 9 public use cabins as needed.

4. Equipment Utilization and Replacement

A. Ursa Major (Zwiefelhofer)

The annual dry docking of the refuge vessel M/V Ursa Major for hull inspection, cleaning, and painting occurred June 12 to 16. A new rudder post, new hydraulic steering splitter-bleeder valve, and electrolytic corrosion zincs were installed. Temporary Biological Technician Bologna, and Volunteers Savage, and Bushong assisted Wildlife Biologist/Boat Operator Zwiefelhofer with these tasks.

In November, while anchored in Amook Pass, the stove stack on the Ursa Major caught fire. Refuge personnel were able to extinguish the blaze before it got out of hand. This event further underscored the need to acquire a new boat.

Failure of the vessel's automatic bilge pump while moored in the Kodiak Harbor on December 25 resulted in extensive flooding of the engine room. Wildlife Biologist/Boat Operator Zwiefelhofer pumped out the vessel, flushed out the main engine and reduction gear, and replaced various electrical components destroyed by the saltwater including the starter, alternators, and glow plug relays.

B. Airplanes (Patterson)

In June, Office of Aircraft Service put our Cessna 206, N9623R onto straight floats for the summer months. The airplane, with its higher useful load is very well suited for our transportation needs. On October 11, Fishery Biologist/Pilot Chatto returned the straight seaplane to Anchorage to be re-configured to amphibious floats for the winter.



Uganik Lake cabin with new wide door, porch railing and ramp. This public cabin facility was upgraded for use by the handicapped. (89-41) DM



Newly constructed outhouse, at Uganik Lake with wide door and railings to accommodate wheelchair users. (89-42) DM

6. Computer Systems (Zwiefelhofer)

The refuge staff bolstered their move into the "computer age" during fiscal year 1989 with the acquisition of various items. Two laptop computers were acquired to be utilized by the biological staff. Since the laptops can be powered by batteries or electrical power, they can be used to enter data in the field or for report writing in the office. Staff members are trying to become fluent in a variety of software packages including data base managers, spreadsheets, word processors, statistical analysis packages, and desktop publishing.

A hard disk upgrade of the desktop computer acquired during fiscal year 1988 occurred in fiscal year 1989. The computer was initially ordered with a 40 megabyte hard disk but was received with a 20 instead. Eventually a 80 megabyte hard drive was acquired and installed to ensure we would have sufficient memory for the variety of software packages we hoped to use. In order to make better utilization of our desktop publishing software, several components including a mouse, an optical scanner, and a laser printer were added to the desktop computer system in fiscal year 1989.

Although the refuge hopes to eventually phase out use of the 10SP Data General computer system, we did acquire an "excessed" work station from another refuge during fiscal year 1989. The additional work station allows the clerical staff to work on word processing projects concurrently. Word processing is the only function we use the Data General system for.

J. OTHER ITEMS

1. Cooperative Programs (Patterson)

The refuge "houses and hosts" Vic Barnes, a research biologist with the Alaska Fish and Wildlife Research Center. Research (Sec. D-5) is directed toward the ecology and status of the refuge's brown bear population to improve management actions.

The refuge entered into a cooperative agreement with the Kodiak Audubon Society for work on the Triplet Islands and inner Chiniak Bay. The refuge staff has surveyed seabird colonies for inventory purposes and to document breeding success since 1977. This agreement will continue this work beyond 1989.

The refuge obtained information to help the Bureau of Land Management establish the validity of 17(b) easements in the Akalura Creek area.

2. Other Economic Uses (Patterson)

With the increased air traffic due to the oil spill assessment, all air taxi and helicopter companies operating on the refuge, were sent letters reminding them of the restrictions that apply to wildlife harassment. Numerous complaints were received regarding unnecessary low flying and wildlife harassment by helicopters.

All permittees providing visitor services were informed by letter of the new permit and insurance requirements.

The Kodiak Island Borough Planning and Zoning Office proposed to liberalize zoning restrictions on refuge inholdings. Specifically, they are planning to allow both agriculture (grazing) and large, uncontrolled lodge development. A letter was sent to the Borough stating that this zoning change is not appropriate nor consistent with the refuge comprehensive conservation plan.

The refuge informed Exxon that they violated the provisions of their special use permit by setting up a work camp on refuge land. When instructed to remove the camp, Exxon representatives denied that it was related to their operation. Investigation by the staff revealed that the cleanup crew from Akhiok was using the camp. Akhiok villagers contacted various State and Federal officials to complain about the refuge's unreasonable action. A minor flurry of Congressional activity followed. Ironically, at the same time the Congressional calls were coming in, Exxon was removing the camp.

Assistant Manager Ryan met with the Kodiak Planning and Zoning Commission at the request of Chugach Alaska Fisheries to discuss a sanitary landfill on Sally Island. The refuge intends to deny this request.

3. Items of Interest

Exxon Valdez Oil Spill (Zwiefelhofer, Bellinger)

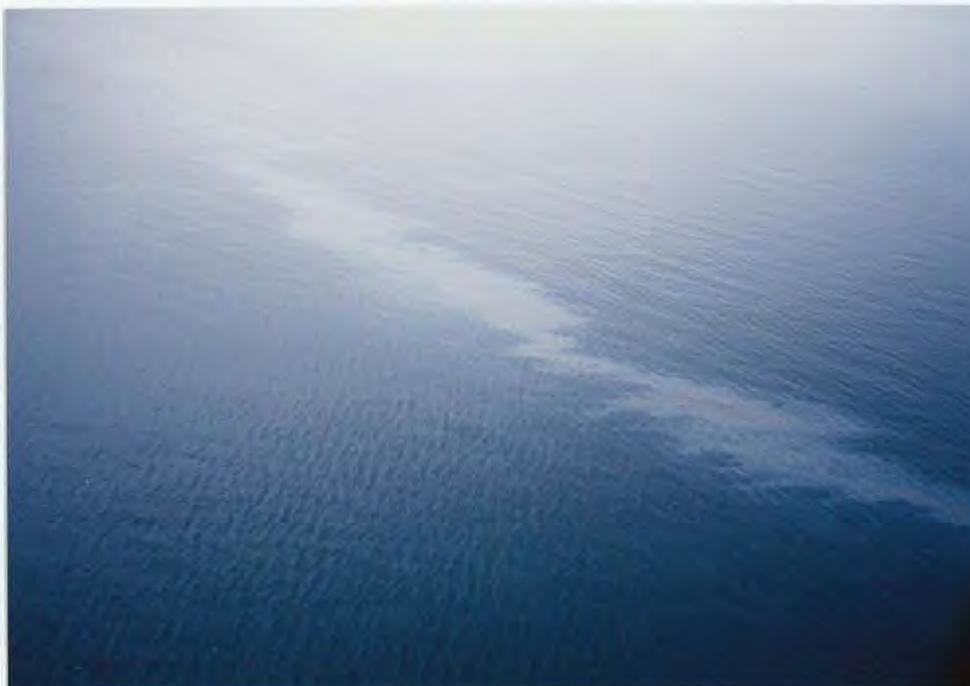
The expansive impact of over 10 million gallons of spilled Prudoe Bay crude oil from the T/V Exxon Valdez became apparent as approximately 20% of the oil was carried on the prevailing southwesterly flowing ocean currents out of Prince William Sound and into the Gulf of Alaska. In response, biologists from state and federal agencies attempted to assess the potential for food and habitat destruction on the wide variety of marine dependent wildlife species found in the Kodiak Archipelago.

The Kodiak Archipelago is comprised of sixteen islands (> 5 sq. mi.) covering an area approximately 75 miles wide by 200 miles long in the western Gulf of Alaska and contains approximately 2500 miles of coastline.

The presence of oil was first reported on the northeastern end of the Kodiak Archipelago on April 9 with the first oiled seabird carcasses collected from that locality on April 15.

As of September 1, the Kodiak Zone (Kodiak Archipelago and the Alaska Peninsula from Cape Douglas to Mitrofanina Bay) of the Exxon Valdez oil spill response operation estimated 1955 miles of shoreline affected (17 heavy, 58 moderate, 247 light, and 1633 very light). Approximately 550 miles of the shoreline included in the Kodiak Zone's affected coastline came from coastal habitats in three different National Wildlife Refuges (Alaska Maritime, Alaska Peninsula/Becharof and Kodiak). It is estimated 205 miles (18

moderate to heavy, 187 very light to light) of the Kodiak Refuge shoreline were included in the Kodiak Zone coastline total. By May 20 the majority of the oil had dispersed out to sea, washed up on shorelines, or collected in sediments and sank.



Oil slick in Shelikof Straits less than 5 miles from Kodiak Island's shoreline, late May. (89-43) VB

Damage Assessment Work - Kodiak Zone (Zwiefelhofer)

The Kodiak Island Archipelago supports one of the largest resident bald eagle populations in North America. The total population is estimated to be in the range of 1300 to 1500 birds but seasonal interchanges of bald eagles from mainland populations have been shown to occur and probably influences the total number of bald eagles seasonally present in the Archipelago.

The bald eagle is one of the primary species that the Kodiak Refuge was established to protect. Therefore, determining the potential impacts of oil contamination on the Archipelago's bald eagles productivity and population became an important component in Kodiak's assessment activities. Since bald eagles are primary consumers (and scavengers), they have a high potential for concentrating any contaminants introduced into the marine ecosystem.



Mousse and oil sheen along Alaska Peninsula shoreline near Katmai Bay, mid-May. (89-44) VB



Mousse on the beach at Chief Cove after three days of non-mechanical cleanup. (89-45) JS



This oil traveled almost 500 miles from the Exxon Valdez to wind up on the beaches of Chief Cove along the west shore of Kodiak Island. (89-46) JS



Dead birds, some in an advanced stage of decomposition washed up on Kodiak beaches in association with mousse. (89-47) JS

The abundance of oil contaminated seabird and marine mammal carcasses available when normal food resources for bald eagles were at their lowest abundance, combined with many breeding adults initiating egg laying, served to magnify the potential for detrimental impacts to eagles from the oil spill.

Contamination of breeding adults through ingestion of oiled prey or direct physical contact with oil may decrease nesting success, production of eggs, survival of young, and limit long-term survival for bald eagles of all ages. Secondary impacts caused by human activities, during beach assessment and cleanup activities, is likely to have an equally significant detrimental impact on bald eagle productivity.

Overall the coastline of Kodiak Island from Spruce Cape to Cape Grant, plus Shuyak, Afognak, Ban, Raspberry, Whale, Spruce, Uganik, and Amook Islands was aerially surveyed for bald eagle nesting activity and production of young.

Surveys were conducted from Cape Grant to Spruce Cape using a PA-18 Piper supercub from May 10-12. Fisheries Biologist/Pilot Chatto and Wildlife Biologist/Boat Operator Zwiefelhofer conducted the surveys. Approximately 21 hours of fixed-wing flight time was expended on the initial nesting survey.



Unhatched bald eagle eggs and a single young from a nest on the heavily oiled east side of Shuyak Island. (89-48) Photo by Gary Johnson



Wildlife Biologist Zwiefelhofer is collecting the unhatched eggs for laboratory analysis of hydrocarbon contamination. (89-49) Photo by Debbie Kahn

The Afognak, Shuyak, and other previously described coastal areas were surveyed from a Bell Jet Ranger 206A helicopter on June 1, 6, 7, and 16th with Alaska Helicopter pilot, M. Malchulsky. Kodiak Refuge personnel, Zwiefelhofer, Menke, and Research Biologist, Barnes were separate survey observers on June 1, 7 and June 6 and 16, respectively. Approximately 22 hours of rotary-winged flight time was expended on the initial June nest survey.

To determine production, nest sites which were judged to have been active on the initial nest surveys in May and June were surveyed again for young in July and August.

Active nests on Afognak, Shuyak, Raspberry, and islands other than Kodiak were revisited on July 21 and 22 using the Alaska Helicopters Jet Ranger piloted by M. Machulsky with Zwiefelhofer as the observer and required approximately 11.5 hours of survey time to recheck active nest sites.

Active nests on Kodiak Island were rechecked on July 30-31 and August 1, 5 using a fixed-winged Piper PA-18 aircraft flown by Refuge Pilot Patterson with Biological Technician Hander as observer. Approximately 14 hours of flight time was required to complete the production portion of the Kodiak Island surveys.

Wildlife Biologist/Boat Operator Zwiefelhofer was responsible for data collection in the oil impact assessment of the Archipelago's seabird and seaduck populations. The assessment activities were carried out from June 16 to October 10 using the refuge vessel M/V Ursa Major. The historic winter survey transect lines on the west

side of Kodiak were utilized for the assessment in that area. All the transect lines were completed four times during the summer and fall. In addition, shoreline transects around Afognak and Shuyak Islands were completed three times during the summer. Selected "drift" beaches on Kodiak, Afognak, and Shuyak were also surveyed on four different occasions for seabird mortalities during the same period. Fish and Wildlife Service personnel and volunteers that assisted with these surveys were as follows: Rosemary Bushong, Robert Harned, Debra Kahn, Allison Banks, Ray Hander, Caroline Askew, Leslie Slater, Jim Fuller, David Blomstrom, Tess Madigan, and Leslie Kerr.

Spill Response - Kodiak Zone (Bellinger)

Kodiak Refuge initially became involved in the spill response effort when the Service decided to do pre-impact surveys of marine mammals, sea birds and waterfowl in the area. Surveys were initiated April 7 and completed for the Kodiak Archipelago on April 13 (Sec. E-7). A sea otter survey of the Alaska Peninsula and Kodiak Archipelago was conducted during the period April 12 through May 24. In addition, a follow-up survey of most of these areas was conducted in fall 1989.

On April 8, Don Kane of our Olympia, Washington Ecological Services office and Alice Berkner of the International Bird Rescue Center came to Kodiak to present a training course to bird rescue volunteers. Don stayed on through April 21, during this time, he lined up the National Guard Armory for a bird rehabilitation center and National Marine Fisheries enforcement building as an intermediate care facility for sea otters.



One of several bald eagles brought into a bird rehabilitation center set up at the Kodiak National Guard Armory. (89-50) DM



Kodiak "Bird Morgue" with early casualties set up for identification. (89-51) DM



This oiled immature red phalarope showed up on a Kodiak beach during August, 1989. Note dark staining around the bill and lower belly. (89-52) DM

Refuge Manager Bellinger assumed the duty of Kodiak Zone Coordinator full time on April 22 and continued in this role until early October. By late April, a bird morgue facility had been established in town to process dead birds and animals and a fleet of Exxon chartered wildlife rescue boats were chartered. During the peak of the effort, the activities of 16 bird rescue boats and two vessels that transported dead birds in from the rescue boats and three sea otter rescue boats were being supervised. These vessels ranged in size from 50 to 95 feet in length. A total of 10 wildlife rescue small boat crews out of the villages of Larsen Bay, Port Lions, Ouzinkie, and the town of Kodiak were also used in the effort.

In June, an eagle capture team was included in our efforts at Kodiak which followed up leads that we had accumulated on oiled eagles for the first few weeks. The team then switched to intensive trapping in the more heavily oiled areas. This effort was also supervised by our office in Kodiak.

Fish and Wildlife Service personnel identified and maintained chain of custody on all dead migratory birds and marine mammals that were brought into Kodiak. By the end of wildlife collection effort, two 40' freezer vans had been filled with carcasses.



Murres comprised over 60% of the bird mortalities in the Kodiak Zone. (89-53) DZ

Table 14 represents wildlife collection efforts in the Kodiak Zone.

Table 14
Wildlife collection efforts in Kodiak Zone.

Category/ Species	Number	Kodiak Zone as a Percentage of all Zones
Dead Migratory Birds	22624	63
Live Migratory Birds	221	22
Dead Sea Otters	196	19
Live Sea Otters	24	6
Dead Bald Eagles	62	43
Live Bald Eagles	19	35

In addition to the wildlife responsibility, efforts were also directed at having a Service representative on location for all cleanup activities on or adjacent to Service lands. Several different types of positions were developed to meet this responsibility as follows:

Fish and Wildlife Service representative on Exxon Shoreline Cleanup Assessment Teams (SCAT). This team was comprised of a geologist, marine biologist, and archaeologist hired by Exxon to map out oil impacted areas and list biological and archaeological concerns in the impacted areas. Our presence proved beneficial in delineating biological concerns outside the tidal area, i.e. active eagle nests, sea bird nesting colonies, seal/sea lion haul outs and pupping areas, etc.

Fish and Wildlife Service representative on Exxon cleanup crews. The Service ensured that cleanup activities were minimized in sensitive wildlife areas, and archaeological resource areas, and made recommendations to Coast Guard representatives in regard to additional cleanup needs.

Fish and Wildlife Service Representative on demobilization inspection team. This team was made up of Exxon, Coast Guard, Alaska Department of Environmental Conservation, and the respective agency land manager. The primary objective of this team was to inspect areas after they had been treated by a cleanup crew to determine if surface removal of oil had progressed to the point where additional cleanup was unnecessary and efforts could be moved to another area. The land manager did not have sign-off authority, but was able to make written comments on the back-side of the sign-off form.

Additionally, the Service is also a member of the Kodiak Interagency Shoreline Cleanup Committee. This committee delineated critical resource concerns, requested cleanup in relation to these concerns and recommended time frames for cleanup in particular areas. The committee also directed SCAT assessment of particular areas and reviewed Exxon work plans for type B (mechanical) cleanup. Type A cleanup (by hand) was approved for the entire spill in the original cleanup plan. Refuge Manager Bellinger served as the Service representative on this committee throughout the spill.



Volunteers bagged oiled sand, rock, and beach drift near the town of Kodiak. (89-54) DM

A large number of Service and volunteer personnel worked on the oil spill during the year. In addition Service employees from outside of Alaska worked on the spill for at least 30 day assignments. These individuals did an outstanding job under very stressful situations often under adverse weather conditions. The following individuals assisted in the Kodiak Zone.

Name	Affiliation/Agency	Duty Station/Home
Brian Hatfield	USFWS, Ecological Services	California
Greg Sanders	USFWS, Ecological Services	California
Dan Stinnett	USFWS, Ecological Services	Oklahoma
Paul Burke	USFWS, Ecological Services	Minnesota
Don Kane	USFWS, Ecological Services	Washington
Buddy Jensen	USFWS, Fish Hatchery	New Mexico
Homer Zumstein	USFWS, Fish Hatchery	Pennsylvania
Dave Ostergaard	USFWS, Fish Hatchery	Pennsylvania
Pat Rogers	USFWS, Law Enforcement	Virginia
Dave Kirkby	USFWS, Law Enforcement	Alabama

Kathy Firchow	USFWS, Fish/Wildlife Enhancement	Wyoming
Gary Burke	USFWS, Asst. Assoc. Mgr, Refuges	New Mexico
Tedd Gutzke	USFWS, Des Lacs NWR	North Dakota
Allison Banks	USFWS, Umatilla NWR	Oregon
Jim Nolke	USFWS, Ecological Services	Alaska
Dennis Prichard	USFWS, Innoko NWR	Alaska
Bob Skinner	USFWS, Innoko NWR	Alaska
Donna Dewhurst	USFWS, AK Peninsula/Becharof NWR	Alaska
Dwight Mumma	USFWS, AK Peninsula/Becharof NWR	Alaska
Van Klett	USFWS, AK Maritime Aleutian Is.	Alaska
Brian Anderson	USFWS, Ecological Services	Alaska
Dan Monson	USFWS, Research	Alaska
Chuck Dieters	USFWS, Resource Support	Alaska
Bob Seemel	USFWS, Resource Support	Alaska
Bill Kirk	USFWS, Resource Support	Alaska
Bill Knauer	USFWS, Resource Support	Alaska
Leslie Kerr	USFWS, Resource Support	Alaska
Leslie Slater	USFWS, Realty	Alaska
JoAnn Karcz	USFWS, Realty	Alaska
Linda Campbell	USFWS, Migratory Birds	Alaska
Paul Bologna	USFWS, Kodiak NWR (Temp Bio Tech)	Alaska
Ray Hander	USFWS, Kodiak NWR (Temp Bio Tech)	Alaska
Jeff Selinger	USFWS, Kodiak NWR (Temp Bio Tech)	Alaska
Jim Fuller	USFWS, AK Maritime Aleutian Is.	Alaska
Joel Hubbard	Mineral Mgmt. Service, Biologist	Alaska
Gary Wheeler	Mineral Mgmt. Service, Biologist	Alaska
David Blomstrom	Volunteer	Washington
Kimberly Hollander	Volunteer	Unknown
Lea Brant	Volunteer	Unknown
Jim Savage	Volunteer	New Jersey
Chris Berkman	Volunteer	California
Debbie Kahn	Volunteer	Florida
Caroline Askew	Volunteer	Great Britian
Theresa Madigan	Volunteer	New Brunswick
Vicki Vanek	Volunteer/Sea Otter Vet	Alaska
Jake Ivanoff	Volunteer/Native Sea Otter Catcher	Alaska
Dean Kasnikoff	Volunteer/Native Sea Otter Catcher	Alaska
Jack Dean	Volunteer	Alaska

The entire staff of the Kodiak Refuge assisted as needed throughout the spill.

The primary work that continued at year's end was periodic meetings of the interagency group and refuge Pilot Patterson's involvement on the interagency winter beach monitoring team.

4. Credits

As usual, the writing of the annual narrative report for Kodiak Refuge is a team effort. Staff members who wrote or contributed to a section are identified by name in parenthesis following the section title. Chatto, Munoz, Patterson, and Castonguay edited the report. Menke provided the information packet, and the typing and compiling was accomplished by Castonguay and Christian.

K. FEEDBACK

The collection of a baseline data on marine populations before ecological disasters occur, has, unfortunately, not been a priority in regional resource planning. In light of the accelerated development and utilization of Alaska's coastal resources in recent years, resource managers will hopefully realize baseline data is priceless in the damage assessment process. Although developers will adamantly deny any potential for accidents, their occurrence is usually the only thing we can be assured of.





United States Department of the Interior



IN REPLY REFER TO:

AM0034.GMC

FISH AND WILDLIFE SERVICE
1011 E. TUDOR RD.
ANCHORAGE, ALASKA 99503

Memorandum

To: Refuge Manager
Kodiak National Wildlife Refuge

From: Associate Manager, Refuges and Wildlife

Subject: Annual Narrative Reports

I would like to take this opportunity to thank all refuge employees involved in the preparation (i.e., writing, photography, typing, editing, and assembly) of your 1989 annual narrative reports. I appreciate the amount of work that goes into these documents. Attached is the signature page for your office copy, and our specific comments on your 1989 narrative report.

I have witnessed a continuing improvement in the quality of annual narrative reports in this region. The 1989 narratives are the best I have seen. Please express my thanks to all staff members for their efforts. Keep up the good work.

Attachment



IN REPLY REFER TO:

AM0036.ETH

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1011 E. TUDOR RD.
ANCHORAGE, ALASKA 99503



Memorandum

To: Refuge Manager, Kodiak National Wildlife Refuge
From: Deputy Associate Manager, Refuges and Wildlife
Subject: Calendar Year 1989 Annual Narrative Report

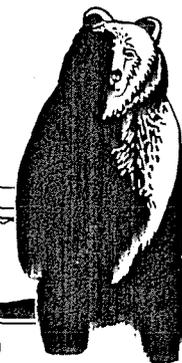
ETH

I have just finished reading the 1989 Kodiak Narrative Report; it is an excellent document. The text is clear and concise, the documentation of refuge programs is good, and the photographs are excellent. Having written quite a few narratives myself, I appreciate the amount of time and effort that goes into a good report.

I had intended to provide some constructive criticism, but there's not much that I can say except keep up the good work.

Please extend my thanks to your staff for a job well done (and for a timely submission).

Public Use Management Plan



Workbook 1 Update

February, 1989

What's It All About?

Recently you let us know you wanted to be involved with the development of the Kodiak National Wildlife Refuge (Kodiak Refuge) Public Use Management Plan. This update summarizes comments we received to Workbook 1 outlining public use issues and objectives for refuge lands. The first four pages of this update contain background information presented in the previous workbook including: 1) a brief history of the refuge, 2) a summary of decisions made in the 1987 Refuge Comprehensive Conservation Plan (comprehensive plan) affecting public use, 3) a map showing land management categories and ownership patterns and 4) a list of objectives for public use programs on the refuge. If you are familiar with the background of Kodiak refuge you may want to **skip to the last four pages of this update for a summary of the responses we received** to the objectives and issues presented in Workbook 1.

Setting The Stage

Looking at past history often provides us with a valuable understanding of the present situation and helps us plan for the future. In the following section of this workbook we will review some of the important milestones in the historical development of Kodiak Refuge.

1941

Recognizing the significance of Kodiak Island as a "natural feeding and breeding ground for brown bears and other wildlife," Kodiak National Wildlife Refuge was established by Executive Order on August 19. When established, the refuge consisted of all of Uganik Island and all lands on Kodiak Island south of Ugak Bay and Kizhuyak Bay, a total of approximately 1,957,000 acres. The Executive Order provided that a one-mile strip along the coastline within the refuge boundary remain open to settlement.

1958

A 1958 land order made two boundary changes affecting the refuge. Recognizing the importance of the refuge coastline to wildlife, this order withdrew the one-mile coastal strip within the refuge boundary from all forms of settlement and also removed the Shearwater and Kupreanof Peninsulas from the refuge to accommodate other uses of these areas. Eight village sites and the Karluk Reservation were also excluded from the refuge boundary by this order.

1971

The Alaska Native Claims Settlement Act (Native Claims Act) had a major impact on land ownership patterns within the refuge boundary. This act authorized transfer of approximately 310,000 acres of refuge lands to Native Corporation ownership. Areas conveyed to these corporations include many with high resource and recreational

values including most of Karluk River and Lake, Dog Salmon River, Upper Station Lakes, and the Sturgeon River. Although Native corporation land is privately owned and no longer part of the refuge, the Fish and Wildlife Service retains an oversight function on the use and development of the land conveyed to corporations under the Native Claims Act.

1980

In December, Congress enacted the Alaska National Interest Lands Conservation Act (Lands Act) which expanded purposes for the refuge. The purposes of Kodiak Refuge listed in the Lands Act are:

1. To conserve fish and wildlife populations and habitats in their natural diversity including brown bears, salmon, sea otters, sea lions, and other marine mammals and migratory birds.
2. To fulfill international fish and wildlife treaty obligations of the United States.
3. To provide local residents the opportunity for subsistence use consistent with refuge purposes number 1 and 2.
4. To ensure the maintenance of water quality and quantity within the refuge consistent with refuge purpose 1.

Setting The Stage (continued)

The Lands Act also designated an area on Afognak and Ban Islands as part of the refuge. The current size of the refuge excluding Native conveyed lands is about 1,592,000 acres.

Another provision of the Lands Act provided that a comprehensive plan be prepared for the refuge. This plan was finalized in December 1987. Provisions of the comprehensive plan affecting public use on the refuge are summarized below. The plan recommended that 73 percent of the refuge, including most of the interior, become a wilderness area. Wilderness designation will require Congressional approval. Until Congress decides on wilderness designation the 1,170,000-acre area proposed for wilderness is being administered as a minimal management area as outlined in the plan.

Where We've Been

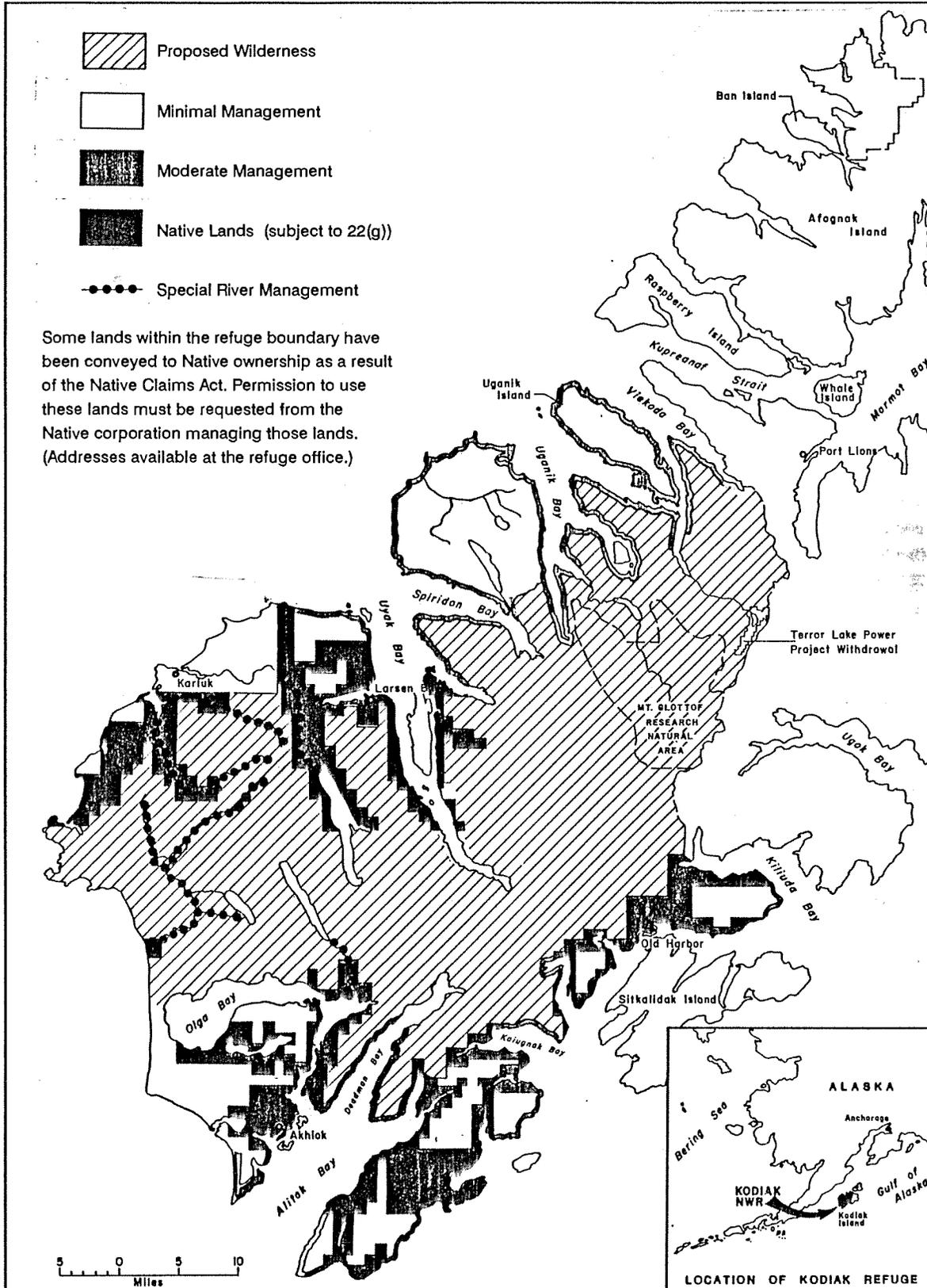
A Review of Decisions Made in the Refuge Comprehensive Plan

The comprehensive plan provides general management direction for the refuge. A number of refuge public use issues were identified and resolved in the comprehensive planning process. Other issues involving public use on the refuge were identified for a more thorough investigation in the Public Use Management Plan (public use plan). **The resolution of issues involving public use management is the primary reason we are working on the public use plan.** Many concerns, issues, and topics addressed in the comprehensive plan require an understanding of management categories identified in the plan and shown on the map on the following page. **Listed below are a number of the important decisions made in the refuge comprehensive plan involving public use concerns.** These topics are addressed in greater detail on pages 154 to 169 of the final plan and on pages 24 to 28 of the plan summary.

- **Hunting, fishing, and trapping (both subsistence and recreational)** are permitted throughout the refuge subject to state and federal regulations.
- **Wildlife observation** including photography is permitted throughout the refuge.
- **Interpretation and educational programs** may be provided throughout the refuge but no facilities will be developed on the refuge to promote these programs.
- ***Nonmotorized access** is permitted throughout the refuge subject to access restrictions at certain times to protect resources and public safety including access by foot, kayak, raft, and nonmotorized means.
- ***Pack animals** are listed in the comprehensive plan as "not permitted" but it was decided prior to finalizing the comprehensive plan to reconsider this issue in the public use plan.
- ***Motorboats** including inboard and outboard powerboats are permitted on all refuge waters with the exception that jet outboard boats are permitted only in areas designated for moderate management.
- ***Fixed-wing aircraft** are permitted to land on all refuge waters, ocean beaches and frozen water bodies subject to reasonable regulation. Upland aircraft landings are not permitted on the refuge.
- **Helicopters** are not permitted on the refuge for recreational purposes and other helicopter access requires a special use permit.
- ***Snowmobiles** may be permitted on refuge lands subject to reasonable regulation. The possible conflict of snowmobile use in bear denning areas is one of the issues to be considered in the public use plan.
- **Other motorized vehicles** including wheeled vehicles, tracked vehicles, airboats, air cushion boats, and other off-road vehicles are not permitted on the refuge.
- ***Primitive camping** is allowed throughout the refuge subject to time limitations which will be addressed in the public use plan.
- **Improved campsites** may be provided by the refuge in moderate management areas.
- ***Temporary facilities** such as tent platforms and shelters are permitted in moderate management areas and if they are compatible with refuge purposes.
- **Public use cabins** will be maintained and may be rebuilt; new public use cabins will only be built in moderate management areas and if they are compatible with refuge purposes.
- **Visitor contact facilities and foot trails** may be developed by the refuge.
- **Guiding, outfitting, and transporting** recreational clients by commercial users is permitted throughout the refuge subject to reasonable regulation. No new permanent facilities to support these activities will be allowed on refuge lands. Tent camps may be allowed for commercial users throughout the refuge. All commercial users must have a special use permit.

*Any proposal to restrict these uses will require implementation of the procedures outlined in the federal rule making process. This process includes publication in the Federal Register and holding public hearings.

Refuge Management Areas



For a more detailed description of management categories refer to the Kodiak National Wildlife Refuge Comprehensive Conservation Plan.

Programs For People

The primary purpose of Kodiak Refuge as set forth in the Lands Act is to conserve fish and wildlife populations and habitats in their natural diversity. The Lands Act also provides guidance for public and recreational uses of federal lands. We have outlined the goal and five general management objectives for public use programs on refuge lands. You will note that each of the objectives is related to one or more of the refuge purposes outlined in the Lands Act. These objectives are intended to support important refuge purposes.

Objectives For Public Use

The following objectives are being considered to provide a decision making framework for the refuge's public use program. Management strategies designed during the formulation of the public use plan will be evaluated according to how well they support these five objectives:

- To ensure that public use programs are compatible with the natural diversity of refuge resources and habitats.
- To provide public use programs which minimize possible conflicts between and among subsistence, recreational and commercial users.
- To provide opportunities for fish and wildlife oriented recreation emphasizing short term, low density public use.
- To maintain access to all areas of the refuge for subsistence, recreation and commercial users to the maximum extent possible consistent with refuge purposes. Maintaining traditional access to refuge lands for subsistence users and the general public is recognized as a priority.
- To develop and maintain facilities for recreational users which are consistent with refuge public safety, natural diversity and fish and wildlife management concerns. Emphasis will be on providing for fish and wildlife oriented recreation opportunities requiring minimal facility development and habitat alteration.

Responses to Workbook 1

What We Heard About Public Use Objectives

Most respondents to Workbook 1 who commented on objectives listed by refuge staff felt they were appropriate for public use programs. Based on what we heard it doesn't appear that any changes or additions to refuge public use objectives will be needed. The following two paragraphs outline the comments we received concerning refuge public use objectives and our responses to several comments.

Two respondents felt that the words "to develop and maintain facilities" should not be included in the fifth objective. Other comments related to public use objectives included: "...only those uses truly compatible with conserving fish and wildlife and their habitats should be allowed." "Maintaining traditional access for subsistence and the general public is not the same as increasing access for commercial users or recreational users." "Additional refuge purpose to be established by Congress: to provide Wilderness System protection for all qualified refuge lands." "Allowing unrestricted commercial salmon activities to occur that may be removing substantial brown bear food reserves is contradictory to the primary purpose (of the refuge). Also the apparent 'totally open' hunting and trapping presently occurring on the refuge is equally contradictory to the primary purpose." "I think priority (sic) for local users should enter into this list of objectives.... Local people should be the last to be limited." "The major concern...within the refuge is man/bear conflicts. If the trends continue the populations and conflicts will continue to grow."

To answer some of these comments we would like to offer the following explanations. The listed objectives recognize the overriding concerns for **conserving fish and wildlife and their habitats**. The third objective providing for short term, low density public use should help address both **wilderness** quality concerns and the concern about **bear/man conflicts**. References to **facility development and maintenance** apply primarily to existing public use cabins needing repairs and the possible use of small food storage structures or meat caches at popular recreation sites. Other developments being considered in the public use plan include the possible development of trails throughout the refuge and new campsites, public use cabins and temporary facilities such as tent platforms in moderate management areas (see map on previous page.) **Local user access priority** is recognized for subsistence users and some categories of visitor service providers as outlined in section 1307 of the Lands Act. Both **commercial salmon harvest** and **hunting and trapping** are regulated by the Alaska Department of Fish & Game and in some cases by refuge permits. Needs of refuge wildlife are taken into account in the regulation of these activities.

A Goal To Consider

Recognizing the purposes of the refuge set forth in the Lands Act the following goal has been established for the refuge's public use program:

"The goal of the recreation and public use program at Kodiak Refuge is to provide high quality fish and wildlife oriented recreation, interpretive and educational opportunities consistent with the refuge's resource and subsistence oriented purposes."

What We Heard About Public Use Issues

Workbook 1 was mailed to approximately 135 participants who had indicated that they were willing to be actively involved with the planning process. The refuge received 36 responses. The majority of the respondents were from Kodiak Island with about equal numbers of interested individuals and refuge permittees, as shown below:

	Kodiak	Other Alaska	Lower 48	Government	Total
Interested Individual	11	3			14
Refuge Permittee	10	4			14
Native Organization	1				1
Conservation Organization	1	2	1		4
Business/Government	2			1	3

Although the purpose of the workbook was to simply identify issues, we also received many comments on the issues. All the issues identified in Workbook 1 were identified as important by the respondents. One new issue was identified. In the next workbook and the workshops that follow, specific management options dealing with these issues will be discussed. The issues fell into five major categories: access, commercial use, facility development and use, information/education and other issues as outlined on the following pages.

1. Access

A. The use of snow machines on refuge lands near bear denning locations may disrupt denning. Considering the importance of brown bears to refuge purposes, it may be necessary to prohibit snow machine access to these areas.

- Respondents were overwhelmingly in favor of regulating this use.
- Some comments: "I would certainly want the use of snow machines banned in any areas where denning may be disrupted." "Other species should be afforded comparable protection from harassment. In general, snow machines should be allowed for subsistence hunting and fishing only..." "Snow machine use should be restricted to coastal areas and those areas which are already developed. Snow machines should be prohibited from the rest of the refuge." "If for some reason in the future, we receive more snow than we do know(sic), subsistence users should be allowed to use snow machines for subsistence purposes."

B. Allowing pack animal use on the refuge may result in increased killing of bears to protect pack animals. The types of pack animals allowed and the extent of their use on the refuge should be carefully considered because of the potential impact on bear populations and other refuge resources.

- Of 31 respondents that commented, 10 were in favor of pack animal use and 18 were against pack animal use.
- Some comments: "I see nothing wrong with allowing pack animal use on the refuge...I don't believe, given the terrain and heavy vegetation of the refuge, that pack animals will ever be in wide use." "Pack animals should be prohibited. Horses especially create habitat destruction where terrain is grass-covered and trails are used over and over again. Let's not create additional DLP pressure with pack animals." "Pack dogs OK, not horses." "I do not feel there is any justification is(sic) disallowing dogs for pack animals which some hunters currently use." "Pack animals should not be allowed to overwinter - no grazing leases or support structures for the animals." "The Alaska llama club is presently gathering information that should be considered before banning pack animals."

C. Public access to areas with important wildlife concentrations may need to be restricted at certain times of the year when wildlife is much more susceptible to disturbance. Those areas may include eagle and swan nesting sites and key salmon streams with unusual brown bear feeding concentrations. These areas need to be identified and the impact of increased public use evaluated.

- Of those that commented, 15 were for access restrictions to areas with important wildlife concentrations. 10 were for no restrictions.
- Some comments: "I have always been against restriction to public access, as used in Mt. McKinly(sic) Park." "I can see where certain areas may need to be restricted, but before banning the public from areas, I would try limiting the types of access where practical, thus making them walk-in areas." "I am in complete agreement that key wildlife-use areas be identified and human activity in such areas be restricted and/or eliminated if problems exist."

What We Heard About Public Use Issues (continued)

2. Commercial Use

A. If additional commercial activities are allowed in private facilities currently under permit, refuge wildlife and habitats may be jeopardized by concentrating human use for longer periods. The impacts of allowing new uses in facilities with refuge permits will be discussed.

- Of comments received, 5 were for allowing additional commercial activities and 17 were against.
- Some comments: "Keep commercial use on refuge lands status quo." "I am opposed to allowing additional commercial activities in private facilities currently under permit." "The private land owner should not be deprived to the right of free enterprise. We have to come to some understanding that will allow the private land owner to benefit from his holding without jeopardizing the purposes of the refuge." "Only the activities that are specifically allowed by existing law should be occurring at these sites."

B. Limiting the number of guides, outfitters and their clients allowed to operate on refuge lands may reduce impacts on refuge resources and conflicts between users. The public use plan will evaluate the numbers and limits of commercial users as outlined in the comprehensive plan.

- With the exception of one respondent, all were in favor of some limit on the number of guides and outfitters allowed to operate on the refuge. Of comments received, all were in favor of limiting the number of clients.
- Some comments: "Limiting the number of guides, outfitters and their clients as well as the areas they can operate in is extremely important in meeting the primary purpose of the refuge." "The right to free enterprise has to be recognized."

C. The levels of unguided public use in some areas of the refuge or during certain time periods may be limited to protect important refuge resources and conflicts between users. Both the number of people and the length of time they are allowed to stay in one location will be evaluated.

- Over 90 percent of the respondents that commented were interested in limiting unguided public use as well as the length of stay if necessary to protect refuge resources and conflicts between users.
- Some comments: "I think that the level of unguided public use of Kodiak National Wildlife Refuge should have an upper limit just as the guided use has an upper limit." "...I think public use should always have priority over commercial users. I hate to see number and time restrictions put on the users of the refuge."

3. Facility Development and Use

A. New trail construction and development of improved campsites on refuge lands may increase the potential for problem bear/human encounters by concentrating use. Both the positive and negative impacts of such development need to be considered in the public use plan.

- Of 26 respondents that made comments about trail construction, 17 were against new trail construction and 9 were in favor of new trail construction. 21 respondents commented on development of improved campsites. Of these, 9 were for further development and 12 were against further development.
- Some comments: "Kodiak is largely de facto wilderness that has been used successfully for decades without a trail system. There is no demonstrated need for trails and developed campsites." "I'm opposed to new trail construction and most development of improved campsites." "Further development to improved campsites should take place in areas with the least possible conflict with bears and impact to the environment." "Trail construction would have to be limited to higher ground to stay away from erosion and muddy trails."

B. The number of public use cabins on the refuge and the way they are managed may have either a positive or negative effect on refuge wildlife and habitats. The need for new cabins, the problems associated with providing more cabins and the way they are managed will be evaluated in the public use plan.

- Of 21 respondents that commented, 17 would like to see public use cabin numbers remain "status quo" or reduced and 4 would like to see an increase in the number of cabins. Although constructing new public use cabins does not appear to be a major public use issue, since most respondents favor the status quo, the draft public use plan will outline several recommendations to better manage and maintain these cabins. Many respondents felt that the refuge needed to have better supervision and maintenance programs for public use cabins.
- Some comments: "I'm opposed to any more public use cabins being constructed." "The present public use cabins are abused terribly. They are frequently used for commercial activities....To build more would be a mistake, and the present ones should be controlled better." "We believe the existing cabins have a positive effect on bear/human relations and contribute to the quality of user experience. Maintain what we have and add more."

What We Heard About Public Use Issues (continued)

4. Information/Education

A. Increased emphasis on information and education programs may serve to make the public more aware of refuge resource management programs. The need for additional information and education programs will be discussed in the public use plan.

- Although 20 respondents indicated that this was an important issue to them, 15 made no comment at all. All comments we received were for increased educational and informational programs. This non-controversial issue will not be further discussed in the upcoming workbook. Specific recommendations to improve information services will be outlined in the draft public use plan.
- Some comments: "Information and education programs are a real need and will benefit the refuge resource management programs." "More education and information about the refuge will make more people aware of its opportunities so you had better start a plan for the regulation of unguided public use now!"

B. Information concerning land ownership patterns within and adjacent to the refuge boundary is an important public concern. A better means of making this information available to the public will be explored in the public use plan.

- 21 people indicated that this was an important issue, while 14 made no comment. All comments received were for increased information about land use patterns. This non-controversial issue will not be discussed in the upcoming workbook, but will be dealt with in the draft plan with a set of recommendations to improve information concerning land ownership patterns.
- Some comments: "This has become increasingly confusing." "The refuge should develop a public directory concerning land ownership patterns on the refuge. Public use of the land would be better managed if the public was aware of who owned the land, where and when they are allowed to camp, and which agency is responsible for maintaining the various parcels of land scattered throughout the refuge."

5. Other Issues

One additional public use issue which will be considered in the upcoming workbook and workshops was raised by several people who responded to Workbook 1. Respondents also made a number of comments about refuge issues that had been resolved in the comprehensive plan. In addition, some comments did not relate to public use and others fell outside the jurisdiction of refuge management.

A new issue for the public use plan: Development and use of inholdings and other lands and waters bordering the refuge may result in impacts not only to refuge fish and wildlife and their habitats, but also to the economic welfare of commercial users of refuge resources.

- This issue was raised by 10 respondents. Further consideration of this issue and discussion will be part of this planning process.
- Some comments: "...the (Fish & Wildlife) Service must clarify its authority to prohibit incompatible uses proposed for the water column and submerged land adjacent to refuge uplands." "I believe that key parcels of land on Kodiak should be purchased back from private landowners...." "Float homes in state owned waters around the refuge may become an issue in the future." "With the amount of "Native" land & the recently sold private (Trillium) lands there will be many more cabins, buildings, lodges etc. adjacent to refuge lands." "...the major impact of refuge use by neighboring lands, patented parcels within the refuge, native lands & boat/floating cabins has to be looked at closely due to the lands & ecosystem being as susceptible and as fragile as they are." "Commercial operations on refuge lands are primarily now based from private facilities and will expand rapidly in the future." "Too much emphasis is being placed on tight control of actual refuge land based operators versus an apparent attitude that utilization from off-refuge operators (using refuge resources) is something that can't be controlled." "The private land owner and his right to free enterprise and the purposes of the Wildlife Refuge are on a head-on collision course. We have to do what we can to allow both to exist, or buy the private land owner out." "Private land within refuge boundaries (sic) will eventually defeat the purpose of the refuge. I see very little the refuge can do to control this unfortunate situation." "It is unfortunate that the integrity of the refuge is interrupted by private inholdings." "There is a lot of private ownership now that the refuge has no control over. If needed let it (additional commercial activity) be there."

What We Heard About Public Issues (continued)

Issues resolved in the comprehensive plan: "I think the inclusion of 3 and 4 wheeled ATV's should be controlled." (the comprehensive plan prohibits use of these vehicles in the refuge subject to sections 811 and 1110 of the Lands Act.) "Fixed wing aircraft should be restricted to landings on only the larger lakes, (14) total and the ocean beaches." "Do not allow air strips for aircraft landings on the refuge." (the comprehensive plan says that upland aircraft landings are not permitted on the refuge. Landings are only permitted on refuge waters, ocean beaches and frozen water bodies. Refuge regulations concerning aircraft landings will be drafted following the public use management plan.)

Issues not relating to this plan: "Salmon enhancement projects should be encouraged." "I believe that key parcels of land on Kodiak should be purchased back from private land owners and returned to Kodiak National Wildlife Refuge status." "Support increased research on the impact of trophy brown bear hunting on the bear population."

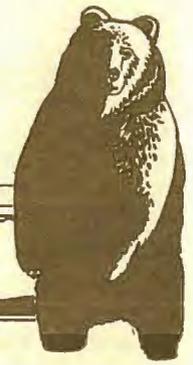
Issues outside the jurisdiction of the refuge: "Float homes in the state owned waters around the refuge may become an issue in the future." "Reduction of brown bear kills" in defense of life and property; incorporating number of DLP kills in setting bag limit on brown bear." (The refuge will continue to cooperate with state agencies to address these topics and their potential impact on refuge resources.)

Miscellaneous Comments & Discussion:

Several comments raised by one or more respondents to Workbook 1 may merit further attention or explanation as follows:

- A number of respondents felt that additional developed facilities on the refuge such as trails, campgrounds and cabins would be inconsistent with the wilderness character of the refuge and were more appropriate to parks than refuges.
- Several people commented that the use of snow machines and pack animals were not issues since there was little history of their use on the refuge. **Note:** Discussion of pack animal and snow machine use in this plan is the result of some recent indications of interest in their use and questions raised during the development of the refuge comprehensive plan.
- One respondent felt that "public use and access to the area surrounding the Terror Lake Hydroelectric Project should be addressed in the public use plan." **Note:** Other than use of the Terror Lake access road which is controlled by stipulations in the Federal Energy Regulatory Commission License, we do not expect to treat the Terror Lake area differently in terms of access and public use than other areas of the refuge.
- At least two respondents mentioned that the potential impacts of snow machine use on species other than bears should be considered in evaluating impacts on refuge resources. **Note:** The public use plan evaluation of snow machine use will consider possible impacts on other species including winter concentrations of deer.
- One respondent expressed the concern that "access through the productive (salmon) streams could have negative impact on future production and should be addressed in the public use plan." **Note:** Various access provisions anticipated for discussion in this plan including snow machine use, pack animal use and development of trails and campsites will be evaluated in terms of impacts on resources and habitats. State law restricts crossing of anadromous streams including those on the refuge. Some types of mechanized access are prohibited on refuge lands and waters including use of air boats and other off road vehicles except as provided for in the Lands Act.
- Another person wanted to know how the refuge will deal with "management of lands acquired after the completion of the comprehensive and public use plans." **Note:** Management actions taken in the refuge public use and comprehensive plans apply only to federally owned lands and waters. A separate plan or amendment to the current plans would be required for any large scale future addition to the refuge land base.
- A question arose concerning commercial and recreational mineral extraction activities on refuge lands. **Note:** Commercial "hard rock" mining and oil and gas development are not allowed on Kodiak Refuge (see comprehensive plan). Recreational mineral extraction is permitted with activities restricted to surface collection by hand (including gold pans.)
- Another question concerned allowing military exercises on refuge lands. **Note:** All proposals for such exercises would be evaluated on a case by case basis and permitted only if compatible with refuge purposes.
- Two people commented that the refuge should consider developing viewing platforms. The possibility of developing this type of facility was considered during the comprehensive planning process, but rejected primarily due to the effect it would have in concentrating both bears and people in some areas and the possibility of displacing bears because of increased levels of human activity.

Public Use Management Plan



Update 2

May, 1989

Where We Are

In December, 1988 the public was invited to assist the Kodiak National Wildlife Refuge staff in identifying issues, objectives and management options for the refuge public use program. This process will result in a refuge Public Use Management Plan to be completed in December, 1989. **As a result of an initial workbook sent out in December nine public use issues and five public use objectives were identified.** Last February an update summarizing responses to the workbook was distributed. In March and April management options for public use issues were discussed in a second workbook and a series of meetings and workshops. **This update summarizes the responses we received to Workbook 2 and the workshops.** Meetings were also scheduled to receive input from the state agencies and the Kodiak Island Borough.

Who We Heard From

Comment on management options for public use issues was received from individuals, agency representatives and interest groups. Comments were received in the form of workbook responses as well as meetings and workshops held in March and April. In March, Workbook 2 was mailed to 325 people. Seventy-four individuals and organizations provided workbook responses as follows:

	Kodiak	Other Alaska	Lower 48	Total
Interested Individuals	18	7	10	35
Commercial Users	20	5	2	27
Conservation Organization	1	2	2	5
No Information	-	-	-	7
Grand Total				74

A series of workshops and meetings were held during March and April including: March 28 - meeting with Kodiak Island Borough staff, March 29 - meeting with State of Alaska staff, March 30 - workshop with commercial users in Kodiak, April 1 - workshop with public users in Kodiak, April 3 - workshop in Old Harbor, April 4 - workshop in Larsen Bay, April 5 - workshop in Karluk, April 15 - workshop in Anchorage, April 26 - workshop in Akhiok. At all of the workshops participants were urged to fill out workbooks and either turn them in at the end of the workshop or mail them in. A total of 86 people participated in these meetings and workshops.

What Comes Next

As we develop the public use plan for Kodiak Refuge we will consider various alternatives for addressing public use issues. The four alternatives being considered are found on the final page of this update. Each of the four preliminary alternatives will be evaluated to determine how well it supports refuge purposes and helps achieve the following public use objectives:

- To ensure that public use programs are compatible with the natural diversity of refuge resources and habitats.
- To provide public use programs which minimize possible conflicts between and among subsistence, recreational, and commercial users.
- To provide opportunities for fish and wildlife oriented recreation emphasizing short term, low density public use.
- To maintain access and existing uses of the refuge for subsistence, recreation and commercial users to the maximum extent possible consistent with refuge purposes. Maintaining traditional and nonmotorized access to refuge lands for subsistence users and the general public is recognized as a priority.
- To develop and maintain facilities for recreational users which are consistent with refuge public safety, natural diversity and fish and wildlife management concerns. Emphasis will be on providing for fish and wildlife oriented recreation opportunities requiring minimal facility development and habitat alteration.

In December, 1989 the Public Use Management Plan will be completed. The public will have the opportunity to provide written comments as well as attend public meetings scheduled during January-March, 1990.

Your Comments on the Issues

The following pages summarize responses received from Workbook 2 and workshops. Workbook respondents were asked to identify options they preferred for each issue or to suggest an option of their own. The tabulation of workbook responses reflects each time an option was favored by a respondent. In some cases respondents indicated that more than one option was favored (numbers in parentheses indicate the respondents favoring each option.)

1. The use of snow machines on refuge lands near bear denning areas may disrupt denning. Considering the importance of brown bears to refuge purposes it may be necessary to prohibit snow machine access to these areas.

Workbook Response:

Of 74 respondents (one response was signed by thirteen individuals), 73 chose to comment on this issue. The majority of the responses were in favor of prohibiting snow machine use throughout the refuge. Responses were tabulated as follows:

1. Allow snow machine use throughout the refuge. (3)
2. Restrict snow machine use in all bear denning areas. (11)
3. Restrict snow machine use in all areas where wildlife and habitats may be threatened by their use. (21)
4. Allow snow machines only on trails, beaches and other areas of the refuge where damage to wildlife and habitats could be minimized. (13)
5. Prohibit snow machine use throughout the refuge. (43)

Comments included: "If snow machines were not permitted on the refuge prior to 1980, their use cannot be considered traditional-even for subsistence purposes..." "The refuge should be very cautious in permitting a new activity (snow machines, pack animals)..." "Snow machines do not hurt the land like 3-4 wheelers." "Most denning areas are probably already inaccessible to snow machines because of terrain and as Kodiak's climate does not generate a heavy snow pack...." A response signed by thirteen individuals stated "...We would like recreational use of the refuge three months per year (January through March)...we feel that with some possible restrictions to denning areas, we could ride snowmobiles in the refuge with little or no impact on the wildlife."

Workshop Comments:

Meeting participants at Akhiok said they were not currently using snow machines but that they would like to see the option for subsistence use of snow machines remain open should colder weather patterns prevail in the future. One Larsen Bay resident preferred limiting snow machine use to trails where the impacts on wildlife could be minimized. A Karluk resident was interested in the use of ATV's when the ground was frozen (January and February) which he felt would cause less damage than snow machines. Comments in Old Harbor were opposed to snow machine use. Comments received at a meeting with State of Alaska representatives generally supported restrictions on use of snow machines in bear denning and deer wintering areas. The possibility of more "narrowly" allowing some refuge snow machine use consistent with ANILCA was also mentioned. Limiting use above certain elevation levels was suggested as one method of limiting disturbance of denning bears. Most comments at both Kodiak meetings favored restriction of snow machine use on the refuge but one comment favored allowing snow machines for traditional subsistence uses. Another commentor felt that no action should be taken to restrict snow machine use for search and rescue activities.

2. Allowing pack animal use on the refuge may result in increased killing of bears to protect pack animals. The types of pack animals allowed and the extent of their use on the refuge should be carefully considered because of the potential impacts on bear populations and other refuge resources.

Workbook Response:

Of 74 respondents, 71 chose to comment. The majority chose the option to prohibit the use of pack animals throughout the refuge or to limit their use to traditional subsistence purposes. Responses were tabulated as follows:

1. Allow the use of pack animals throughout the refuge. (9)
2. Allow the use of pack animals, but prohibit overwintering of pack animals on refuge lands. (16)
3. Allow pack animal use only during hunting seasons. (11)
4. Allow the use of dogs, but not grazing animals (ungulates) as pack animals on the refuge. (3)
5. Prohibit the use of all pack animals throughout the refuge, except for traditional subsistence purposes. (13)
6. Prohibit the use of all pack animals throughout the refuge. (31)

Comments included: "Lamas are good pack animals and easily kept." "Allow pack animals under a trial basis by permit only. Inholders might use their property as a base and develop a business using refuge lands." "Prohibit overwintering of pack animals on refuge lands." "Dogs can be a bigger potential problem related to bear interaction than horses." "This is essentially a non-traditional activity. If you allow this activity, even on a trail basis, it is going to be extremely difficult to get rid of it at a later date if you decide that it is detrimental to refuge resources." "Ungulates compete with wildlife for food, cause physical damage to delicate terrain, attract bears & therefore increase human/bear problems..."

Workshop Comments:

Karluk, Larsen Bay and Old Harbor residents did not favor allowing pack animals on refuge lands, but Akhiok residents wanted to keep the option for pack animal use open. One commentor in Larsen Bay felt that pack dogs should not be allowed since dog food might attract bears. One Karluk resident feared pack animals could spread disease to wild animals. One commentor from the State of Alaska mentioned problems with pack animal use and brown bear defense of life and property kills in the Ship Creek area of Chugach State Park. The State favored limiting pack animal use in areas where there are demonstrated conflicts with bears. There was no clear consensus or majority opinion as to how pack animals should be regulated on refuge lands at the Kodiak commercial user workshop. One participant felt that as long as dogs were allowed on the refuge they shouldn't be prohibited from carrying packs. Several comments at the Kodiak public user workshop opposed pack animal use. One commentor at the Kodiak commercial user workshop felt pack animal use in the Brooks Range did not cause bear problems.

3. Public access to areas with important and highly sensitive wildlife concentrations may need to be restricted at certain times of the year when wildlife is much more susceptible to disturbance. Those areas may include eagle and swan nesting sites and salmon streams with unusually high brown bear feeding concentrations. These areas need to be identified and the impact of increased public use evaluated.

Workbook Responses

Of 74 respondents, 73 commented on this issue. Of the five options presented in the workbook nearly equal favorable comment was received for options 3,4 and 5. Responses were tabulated as follows:

1. Do not restrict public use or access to any areas of the refuge. (6)
2. Do not restrict public use or access to any areas of the refuge at this time, but monitor these areas and place appropriate restrictions on public use and access should it become necessary in the future. (25)
3. Close the most highly sensitive wildlife concentration areas seasonally - when wildlife is most vulnerable to disturbance - to public access if required to protect wildlife. (25)
4. Restrict all motorized access to important wildlife concentration areas, while still allowing the public access on foot. (31)
5. Close all areas with important wildlife concentrations to the public. (7)

Comments included: "Restrict access by a permit process." "Close highly sensitive wildlife concentration areas seasonally by permit with required restrictions to protect vulnerable areas." "In the case of bear concentration areas, such closures are also necessary for public safety reasons." "Motorized access should be restricted in important wildlife areas." "I would prefer to see as little restrictions as possible. I live in Alaska for many reasons and one of these is personal freedom." "Refuge personnel should have the option to restrict access if a problem arises."

Workshop Comments:

A participant in Larsen Bay favored closing highly sensitive wildlife concentration areas seasonally. At the meeting with the State of Alaska a very cautious approach seemed to be favored before recommending any area be closed. The State mentioned the shoreline of Karluk Lake in the fall as one sensitive area where conflicts between bears and deer hunters were unavoidable. The State urged the refuge to be specific as to the area and time of all proposed closures and to consult with the State prior to implementing area closures. Commentors at the Kodiak commercial user workshop suggested several possible options including: 1) not restricting access at this time, but monitoring impacts, 2) instituting a permit system to limit impacts and 3) not allowing motorized access. Some commercial users at both the Anchorage and Kodiak workshops were opposed to any access closures, fearing they would lead to more area widespread closures in the future. Several participants at both the Anchorage and Kodiak public user workshops felt that the area and time specific closures were probably necessary. One commentor at the Kodiak public user workshop felt that closing areas to motorized access (airplanes/motor boats) would, in effect, close the area to all public use because of difficulty of foot access.

4. The levels of unguided public use in some areas of the refuge or during certain time periods may need to be limited to protect important refuge resources and reduce conflicts between users. Both the number of people and the length of time they are allowed to stay in one location will be evaluated.

Workbook Response:

Of 74 respondents, 70 chose to comment on this issue. The majority of respondents were in favor of establishing critical use "areas" on the refuge where permits would be required for unguided users. Responses were tabulated as follows:

1. Take no action to limit the number of unguided users, the location of their visit, or the length of their stay on the refuge. (12)
2. Establish camping time limits for unguided users that correspond with those currently in use for guided users. (21)
3. Limit the group size of unguided users and the length of their stay, but not the location of their visit. (7)
4. Establish critical use "areas" on the refuge where permits would be required for unguided users and place a limit on the number of users that would be allowed to visit these areas. (45)

Comments included: "Unguided users should have to obtain a permit like the Denali National Park enforces..." "Also give unguided users priority over guided parties for use of restricted areas." "Commercial users require greater control and have a stronger impact than non-commercial users." "There are two main aspects to the Public Use Management Plan: 1. restricting human use to protect refuge resources and 2. allocating that use among user groups."

Workshop Comments:

Several people in Larsen Bay felt that restricting camping to seven days in a single location would be ineffective since another group would then occupy the same camping spot. This sentiment was also supported by several commentors in Kodiak. Both Larsen Bay and commercial users in Kodiak also felt that a permitting system would be the most effective way of keeping "semi-permanent" camps from becoming established. The Kodiak Island Borough said the refuge should consider the option of backcountry permits rather than camping time limits. One participant at the meeting with the State of Alaska suggested that the refuge should consider camping time limits only in critical wildlife areas rather than refuge wide restrictions.

5. If additional commercial activities are allowed in private facilities currently under permit, refuge wildlife and habitats may be jeopardized by concentrating human use for longer periods. The impacts of allowing new uses in facilities with refuge permits will be discussed in the public use plan.

Workbook Response:

Of 74 respondents, 69 chose to comment on this issue. The option overwhelmingly chosen was not to allow new commercial activities in private facilities currently under permit. Responses were tabulated as follows:

1. Do not allow new commercial activities in private facilities currently under permit. (51)
2. Allow new commercial activities in private facilities on refuge lands within the currently permitted season. (7)
3. Allow new commercial activities in private facilities on the refuge and extend the season of use for these facilities to accommodate new uses. (8)

Comments included: "All new activities would have to be studied by refuge staff to determine if they would be in conflict with or damage the primary purposes of the refuge." "Cabins should be restricted to general purposes of original permit." "I feel this is one area the refuge should remain flexible...." "Allow only new activities which are provided for in ANILCA and the Comprehensive Conservation Plan for Kodiak." "Not only will increased long term human presence increase bear/human conflicts -the activities of added "commercial" users will have an adverse impact."

Workshop Comments:

Comments in Akhiok and Karluk were generally opposed to allowing new uses of cabins on the refuge. One participant at the Kodiak commercial user workshop felt entirely new uses of cabins with refuge permits should not be allowed but the refuge should remain flexible as to changing requirements for currently allowed commercial activities. The State comment favored not allowing new activities in refuge permitted cabins. Other commentors felt the refuge should evaluate each proposed new use of refuge permitted facilities on a case-by-case basis. An Anchorage participant felt that ANILCA's intent was to allow only commercial fishing activities in those facilities with refuge permits. Kodiak public user workshop participants were mostly opposed to allowing new uses in cabins with refuge permits. Some commercial user workshop participants felt the refuge should be more flexible with regard to allowing new types of hunting in hunting guide cabins. One commentor at the Kodiak public user workshop felt the additional uses of refuge permitted facilities would be inconsistent with the refuge's commercial fishing facilities plan and the public use objective of short-term, low-density use on the refuge.

6. Limiting the number of guides, outfitters and their clients allowed to operate on refuge lands may reduce impacts on refuge resources and conflicts between users. The public use plan will evaluate the numbers and limits on commercial users outlined in the comprehensive plan.

A. Options for numbers of permittees:

Workbook Responses

Of 74 respondents, 66 chose to comment on this issue. The majority of responses were in favor of retaining the current limits of guides, outfitters and their clients. Responses were tabulated as follows:

1. Retain the number of guides, outfitters and their clients permitted to operate on the refuge and do not increase numbers. (34)
2. Reduce the number of guides, outfitters and their clients permitted to operate on the refuge. (17)
3. Limit the number of transporters (air taxi and boat operators) and recreation guides (photography, sight-seeing) that are permitted to operate on the refuge. (24)
4. Increase the number of guides, outfitters and their clients permitted to operate on the refuge. (7)

Comments included: "It seems best to limit the permits in this area (air and boat operators). Unrestricted use of the refuge will give too easy access to poaching the wildlife." "Do not turn into a limited entry program. Economics will decide numbers." "No increase or decrease in the number of guides, outfitters and their clients should be made pending (a) a carrying capacity analysis of the number of visitors that is compatible with refuge purposes; and (b) Congress' decision on wilderness proposals."

Workshop Comments:

One Larsen Bay resident felt that limits should be placed on the number of refuge permittees conducting hunting since Larsen Bay and Uyak Bay were "saturated" with deer hunting operators. Old Harbor, Larsen Bay and Akhiok residents all expressed a concern for the increased difficulty deer hunters cause village residents trying to subsist. In a meeting with the State of Alaska one participant suggested that the refuge should be more flexible both in the establishment of outfitter areas and the activities outfitters were allowed to conduct. Several commentors at both Kodiak workshops felt that additional regulation of air and marine transporters would more fairly allocate use among various users. Some participants at Kodiak workshops felt that the users should be regulated through a backcountry permitting system and then those people with permits should be free to choose their own means of access to refuge lands. Some commentors at the Kodiak public user workshop felt that the refuge needed to work toward determining use levels, since the amount of use could increase greatly even if the number of permittees remains constant.

B. Options for numbers of clients:

Workbook Responses:

Of 73 respondents, 60 chose to comment on this issue. The majority of comments received were in favor of maintaining the current client numbers for guided and outfitted users. Responses were tabulated as follows:

1. Do not limit the number of clients permitted to be in camp as outlined above. (3)
2. Raise the current client numbers. (1)
3. Maintain the current client numbers. (39)
4. Reduce the current client numbers to fewer than are currently permitted. (13)

Comments included: "Establish a fixed number for outfitters and transporters." "Limiting numbers of hunters etc. can best be done by changing bag limits in certain areas..." "I think its a very stable system for the current time. Both the number of clients and time limits..." "In general, as long as you retain the option to change in the future, then it seems to me that what is currently permitted could be continued."

C. Options for camping time limits:

Workbook Responses:

Of 74 respondents to the workbook, 61 comments on this issue were received. The majority were in favor of maintaining the current camping time period limits. Responses were tabulated as follows:

1. Do not limit the camping time period as outlined above. (6)
2. Increase the current time period limits. (0)
3. Maintain the current time period limits. (39)
4. Reduce the current time period limits. (14)

Comments included: "Also reduce the current time limits on camping. Again this will reduce the human impact on the environment." "The current time period seems reasonable and in most cases in step with a client's normal vacation time frame."

7. New trail construction and development of improved campsites on refuge lands may increase the potential for bear/human problems by concentrating use. Both the positive and negative impacts of such development need to be considered in the public use plan.

Workbook Response:

Of 74 respondents, 70 chose to comment on this issue. The majority of responses received were in favor of no new construction or development of trails campsites. Responses were tabulated as follows:

1. Do not construct or allow development of new trails or improved campsites on the refuge. (46)
2. Identify and improve the most heavily used campsites on refuge lands. (15)
3. Establish a new refuge-wide trail system. (5)
4. Construct new trails and campsites only if necessary to protect refuge resources. (14)
5. Construct new trails and improved campsites on the refuge to accommodate increased demands for recreational use. (8)

Comments included: "Establish a new trail system only to get across or around native land holdings." "Trails and designated campsites concentrate users and increase use." "Agree with improving campsites; new trails are not necessary." "This is a wildlife refuge not a national park." "If you prohibit use of private cabins etc., then you shouldn't be encouraging more bear/man conflicts by building trails etc."

Workshop Comments:

Commentors in the villages of Kodiak, Larsen Bay, Old Harbor and Akhiok all spoke in opposition to development of trails and campsites. Several participants in villages felt that any such development would increase trespass problems on adjacent Native lands. Although Larsen Bay residents did not favor development of campsites, they felt their use and negative impacts could be controlled with a permitting system. The State of Alaska identified a number of sites suitable for developed campsites and suggested developing meat caches at heavy use sites. Several participants at both public meetings in Kodiak and at the Anchorage workshop felt developed campsites would cause litter problems and negatively impact wildlife.

8. The number of public use cabins on the refuge and the way they are managed may have either a positive or negative effect on refuge wildlife and habitats. The need for new cabins, the problems associated with providing more cabins and the way they are managed will be evaluated in the public use plan.

Workbook Response:

Of 74 respondents, 69 chose to comment on this issue. The majority were in favor of retaining the existing number of cabins and increasing efforts to educate cabin users about back country ethics. Responses were tabulated as follows:

1. Retain the existing number of cabins on the refuge and continue current management practices. (17)
2. Retain the existing number of cabins on the refuge and increase efforts to educate cabin users about back country ethics and bear/human encounters. Step up efforts to enforce littering regulations. (46)
3. Restrict use of the cabins to no more than 15 days in any 30 day period, thus limiting the impacts of long-term use which may be occurring at public use cabins. (25)
4. Increase the number of public use cabins throughout the refuge. (5)
5. Reduce the number of public use cabins on the refuge. (9)

Comments included: "Every cabin I go to is a wreck and trash everywhere." "Reduce the number of public use cabins and allow commercial use of existing permitted cabins instead." "User fees should be dedicated to maintaining the cabins. Increased fees may be in order." "There are alot more bears killed from these cabins than are reported each year." "I think there is a definite need to avoid long term habituation and a break period would help." "A decision on new public use cabins should be deferred pending Congress' wilderness review."

Workshop Comments:

Most commentors at village meetings were opposed to development of refuge public use cabins especially those which might be developed near Native inholdings. A participant at Karluk felt that the refuge should not consider developing new cabins along the coast since this might cause negative impacts on bears scavenging the coast soon after leaving dens. The State of Alaska suggested a number of locations the refuge should consider for future public use cabin development. Both public and commercial users at the Kodiak workshops mostly opposed construction of additional public use cabins and emphasized the need for more law enforcement and better maintenance at existing cabins.

9. Development and use of inholdings and other lands and waters bordering the refuge may result in impacts to refuge fish and wildlife and their habitats.

Workbook Response:

Of 74 respondents, 70 chose to comment on this issue. The majority of the responses indicated that a combination of options 3, 4 and 5 should be considered. Responses were tabulated as follows:

1. Do not take any action to limit development and use of inholdings and adjacent lands and waters. (6)
2. Monitor the development and use of inholdings and other lands and waters bordering the refuge to determine if and when those areas have an impact on refuge fish and wildlife populations and their habitats. (24)
3. Identify and acquire from willing sellers - by purchase or exchange - critical inholdings or adjacent lands. (50)
4. Identify and enter into cooperative agreements with the owners of critical inholdings or adjacent lands, to help achieve the purposes for which the refuge was established. (46)
5. Actively work with the Kodiak Island Borough to ensure that zoning of inholdings is appropriate to protection of refuge purposes to the maximum extent possible. (43)

Comments included: "If land owners agree refuge should acquire as much land as possible." "I strongly feel (support) for any and all actions to gain control of all inholdings, whether through purchase or management." "Many of the patented parcels were deeded long before the existence of the refuge and most of the parcels recently sold were offered to the refuge before the general public, so for the refuge to now take a stand against the development of these properties would seem unethical."

Workshop Comments:

A participant in Akhiok said that the topic of refuge inholdings was of major concern to the village and they didn't want any action of the refuge to deter future economic opportunities such as fin fish farming. Commentors in Akhiok and Old Harbor felt the refuge needed to support land trades, particularly if the refuge wanted to limit the future development of Native conveyed lands. The State of Alaska favored options 2,3,4 and 5 as listed above. The Kodiak Island Borough suggested that the refuge develop a list of inholdings to be acquired and establish priorities for acquisition. One participant at a Kodiak workshop felt the refuge should work with the Nature Conservancy to acquire critical inholdings. One Kodiak commentor was opposed to the refuge trying to influence zoning decisions affecting private lands. One commentor at the Kodiak public user workshop felt that cooperative agreements might be an effective way to limit impacts to on refuge and off refuge fish and wildlife resources.

About the Alternatives

Based on the workbooks returned and comments received at meetings and workshops, four preliminary alternatives were identified for managing the refuge's public use program. The alternatives are designed to provide a range of management options including the current situation which is identified as alternative A.

As the refuge public use management plan is developed each of the four alternatives will be evaluated as to how well it supports refuge purposes, public use objectives (see page 1) and how well it conforms to the public input received. Although alternatives will be modified somewhat in the planning process, one of the four alternatives will be chosen to address issues identified as significant during the planning process.

Kodiak National Wildlife Refuge - Public Use Management Plan - Preliminary Alternatives

Issue	Alternative A - Current Situation	Alternative B	Alternative C	Alternative D
1. Snowmachine use	Snow machines allowed for traditional activities throughout the refuge	Snowmachines allowed throughout refuge	Restrict in bear denning and deer wintering areas	Prohibit throughout refuge
2. Pack animals	Allow throughout refuge (no grazing)	Allow throughout refuge	Prohibit throughout refuge	Prohibit throughout refuge
3. Wildlife concentration areas	No access restrictions	No access restrictions	Close sensitive areas seasonally	Close all areas with important wildlife concentrations
4. Unguided public use	No "user" limits	No "user" limits	Establish camping time limits (as for guided users)	Establish "critical use" areas requiring permits to limit time/numbers/location
5. New activities in permitted cabins	No new activities	Allow new activities/extend seasons	No new activities	No new activities
6. Guides/outfitters				
A. Guide/outfitter numbers	Retain current numbers, no additional restrictions	Increase numbers, no additional restrictions	Retain current numbers, no additional restrictions	Reduce current numbers
B. Guide/outfitter client numbers	Maintain current numbers	Do not limit	Maintain current numbers	Reduce current numbers
C. Guide/outfitter camping time limits	Maintain current limits	Do not limit	Maintain current limits	Reduce current limits
7. Trail & improved campsite construction	No current development	Construct new trails & campsites	Do not construct new trails or campsites	Do not construct new trails or campsites
8. Public use cabins	No current development	Increase number	Maintain existing numbers	Reduce number
9. Inholdings	Identify critical inholdings; monitor development & use	Take no action	Identify and acquire critical inholdings, use cooperative agreements, work with borough zoning	Identify and acquire critical inholdings
10. Information/education programs	Maintain current program	Increase services	Increase services	Increase services
*11. Fixed-wing aircraft	Allowed for traditional activities	No upland landings	No upland landings	No upland landings
*12. Jet boat use	Allowed for traditional activities	Use restricted to "moderate management" areas	Use restricted to "moderate management" areas	Use restricted to "moderate management" areas
*13. Tent frames	Allowed when directly related to taking of fish & wildlife	Use restricted to "moderate management" areas	Use restricted to "moderate management" areas	Use restricted to "moderate management" areas

* Issues resolved in the Comprehensive Conservation Plan which require development of regulations.