

US FISH & WILDLIFE SERVICE--ALASKA



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Kenai National  
Wildlife Refuge

Annual Narrative  
Report

Calendar Year 1995

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REVIEW AND APPROVALS  
KENAI NATIONAL WILDLIFE REFUGE  
Soldotna, Alaska

ANNUAL NARRATIVE REPORT  
Calendar Year 1995

<u>Rob. J. West</u>	<u>9/8/97</u>	<u>Janet E. Holm</u>	<u>9/11/97</u>
Refuge Manager	Date	GARD-South	Date
<u><i>[Signature]</i></u>		<u>9/10/97</u>	
Regional Office Approval		Date	

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## INTRODUCTION

The Kenai National Wildlife Refuge is located on the Kenai Peninsula in southcentral Alaska. The northern portion of the Refuge is just 15 air miles from the state's largest population center, the city of Anchorage. Despite its proximity, a scenic 112-mile drive through the Kenai Mountains is necessary to reach the nearest portion of the Refuge by road from Anchorage. Commercial commuter aircraft fly into the nearby cities of Kenai and Soldotna daily.

Extending 115 miles from Turnagain Arm on the north to nearly the Gulf of Alaska on the south, the Refuge encompasses about one-third of the Kenai Peninsula. The western portions of the Kenai Mountains generally form the eastern Refuge boundary, a common boundary shared with our Chugach National Forest and Kenai Fjords National Park neighbors.

Since the establishment of the Refuge as the Kenai National Moose Range on December 16, 1941, under E.O. 8979, these lands have undergone at least two boundary changes and a name change. The original Refuge included 2,058,000 acres and, among other mandates, authorized settlement, location, and other disposition under public land laws applicable to Alaska. At that time, the Refuge was bounded on the northwest, from Point Possession to the Kasilof River, by the waters of Cook Inlet. A six-mile-wide strip of land from Boulder Point to the Kasilof River and a six-mile strip of land, including portions of the Kenai River, were left open for development. Homesteads, grazing areas, road systems, and other developments occurred in these areas, and they were excluded from the Refuge during a 1964 boundary adjustment. Excluded at the same time were Cook Inlet coastal lands one to three miles inland and considerable portions of the Harding Ice Field, reducing the Refuge area to 1.73 million acres.

Passage of the Alaska National Interest Lands Conservation Act (ANILCA), commonly known as "The Alaska Lands Act," on December 2, 1980, redesignated the Kenai National Moose Range as the Kenai National Wildlife Refuge. The Act also increased the Refuge acreage, adding approximately 150,000 acres at the southern tip of the Refuge and about 90,000 acres of former Forest Service lands to the extreme northeast portion of the Refuge near Chickaloon Flats. At the same time, passage of ANILCA withdrew 16,535 acres from the Refuge to satisfy the claims of the Salamatof Native Association under the Alaska Native Claims Settlement Act of 1971. The now 1.97-million-acre Refuge was reestablished and its purposes redefined as follows: 1) conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, moose, bears, mountain goats, Dall sheep, wolves and other furbearers, salmonoids and other fish, waterfowl and other migratory and nonmigratory birds; 2) fulfill international treaty obligations of the United States with respect to fish and wildlife and their habitats; 3) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (1), water quality and necessary water quantity within the refuge; 4) provide in a manner consistent with subparagraphs (1) and (2), opportunities for scientific research, interpretation, environmental education, and land management training; and 5) provide, in a manner compatible with these purposes, opportunities for fish and wildlife-oriented recreation. In addition to establishing a new name, new

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boundaries, and new purposes, ANILCA formally designated 1.35 million acres of the Refuge as wilderness.

The Refuge is divided into two main physiographic regions: a mountainous region and a forested lowland. Elevations on the Refuge range from sea level to more than 6600 feet in the Kenai Mountains, with treeline at about 1800 feet. Among the peaks of the Kenai Mountains lies the Harding Ice Field which thrusts numerous glacial fingers out into the Refuge. The glaciers, mountains, lakes, alpine tundra, and foothills are extremely scenic.

Thirty-nine percent of the Refuge is forested. Swampy forests of black spruce alternate with peatbogs and grassy mires, while white spruce forests dominate the drier areas and the foothills and mountains. White spruce stands are often intermixed with and include deciduous trees, such as white birch and aspen, especially in old burns and cut-over areas. Lowland shrub (alder and willow) covers nine percent of the Refuge. Mountain tundra covers about 11 percent. Of this class, about 87 percent is dwarf shrub and lichen tundra, and 13 percent is tall shrub (alder and willow) thickets usually associated with tundra. Water and associated wetlands cover 13 percent, and snow, ice, and glaciers cover the remainder of the Refuge.

The Kenai River, the largest river system on the peninsula, drains about 2148 square miles (5563 km<sup>2</sup>). About 54 percent of the watershed is on the Refuge, 37 percent in the Chugach National Forest, and the remainder on private lands. Ten major tributaries feed the Kenai River System: Beaver Creek, Slikok Creek, Soldotna Creek, Funny River, Moose River, Killey River, Skilak River, Russian River, Cooper Creek, and Juneau Creek. Other Refuge river and stream systems flowing westward into Cook Inlet include the Kasilof River (which drains Tustumena Lake), Deep Creek, and the Swanson, Fox, Ninilchik, and Chickaloon Rivers.

There are thousands of lakes on the Kenai Peninsula, and most of them are on the Refuge. The largest are two glacial lakes, Tustumena Lake (74,000 acres or 31,000 ha) and Skilak Lake (25,000 acres or 10,000 ha). More than 4500 smaller lakes dot the Refuge, mostly in the Moose, Swanson, and Chickaloon River drainages.

At least 199 species of amphibians, birds, and mammals use the wildlife habitats on the Refuge. None of these species are known to be threatened or endangered. Five species of salmon, a wide variety of furbearers, and significant populations of brown and black bear, sheep, goats, wolves, Bald Eagles, Trumpeter Swans, caribou, moose, and loons occur on the Refuge.

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K. FEEDBACK NTR

A. HIGHLIGHTS

- Subsistence comes to the Kenai! (H.8 Hunting)
- Fall flooding hits the Peninsula hard (B. Climatic Conditions)
- The year sees a tremendous proliferation of "save the Kenai" groups (D.2 Management Plans)
- Jims' Landing rehab - a major *faux pas* (I.2 Rehabilitation)
- Moose Range Meadows public access easement issue hits the proverbial fan (C.2 Easements)
- Changing of the guard; Doshier heads south, West takes the helm (E.1 Personnel)



Kenai cow moose with twins calves. JF

B. CLIMATIC CONDITIONSTable 1. Monthly temperatures (averages) and precipitation data, 1995\*.

	Temperature (Fahrenheit)				Precipitation		Snowfall**	
	Averages				Inches		Inches	
	Normal	High	Low	1995	Normal	1995	Normal	1995
January	12.5°	41°	-30°	15.2°	1.05	.89	10.7	13.1
February	16.5°	43°	-23°	18.2°	.96	.98	9.8	13.5
March	23.0°	46°	-22°	13.5°	.96	.86	9.3	10.7
April	33.6°	62°	22°	38.8°	.82	.50	4.7	--
May	43.7°	64°	31°	46.6°	1.10	2.24	0.4	--
June	50.2°	77°	34°	52.3°	1.20	2.10	--	--
July	54.5°	69°	42°	55.7°	1.61	4.22	--	--
August	53.7°	72°	39°	55.1°	2.49	3.09	--	--
September	47.1°	64°	36°	52.1°	3.16	4.66	--	--
October	34.7°	58°	18°	38.0°	2.72	2.27	3.4	0.4
November	21.0°	44°	-4°	20.7°	1.50	.38	8.6	0.8
December	14.4°	38°	-16°	20.9°	1.40	0.26	12.4	6.2
<u>Yearly</u>								
Average	33.7°	56.5°	10.6°	35.6°				
Totals					18.97	22.45	59.3	44.7

\*1995 data were obtained from monthly National Oceanic and Atmospheric Administration (NOAA) Climatological Data reports. For temperature and precipitation, the reference period for normal values is 1961-1990.

\*\*Information obtained from monthly NOAA Climatological Data reports, the State Climatologist, the Federal Aviation Administration, and the National Weather Service.

The winter of 1994-95 experienced very heavy snowfall of 119" for October through March 1995, compared to the normal 54" for these months. Much of this snow fell in November 1994 (51.6") but it remained on the ground the rest of the winter.

Monthly summer temperatures were about two degrees above normal, and summer precipitation was 80 percent above normal, although local residents considered the summer weather to be "average" with no memorable ups or downs.

Following the summer of above average precipitation, heavy September rains caused extensive flooding on the Kenai River and over much of the Peninsula. Extensive property damage occurred on the Lower Kenai River and Resurrection River at Seward. Flood levels on the Upper Kenai River were measured at the 25-year flood level and at the 100-year flood level on the Lower Kenai River. As a result of high water, emergency closures of the Russian River Campground, Jims' Landing, the Upper Kenai River, and Mystery Creek Road at Mystery Creek were enacted until floodwaters subsided.

The winter of 1995-96 recorded very little snowfall until February 1996.

C. LAND ACQUISITION1. Fee TitleKenai Native Association, Incorporated (KNA)

As required by Public Law 102-458, negotiations on the Kenai Native Association (KNA)/Kenai Wildlife Refuge (Refuge) proposed land exchange continued during 1995. Negotiations picked-up steam near year's end as numerous parties sought to settle the 13 year-old negotiation phase. Kenai Native Association tracts being considered in the exchange include Stephanka, Moose River, Swanson River Road (East and West), Tustumena Lake (Central), and the Old Kenai National Wildlife Refuge Headquarters.

The latest proposal included Kenai Wilderness removal, Kenai Wilderness designation and boundary changes, change in Alaska Native Claims Settlement Act (ANCSA) section 22g status, cash or surplus property transfer, and transfer of current KNA lands within the Refuge. A proposal to also remove the Swanson River West tract also surfaced during late 1995 and for the first time a broader removal of ANCSA section 22g status emerged in the discussions. Also, for the first time, lands beyond the Kenai Peninsula entered the discussions as possible mitigating features.

Salamatof Native Association (SNA)

One of the largest segments of non-developed habitat along the Kenai River was purchased by the Exxon Valdez trust fund for reinclusion into the Refuge.

RKJ

The Salamatof Native Association nominated a Kenai Riverfront parcel for purchase by the Exxon Valdez Oil Spill (EVOS) Trustee Council. The parcel is located on both sides of the River at the upstream end of the Moose Range Meadows area. The parcel totals 1377 acres and includes 73.84 acres of lands currently outside the Refuge boundary. If approved for purchase by the Trustees, the lands will become part of Kenai National Wildlife Refuge (KNWR) and a minor boundary adjustment will be required.

Large numbers of visitors continued to use the public use easements associated with Salamatof's Moose Range Meadows subdivision. Habitat damage accelerated as both anglers and private property guests trampled accessible shoreline areas. In response, Acting Manager Mark Chase temporarily closed the public use easements by emergency order to protect the deteriorating banks (see section C.2 for an expanded discussion of the easements). Refuge staff continued to meet with Moose Range Meadows Subdivision property owners and Salamatof representatives to discuss alternatives for restoring and preventing future damage to several heavily impacted shoreline areas along the 25-foot public use easement.



Easement closure signs were placed at several locations informing anglers of the closure. RKJ

#### Cook Inlet Region Incorporated (CIRI)

For years the status of future ownership at the Russian River site that includes Cook Inlet Region, Inc. (CIRI) Section 14(h)(1) application (AA-11096) has been uncertain. Cook Inlet Region Incorporated filed four separate Section 14(h)(1) applications, including the original AA-11096, in 1975. The Bureau of Land Management (BLM) took administrative action in

1978 and 1986 that combined the four applications into AA-11096. The actual filings were well in advance of the December 31, 1976, deadline for 14(h)(1) applications established by Federal regulations. The original application was amended eight times after the 1976 deadline had passed. The amendments resulted from the Bureau of Indian Affairs (BIA) documenting additional archaeological features in the area. In each case, BLM agreed that the amendments were corrections to the original selection application. CIRI responded to BLM's guidance and agreed that the newly discovered areas were amendments to the original application. At a later date, BLM indicated that a Secretarial waiver was needed to allow the process to go forward on the amendments. To date, BIA has acted on and certified only lands within the current application (AA-11096 including amendments), which is far less than all lands covered by CIRI's selection application. No decision has been rendered on the Secretarial waiver.

Informal discussions on the matter of cooperative planning and management of the area have been ongoing between CIRI, the State of Alaska and Fish and Wildlife Service (Service). In January 1995, the Refuge Manager requested a timely adjudication process on application AA-11096 and amendments.

#### Point Possession Native Group

Representatives of Point Possession made several inquiries regarding the Services interest in purchasing their lands within the Refuge. Dave Hanson, of Arktos Inc., who often represents the group, also stated they were negotiating with several potential buyers. He noted they were going to divide the property up into several smaller parcels for sale. He reiterated their desire to sell the land to the Refuge.

#### Native Allotments

Administrative Law Judge Childs ruled in favor of the Dolchok heirs and awarded a 100-acre native allotment at Harvey Lake during 1993. An appeal of the ruling to the full Interior Board of Lands Appeal (IBLA) was also filed in 1993. The appeal has been pending to date and is not expected until 1997.

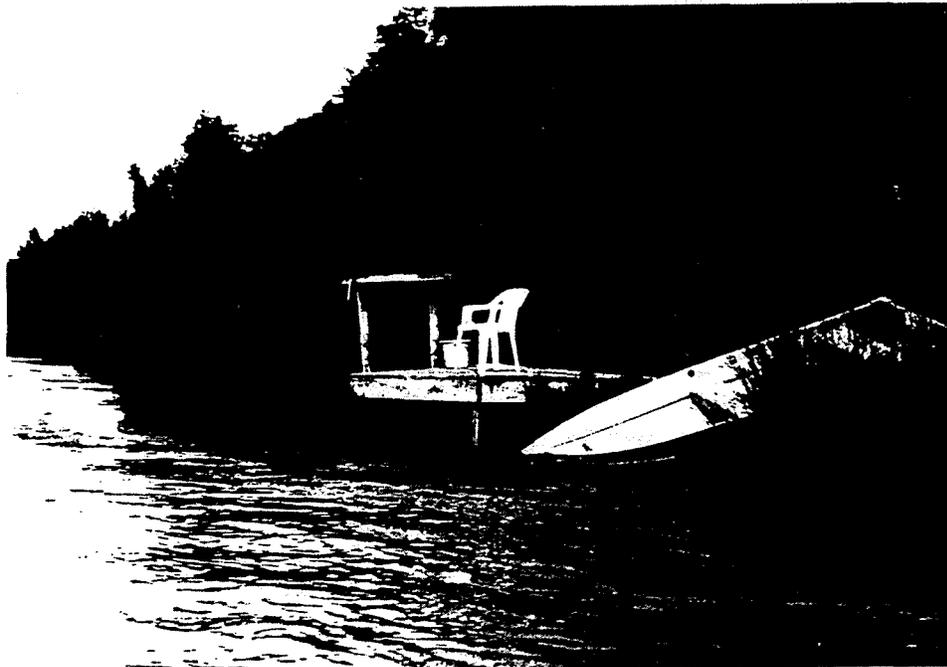
The Morris Miller allotment at Olsen Lake was purchased with Land and Water Conservation Fund monies and has been returned to Refuge ownership. The Service closed on the 80 acre parcel on October 11, 1995, with an acquisition cost of \$90K.

## 2. Easements

Refuge Manager Doshier and Assistant Refuge Manager Chase met several times with Moose Range Meadows (MRM) property owners to discuss growing concerns regarding shoreline damage and other depreciative behavior occurring along the two public use easements. The long-brewing controversy over the MRM easements took a new turn as the issue was forced by the Refuge's emergency closure of the easements. In one of his first acts as Acting Refuge Manager, Chase issued the emergency closure pursuant to authority granted in 50 CFR 36.42(a). All public entry into portions of two, 25-foot wide

public use easements along the Kenai River was closed at midnight July 27, and remained closed for 30 days consistent with the provisions of 50 CFR 36.42(c)(4). The closure also included two, 25-foot access trail easements from Funny River Road and Keystone Drive as these easements were reserved for the specific purpose of accessing the riverbank easements. Public support overwhelmingly favored the Refuge's decision to close the easements. The only opposition came from a small, but extremely vocal, group of users who felt strongly that if the easements were closed to the public, they should be closed to the property owners as well. Property owners were requested to minimize their own use of the sensitive banks and become part of the solution. With a few notable exceptions, support from the landowners was excellent. Discussions with numerous Federal, State, local, and public entities continued through years' end on a long-term solution for responsible management of the easements.

The status of the ownership of the variable non-development easements remained unresolved. Regional Office Realty staff continued to work on various issues associated with formal transfer of the non-development easements to the United States.



An illegal structure was discovered along the Kenai River easements within Moose Range Meadows Subdivision. The structure was later removed.

RKJ

Two property owners were contacted regarding unauthorized construction within the non-development easements. In both cases, the property owners complied with the Refuge Officers request to correct easement

encroachments. Several previous easement violations, which had been referred to the Regional Solicitor for resolution, including several of significant concern, remained unresolved. In these instances, the encroachments are ongoing.

### 3. Other

#### Inholders

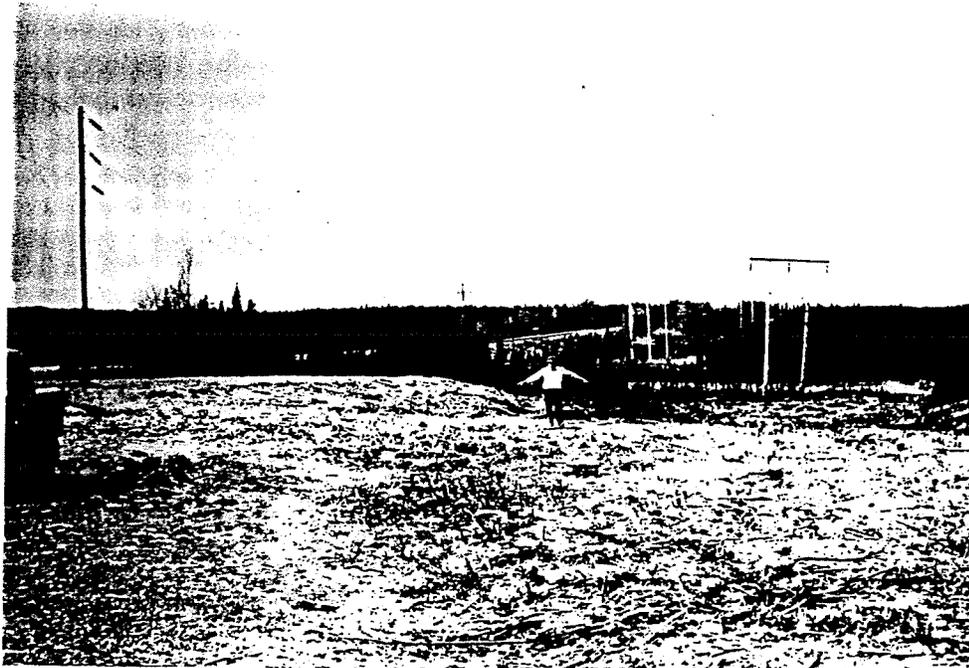
Regional Office Realty appraisers made several visits to the inholding at Ptarmigan Head (US Survey 4722) in response to the owner's interest in selling the property.

Bear Creek inholder Michael Sipes expanded his acreage by 9-acres at the mouth of Bear Creek, having purchased a parcel previously owned by Gill, et al., holding company of Anchorage. The exchange of this critical parcel of land was a missed opportunity to acquire this Kenai Wilderness inholding.

In a related development, Sipes applied for a Refuge and Corps of Engineers permit to construct a small boat harbor on the newly acquired parcel. At years' end, Sipes was still trying to obtain State and Federal approvals, although the Service determined not to require a right-of-way permit when he modified his proposal to have all development remain on his inholding. Refuge staff did however, comment through Ecological Services regarding the Corps permit application and through the State of Alaska coastal zone planning permitting process.

#### Rights-of-Way

On April 29, 1995, a Refuge employee discovered an unprecedented right-of-way clearing project involving the parallel transmission lines KE-47 and 48. Substantial clearing already had occurred for approximately seven miles parallel to the Sterling Highway. The clearing was a significant expansion of limits historically approved for both rights-of-way. Screening vegetation specifically retained during initial construction and several recurrent maintenance projects had been entirely removed. The clearing work on the Homer Electric Association (HEA) rights-of-way was being conducted by Carlos Contracting under contract with Chugach Electric Association. On May 1, 1995, Refuge Manager Doshier sent a "cease and desist" letter rescinding a March 6, 1995, clearing authorization. Several days later Refuge staff met with Chugach Electric Association representatives to provide new clearing guidance consistent with the historically approved clearing limits. The representatives declined to continue work until HEA had been consulted. Chugach Electric Association has not contacted the Refuge since and additional work has not been requested. Refuge staff conducted a review of the incident, the right-of-way files, and the over all operating relationship with HEA to determine how such a dramatic departure from previously determined clearing standards could have occurred. The analysis determined that mis-communications, poorly worded permits, and an unauthorized transfer of the permit from Homer Electric Association to Chugach Electric Association collectively contributed to the incident.



Refuge Pilot/Ranger Johnston surveys an area along the 115 KV HEA transmission line where a vegetation buffer was destroyed during R-O-W reclearing. The vegetation buffer was located at the Watson Lake Road.

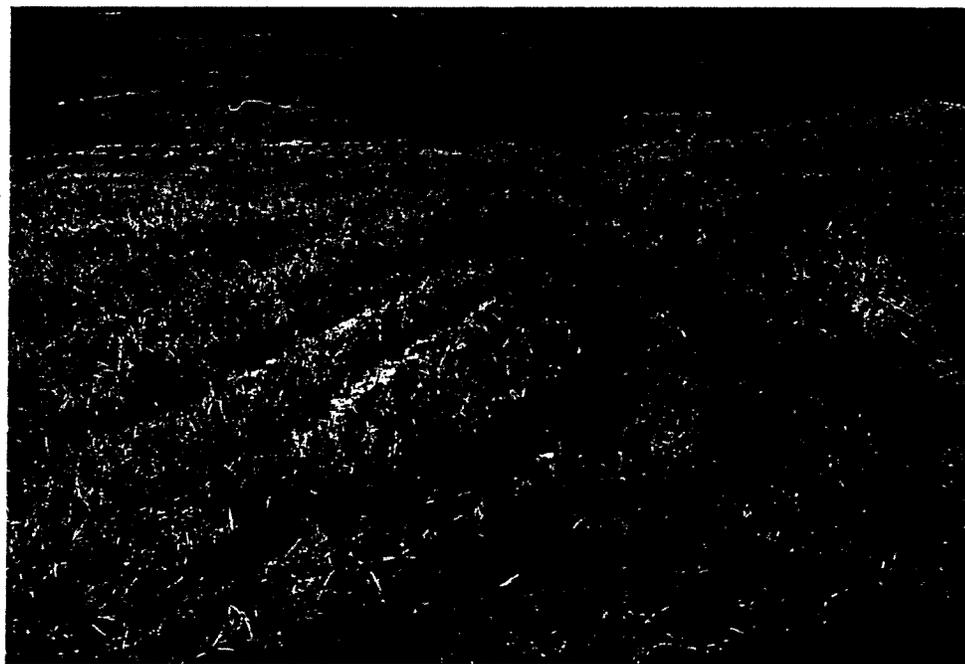


An aerial photograph depicts the over-cutting which occurred along two parallel HEA lines, which follow the Sterling Highway. RKJ

During May, Refuge Manager Doshier and Refuge employee Johnston met with an HEA representative providing copies of regulations, prior clearing agreements, photographs of the Sterling Highway clearing project and appropriate directions in order for HEA to proceed with the project. Homer Electric Officials provided documents that confirmed that an unauthorized transfer and/or lease to Chugach had occurred. The documents were forwarded to the Regional Realty Office.

The Service's response to the clearing incident and the apparent unauthorized transfer was sent to HEA in July. In subsequent correspondence, HEA denied the unauthorized transfer to Chugach, disputing the Service's authority to direct right-of-way clearing operations, or that any mitigation measures could be required. Homer Electric Association also denied ever agreeing to clearing controls (not supported by record), and HEA challenged the Service's authority to rewrite the permit. Although a draft response was prepared by Refuge and Realty staff, a response to HEA's extraordinary challenge of Service authority had not been sent at years' end.

Unauthorized use of all-terrain vehicles (ATV), and other vehicle uses continues to be a concern at several Refuge locations where right-of-way clearings have removed or modified natural vegetation breaks. Control points along the Refuge boundary have also changed significantly due to native land conveyances. Several problem areas were identified for barrier construction and/or signing during 1994.



Example of damage done by ATV use on the Refuge.

Alascom Inc. (Permit No. T-58-KE) was authorized to construct a security gate on the access road to their communications tower.

A permit was issued to Enstar to conduct right-of-way reclearing from the Atkins Road gate to the East Fork Moose River. Stipulations were included to prevent maintenance vehicle operation within the river.

A permit was issued to HEA for right-of-way reclearing of the 69/115 KV transmission line between Beaver Creek and Spirit Lake Road (Permit # KE97-47).

D. PLANNING2. Management PlansPublic Use Management Plan

The ongoing effort to develop a Public Use Management Plan (PUMP) for the Refuge involved data-gathering and cooperative efforts with neighboring land management agencies to address issues to be included in the PUMP. Kenai River issues were the primary focus for Outdoor Recreation Planner Emily Dekker-Fiala. The PUMP team also developed preferred alternatives for trails and public use cabins.

Upper Kenai River Cooperative Plan

The Upper Kenai River Cooperative Planning process, which will produce a document to be incorporated into the PUMP, officially began in January following a briefing at the Regional Office. The Plan is a joint effort of the Refuge, Chugach National Forest, Alaska State Parks, Alaska Department of Fish and Game, Kenai Peninsula Borough, Cook Inlet Region, Inc., and the public.

The Limits of Acceptable Change approach is being used in this planning effort. Based on public and agency input, a Statement of Desired Future Condition was developed for the public lands and waters between Kenai, Skilak, and Lower Russian Lakes. This statement identifies the opportunities and characteristics of the upper Kenai River corridor that are collectively valued, so they can be preserved and protected. Key indicators of these desired resource and social conditions were selected for future monitoring.

Caribou Management Plan

Biologist/Pilot Ernst completed the final edits to the Kenai Peninsula Caribou Management Plan in October 1994. Signatures of approval from the U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game followed in November and December, respectively. The U.S. Forest Service did not sign the document until April 1995. The Plan calls for cooperative management between the three agencies and outlines four goals:

- 1) Establish and maintain caribou populations at optimum levels commensurate with long-term habitat protection.
- 2) Provide the opportunity for herds to expand into suitable but unoccupied range.
- 3) Provide for consumptive and non-consumptive recreational use.
- 4) Provide for scientific research.

The Plan calls for a meeting of the agencies each November or December to review census, composition survey, radio-telemetry and harvest data collected the previous year, and make any necessary management changes.

Moose/Habitat Management Plan

Work on completion of the moose/habitat plan was back-burnered in 1995 due to other priorities and controversy over the future direction of moose management on the Kenai.

Fire Planning

Work continued on updating the five-year station fire plan during a couple of extended periods during 1995. However, due to a long running illness in the Fire Management Officer's family, and the loss of the Bio-Tech position and subsequent delays trying to hire a knowledgeable fire person into this key forest technician position, the plan has not been wrapped up.

The annual review of the Alaska Interagency Fire Management Plan was accomplished, and the suppression agency notified that we had made the review, as per agreement, with no major changes.

3. Public Participation



Anglers attempted to fish by wading along a segment of the Moose Range Meadow easement which was closed to entry. RKJ

An intensive public involvement effort was initiated for the Upper Kenai River Cooperative Plan. In February, over 60 people attended a public forum in Cooper Landing to discuss their concerns and visions for the Upper Kenai River corridor. Region 7 Public Involvement Specialist Bob Stevens assisted the interagency planning team in organizing and facilitating the

forum. The forum was followed by six issue-specific public workshops in Soldotna, Kenai, and Anchorage. Attendance at these sessions ranged from 11 to 23 people. A summary of the input from the forum and workshops was prepared and distributed in August to all who had participated. In October, a project update was mailed including notice of another public workshop in late October. This workshop, again held in Cooper Landing, attracted 31 participants. The Limits of Acceptable Change approach was introduced and the draft Desired Future Condition statement critiqued at the workshop.

The Refuge hosted a stakeholders meeting in January to brainstorm remedies for problems associated with the Moose Range Meadows public use easement (see Section C.2). Refuge staff were joined by representatives from Salamatof Native Association, the Moose Range Meadows property owners, Alaska Department of Fish and Game (ADF&G), State Parks, Kenai Fisheries Resource Office, and sport anglers. A second meeting was held in March.

#### 4. Compliance with Environmental and Cultural Resource Mandates

An environmental compliance assessment was conducted on June 9, 1995, by members of the Environmental Process Division from the U.S. Army Corps of Engineers, Construction Engineering Research Laboratories in Champaign, Ill. The audit focused on five major categories: (1) hazardous materials management; (2) hazardous waste management; (3) petroleum, oils and lubricant management; (4) solid waste management; (5) underground storage tank management.

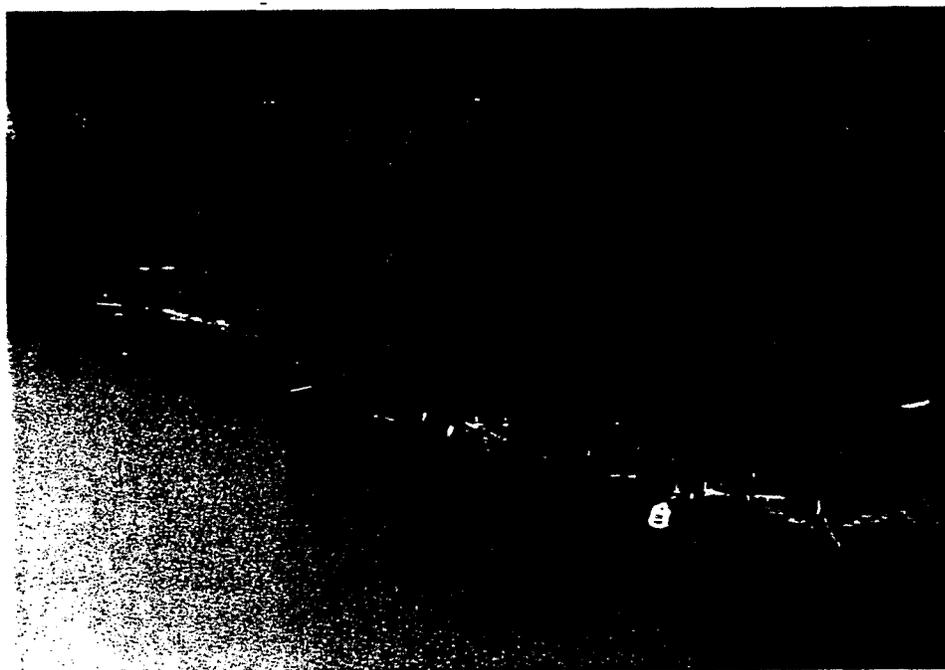
Overall, the review team was pleased with our past environmental management practices, procedures, documentation and accountability with applicable regulations. A number of corrective action items were identified and corrected by year's end. Results of the inspection and a documentation of corrective actions are maintained in the environmental compliance files located at the Refuge maintenance shop.

A Safety and Environmental Health Inspection (SEHI) was conducted by Dale Robinson from the Regional Safety Manager's Office on October 25 and 26. Again, the Refuge was complimented on its safety management and compliance program. All identified hazards were corrected and an abatement status report submitted.

The Refuge continues to work closely with representatives of the oil and gas industry, the Alaska Department of Environmental Conservation, and the Bureau of Land Management in monitoring environmental compliance activities within the Swanson River and Beaver Creek Fields. Interagency meetings with industry are held periodically throughout the year to review annual plans of operations, identify potential problems and discuss status of current remediation efforts. Maintaining these lines of communication provides a unique interface for team members to participate in a unified effort to provide, as well as promote, the highest level of resource protection while achieving a diverse, and sometimes conflicting, range of mutual goals and objectives.

Refuge Operations Specialist Jim Frates and Deputy Refuge Manager Mark Chase attended a Resource Conservation and Recovery Act (RCRA) waste management regulations course in Anchorage on February 22 and 23.

In response to concerns about damage to archeological features within the Hidden Creek 14(h)1 selection, Regional Archeologist Debra Corbett, accompanied Ron Jones (Kenaitze Indian Tribe), Mike Huhndorf (CIRI), and Refuge staff on a reconnaissance of the area. Trampling, trash, and fire pits were evident in house and cache pits where recreation use is most concentrated near the mouth of Hidden Creek and along the shore of Skilak Lake. Realignment of trails, removal of trash and fire remains, and inclusion in the Site Stewardship program were recommended to mitigate these impacts.



Camping at the outlet of Skilak Lake has become a growing concern for protection of winter resources of brown bear travel corridors, and shoreline habitat. RKJ

Archeologist Corbett accompanied staff from the Refuge, Alaska State Parks, and ADF&G Habitat and Restoration on a reconnaissance of areas impacted by camping along the Kenai River below Skilak Lake. Extensive bank use by anglers accessing the area by boat has led to damage to cultural resources and loss of salmon rearing habitat. The issue of how and where camping should be allowed will be addressed in the PUMP. Virtually all sites being used for camping in this area include significant cultural resources. These sites are contributing elements of the proposed Stephanka district which is being nominated for the National Register of Historic Places. Two

areas were identified which would be suitable for dispersed camping without impacting cultural resources.

## 5. Research and Investigations

### Lynx and Coyote Study

Graduate student and former Refuge seasonal employee Winthrop R. Staples III completed his M.Sc. thesis entitled Lynx and Coyote Diet and Habitat Relationships during a Low Hare Population on the Kenai Peninsula, Alaska on October 27, 1995, at the University of Alaska-Fairbanks. All of the fieldwork for this study was completed on the Kenai National Wildlife Refuge. An abstract of the thesis follows:

#### Abstract

Food habits and habitat use of lynx and coyotes were compared 1987-1991 on the Kenai Peninsula, Alaska, when the snowshoe hare population was low (<0.5 hares/ha). During snow seasons, lynx fed primarily on hares (64 percent total items), whereas coyotes relied heavily on moose carcasses (42 percent total items). Diet overlap was 42 percent and hare use overlap was 16 percent. Habitat use overlap was 92 percent, but coyotes used roads more than lynx. Both carnivores selected 1947 burn and avoided 1969 burn and large expanses of mature forest. I conclude that there was exploitation competition for food between these predators, because both used the same habitats and hares, a major food, were scarce. The coyote, however, may be using resources that were previously used by red fox which may have been reduced to low levels. Lynx displayed little fear of humans and were vulnerable to shooting incidental to hunting and depredation events.

Historical records suggest coyotes did not colonize the Kenai Peninsula until the early 1900's. Coyotes appeared on the Peninsula at the same period in history that the original Kenai Peninsula wolves were extirpated by humans. Thus, the coyote population began expanding in a habitat where they did not have a large canid competitor (the wolf) and where they may have competed against a smaller native wild canid (the red fox). Today, native red fox are extremely uncommon on the Kenai Peninsula and coyotes are abundant. Coyotes are especially well established in habitats occupied by humans because those habitats are generally avoided by packs of wolves. The above research provides evidence that coyotes compete with lynx on the Peninsula for food and habitat during periods when snowshoe hare populations are low.

### Brown Bear Study

An interagency brown bear study was initiated on the Kenai Peninsula in the spring of 1995. Cooperators include: Kenai National Wildlife Refuge, Alaska Department of Fish and Game, Chugach National Forest, and Kenai Fjords National Park. The Kenai Refuge contributed \$60,000 to this study in 1995. The Refuge currently provides the majority of habitat remaining on the Kenai Peninsula for brown bears. Adjacent private, Borough, Native, and State lands are rapidly being developed for an ever increasing human

population. The brown bear population is threatened from increased pressures related to human-caused mortality, loss of habitat to development and logging, and displacement from feeding areas resulting from increasing recreational pressures. Concern over the future of brown bears on the Kenai Peninsula has prompted this study. Objectives of the study include:

1. To evaluate a cumulative effects model developed by the Interagency Brown Bear Study Team.
2. To identify critical components of brown bear habitat and movement corridors between these habitats.
3. To estimate the survival rates of radio-collared female brown bears relative to human-caused mortality.
4. Model the brown bear population to estimate sustainable yield and assess population viability with the ultimate goal of developing a brown bear management plan.



Refuge Pilot Rick Ernst returns to Kenai Refuge Headquarters after a brown bear radio telemetry flight. RKJ

Tagging operations were started on May 19 and continued through October. Twenty-one bears were successfully captured and 15 were fitted with conventional VHF transmitters. One collar contained a new prototype Global Positioning System (GPS) transmitter with an uplink via an ARGOS satellite. One marked bear died from natural causes. Bears were relocated via aircraft once every 7-10 days throughout the active season. Locations (n=207) were recorded into a database for future analysis.

Kenai River Rainbow Trout Study

The Kenai Fishery Resource Office initiated a telemetry study during August to assess the migratory behavior and seasonal distribution of rainbow trout in the Kenai River. This study was initiated because the sport fishery targeting rainbow trout in the Kenai River has experienced rapid growth in recent years and movement patterns of rainbow trout in the Kenai River are poorly understood.

Seventy-nine rainbow trout ranging from 350-662 mm fork length were radio-tagged during August and September. Forty fish were radio-tagged between Skilak and Kenai lakes and 39 were radio-tagged between Bing's Landing and Skilak Lake. Hook and line gear was used to capture fish for radio-tagging. Radio transmitters, each weighing about 1/3 ounce, were surgically implanted into the body cavity of each fish just in front of the pelvic girdle. An external antenna was routed under the pelvic girdle and through the body wall anterior to the vent. Each transmitter will emit a signal for about 390 days.



An immature Bald Eagle inspects Super Cub 784  
prior to a survey flight. RKJ.

Movements of radio-tagged fish were documented using a combination of fixed-station receivers and aerial and ground-based surveys. Fixed-station receivers were installed at strategic locations to automatically monitor the timing and identities of fish moving into or out of Skilak and Kenai lakes. Aerial and ground-based tracking were used to determine specific locations of radio-tagged fish. Fixed-station receivers were operated continuously from mid-August through late-November and ground-based tracking was conducted from a drift boat each week from mid-August through

late November. Aerial tracking was conducted monthly from September through December.

Movements of radio-tagged fish indicate that the seasonal migration from summer feeding areas to overwintering areas begins in late September and is complete by late November. Rainbow trout radio-tagged above Skilak Lake selected overwintering areas in Skilak Lake (64 percent), Kenai Lake (18 percent), and the Kenai River (18 percent). Rainbow trout radio-tagged below Skilak Lake selected overwintering areas in Skilak Lake (77 percent), Skilak outlet above River Mile 48 (19 percent), and the Kenai River (4 percent).

#### Wolf Population Dynamics Study



Liz Jozwiak with a wolf from the Swanson River pack.

Refuge biological technician and graduate student Elizabeth Jozwiak, returned to full time employment on February 1, 1995, after completing course work requirements for a master of science degree at Colorado State University, Fort Collins, Colorado. For her thesis, Liz analyzed radio telemetry data collected from 107 wolves over the last 10 years to determine the effect of harvest on pack size, territory size, density and dispersal. She also conducted an experiment in 1994 and 1995 that tested the accuracy of aerial-obtained Ground-Position-Satellite (GPS) wolf locations. Preliminary findings suggest that pack size and territory size were not correlated with the level of wolf harvest on the Kenai National Wildlife Refuge (NWR). Wolf density did not increase when wolf harvest declined in the mid 1980's. However, a higher proportion of radio-collared wolves dispersed during years when harvest was low than in years when

harvest was high which resulted in a steady density of 14 wolves/1,000 km<sup>2</sup> in the late 1980's to early 1990's.

Bufflehead Oil/Gas Well Site Study

Table 2. Bird species present in the Bufflehead study area, Swanson River Oil Fields in 1995.

Species	Relative Abundance	Frequency
Swainson's Thrush	48/49	98%
Blackpoll Warbler	32/49	65%
Myrtle Warbler	48/49	98%
Orange-crowned Warbler	16/49	33%
Common Redpoll	30/49	61%
Pine Siskin	3/49	6%
Black-capped Chickadee	14/49	28%
Boreal Chickadee	16/49	33%
Ruby-crowned Kinglet	2/49	4%
Alder Flycatcher	39/49	80%
American Robin	9/49	18%
Slate-colored Junco	48/49	98%
Tree Swallow	2/49	4%
Varied Thrush	6/49	12%
Gray Jay	17/49	35%
Olive-sided Flycatcher	2/49	4%
Hermit Thrush	4/49	8%
Fox Sparrow	9/49	18%
Red-breasted Nuthatch	9/49	18%
Brown Creeper	5/49	10%
Gray-cheeked Thrush	8/49	16%
White-crowned Sparrow	1/49	2%
Northern Waterthrush	3/49	6%
Song Sparrow	10/49	20%
Pine Grosbeak	2/49	4%
Wilson's Warbler	1/49	2%
Hairy Woodpecker	2/49	4%
Downy Woodpecker	1/49	2%
Spruce Grouse	2/49	4%
Saw whet Owl	1/49	2%

Approximately four acres of mature birch forest was removed for the construction of a 0.7 mile right of way to the Bufflehead oil pad in July 1995. Biological Technician Jozwiak collected site specific pre-treatment data from June 7-27, on forest land birds and small mammals to determine species presence and abundance in the area before construction of an access road and drilling pad. Little information is available on the effects of small scale wildlife habitat removal in mature birch forests of southcentral Alaska on resident small mammals and birds. Therefore data in subsequent years will continue to be collected on land birds and small

mammals to monitor and quantify changes, if any, in species composition as a result of road construction. Pre-treatment findings indicated low densities of red-backed voles and masked shrews. Densities averaged 0.14/m<sup>2</sup> for red-backed voles, and densities of masked shrews were too low to calculate population estimates. Thirty species of land birds, typical of an upland mature hardwood stand, were detected. The most common species observed (located >98 percent) were Swainson's Thrush, Myrtle Warbler, Slate-colored Junco, and Alder Flycatcher. Bird species recorded at the study site are summarized in Table 2.



Hairy Woodpecker found on the Kenai National  
Wildlife Refuge.

MB

#### Spruce Bark Beetle History Study

The present widespread spruce bark beetle outbreak on the Kenai Peninsula has raised questions about the "normal" role of beetles in these forests. We suspect that bark beetles have always been in the ecosystem and that their populations fluctuate widely. Refuge Ecologist Berg initiated work to assess the history of bark beetles on the Kenai Peninsula.

On the time-scale of living trees (300 years), we can look at increment cores and slabs cut from stumps for evidence of past beetle attacks. The best method developed to-date uses release pulses. Growth releases can occur when the forest canopy is thinned, due to death of the larger trees, say by beetles or blowdown. We examine the annual rings of the survivors, perhaps 100 years later, and see that the survivors suddenly began growing rapidly, perhaps for 25 to 75 years, and that growth slows as the canopy re-closes.

This method was pioneered for bark beetles in northwest Colorado, where researchers found two distinct release pulses in the Englemann spruce forests, in the 1940's and 1850's. The 1940's outbreak killed >90 percent of the merchantable volume of spruce in the White River National Forest. The 1850's outbreak was part of a much more extensive outbreak of the 1850's to 1880's. That outbreak covered a 1200 km axis along the Rocky Mountains from northern New Mexico to northwestern Wyoming. These studies clearly show that wide-ranging insect outbreaks were occurring in these forests well before the advent of modern fire suppression.

The release pulse method is currently being applied on the Kenai Peninsula by University of Arizona postdoc Chris Fastie and Ecologist Ed Berg. Preliminary analysis of 1994 fieldwork located release pulses in white spruce clearcuts at Juneau Creek, Falls Creek Road, and Anchor Point, and two unlogged sites on the Swanson River Road, all dating around 1880-1920. In 1995 Chris Fastie examined a series of climate-sensitive sites to see how climate might affect patterns of bark beetle outbreaks and fire. Four sites on the Refuge and three sites around Kachemak Bay were sampled.

In October 1994, Ed Berg and biology students from Homer High School sampled a 4.5 acre clearcut west of Homer, which showed an extreme canopy thinning event about 1884. The students mapped tree locations in 50 m quadrats, and volunteers and Refuge staff cut 550 slabs from stumps. Some slabs show several years of slowed growth before the release, and some show a thin irregular pitch ring, at the year of release or 1 to 3 years prior to release, perhaps formed when the trees successfully swamped the beetle burrows with pitch.

These studies are showing that mature spruce forests on the Kenai Peninsula can regenerate through release in less than 100 years after a severe canopy thinning event. Bark beetles are the most likely source of such events, but even if we determined that the events have other causes, we have clearly demonstrated the fact of regeneration from released survivors. Most beetle-attacked stands on the Refuge have juvenile trees in the understory which can be expected to release and grow to maturity in the next 100 years. Beetle-attacked stands which lack juveniles, however, will take much longer to regenerate because seedlings will have to be recruited through a thick sod of bluejoint grass. Our preliminary fieldwork, however, suggests that there are few stands lacking juvenile cohorts, and we do not expect to see KNWR spruce forests replaced by grasslands, as some commentators have suggested.

#### Fire History Studies

European settlement of the Kenai Peninsula began in earnest after the mid-1800's and initiated a period of large-scale human-caused fires. Unlike Interior Alaska, lightning is infrequent on the Peninsula, so it is possible that fire did not play a major role in the pre-settlement era. Early travelers reported few moose, suggesting a lack of early successional hardwood browse, and thus a lack of fire.

Fire behavior in the large 1947 and 1969 burns revealed two distinct fire regimes on the Refuge landscape, with low-lying black spruce stands burning

much more readily than upland white spruce and hardwoods. To look at the oldest fire record on the Refuge, Ecologist Ed Berg and Biological Technician Mike Gracz are studying the age composition of the oldest stands, focusing on mature upland white spruce and mixed white spruce/hardwoods stands.

When a stand originates from a stand-replacing disturbance (such as fire or windthrow), a histogram of tree ages will show an initial "even-aged" cohort recruited soon after the disturbance. Younger trees may be present, but usually not in distinct age pulses.

A stand whose existing trees did not originate from a singular disturbance will show a more-or-less even distribution of tree ages. Trees in this case are recruited in tree-fall gaps; this is an on-going process, described as "gap-phase" recruitment. At many sites we found charcoal in the soil or on old wood, indicating that fire occurred sometime during the last 4000 years since the post-glacial appearance of forests on the Peninsula. If a stand burned so long ago that the initial even-aged cohort has died (e.g., >220y ago), its histogram will show a wide distribution of tree ages because the existing trees are a product of gap-phase recruitment.

Mike Gracz randomly selected twenty mature forest stands (mapped as homogeneous polygons on aerial photos) covering a total of 74,533 ha, which represents about 37 percent of the KNWR mature forest area (Fig. 1). During the field seasons of 1994 and 1995 Gracz and Biological Technicians Andrew DeVolder and Eric Meester traveled by plane, helicopter, 4-wheelers, boats, and backpacking to these polygons. In each polygon they took one to three variable-width 150m transects, sampling about 100 trees/transect with basal increment cores and cross-sectional disks. They described the vegetation, measured fuels, and examined soils and dead wood for charcoal. A total of 3292 cores and 784 disks were aged by ring counts, and histograms of tree ages were prepared (Fig. 2-4).

The tree age histograms indicate that 9 of the 20 polygons (representing 46,379 ha) clearly originated from stand-replacing disturbances, probably fire (Fig. 2). Eleven polygons exhibit gap-phase recruitment (Fig. 3). Two of the latter probably originated from fires long ago; these polygons were assigned rough fire dates (Nikolai - 1760, Dolly - 1776) on the basis of the oldest birch, although they are now well into the gap-phase recruitment mode.

The histograms interpreted together suggest that upland white spruce forests on the KNWR (unlike the Interior) burn only at long intervals, and that fire has not been the dominant factor determining the age structure of these mature forests. We found this result surprising, given the high rate of human-caused fires in the post-settlement period.

The histograms also show that birch can be recruited within mature stands. The classical boreal forest succession model predicts that shade-intolerant birch will appear only at the beginning of succession, and that it will be out-competed by spruce, as at Trapper, (Fig. 2). At Dolly, Nikolai, and Clear, however, young birch is recruiting in treefall gaps, and we expect a

mixed spruce/birch forest to be the "climax" vegetation at these sites, contrary to the classical succession model.

Table 3. Age structures of trees in polygons of mature forest stands sampled during the fire history study.

Even-Aged Polygons	Area Ha	Origin Date	Uneven-Aged Polygons	Area Ha
Northern Refuge				
Shoepac	1594	1870's	Neukutak	924
Road	954	1830's	Dolly	104
Trapper	258	1860'S	Gate	71
Drake	175	mid-19th cent	NEW	32
Forest	191	mid-19th cent		
Swanson	<u>60</u>	mid-19th cent		
Total	3232 ha			1131 ha
Central Refuge				
Funny	42,896	1880's	Russian	1696
Pollard	<u>219</u>	early 1900's	Emma	<u>1630</u>
Total	43,115 ha			3326 ha
Northern Refuge				
Fox	32	1820's	Nikolai	17,069
			Devil	5,997
			Clear	<u>555</u>
Total	32 ha			23,621 ha
Non-spruce polygons				
			Cottonwoods	1.4
			(Cottonwood)	
			Goat (Hemlock)	<u>75</u>
Total				<u>76</u> ha
Total	<u>46,379</u> ha			28,154 ha
Grand total:	74,533 ha (184,170 acres)			

Ratio of sampled area to mature forest area:  $184,170\text{ac}/495,000\text{ac} = 37$  percent.

When birch germination dates from all polygons are pooled together (Fig. 4), we see a long hiatus in birch recruitment, from about 1890 to 1940. This probably represents a period of dramatic moose population increase due to browse regeneration following the late 19th-century fires. It appears that the moose (and hares, during peak years) simply consumed all available birch regeneration in the polygons during this period. This too was an unexpected result.

Andy DeVolder also volunteered more than 150 hours to do a supplemental study of fires in lowland black spruce. Using fire scars and ring width measurements, he examined 100 sections and 75 cores, and identified three previously unknown fires (1849, 1835, and app. 1764) in the Mystery Creek Road area. He plans to extend this study as a Master's Degree project at Northern Arizona University.

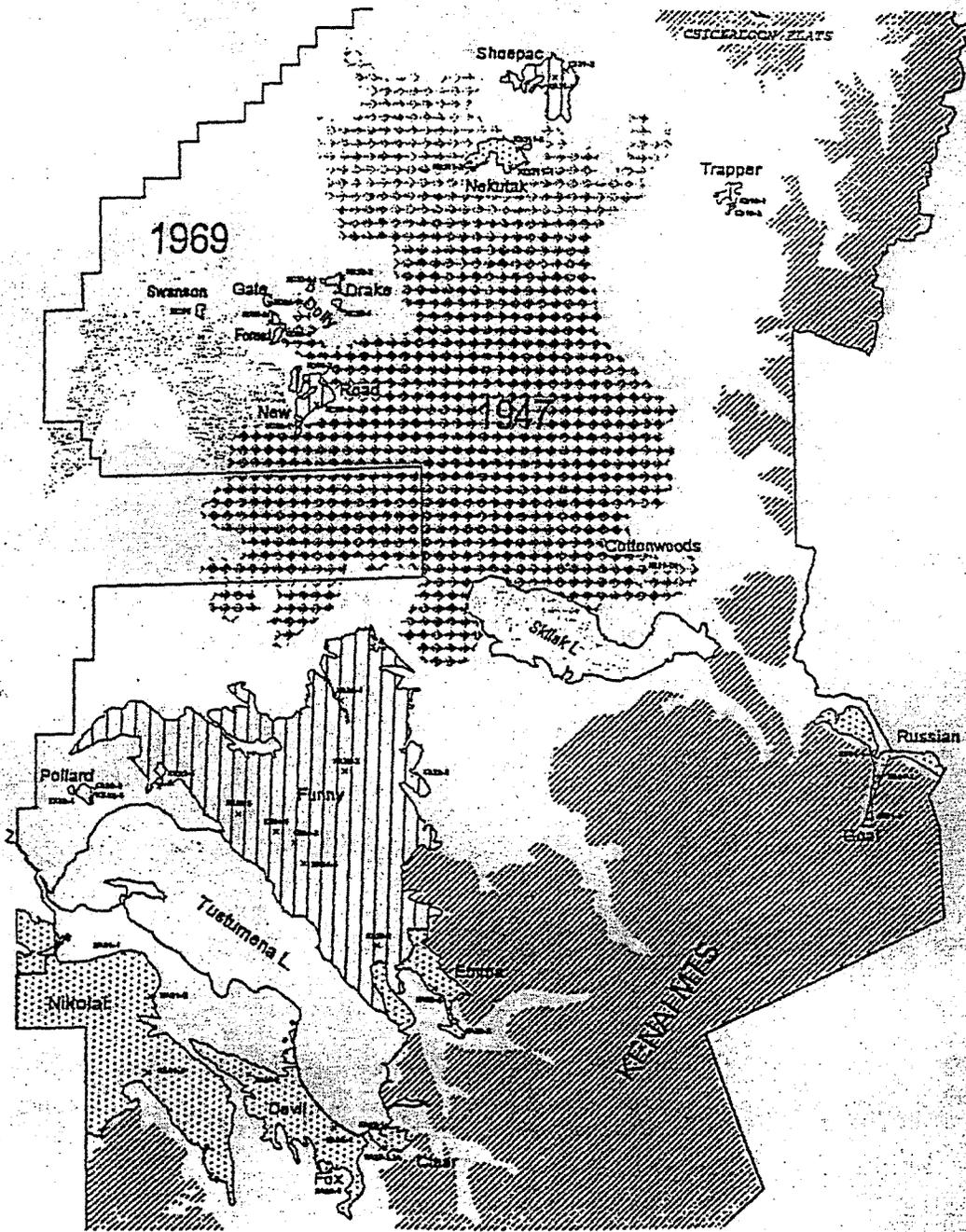


Figure 1. Locations of mature forest polygons and transects, sampled in the 1994-95 fire history study. Vertically-lined polygons are even-aged stands, probably originating from fires. Stippled polygons are uneven-aged stands, with gap-phase recruitment. The 1947 and 1969 burns are also shown.

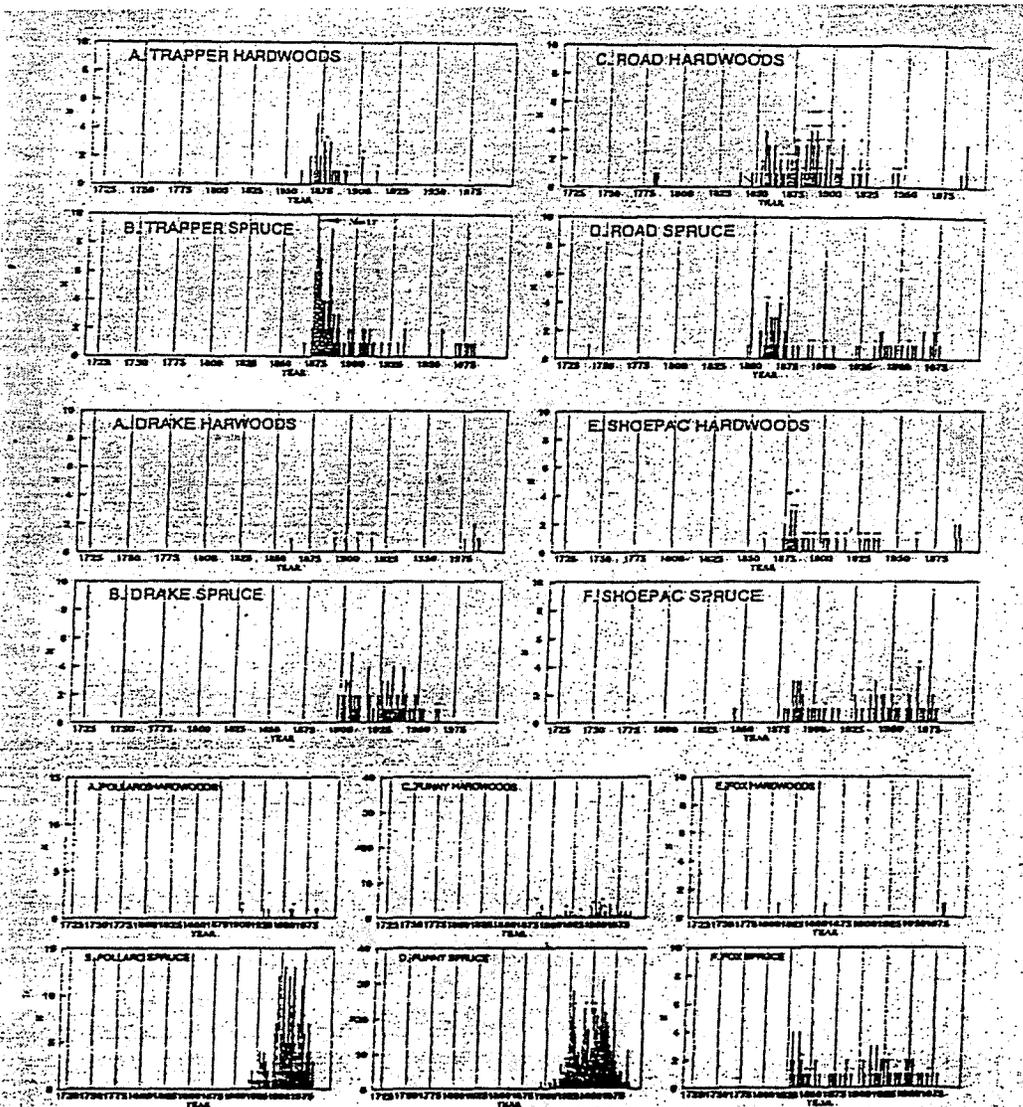


Figure 2. Even-aged stands. Histograms of germination dates. A dot represents the latest possible germination date for a tree with a rotten core.

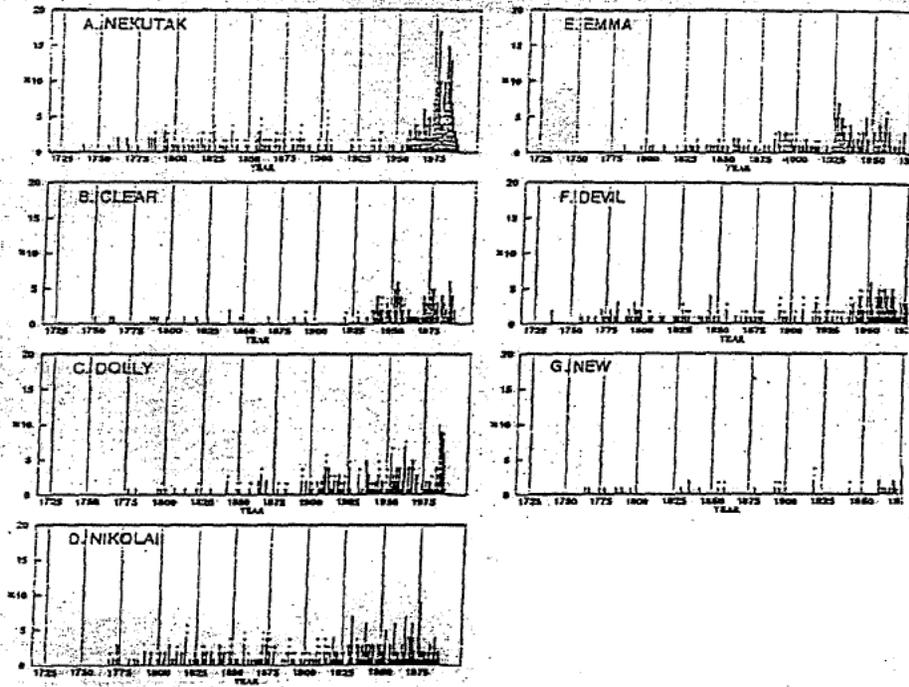


Figure 3. Uneven-aged stands. Histograms of germination dates. A dot represents the latest possible germination date for a tree with a rotten core.

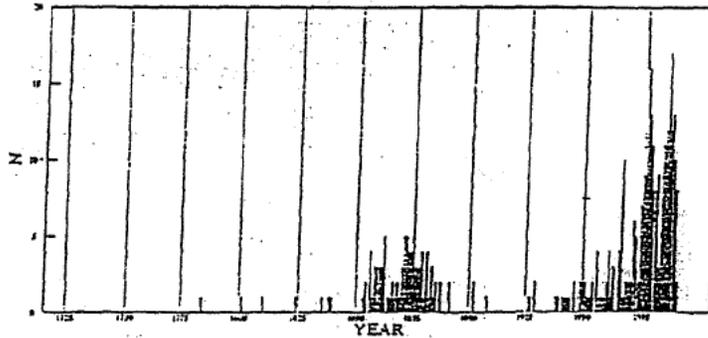


Figure 4. Germination dates for birch, pooled from all polygons. No trees with rotten cores are shown; all individuals have a dateable pith.

Sediment cores were taken in four lakes to look for charcoal from fires during the last 1000 years or so. Dr. Jim Clark and graduate student Jason Lynch from Duke University will analyze the cores for charcoal, and date them with radio-isotope methods. Dr. Scott Anderson from Northern Arizona University will look at the cores for pollen and fossil beetle parts. This is a pilot study to see if Refuge lake sediments contain useable long-term records of fire and bark beetle frequency.

## 6. Other

### Kenai River Planning

The year saw the proliferation of many "save the Kenai" groups as Kenai River protection (or at least talking about Kenai River protection) became en vogue in 1995. Concerned citizens, property owners, user groups and Federal, State, and local governments all clamored to be heard through numerous different groups, committees, coalitions, councils, boards, and teams. It seems as though the realities of the depleted salmon stocks of the Pacific Northwest are finally sinking in for many Alaskans as we begin to "wake up and smell the coffee" as it were. Many of the concerned publics are experiencing *deja vu* as they recall similar conversations and discussions that occurred in Washington, Oregon, and northern California not all that many years ago.

### Kenai River Special Management Area Advisory Board (KRSMA)

Governor Tony Knowles revamped the Board in 1995, redesignating the Board's purposes and charging the Board with updating and rewriting the Kenai River Comprehensive Management Plan. The original plan was completed in 1986, and adopted as policy by the Department of Natural Resources (DNR) which manages the Kenai River Special Management Area. The original Plan required that numerous other entities "step up to the plate" to fully protect the river, however, it lacked any binding commitment on other agencies and entities. The intent in reworking the plan is to produce a document that all stakeholders will buy into, and subsequently do their part to protect the Kenai River. The Board is made up of 15 members including private citizens, local government representatives, and State and Federal agency personnel. Acting Manager Chase represented the Service on the Board through years' end. Work on the Plan rewrite proceeded slowly as committees were formed and "scoping" of the revised plan took shape. Comprehensive planning on any major river is controversial to say the least due to the variety of stakeholders involved; the Kenai is no exception.

### Kenai River Watershed Interagency Coordinating Group (KRWICG)

The Environmental Protection Agency (EPA) undertook an ambitious task in late 1994, to bring together all of the agency (Federal, State, and local) personnel involved with management of the Kenai River. The goal was to provide a forum for coordination of activities within the Kenai River Watershed. The group assembled what the various agencies were doing on the Kenai River which included: tasks and initiatives, accomplishments and milestones of those initiatives, key agency contacts, and public participation opportunities related to the various initiatives. With that

accomplished, interest in the group waned, and by years' end, the group had essentially disbanded. Many participants felt that the group simply grew beyond its usefulness. Refuge Manager Doshier and Assistant Refuge Manager Chase represented the Refuge while other Service entities were represented as well. Ann Rappoport and Larry Dugan represented the Western Area Ecological Services office (WAES) and Project Leader Gary Sonnevil represented the Kenai Fishery Resource Office (KFRO).

#### Upper Kenai River Cooperative Planning Group

A detailed discussion of this group's activities and accomplishments can be found in D.2 Management Plans.

#### Kenai Habitat Restoration & Recreation Enhancement Project Interdisciplinary Team

A small group of Federal, State and local government representatives were assembled to deal with restoration and recreation opportunities on public lands along the Kenai River in order to benefit injured resources from the Exxon Valdez oil spill (EVOS). Funding for the project is provided by the EVOS Trustee Council, with an anticipated commitment for three years of funding. The group is charged with identifying and ranking projects that will benefit Dolly Varden, pink salmon, sockeye salmon, and public recreation through habitat protection and facility development. Acting Refuge Manager Chase and Outdoor Recreation Planner (ORP) Dekker-Fiala represented the Refuge and Service. Laurie Fairchild (WAES) took the lead on writing an environmental assessment for the group. The group's first meeting was in November 1995, and by years' end, project ranking criteria had been developed.

#### Kenai River Work Group (FWS)

An internal, interdisciplinary group of Service employees was created, at the request of Associate Regional Director (ARD) Glenn Elison, in order to serve in an advisory capacity to the Kenai Refuge Manager on the complex and controversial issues surrounding Kenai River management. As we moved into implementation of the Regional reorganization, the eco-team, more or less, replaced this group.

#### Kenai River Community Forum Steering Committee

The Nature Conservancy of Alaska (TNC), with funding from EPA to address Kenai River issues, formed a steering committee to organize a community forum to share information and ideas about the future of the Kenai River. The forum is scheduled for spring 1996. Refuge Planner Dekker-Fiala participated on the Steering Committee. Western Area Ecological Services is providing Challenge Grant monies to assist with publication of a post-forum report.

#### Kenai River Working Group (Borough)

A group of stakeholder representatives were invited to develop recommendations to the Kenai Peninsula Borough (KPB) Assembly concerning a

future land use ordinance for properties along the Kenai River. The group was led by KPB Assembly vice-chair, Sharon Mooock. After a long and painful process, the group recommended a 50-foot buffer along the mainstem Kenai to protect fish habitat. The group purposefully excluded agency personnel but did solicit technical assistance from State and Federal representatives. Dekker-Fiala represented the Refuge.

Kenai River Habitat Interagency Technical Group

The State of Alaska Board of Fisheries (Board) requested Alaska Department of Fish & Game (ADF&G) to establish a group to provide the Board with technical information and recommendations on how to deal with angler impacts to shoreline habitats on the Kenai River. During the 1995 use season, the group, in cooperation with managing agencies, monitored fishing densities throughout the mainstem Kenai River at various times during the sockeye fishery and established permanent photo plots for long-term monitoring. Refuge personnel conducted angler counts on the upper Kenai River from Kenai to Skilak Lake on three occasions. By years' end, the group had formulated recommendations for the Board to address at their February 1996 meeting. The group's recommendations were formatted into a draft Kenai River Habitat Management Policy which included: 1) recognition that recreational angling may negatively impact riparian habitats along the Kenai River; 2) the Board's intent to consider potential impacts to Kenai River riparian habitats in their deliberations; and 3) a delegation of emergency order authority to ADF&G to close public riparian areas to fishing in order to protect habitat, or to open fishing only from approved areas or structures including boats, boardwalks, docks, gravel bars, natural formations identified by ADF&G, or other areas where fishing will not compromise the integrity of the habitat the closures are designed to protect. Chase and Sonnevil of the Kenai Fisheries Resource Office (KFRO) represented the Service on the team.

E. ADMINISTRATION

1. Personnel



Refuge staff left to right: Theodore Bailey, Deanne Nelson, Mark Chase, Al O'Guinn, Brenda Marsters, Jim Frates, Daniel Doshier, Tony Fischbach, Elizabeth Jozwiak, Larry Adams, Bill Kent, Ed Berg, Chris Johnson, Emily Dekker-Fiala, Richard McAvinchey, Brenda Wise, Richard Johnston, Diana Thomas, Richard Ernst. 10/95



Daniel Doshier smiling because he's leavin'.

Table 4. Listing of permanent personnel for the Kenai National Wildlife Refuge, 1995.

<u>Employee</u>	<u>Position</u>	<u>Grade</u>	<u>Type</u>
1. Larry Adams	Fire Mgmt Officer	GS-11	PFT
2. Theodore Bailey	F&W Biologist	GS-12	PFT
3. Edward Berg	Ecologist	GS-11	PFT
4. Mark Chase	Refuge Ops Spec	GS-12	PFT
5. Emily Dekker-Fiala	Outdoor Rec Planner	GS-09	PFT
6. Daniel Doshier	Refuge Manager	GM-14	PFT
7. Richard Ernst	Biologist/Pilot	GS-12	PFT
8. James M. Farrar	Laborer	WG-03	PPT
9. James Frates	Refuge Ops Spec	GS-12	PFT
10. Christopher Johnson	Refuge Officer	GS-07	PFT
11. Richard Johnston	Park Ranger/Pilot	GS-12	PFT
12. Elizabeth Jozwiak	Biological Tech	GS-07	PFT
13. Brian Kemsley	Automotive Worker	WG-8	PPT
14. William Kent	Park Ranger	GS-12	PFT
15. Richard Kivi	Equipment Operator	WG-10	PFT
16. Albert Marrs	Carpenter	WG-9	PPT
17. Brenda Marsters	Refuge Clerk	GS-04	PFT
18. Richard McAvinchey	Wildlife Biologist	GS-09	PFT
19. Deanne Nelson	Accounting Tech	GS-05	PFT
20. Al O'Guinn	Mechanic	WG-10	PFT
21. Pamela Sperry	Computer Specialist	GS-09	PFT
22. Candace Ward	Park Ranger	GS-09	PFT
23. Robin West	Refuge Manager	GS-14	PFT
24. Brenda Wise	Travel Clerk	GS-04	PFT

Table 5. Listing of temporary/seasonal personnel for the Kenai National Wildlife Refuge, 1995.

<u>Employee</u>	<u>Position</u>	<u>Grade</u>
25. Robert E. Barto	Park Ranger	GS-05
26. Andrew Devolder	Bio Tech	GS-05
27. Madeline A. Duffy	Park Ranger	GS-05
28. Amy J. George	Forestry Tech	GS-05
29. Gregory S. George	Park Ranger	GS-06
30. Mike Gracz	Bio Tech	GS-07
31. Susan McKee	Bio Tech	GS-05
32. Eric Meester	Bio Tech	GS-05
33. David P. Reese	Forestry Tech	GS-05
34. Scott S. Slavik	Park Ranger	GS-05
35. Margaret M. Szweda	Park Ranger	GS-05
36. Diana R. Thomas	Forestry Tech	GS-06
37. Ray S. Vinkey	Bio Tech	GS-05
38. Mark W. Wegner	Laborer	WG-03
39. Michael E. Welsh	Park Ranger	GS-05
40. John Williamson	Park Ranger	GS-03

Table 6. Staff breakdown from Fiscal Year 1991-1995.

Year	Permanent		Vacant as of 12/31	Temporary	Volunteers
	Full-time	Part-time			
FY91	16	1	3	15	66
FY92	16	1	2	15	73
FY93	18	2	0	12	71
FY94	20	2	1	20	71
FY95	20	3	0	19	56

Table 7. Temporary/seasonal positions for 1991-1995.

Position	1991	1992	1993	1994	1995
Biological Aids & Technicians	3	3	1	8	5
Forestry Technicians	0	0	0	2	2
Laborers & Carpenter	4	4	3	3	4
Park Rangers	6	6	7	6	7
YACC/YCC Staff	1	1	1	1	1
Student Trainee	1	1	1	0	0
TOTAL	15	15	13	20	19

After nine years, Refuge Manager Doshier decided to trade the mosquitos for the chiggers and departed Kenai to take the helm at Crab Orchard NWR.

Robin West succeeded Doshier as Refuge Manager and arrived with his family in January 1996. Robin comes to the Kenai after five years in the Anchorage Regional Office "doing his time" as the Migratory Bird Coordinator.

Pam Sperry joined the Kenai staff in February 1995 filling a new position as a GS-0334 Computer Specialist. Pam functions as the station's administrative officer overseeing the administrative staff and maintaining the station's computer network. Pam's addition to the staff has proven invaluable in keeping a bunch of computer users working while technology seems to pass most of us by.

After many years of dedicated seasonal service, Jim Farrar was finally picked up in a permanent position. Jim now has permanent status and will work a seasonal schedule.

Supervisory Refuge Operations Specialist Chase was promoted to a GS-12 functioning as the *de facto* Deputy.

Refuge Officer Johnson was finally upgraded in 1995. After a great deal of hand-wringing, Chris's GS-1802 position was finally approved at the 8/9 level. Chris was promoted to the 8 level in February 1995.

Changes in personnel regulations for the way we handle "seasonal" employees went into effect in 1995. As a result, a few positions had work seasons shortened in order to comply with the 6-month maximum for seasonal employees.

As pawns in a chess game, Interior employees were tangled in the mire of conflicts at a higher level. Due to differing budget philosophies between the White House and Congress, we ended up on furlough from November 14 through November 17. As it turns out, that was the short one and the worst was yet to come. Acting Manager Chase and Refuge Officer Johnson continued to work throughout the furlough as designated "essential" employees. Chase held down the office, while Johnson continued to protect visitor facilities and wildlife resources.

### Hiring

A Biotech position assigned to the fire program evaporated at the end of the 1994 field season. The opportunity was taken to create a forestry technician position which would have significant training records management and burnsite archeological clearance coordination and some lead technician duties. The position was subsequently filled by Forest Technician Diana Thomas.

Temporary Forest Technicians Dave Reese and Amy George were seasonally reinstated into their 1994 positions.



Fire Tech Amy George hosting a campfire program on Fire Ecology.

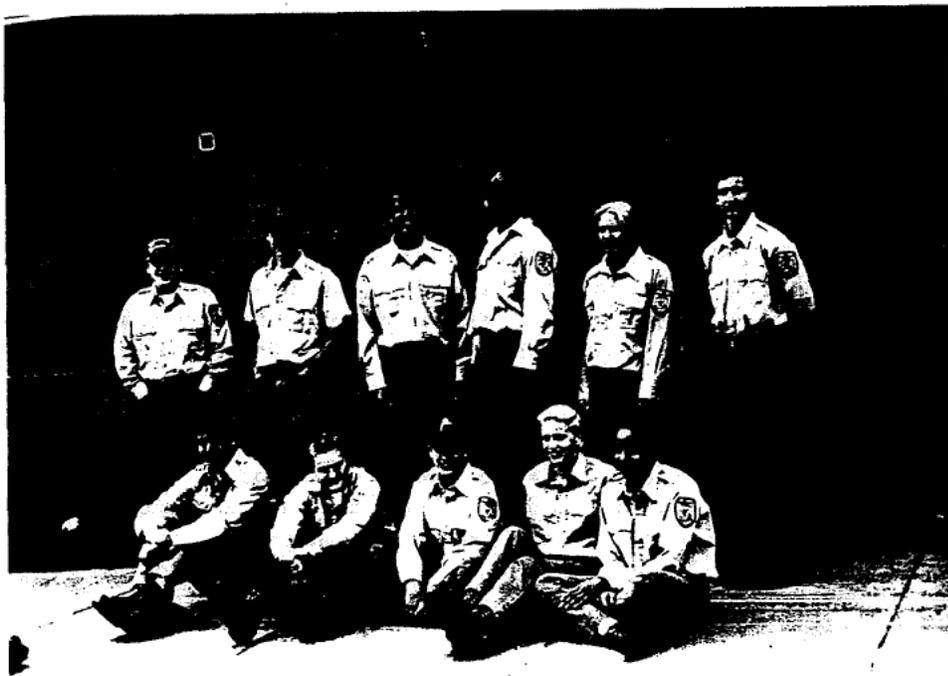
2. Youth Programs

Youth Conservation Corps

This year's Youth Conservation Corps (YCC) program consisted of ten enrollees, two of which were utilized in the Visitor Center on a regular basis. Mike Oexner led the YCC program for the second year and did a very good job with a diverse group of young people. Mike was assisted by John Williams, who had been a YCC enrollee previously, and was hired as a Youth Leader. The field season ran from June 13 through August 5.

This year's crew completed a wide variety of challenging work projects. The enrollees performed 2,688 labor hours this year. The projects were divided into nine categories of task classifications. These classifications included:

* Campground/Facility Maintenance.....	395 hours
* Trail Construction.....	705
* Trail Maintenance.....	272
* Litter Patrol.....	220
* Wildlife/Fishery Projects.....	99
* Fence Maintenance.....	440
* Erosion Control.....	231
* Recreation Projects.....	216
* Agency Support.....	110



The YCC's for 1995: Back row, Steven Manley, Mathew Davidhizer, James Cannava, Andy Johansen, Angela Woodward, Robert Miller, John Williamson, Heather Schmiege, Jennifer Silverman, Inger Deedee, and Megan Parshall. 7/95

There were also 88 hours of holiday pay, and 242 hours of orientation and training.

The YCC Crew participated in spike camps which periodically provided a welcome change in their work environment and expectations. Additionally, the biology projects in which they participated provided valuable insight into management practices and how data gathered in the field contributes to sound decision-making beneficial for fish and wildlife populations.

Environmental education continues to be an integral part of the Kenai Refuge's YCC program. It contributes to a successful summer by enhancing the enrollees' awareness of their surroundings and the world as a whole. During the eight-week camp, the leaders tried to set aside one day a week for this purpose; methods-used were field trips, guest speakers, videos and informal discussions.

#### Student Conservation Association

A Student Conservation Association (SCA) high school work group participated in a trail project on the Refuge during 1995. The crew, with eight enrollees and two leaders, rerouted, widened, and rehabilitated approximately 1.5 miles of the Fuller Lakes Trail. The crew stayed in a spike camp near their work site. This project utilized Maintenance Management System funds to acquire the crew and for supplies and materials. This was the second of a three-year project to rehabilitate Fuller Lakes Trail.

#### 4. Volunteer Services

Kenai's volunteer program, which involved 56 people and thousands of volunteer hours in 1995, consists of several components: seasonal volunteers; Student Conservation Association (SCA) resource assistants; community volunteers; and campground hosts.

Volunteers contributed 19,398 hours of service to Kenai National Wildlife Refuge in 1995, the equivalent of more than nine permanent full time (PFT) staff positions. Of the total, the Student Conservation Association Program accounted for two-thirds of the work hours with more than 12,800 hours of service.

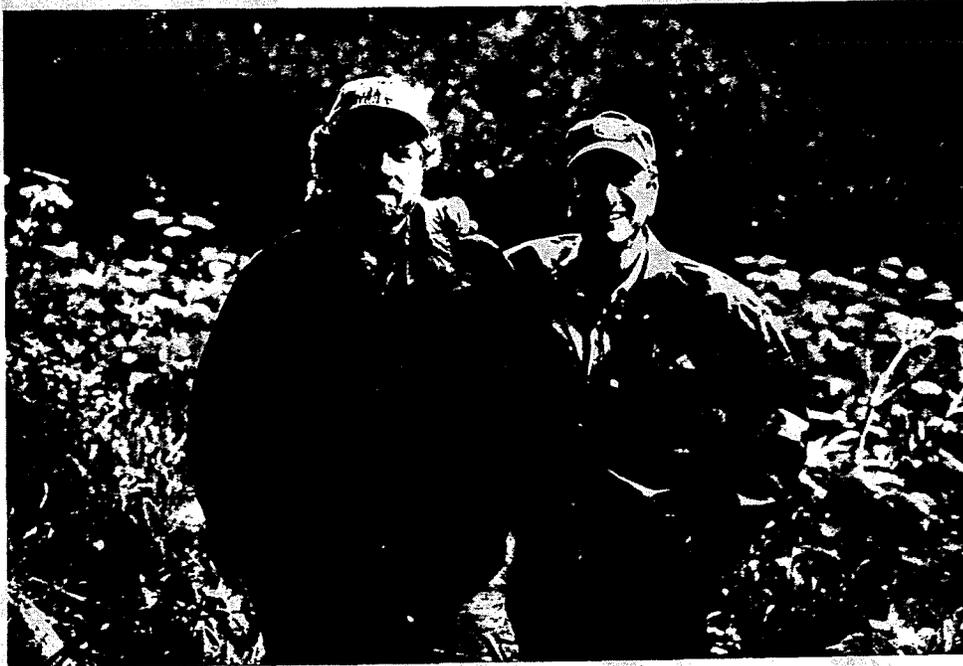
Alaska Flyfishers sponsored the third annual Upper Kenai River cleanup September 16-17. The crew staged their operations at the Kenai-Russian River Access Area. A dump truck full of trash was removed from the area, which was scoured the following week by a major flood. So while it was extremely timely to remove litter prior to it washing down into Skilak Lake, the flood deposited an entirely new population of trash and debris along the upper river.

##### a. Seasonal Volunteers

Seasonal volunteers commit to at least three months of continuous 40 hour-per-week service. Generally these volunteers are recruited through the U.S. Fish and Wildlife Service, Region 7 Volunteer Program, coordinated by

Bill Kirk at the Regional Office in Anchorage. Seasonal volunteers receive free housing, transportation, and a per diem subsistence allowance for food and essentials. In 1995, seasonal volunteers participated primarily in public use and biological field work, often in conjunction with pursuing undergraduate and graduate degrees.

b. Student Conservation Association Resource Assistant Program



Ranger/Pilot Johnston and Student Conservation Association Vice President Jay Satz at Lower Fuller Lakes after inspecting the Fuller Lake Trail project.

Student Conservation Association (SCA) Resource Assistants work with the Refuge for twelve to sixteen-week terms, completing a variety of operational tasks while learning about resource agency careers. Student Conservation Association Resource Assistants receive a small subsistence allowance and round-trip transportation to the Refuge.

In 1995, eleven SCA Resource Assistants and one SCA high school crew contributed to biological field assistance, interpretation, environmental education, back country patrol, visitor service, trail construction, and maintenance.

Since 1985, the Refuge has been extremely fortunate to select consistently high-caliber Resource Assistants who accomplish quality work. The SCA Resource Assistant Program continues to expand and remains the backbone of the Refuge's volunteer program.



High school SCA crews constructed a bridge across Fuller Creek as part of their 1995 work projects. LS



Biology SCA's David Clark, Mireille Martel, and Paul Smotherman.



Student Conservation Association high school crew with leaders Lou Shelly and Sue Murray and SCA vice president Jay Satz at Lower Fuller Lake.



Refuge laborer Wegner transported SCA field camp gear to Lower Fuller Lakes where the SCA high school crew set up their camp. RKJ

c. Community Volunteers

During the spring and summer of 1995, several youth service organizations, such as Scouts, 4-H, Campfire, and church youth, as well as adult groups such as Alaska Flyfishers volunteered for work projects involving litter pick-up, campground maintenance, and canoe trail portage rehabilitation. Often the groups visited the Refuge Visitor Center for training in minimum impact camping and bear safety prior to beginning their service projects.

d. Campground Hosts

The Campground Host Program is responsible for caretaking at Hidden Lake and Upper Skilak Campgrounds. Helen and Robert Sage worked as hosts at Hidden Lake Campground during the summer of 1995.

Unfortunately there were no applicants for campground hosts at Upper Skilak Campground this year.

5. Funding

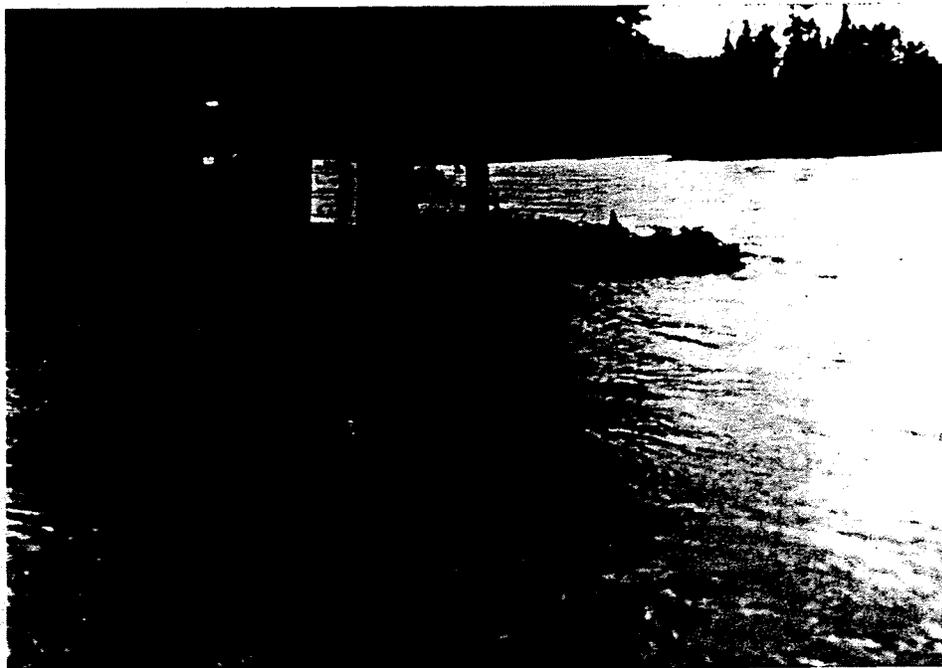
A three-year funding summary follows in Table 8.

Table 8 . Funding summary for the Kenai National Wildlife Refuge for the years 1993-1995.

<u>FUND</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>FY 1995</u>
1261			
Fixed Costs	896.0	825.0	785.0
Projects	141.0	280.0	280.0
Challenge Grants	59.0	27.0	13.0
Ecosystems	0.0	0.0	40.0
Subtotals	<u>1096.0</u>	<u>1132.0</u>	<u>1118.0</u>
1262			
Fixed Costs	349.0	371.0	361.0
MMS Projects	210.0	152.0	162.0
Contaminants	46.0	0.0	0.0
Subtotals	<u>605.0</u>	<u>523.0</u>	<u>523.0</u>
9110			
Fire Administration	257.0	219.0	219.0
9120			
Fire (Studies/Projects)	81.0	173.0	197.5
6860			
Expenses for Sales	90.0	90.0	90.0
4960			
Fee Collection Revenues	4.5	8.7	24.7
8610			
Quarters Revenues	<u>13.6</u>	<u>16.6</u>	<u>21.0</u>
Grand Total	2147.0	2162.3	2193.3

## 6. Safety

During the September 1995 floods, Acting RM Chase issued an emergency closure of several portions of the Refuge consistent with the public safety provisions of 50 CFR 36.42. Specific areas affected by the closure included the Russian River ferry crossing, Jims' Landing, and Mystery Creek Road at Mystery Creek. The closure remained in effect until flooding subsided and public safety could be assured. Portions of the Kenai River were also closed by Alaska State Parks. Refuge staff participated in the emergency response activities associated with the incident command system established to deal with the flood emergency. Staff participated in daily press and coordination briefings, river and lake patrols, inholder welfare checks, and aerial monitoring flights.



Jims' Landing during the flood of September  
1995. 9/95 RKJ

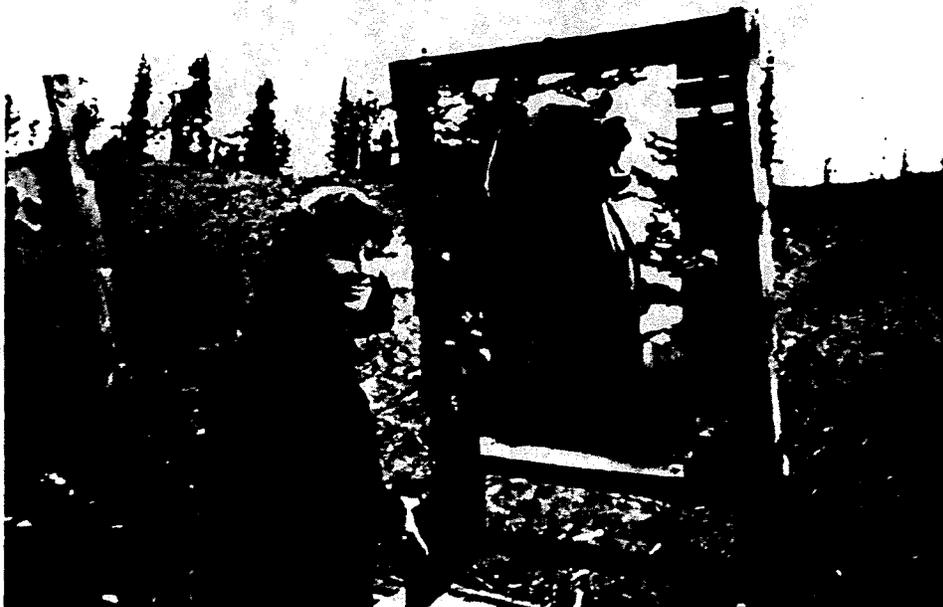
Monthly safety meetings provided information on moose-vehicle collision avoidance, cold weather survival, hazardous waste disposal, Material Safety Data Sheets, and drinking and driving.

All Terrain Vehicle (ATV) training was presented to permanent, seasonal, and volunteer staffs from Kenai Refuge, Alaska Maritime Refuge, and Kenai Fisheries offices. Thirteen employees received the training from Jim Croak on 30 May. Training was conducted at the Twin Cities Raceway in Kenai.

Basic Aviation Safety training was given to 14 seasonal employees and volunteers on 5 June. Eric Akola (Regional Aviation Training Manager) came from Anchorage to teach the course.

Mechanic Al O'Guinn constructed a 10-foot X 24-inch X 6-inch aluminum drip pan to be used under the two glycol circulating pumps in the boiler room at Refuge Headquarters/Visitor Center.

Bear and Firearms Safety Training courses were held for permanent, seasonal, and volunteer employees, as well as requested abbreviated courses for Refuge cooperators. Chase and Johnson conducted the classroom training, and Chase, Johnson, and Kent conducted the firearms portion. In 1995, 49 employees completed the classroom portion of bear safety along with three oil-field workers. Forty-five employees completed the firearms training including the practical shooting exercises on the range. With the large number of seasonal and volunteer employees arriving at different times throughout the year, providing bear and watercraft safety training continues to require significant time investments of all involved. Kenai NWR continues to provide bear training to employees of other divisions of the Service as well.



Park Ranger Duffy showing off her target at the firearms training. 5/95

Standards for Survival Training was given to approximately 20 people who we anticipated participating in the fire program. The training included fire shelter training and refresher training. This class included individual refresher training in the proper use of fire shelters.

Watercraft training was conducted on May 25 and 30 by Refuge Officer Chris Johnson with help from Chase, Wegner, Greg George, Barto and Slavic. Instruction included sections on Region 7 Policy and the Department of Interior proposed policy, watercraft orientation, radio communication, basic weather, watercraft equipment and use, rules of the road, emergency and survival equipment, and practical demonstrations on watercraft operations and trailering. Students had to demonstrate proficiency using a raft on a float down the Kenai River. Each student was given an opportunity to operate the raft on the float. River dynamics, river operation, and safety procedures were discussed and demonstrated. Students had to demonstrate their proficiency using both a 18-foot Boston Whaler and a 12-foot inflatable skiff with a stern-directed outboard. Students demonstrated that they could come along side another boat and pick up an object in the water.



Youth Conservation Corps water training in the Nikiski swimming pool.

A team of staff employees outlined a Kenai specific watercraft safety course and received approval from the Safety Office and Regional Boating Safety Team to proceed with developing Kenai specific training. Most seasonal and volunteer employees are generally only involved with flatwater canoe operations or upper river non-motorized floats. Consequently, the current training contains numerous modules which take time but have little applicability to specific situations. The team consisted of Chief Watercraft Safety Instructor Johnson, ORP Fiala (extensive whitewater experience), Laborer Wegner (US Coast Guard water safety instructor), and Ranger Slavic (extensive canoe experience). The team produced an outline which retains the fundamentals of the Regional and Departmental course, but

replaces marine, anchoring, and motorized sections with in-depth study and practical exercises involving canoes, drift boats, and rafts. We hope to have the program fully functioning by 1997.

The Refuge's Station Safety Plan was updated in July and copies submitted to the Regional Office and the Soldotna Post of the Alaska State Troopers.



A Cessna 172 made an emergency landing near Timberline Lake. The aircraft was salvaged and removed from Refuge lands. RKJ.

#### 7. Technical Assistance

Pilot/Park Ranger Johnston provided logistic support and assistance to Bureau of Land Management employees working on the Russian River navigability issue.

Refuge pilots, pilot/biologists, and aircraft continued to support Refuge-related fisheries research and resource projects on the Kenai River in 1995. Refuge biologists and pilots also supported the Alaska Department of Fish and Game in conducting joint moose and caribou surveys.

#### 8. Other Items

Fire Management Officer Adams participated in a career shadowing day sponsored by the City of Kenai Chamber of Commerce. The student assigned to Adams was interested in finding out about careers in forestry and fire management.

## F. HABITAT MANAGEMENT

### 1. General

The Kenai Refuge has a variety of terrestrial wildlife habitats and species. Fifteen habitats have been described in six habitat classes: special habitat class (riparian habitat, wetlands habitat, and an estuary habitat), forested (mature forest, intermediate forest, and early forest); alpine (alpine shrub-lichen tundra), shrub (lowland shrub and subalpine shrub), unique (cliffs and islands in lakes), and others (snow, ice, and glaciers, gravel and rock, and water).

At least 199 species of birds and mammals, and one amphibian species permanently or casually use these habitats. Many of these species actually use a variety of habitats. The value of heterogeneous vegetation patterns, which contribute to habitat diversity, is important to many species, such as moose, black bear, wolves, and lynx.

The Refuge has been categorized as having about 462,000 acres in several levels of management other than the 1,350,000 acres that is under Wilderness management. About 44 percent of the non-wilderness lands are open to habitat manipulation, such as timber harvesting and firewood cutting, under the Refuge's Comprehensive Conservation Plan (CCP). In the CCP, timber harvesting is acknowledged to be an effective means of habitat manipulation and management for moose. At the present time the Refuge has de-emphasized timber harvesting as a management tool in favor of prescribed burning.

#### Refuge Vegetation Monitoring Program

Vegetation on the Kenai National Wildlife Refuge has been subjected to numerous disturbances in the past including wildfires, prescribed fires, and large scale mechanical crushing of vegetation sometimes followed by prescribed burning. A variety of methods have been used to evaluate the changes in vegetation in response to these disturbances, as well as relative use of the different resulting wildlife habitats by lynx, moose, snowshoe hares, small mammals, and birds. In 1994, the Refuge formalized a vegetation monitoring program comparable to the Refuge wildlife population monitoring program and adopted the following techniques to evaluate vegetation changes:

- 1) Daubenmire Plots - To sample trees, shrubs, and ground vegetation in a forest stand or forest type. Trees are sampled by a variable plot basal area method, shrubs sampled in a 5m x 1m plot, and ground vegetation in a 1/10m<sup>2</sup> subplot.
- 2) Fire Monitoring Handbook (FMH) Permanent Vegetation and Fuel Plots - This procedure, developed by the National Park Service, evaluates the short and long-term effects of fires, primarily prescribed fires. Fire Monitoring Handbook plots are established and vegetation and fuels are surveyed prior to a prescribed fire. After the area is burned fuels are immediately resurveyed and vegetation is resurveyed one year after the burn and subsequently at three-to-five year intervals after the burn.

3) Wildfire Effects Surveys - These methods use long transects to evaluate effects of wildfires on vegetation where ever wildfires occur on the Refuge. These are rapid response surveys designed to measure 1) trees remaining after a wildfire (numbers, species, d.b.h., and the extent to which they were burned), 2) percent of mineral soil exposed, and 3) remaining ground vegetation.

#### Daubenmire Plot Surveys

In 1988, ten starting points for transects using Daubenmire Plots were established in each of two large crushed areas north of Skilak Loop Road (Skilak Loop I and II) and in a crushed and burned area north of the Sterling Highway west of Lily Lake. In 1991 and 1992, ten transect starting points were established in the proposed Mystery Creek prescribed burn area, and four transect starting points were established in two different areas of the 1991 Pothole Lake burn east of Skilak Lake. These transects have been surveyed at three-to-four year intervals.

#### National Park Service Fire Monitoring Handbook (FMH) Plot Surveys

In 1994, twenty four permanent FMH plots were established in the proposed Mystery Creek burn units III, IV, V, and VI; six permanent FMH plots were established in the 1991 Pothole Lake Burn; six permanent FMH plots inside and outside two moose exclosure pens in two areas of crushed and burned habitat north of Skilak Loop Road; and two permanent FMH plots were established, one inside and one outside another moose exclosure pen at the southwest corner of Pen #4 at the Moose Research Center at the end of Swan Lake Road.

In 1995, twelve additional permanent FMH plots were established in Mystery Creek burn units I and II and in the adjacent East Fork (Moose River) proposed burn area. Permanent FMH plots were also established within two moose exclosures, and one outside a moose exclosure within the pens at the Moose Research Center.

#### Wildfire Effects Surveys

In 1995, sixteen plots permanently marked by steel fence posts were surveyed in the northern and eastern portions of the 1994 Windy Point Burn south of Tustumena Lake. Additional plots should be established within other portions of this burn to properly evaluate the effects of the 2,800 acre 1994 Windy Point Fire. This was a severe late-season burn to mineral soil which completely removed the vegetative carpet. Abundant birch seedlings were visible one year later, at density of one to two seedlings/meter<sup>2</sup>. The plots usually had >90 percent cover of Ceratodon moss on the exposed mineral soil.

The vegetation crew also extensively sampled a mature (200+ years) white spruce-birch forest north of the Swanson River oilfield along new 0.7 mile Bufflehead road corridor. A total of 300 spruce and 175 birch sections (discs) were collected, and are now being aged by Ecologist Berg and postdoc Chris Fastie. Tree ring widths are being measured to ascertain the stand history (thinning by beetles, fire, regeneration, etc.).

Ecologist Berg conducted a detailed survey of nine plots set up along Skilak Loop Road by former Refuge Manager John Hakala in 1950 to follow vegetation succession in the 1947 burn. These plots were surveyed and photographed in 1950, 1955, 1961, 1965, and surveyed in 1976 (see Section D.5).

### 3. Forests

Timber harvesting on the Refuge continues to be a low priority habitat management technique, with prescribed fire and managed wildfire being preferred. There was no timber harvest during this calendar year.



Logging operation adjacent to the Refuge, South of Tustumena.

Access to the Funny River Road public firewood-cutting area remains popular with many local people. Firewood-cutting also serves the purpose of low-cost habitat and fuel management. Funny River Road provides access to the firewood-cutting area. Families are allowed to cut up to five measured cords of firewood per year for their own personal use. In the fall of this year, Heavy Equipment Operator Dick Kivi extended one of the existing trails approximately two miles, looping through a fire-killed black spruce stand which can be used for firewood or cut in long lengths to use as corral poles. Another three miles of trails were cleared to allow woodcutter access into new areas of the wood cutting area.

The continued progression of this firewood-cutting area to the south-southwest will provide a fuel break between the wilderness areas to the south-southeast and the populated city and extended community of Soldotna (including the Refuge headquarters) to the north. Hardwood regrowth into the previously cut sections has been attracting a number of moose into the area. Woodcutting Permits costing \$20 were issued to 27 households during the calendar year. Deep snow during the winter of 1994 made access through the woodcutting area nearly impossible for the average woodcutter. This resulted in the reduced number of firewood permits issued during the winter of 1994/95.

Fire-killed spruce poles for fences, furniture, and other domestic uses continue to be in demand by a few Peninsula residents. In response, we have issued free permits for pole cutting at a gravel pit access road on the Sterling Highway near Mystery Creek Road turnoff and along certain areas of Mystery Creek Road. Two permits were issued this year.

The Refuge was open in 1995 for free personal-use Christmas tree cutting. No permits were required for this type of cutting, so the extent of use is not known. The spruce regrowth area of the 1947 burn, located on Mystery Creek Road, was made available for commercial Christmas tree harvesting. Only one permit was requested.

Table 9. Woodcutting permits issued on the Kenai National Wildlife Refuge from 1990 to 1995.

<u>Year</u>	<u>Firewood</u>	<u>Poles</u>	<u>Commercial Christmas Trees*</u>
1990	50	5	3
1991	54	4	0
1992	58	6	0
1993	51	3	1
1994	22	3	1
1995	27	2	1

\* Christmas tree permits ranged from 30 to 100 trees per permit.

The spruce bark beetle epidemic that has been occurring through the midsection and points south on the Refuge continues to change the composition of the white spruce stands (white spruce has hybridized with Sitka spruce throughout) and viewsheds. The beetles kill the dominant and co-dominant spruce, resulting in more open stands of old hardwoods with young, small diameter spruce, and a rise in density of Canada bluejoint grass.

The changing forest situation has attracted keen interest in the way the Peninsula forests are managed both on and off of the Refuge. Numerous committees and workgroups have arisen out of the controversy over the role, effects, and means to cope with the beetle. Lost opportunities for timber harvest and fire danger concerns seem to top the list of issues associated with the beetle.

## 9. Fire Management

The main focal point of the Refuge fire program remained the plan to burn the 5000-acre Mystery Creek prescribed burn. The plan review and the necessary signatures and permits were acquired. However, the "nice" warm summer for tourists and residents was too humid, along with the wrong spacing and frequency of rain showers, to allow the Mystery Creek burn unit to come into prescription. The same weather kept the wildfire activity down to a new low for the last 30 or 40 years. Only two fires occurred on the Refuge during 1995. While waiting for dry weather, the fire staff worked on improving local cooperative agreements, going to training, vehicle screening and fire apparatus development, doing vegetation inventories, and preparing for the Northwest Fire Council's annual meeting.

Table 10. Wildland fires on the Kenai National Wildlife Refuge during 1995.

<u>Name</u>	<u>Start Date</u>	<u>Cause</u>	<u>Protection Level</u>	<u>Acres burned</u>
<u>Wildfires</u>				
Afonasi Lake	June 19	Campfire	Modified	3.0
Skyline Trailhead	June 29	Pyromania	Full	0.2
<u>Prescribed burn</u>				
Mystery Creek III	N/A	N/A	Modified	0
Total burned				3.2

### Cooperative agreements

A cooperative agreement to help with our prescribed burning program was written, presented to State Forestry, pursued by the Refuge FMO and R-7 Fire Management Coordinator Vanderlinden, and finally signed by both the Fish and Wildlife Service and State Forestry.

A cooperative agreement was re-established with the non-profit Cook Inlet (oil) Spill Prevention and Response, Inc. (CISPRI) organization to assist us with our helitorch operations, in exchange for them having the opportunity to keep their helitorch qualifications current.

An interagency agreement was written by the Refuge FMO and presented to the Chugach National Forest, soliciting their help with our prescribed burning program. The agreement was then pursued by the Refuge and Regional fire officers. The Chugach National Forest fire officer stalled the process and then transferred out of State without getting the agreement signed.

### Training

Fire Management Officer Adams attended Prescribed Fire Planning and Implementation at Boise, Firefighter Safety and Survival at Kenai, and a Helidunk session at Soldotna.

Assistant FMO McAvinchey attended S-217 (Interagency Helicopter Training at Fairbanks), S-270 (Basic Air Operations at Soldotna), S-290 (Intermediate Fire Behavior at Anchorage), and Firefighter Safety and Survival at Kenai. Forestry Technician Thomas attended S-270 (Basic Air Operations at Soldotna). Region 7 Fire Ecologist Berg stationed at the Refuge, attended S-290 (Intermediate Fire Behavior at Fairbanks), and a week-long Dendro Ecological Field Camp in Alberta.

Forestry Technician Reese attended S-217 (Interagency Helicopter Training at Palmer), S-290 (Intermediate Fire Behavior at Fairbanks) and a U.S. Forest Service Helidunk session at Soldotna. Forestry Technician George attended S-217 (Interagency Helicopter Training at Palmer), and Helidunk at Soldotna. Refuge Clerk Wise attended "Fire Time Keeping" class at Tucson.

Forestry Technicians Reese and George and Assistant FMO MacAvinchey attended a session put on by State Forestry to refresh their employees and cooperators with their contract fire suppression helicopter and operations.

Fire Management Officer Adams took and passed the test for a Commercial Drivers License including endorsements for air-brakes, semi-trailers, and hazard materials. This is needed for the fire staff to be able to move the Refuge dozer, the hydroax, and the fuel tender to burn projects.

Coordination with the local State Forestry office allowed five Refuge employees to receive their first basic wildland fire training.

Forestry Technician Thomas, with help from Forestry Technician George, certified training qualifications, step-tested, and red-carded 20 Refuge employees at the beginning of the fire season. These employees also received the necessary level of Standards for Survival training or the refresher session.

A training budget was put together in 1995 for the Refuge fire personnel, which includes Recreation Planner Fiala attending the Public Information Officer course and the new Refuge Manager and Deputy attending Fire Management for Line Officers.

#### Burn preparation

With wildfire activity in 1995 significantly down all over Alaska, and prescribed burning options rained out, more spruce trees along the boundaries of the planned Mystery Creek #3 burn were pre-treated by hydroax. The hydroax, operated by Fire Fighter Reese, put in 16 miles of 10-foot wide passes, adding 30 to 50 feet to the previous slashing done in 1994 on units V and VI, and between several adjoining units.

The Refuge forestry technicians took 60-point fuel and duff moisture samples two to three times a week during most of the field season within the Mystery Creek project area. Duff depth samples were taken at the three duff depth classes used by the Canadian Forest Fire Danger Rating System, and used to some degree in Alaska by suppression agencies.

Coordination by the Refuge fire staff was done with the Northern Fire Lab personnel of the Pacific Northwest (PNW) Research Station that allowed them to establish a few new plots and to refresh the ones that they put in during 1993 and 1994. They are trying to create "duff moisture-smoke generation" correlation models for Alaskan fuel types.

Contact was maintained throughout the summer with the PNW Research Station as to our chances of doing our prescribed burn, and their availability to respond to their burn plots to take pre-and-post fire measurements.

#### Fire Activity

Four Refuge fire management personnel assisted State Forestry in the suppression and helicopter management of a three-acre off-road fire during the spring. Two other smaller fires occurred on the Refuge were suppressed by cooperators, bringing the grand total burned for the year to 3.2 acres.

#### Preparations for the Northwest Fire Council's Meeting

All Refuge fire personnel were deeply involved in making preparations to be the primary focal point for the Northwest Fire Council's annual meeting that was to be taking place on the Kenai Peninsula during September 1995. Displays were prepared and two papers about our current fire history studies were being completed and dry-runs took place to fine-tune field tour timeframes. Then two weeks before the start of the conference, the session was canceled by the the co-sponsors (Alaska Division of Forestry and the Yukon Territory) due to lack of pre-registrants from Canada and the Lower 48. The Refuge fire staff was shocked and deflated after having put so much energy into the conference. Since the Refuge has had a number of major and recent habitat modifying wildfires and an ongoing prescribed fire program, we had turned out to be the best place for the planned "show and tell" style of conference.

#### 10. Pest Control

The 1995 aerial survey by the U.S. Department of Agriculture (USDA), Forest Service (FS), State, and Private Forestry entomologists reported 50,000 acres of beetle-infested stands between Point Possession and Tustumena Lake, with the heaviest activity between Skilak and Tustumena Lakes. From Tustumena Lake south to Homer and including the Fox River drainage, spruce beetle activity is extremely intense and widespread. More than 400,000 acres of spruce are infested with many stands having >60 percent mortality. The southeast portion of Kachemak Bay from Sheep Creek to Seldovia is experiencing a dramatic increase in spruce beetle infestations: more than 36,000 acres of Sitka spruce are currently impacted vs. 11,400 acres detected last year. (Holsten, E. et al., 1996, Forest Insect and Disease Conditions in Alaska -- 1995, USDA FS GTR R10-TP-61). No logging or silvicultural prescriptions were undertaken this year in beetle-killed stands on the Refuge.

## 11. Water Rights

The Water Resources section of the Regional Office's Division of Refuges and Wildlife installed 11 stream gauging stations on Refuge lands during 1994. This year, they continued their hydrological investigations at Bear Creek, Chickaloon River, Crooked Creek, Fox River, Funny River, Glacier Flats, Killey River, Lower Crooked Creek, Moose River, Mystery Creek, Nikolai Creek, Russian River, Swanson River, upper Chickaloon River, and upper Killey River.

Regional Engineer Warren Keogh began investigating Russian River navigability, boundary, and water rights issues associated with the Russian River.

Water rights applications were filed by Regional Office Realty on five wells at Hidden Lake Campground.

## 12. Wilderness and Special Areas

A memorandum was prepared in 1995 documenting 1993/94 use of helicopters in Kenai Wilderness and also analyzing the "minimal tool" justification regarding each use.

One hundred acres of previously privately owned native allotment land was reincluded into the Refuge. This property was within Kenai Wilderness on Olsen Lake and was restored to Wilderness status (see C.1).



Bear Lake is an access point to Caribou Hills located just west of the Kenai Wilderness boundary.

RKJ

A significant amount of Kenai National Wildlife Refuge's overall public visitor use occurs within various sections of Kenai Wilderness. This use seems to be stable or increasing at most Kenai Wilderness locations, particularly trails originating on the shoreline of Tustumena Lake.

Consistency of visitor use and access method issues continues to be an important concern in the Refuge's Public Use Plan. Specific areas of concern are the growing amount of apparently recreational non-traditional operation of snowmobiles in the Caribou Hills and other Kenai Wilderness locations.



Damage done by off-road vehicles on the Refuge.

RKJ

G. WILDLIFE1. Wildlife Diversity

No new or unique species were observed or reported on the Refuge in 1995.

2. Endangered and/or Threatened Species

The Refuge staff received Endangered Species Act training in March. Training was provided by Teresa Woods of the Regional Office.

3. WaterfowlTrumpeter Swans

Nesting Trumpeter Swans were surveyed on and adjacent to the Refuge on May 30 (northern area) and June 1, 1995, (southern area) by Pilot/Wildlife Biologist Ernst and Fish and Wildlife Biologist Bailey. An early cygnet production survey was flown on July 13 and 14. Data for late cygnet production was extracted from a statewide trumpeter swan survey flown on the Kenai Peninsula by Migratory Birds Division Biologist Bill Larned between August 8-15, 1995. Compared to 1994, numbers of adult swans during the nesting season and early cygnets observed during 1995 was slightly down and numbers of late cygnets observed declined 17 percent (Table 11).

Table 11. Trumpeter Swans observed during aerial nesting and productivity surveys on the Kenai National Wildlife Refuge.

Year	<u>Adult Swans During Nest Survey</u>				<u>Incubating Pairs/Nests</u>	<u>Cygnets</u>	
	<u>Singles</u>	<u>Pairs</u>	<u>Flocked</u>	<u>Total</u>		<u>Early</u>	<u>Late</u>
1991	4	51	0	106	41	89	84
1992	0	56	0	112	50	126	96
1993	6	58	14	136	32	88	-
1994	8	63	21	155	38	103	91
1995	5	71	2	149	37	97	76

Wintering Waterfowl on the Kenai River

Common Goldeneyes and Common Mergansers were the most numerous waterfowl observed using the upper Kenai River during the winter Bald Eagle survey by boat. No waterfowl observations, except for Trumpeter Swans, were recorded during aerial surveys (January, February and December 1995) when ice conditions prevented using a boat. Waterfowl observations from January 1994 through December 1995 are summarized in Tables 12 and 13.

Table 12. Waterfowl observed on the upper Kenai River (Kenai Lake outlet to Jims' Landing) during Bald Eagle float surveys, winters 1994-95, 1995-96.

Date	Mallard	Goldeneye	Merganser	Swan	Bufflehead	Scaup	Unid
01/17/94	46	47	15		2		18
11/25/94	91	97	17	1	17		
12/19/94	86	100	7		27	1	5
01/17/95	46	47	15		2		18
02/16/95	91	97	17	1	17		
11/21/95	29	34	39	3	8	0	
12/14/95	6	26	45	17			

Table 13. Waterfowl observed on the middle Kenai River (Skilak Lake outlet to Bing's Landing) during Bald Eagle float surveys, winters 1994-95, 1995-96.

Date	Mallard	Goldeneye	Merganser	Swan	Bufflehead	Scaup	Scoter	Unid.
01/18/94	104	374	30			13	7	70
02/16/94^		100+	50-100	15				
03/17/94^	100's	100's	100's	13				
11/22/94	73	154	13	12			1 Loon	50
12/16/94	63	223	18				2	2
01/17/95^				12				
02/16/95^				20				
11/20/95	80	29	18					

^ Aerial surveys, rough estimates except for swans

#### Snow Geese- Spring Migration and Staging on the Kenai River Flats

Snow Geese were first seen on the Kenai River Flats in 1995 on April 11. Numbers of Snow Geese observed in 1995 were extremely low with a maximum of 353 Snow Geese observed on a single day compared to 2,234 observed in a single day in 1994 and 4,000-to-10,000 snow geese observed on single days in the 1980's. This was the third year in a row that the numbers of on the Kenai River Flats have continued to decline.



Snow Geese on the Kenai River Flats  
during spring migration.

#### 4. Marsh and Water Birds

A biomonitoring program for Alaska's loon species was initiated for the Common Loon on the Kenai National Wildlife Refuge in 1995. The program is funded jointly by the U.S. Fish and Wildlife Service, Alaska Department of Fish and Game, and the North American Loon Fund. The organization conducting the monitoring program is BioDiversity Inc., 16 Lafayette St., Yarmouth, Maine, 04096, phone (207) 846-2239. BioDiversity personnel participating were Biologists David C. Evers, Peter S. Reaman, Joseph D. Kaplan, and James D. Paruk. Refuge Biologist T. Bailey and Biological Technician E. Jozwiak accompanied BioDiversity personnel between August 16-20 on capture operations nightly from about midnight to 4:00 - 4:30 a.m. Seven of eight roadside-accessible lakes with loon families were visited and five adults and one juvenile loon were captured and banded on the Refuge during this period: Dolly Varden Lake (one adult female, one unknown sex juvenile), Mosquito Lake (one adult male and one adult female), Upper Jean Lake (one unknown sex juvenile), and Pack Lake (one adult male and one adult female). Loons were captured at night using taped recordings and bright lights to temporarily blind the loons while they were approached in a canoe and netted in long-handled fish dip nets.



Loon capture project on the Kenai National Wildlife Refuge.

Prior to the capture operation, Ted Bailey and Rick Ernst conducted an aerial survey of roadside-accessible (within 0.5 mile of a road) lakes on the Refuge between 9-10 August 1995. Of 60 lakes surveyed, 33 lakes (57 percent) had Common Loons and one lake had a pair of Pacific Loons. Of 22 Common Loon pairs located, eight produced young including five, one-chick broods and three, two-chick broods. The number of chicks hatched per territorial pair was 0.50 which was low compared to other Common Loon study sites in North America monitored by BioDiversity Inc.

#### 5. Shorebirds, Gulls, Terns, and Allied Species

Due to limited availability of personnel, no surveys of the nesting colonies of hybrid gulls and cormorants were made on Skilak Lake in 1995.

#### 6. Raptors

##### Bald Eagles

Bald Eagle nesting surveys were conducted from a PA-18 between May 17-19, 1995 by Ernst and Bailey. Of 128 nest sites checked, 53 were inactive, 50 had incubating eagles on nests, 19 previous nests were no longer present (nest fallen from tree or tree blown down), 3 were searched for but could not be located, and 1 nest had adults near the nests but no eggs were observed (Table 14). An eaglet productivity survey on July 10 and 12 revealed that of 55 "active" or "potentially active" nests resurveyed for eaglet production, no eaglets were observed in 23, 1 eaglet in 18, 2 eaglets in 12, and 3 eaglets in 2 nests (Table 15).

Table 14. Summary of nesting Bald Eagle surveys on and adjacent to the Kenai National Wildlife Refuge, 1994-1995.

Year	Nests			Nest Status			
	Sites Visited	Gone	Not Found	Inactive	Active Nests		
					Adult on Nest	Adults Nearby	Unknown Status <sup>1</sup>
1993	102	0	18	31	50	3	-
1994	106	11	-	49	40	6	-
1995	128	19	3	53	50	1	2

<sup>1</sup> Nests found later after nesting survey

#### Wintering Bald Eagles



Picture of a nesting Bald Eagle sitting in a tree on the Kenai National Wildlife Refuge.

Table 15. Summary of aerial surveys of eaglets of Bald Eagles observed at active nests on and adjacent to the Kenai National Wildlife Refuge, 1994-1995.

Year	Active Nests Surveyed	Number of Nests				Total Eaglets
		Eaglets in Nest				
		0	1	2	3	
1993	51	36	7	6	1	22
1994	38	20	7	10	1	30
1995	55	23	18	12	2	48

Bald Eagles continued to winter along the upper and middle Kenai River feeding on late-run salmon throughout the fall and winter (Table 16). As in previous years, Jozwiak, McAvinchey and/or Refuge Officer Johnson conducted counts of Bald Eagles during winter float trips on the river in November and December 1995. Aerial flights were conducted in December 1995 through March 1996 because cold temperatures in late fall caused the river to freeze.

Table 16. Numbers and ages of Bald Eagles observed during boat surveys along the Kenai River during winters 1993-94, 1994-95, and 1995-96.

Survey Dates	River Route				Total	
	Upper River*		Middle River**		Adult	Juvenile
	Adult	Juvenile	Adult	Juvenile		
1993/94						
11/16&17/93	17	8	37	6	54	14
12/13&14/93	28	2	69	5	97	7
01/17&18/94	24	4	65	11	89	15
02/16/94^	12	1	57	5	69	6
03/17/94^ !	1	0	28	0	29	0
1994/95						
11/22&25/94	15	10	67	16	82	26
12/16&19/94	40	17	86	15	126	32
01/17/95^	31	3	57	6	88	9
02/16/95^	18	1	66	6	84	7
1995/96						
11/20&21/95	31	4	63	9	94	13
12/14&15/95^	46	9	69	0	115	9
01/22/96^	7	1	23	2	30	3
02/22/96^	7	0	29	0	36	0
03/28/96^	13	1	37	4	50	5

\* Kenai Lake to Jims' Landing

\*\* Skilak Lake outlet to Bing's Landing

^ Aerial survey

! Severe turbulence - Kenai Lake outlet to Russian River canceled

#### 7. Other Migratory Birds

The North American Breeding Bird Surveys were conducted on the Seven Lakes Route (Skilak Loop and Mystery Creek Roads) on June 17 and on the Swan Lake Road on June 18, 1995, by Wildlife Biologist McAvinchey and Biological Technician Jozwiak. Thirty-two bird species were detected along the Seven Lakes Route and 31 bird species were detected along the Swan Lake Route in 1995 compared to 35 and 36 species, respectively, observed the previous year. The three most frequently recorded species along both routes in 1995 were again the Slate-colored Junco (196), Swainson's Thrush (177), and the Myrtle Warbler (165). The five most frequently recorded species observed along each route are shown in Table 17.

Table 17. The five most frequently recorded birds along the Seven Lakes and Swan Lakes Road Routes in 1995.

Species	Numbers of observations	
	Seven Lakes Route	Swan Lake Road Route
Slate-colored Junco	100	96
Swainson's Thrush	89	88
Myrtle Warbler	83	82
Alder Flycatcher	13	74
American Robin	35	13
Common Redpoll	6	68
Gray Jay	20	16



Black-capped Chickadee, a bird commonly heard on the breeding bird route.

#### 8. Game Mammals

##### Moose

The Refuge conducted a moose census of Game Management Unit (GMU) 15A during March at a cost of approximately \$7,300. Previous years' maps of survey units (SU) were digitized and areas calculated using personal computer ARC/INFO software. Thirty-seven of the 104 survey units were searched over seven days. Clear sunny weather provided for high contrast, making survey conditions marginal. Pilots included Rick Ernst, Bill

Larned, John Sarvis, and Eric Akola. Observers were Daniel Doshier, Ted Bailey, Liz Jozwiak, and Todd Eskelin.

All super high and high SU were searched, eliminating the variance in these strata. Intensive searches were conducted in all super high units and all but one of the high units. When pooled among strata the observed sightability correction factor ( $SCF_0$ ) was 1.35, which was significantly higher than the  $SCF_0$  obtained in 1990 (1.21). The final estimate of the moose population for Game Management Subunit (GAS) 15A was 1,780  $\pm$  13.3 percent (1,543 - 2,017) at the 80 percent CI. This was a significant decline from the last census in 1990 in which the population estimate was 3,616  $\pm$  10.9 percent (3,221 - 4,011). Some reasons for this decline were the severe winter of 1994-95 in which many calves did not survive, the highest reported road-kill ever, and one of the highest sport hunting harvests.

No moose composition survey was done in November due to lack of snow.



Moose harvested during the 1995 season.

### Caribou

Ernst conducted 20 radio-telemetry flights for caribou in the Killey River, Twin Lakes, and Fox River herds. No flights were made for the Kenai Lowland or Kenai Mountain herds. On February 8 all the Twin Lakes radioed caribou (four cows) were located south of the Killey River. No animals or tracks were found north of the Killey River. It appears that the Twin Lakes herd is not a separate herd but part of the Killey River herd. The area north of the Killey River may not be suitable winter range during

severe winters. Thirty-five caribou returned to the Twin Lakes area on April 7.

A calf production survey was conducted on June 9 for the three herds. Percent calves were 19, 29, and 35 for the Twin Lakes, Killey River, and Fox River herds respectively. The largest population figures for each herd were obtained on November 28. Forty-eight caribou were counted in the Twin Lakes herd, 261 in the Killey River herd and 83 in the Fox River herd. Caribou populations for the past five years are summarized in Table 18.

Table 18. Estimated populations for the Kenai Peninsula caribou herds for 1995 (Source: Alaska Department of Fish and Game).

<u>Herd</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>
Killey River	197	222	281	NA	261
Kenai Mt.	310	NA	390	NA	425
Fox River	40	50	57	NA	83
Twin Lakes	26	29	36	NA	48
Kenai Lowlands	110	80	66	86	NA

#### Dall's Sheep and Mountain Goat

Alaska Department of Fish and Game personnel flew goat and sheep surveys in August. Some survey units flown are on the Refuge. These are listed in Tables 19 and 20.



Dall's Sheep on the Refuge.

MB

Table 19. Mountain goat composition count for surveys on the Kenai National Wildlife Refuge for 1993-1995 (source Alaska Department of Fish and Game).

	<u>1993</u>	<u>1994</u>	<u>1995</u>
Unit 7			
Area 331			
Adult	-	0	42
Kids -	0	14	
%Kids	-	0	25.0
Total	-	0	56
Unit 15			
Area 353 *			
Total	-	-	-
Area 354*			
Total	-	-	-
Area 355			
Adults	18	6	-
Kids	4	0	-
%Kids	18.2	0	-
Total	22	6	-
Area 356			
Adult	38	34	-
Kids	10	.4	-
%Kids	20.8	10.5	-
Total	48	38	-
Area 357			
Adult	41	-	39
Kids	17	-	12
%Kids	29.3	-	23.5
Total	58	-	39
Area 358*			
Total	-	-	-
Area 359			
Adult	-	75	-
Kids	-	13	-
%Kids	-	18.5	-
Total	-	92	-
Area 360			
Adult	-	138	-
Kids	-	31	-
%Kids	-	18.3	-
Total	-	169	-
Area 361			
Adult	87	-	-
Kids	13	-	-
%Kids	13.0	-	-
Total	100.	-	-

\*Not surveyed these years.

Table 20. Dall's sheep composition count for surveys on the Kenai National Wildlife Refuge for 1993-1995 (source Alaska Department of Fish and Game).

	<u>1993</u>	<u>1994</u>	<u>1995</u>
Unit 7			
Area 331			
Rams	19	-	0
Ewes	78	-	0
Lambs	13	-	0
Total	110	-	0
Unit 15			
Area 353 *			
Total	-	-	-
Area 354*			
Total	-	-	-
Area 355			
Rams	16	-	-
Ewes	46	-	-
Lambs	14	-	-
Total	76	-	-
Area 356			
Rams	38	119	147
Ewes	296	289	-
Lambs	54	60	-
Total	469	496	-
Area 357			
Rams	41	20	38
Ewes	52	-	28
Lambs	15	-	3
Total	87	-	69
Area 358*			
Total	-	-	-
Area 359			
Rams	-	0	-
Ewes	-	0	-
Lambs	-	0	-
Total	-	0	-
Area 360*			
Total	-	-	-

\*Not surveyed these years.

### Wolves

Observations of radio-collared wolves in packs and other wolf information from the northern portion of the Refuge in 1995 suggests a possible declining wolf population in that portion of the Refuge. Four wolves were captured by helicopter darting in the early spring of 1995 and another wolf was collared after it was purchased from a trapper and removed from a snare in December 1995. In January 1995, ten radio-collared wolves were being monitored in the northern portion of the Refuge, but of these, five were loners or members of a pair only, and the remaining five were members of

two packs. By December 1995, only six wolves were being monitored and of these, four were in two packs: the Elephant Lake and Swanson River Packs, both in the 1969 burn. Attempts to capture wolves in the summer which traditionally used pack territories occupied by the Bear Lake and Skilak Lake packs were unsuccessful and little sign of wolves were encountered in the area.

The Elephant Lake Pack denned at their traditional den northwest of Elephant Lake in 1995 but apparently did not successfully rear many pups. Observations of this pack indicated only three-to-four wolves between February through December 1995.

None of the radio-collared wolves in the Swanson River Pack, which denned near the Swanson River Oilfield in 1994, displayed any denning behavior in 1995. The pack totaled ten individuals in October, 1994, declined to seven wolves by February 1995; only four wolves were observed with the radio-collared members in this pack in December 1995.

The declining numbers of wolves observed in monitored packs, apparent lack of or low pup productivity of monitored packs, scarcity of wolf sign in other areas traditionally used by radio-collared packs, declining harvest of wolves during the trapping season, and lack of reports of large packs by the public, suggest a wolf population that may be in decline in the northern portion of the Refuge. Possible contributing factors for a decline include a declining moose population, high incidence (100 percent) of exposure of tested wolves to parvovirus, infestation of wolves by biting dog lice, human harvest, and other mortality of dominant individuals in wolf packs in the 1969 burn, human disturbance around dens, and possible lack of genetic diversity among wolves on the Refuge.

## 10. Other Resident Wildlife

### Small Mammals

In 1995, small mammal populations were sampled in the snowshoe hares grids during the same period snowshoe hares were captured. A total of 531, three, and nine red-backed voles, tundra voles, and masked shrews, respectively, were captured. These data indicate an increasing small mammal population in the areas sampled on the Refuge in 1995 relative to 1994, when 225 total small mammals were captured in the same grids.

### Snowshoe Hares

Live-trapping snowshoe hares in five study grids in 1995 revealed an increase in numbers of hares in four of five grids compared to 1994. Numbers of hares captured increased in the Swanson River Grid (8 to 11), Funny River Grid (7 to 15), 1969 Burn/Oilfield grid (13 to 43), and Skilak Loop Grid (15 to 24). Numbers captured declined in the Campfire Lake Grid (22 to 17). These numbers are still only a fraction of the total numbers of individual snowshoe hares captured during the peak population period of 1984 and 1985 (Table 21).

Table 21. Snowshoe hares captured and density estimates for the Kenai National Wildlife Refuge, 1983-1995. Density estimates are numbers of hares per hectare.

Year	Snowshoe Hare Study Grid									
	Swanson River Rd.		Funny River Rd.		Campfire Lake		1969 Burn (Oilfield)		Skilak Loop Rd.	
	No.	Den.	No.	Den.	No.	Den.	No.	Den.	No.	Den.
1983	34	1.5	103	2.7	-	-	-	-	-	-
1984	54	1.4	126	7.2	-	-	-	-	-	-
1985	40	2.0	74	3.6	-	-	-	-	-	-
1986	31	1.6	34	1.2	32	0.9	-	-	-	-
1987	12	0.5	31	1.3	24	1.0	-	-	-	-
1988	9	0.4	4	0.04	12	0.2	-	-	-	-
1989	4	0.07	3	0	9	0.2	1	0.04	-	-
1990	3	0.2	1	0.04	5	0.1	1	0.0	-	-
1991	3	0.2	26	0.8	6	0.3	2	0.04	-	-
1992	2	0.2	7	0.1	10	0.5	3	0.1	14	0.4
1993	4	0.2	2	0.04	14	0.2	4	0.0	9	0.8
1994	8	0.6	7	0.4	22	0.7	13	0.4	15	0.1
1995	11	0.7	15	0.7	17	0.4	43	1.8	24	1.0

### Beaver

Aerial surveys of active beaver lodges were flown over the 1947 burn trend area within the Swan Lake Canoe System and the 1969 burn trend area on October 3, 1995 (Table 22). Numbers of active lodges slightly increased in the 1947 burn trend area after a three year decline and steadily increased in the 1969 burn trend area.

Table 22. Summary of aerial surveys of active beaver lodges on the Kenai National Wildlife Refuge, 1988-1995.

Year	Number of active lodges			
	1947 Burn		1969 Burn	Mature Forest <sup>1</sup>
	Swan Lake Canoe Sys.	Swanson River Canoe Sys.		
1995	21	No Survey	43	No Survey
1994	14	23	32	16
1993	15	No Survey	27	No Survey
1992	22	19	21	22
1991	33	No Survey	21	27
1990	31	No Survey	27	23
1989	23	-	No Survey	No Survey
1988	15	-	-	-

<sup>1</sup> Mature forest trend area is in the Vogel Lake- Point Possession area.

### Spruce Grouse

Biological Technician Jozwiak conducted early morning roadside Spruce Grouse surveys along Swanson River/Swan Lake Road (28 miles) and Skilak Loop Road (20 miles) from September 18 to October 4, 1995. An average of 3.75 grouse (range 3-5) were seen along the Swanson River/Swan Lake Road and 30.6 grouse (range 5-66) observed on Skilak Loop road. The low number of grouse observed on the Swanson/Swan Lake road route may be attributed to a higher hunting pressure in this area compared with Skilak Loop. More vehicles/individuals were observed pursuing grouse on Swanson River/Swan Lake Road during roadside surveys (10.8 vehicles hunting/survey) than along Skilak Loop Road (3.3 vehicles hunting/survey) which was open to grouse hunting with bow and arrow only.



Spruce Grouse on the Kenai National Wildlife Refuge.

### Lynx

Thirteen lynx were newly captured (three males, three females) or recaptured (two males, five females) and fitted with radio-collars in the fall of 1995 in order to monitor the status and trend of the lynx population in two areas in the northern portion of the Refuge. The maximum number of radio-collared individuals monitored at one time was 15. The monitoring indicated an annual mortality rate of adult lynx of 17.5 percent in 1995 and an increase in denning behavior by female lynx. Two monitored lynx died during the year but the status of five individuals was unknown (data censored from the mortality estimate) because of the lost of radio contact. In general, the lynx population appears on the increase in conjunction with an increase in snowshoe hares, but there still appears to

be some loss of kittens from the population between the denning period in June and dispersal of young the following March to April.

### Wolverine

Wildlife biologists from the Refuge and Alaska Department of Fish and Game (ADF&G) completed an aerial wolverine survey in the Kenai Mountains on and adjacent to the Refuge on February 23 and 24, 1995. The sampled area (Wolverine Count Area 2) is approximately 2,050 km<sup>2</sup> in size and is located at the north end of the Kenai Mountains between Turnagain Arm and the Kenai River and between Quartz Creek/Six Mile Creek valleys and the foothills to the west. The area was divided into 198 four-km<sup>2</sup> sample units (SU); 180 and 18 SU with a high and moderate probability of encountering wolverine tracks, respectively. Of these, 43 and 2 of the high and moderates SU, respectively, were actually surveyed for wolverine tracks. Tracks of 5 individual wolverines were counted, the calculated population size was 10.7 wolverine (90 percent CI = 5-17.5 wolverine), and the density estimate was 5.2 wolverines/1000 km<sup>2</sup> (90 percent CI = 3.8-8.5). This density was similar to densities of 4.7-5.2 wolverines/1000 km<sup>2</sup> estimated in the eastern Talkeetna Mountains and northern Chugach Mountains in southcentral Alaska.

A liberal estimate of mountainous, comparable wolverine habitat on the Refuge indicates there may be up to 2,300 km<sup>2</sup> available to wolverines. Using 1995 census-derived wolverine density calculations, an estimate of 12.0 wolverines (90 percent CI = 8.7-19.6) is derived for the perceived high quality habitats on the Refuge. Wolverine harvest reports, prior wolverine track surveys from aircraft during the 1993-94 winter, and visual sightings and reports of wolverine on the Refuge over the past 20 years collectively indicate low numbers of wolverines in non-mountainous, lowland forested areas of the Refuge.

## 11. Fisheries Resources

### Hidden Lake

Cook Inlet Aquaculture Association took over the Hidden Lake sockeye enhancement project from the Alaska Department of Fish and Game in 1991. Pertinent data for the Hidden Lake sockeye enhancement program for 1995 are shown in Table 23.

Table 23. Summary of sockeye salmon enhancement activities at Hidden Lake on the Kenai National Wildlife Refuge.

<u>Year</u>	<u>Eggs Taken</u>	<u>Fry Released</u>		<u>Outmigrating Smolts</u>	<u>Returning Adults</u>
		<u>Boat Ramp</u>	<u>Total</u>		
1991	2.78M	0.2M	1.400M	-	112,792 <sup>1</sup>
1992	-----NO DATA AVAILABLE-----				
1993	2.19M	-	2.095M	359,722	11502
1994	2.19M	0.2M	1.815M	417,752	6086
1995	1.89M	0.2M	1.700M	293,680	7542

Russian River

In 1995, the early run escapement of sockeye into the Russian River system was 28,603 compared to 44,872 in 1994. The late-run escapement for sockeye in 1995 was 61,982 compared to 122,248 in 1994. Also see Section H.9 (Fishing) for harvest statistics.

Tustumena Lake System

Sockeye eggs for the Tustumena Lake enhancement project are hatched and the fry reared at the Crooked Creek Fish Hatchery. Cook Inlet Aquaculture Association (CIAA) assumed responsibility to operate the Crooked Creek Fish Hatchery from the Alaska Department of Fish and Game in 1994. In December, CIAA contacted the Refuge requesting that the enhancement project be permitted as an "operational" project as opposed to the "experimental" classification that the project has had for the past 20 years. Manager Doshier outlined the NEPA requirements for CIAA and all agreed that the NEPA process would be the direction followed for this action. Work was begun on an EA, and Gary Sonnevil (KFRO) was designated as the Service lead contact for the process. Pertinent data for the Tustumena Lake sockeye enhancement program for 1995 are shown in Table 24.

Table 24. Summary of sockeye salmon enhancement activities at Tustumena Lake on the Kenai National Wildlife Refuge.

Year	Eggs Taken	Juveniles Rearing in Lake	Returning Adults	
			Bear Creek	Total System
1991	17,7M	-	60,380	-
1992	13.5M	19.4M	44,100	184,178
1993	14.2M	14.3M	45,125	149,939
1994 <sup>1</sup>	15.7M	12.5M	39,100	204,525
1995	16.132M	10.5M	41,863	205,903

## 12. Wildlife Propagation and Stocking

The U.S. Fish and Wildlife Service responded on April 4, 1995, (letter from Acting Regional Director Rowan W. Gould) to a proposal by the Alaska Department of Fish and Game to release Ruffed Grouse on the Kenai Peninsula. The Service did not support the transplant for several reasons:

- 1) Ruffed Grouse are not indigenous to the Kenai National Wildlife Refuge nor to the Kenai Peninsula.
- 2) Because the best habitat for Ruffed Grouse on the Kenai Peninsula - early successional stage forest - occurs on the Refuge, Ruffed Grouse, if they become established, would most likely do so on the Refuge.
- 3) Because of known past ecological disasters regarding the transplanting of non-indigenous species and the unknown and often unanticipated

ecological consequences of such transplants, Service policy does not authorize the stocking of non-native species on Refuge lands.

Despite these Service and Refuge concerns, ADF&G released Ruffed Grouse adjacent to the Refuge's boundary, near Adkins Road east of Sterling in 1995, and plans to release additional Ruffed Grouse adjacent to the Refuge in 1996.

#### 16. Marking and Banding

An annual report of wildlife captured and/or radiocollared on the Refuge during 1995 was sent to the U.S. Fish and Wildlife Service, Division of Law Enforcement in Anchorage. A summary of these activities is reported in Tables 25 and 26.

Table 25. Report of large mammals captured, collected or handled on the Kenai National Wildlife Refuge under Federal Fish and Wildlife Permit #692350 and State of Alaska Permit #95-52 in 1995.

<u>Species</u>	<u>Date</u>	<u>Activity</u>	<u>Age</u>	<u>Sex</u>	<u>Weight</u>	<u>Area</u>
Wolf	04/04/95	Recapture #2	AD	M	110.0 lbs	Forest Lk
Wolf	04/04/95	Radiocollared	AD	F	86.0 lbs	Sunken Island
Wolf	04/04/95	Recapture #3	PU	F	71.0 lbs	Forest Lk
Wolf	04/11/95	Recapture #3	AD	M	111.0 lbs	Marathon Rd.
Wolf	12/16/95	Radiocollared	AD	M	66.0 lbs	Swan Lk
Coyote	05/18/95	Eartagged	SA	M	28.0 lbs	Moose Pens
Coyote	06/16/95	Eartagged	AD	M	25.0 lbs	Moose Pens
Coyote	07/31/95	Eartagged	AD	M	26.0 lbs	Mystery Ck.
Lynx	10/09/95	Recaptured	AD	F	24.5 lbs	Sunken Island
Lynx	10/10/95	Recaptured	SA	M	25.0 lbs	Sunken Island
Lynx	10/11/95	Recaptured	AD	F	25.5 lbs	Mosquito Lk
Lynx	10/12/95	Recaptured	AD	M	33.0 lbs	Swanson RvrRd
Lynx	10/14/95	Recaptured	AD	F	20.0 lbs	Engineer Lake
Lynx	10/17/95	Radiocollared	SA	F	17.0 lbs	Swan Lake Rd
Lynx	10/20/95	Radiocollared	SA	M	22.0 lbs	Skilak Lp Rd
Lynx	10/23/95	Radiocollared	AD	M	24.5 lbs	Swanson Rvr
Lynx	10/24/95	Recaptured	AD	F	19.5 lbs	Fingerlakes
Lynx	10/31/95	Recapture #5	AD	F	22.0 lbs	Mystery Crk
Lynx	11/02/95	Radiocollared	SA	F	21.0 lbs	Skilak Loop
Lynx	11/03/95	Radiocollared	AD	F	16.5 lbs	SR Oilfields
Lynx	11/04/95	Radiocollared	AD	M	23.3 lbs	Engineer Lk

\*Ages: AD=adult, SA=subadult (1-2 yr ), PU=pup (<1 yr )

Table 26. Report of small mammals captured, collected or handled on the Kenai National Wildlife Refuge under Federal Fish and Wildlife Permit #692350 and State of Alaska Permit #95-52 in 1995.

<u>Species</u>	<u>Dates</u>	<u>Results</u>	<u>Area</u>
Snowshoe Hares	5/08- 8/17/95	131 Total Captured (17 Dead)	KNWR Hare Grids
Small Mammals	5/08- 8/17/95	531 Red-Backed Voles (230 Live, 301 Dead) 3 Tundra Voles (1 Live, 2 Dead) 9 Masked Shrews (9 Dead)	KNWR Hare Grids
Total		543 Total Small Mammals	

18. Injured Wildlife



Saw-whet Owl in rehabilitation.

Refuge rehabilitation activities focused primarily on the care and release of injured raptors (owls and Bald Eagles) at Refuge facilities. The baby bird rehabilitation network, comprised of community volunteers and supervised by veterinarian Bart Richards and Biological Technician Jozwiak, both licensed rehabilitators, raised and released numerous baby songbirds in the local area May through July 1995. Jozwiak, with the assistance of

many dedicated summer Student Conservation Association volunteers rehabilitated and released: one adult Bald Eagle, two adult loons, and one juvenile Great Horned Owl. An adult Osprey was held temporarily at the Refuge while it recuperated from the shock of being electrocuted on a powerline. The Osprey was sent to the Sitka Rehabilitation Center for long-term care and regrowth of its flight feathers. A juvenile bald eagle with a fractured wing required long term care and was also sent to the Sitka Center. The Refuge rehabilitation program had a successful year with no mortalities in 1995.

#### 19. Salvage Activities (1995)

The following raptors were submitted to the Refuge or collected by Refuge personnel in 1995: 12 bald eagles (5 Adults, 7 Juveniles); 7 Bald Eagles were sent to the National Eagle Repository in Denver, Colorado, for final disposition, and 2 were sent to National Wildlife Health Research Center in Madison, Wisconsin for toxicological analysis and 3 were disposed of because the carcasses were too decayed for any future use or analysis. One Saw-whet Owl and 2 juvenile Great Horned Owls (all road kills) were added to the Refuge freezer in 1995.

## H. PUBLIC USE

### 1. General

This year was typical for public use activities and programs in regards to visitor uses and trends. Significant improvements were made to many of our visitor facilities which will enhance the Refuge experiences of visitors.

January through March provided many winter outdoor activities including cross-country skiing, snowmobiling, ice-fishing, small game hunting, and wildlife observation opportunities. April and May saw early king salmon anglers on the lower Kenai River and on many Refuge lakes. Snow Geese and other returning waterfowl offered exciting wildlife observation and photography chances throughout the Refuge. June through August mean "SALMON" in Alaska, and the Kenai Refuge is certainly no exception. Along with the piscatorial pursuits come camping, hiking, canoeing and boating, and additional observation and photography, especially of young waterfowl and moose. Big game hunting also begins in August and continues into October; in recent years, fishing activities have continued into October also, especially on the upper Kenai River, and rutting moose are always favorite subjects for photographers. November and December see winter activities drawing visitors to the Refuge, especially if below freezing weather comes early, providing sufficient ice for skating and fishing.

Facility rehabilitation in the Skilak Wildlife Recreation Area continued this year with rehabilitation work on the Visitor Contact Station (VCS) area and Jims' Landing. The road into Jims' was widened and resurfaced, and the area will be day-use only. Hopefully, this will reduce human impacts to the riverbank. A detailed discussion of the Jims' Landing project is contained in section I.2 (Rehabilitation). The VCS area received an improved traffic flow pattern, the log building was relocated, and there are two new concrete-walled restrooms for visitor use. It is expected that the final work will be completed in the spring of 1996.

Overall visitation to the Refuge was estimated at 495,000; this reflects some better calculations of visitor use made possible with new traffic counters at both ends of the Skilak Loop Road.

### 2. Outdoor Classrooms - Students

#### Visitor Center & "Keen Eye" Trail

In 1995, two-thousand-thirty students participated in the Refuge's Environmental Education (EE) program at the visitor center and adjacent nature trail.

A typical field trip to the Visitor Center takes half a day. Students begin with an introductory wildlife film or videotape selected from the Refuge's extensive media library. After the media program, students explore the exhibit area using questionnaires associated with various exhibits. The questionnaires focus on concepts such as animal/plant adaptations, interdependence, natural communities, and succession. The

three levels of questionnaires cover grades kindergarten through first, second through third, and fourth through sixth.

Students then hike the three-quarter-mile "Keen-Eye" Trail engaging in environmental education activities. Led by their teacher or a Student Conservation Association resource assistant, they investigate spruce forest, wetland, and freshwater lake communities through an integrated series of "hands-on" activities. Themes include:

- K/1-Animals & Their Senses
- 2/3-The Role of Predators
- 4/6-Wildlife & Wetlands
- 4/6-The Role of Fire

Fire Tech Amy George and Student Conservation Association (SCA) resource assistants, Emmy Cover, Shannon Wadsworth, and Jean Wu were instrumental in the success of our program assisting students and teachers in activities and training.

#### Outdoor Education Center

In 1995, the Refuge's Outdoor Education Center (OEC), located off Swan Lake Road, was utilized by 572 youth for a total of 1,700 user days. The OEC provides an attractive outdoor site for overnight field trips and youth group retreats. Teachers and youth leaders use the facility free-of-charge to conduct environmental education, nature appreciation, and outdoor skills activities.

Rustic accommodations include six sleeping cabins, a "commons" lodge (called the "Bear Den"), a campfire center, picnic tables, an outhouse, and a water pump.

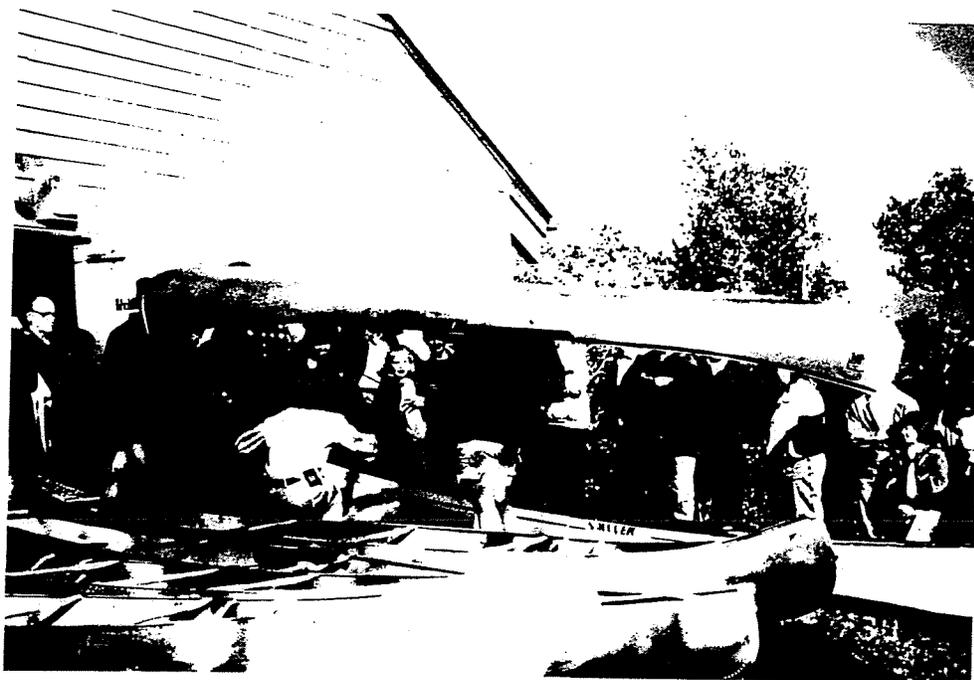
#### 3. Outdoor Classrooms - Teachers

In 1995, ninety-seven educators were introduced to the Refuge's Environmental Education (EE) program through teacher orientation sessions and EE workshops taught by Refuge staff. Orientation sessions are scheduled in the fall and spring, when teachers show the greatest interest in bringing classes for field trips to the Refuge. During a three hour orientation, teachers experience an abbreviated version of a sample class field trip. Workshops are given in four to eight hour blocks and explore environmental education topics in greater depth with teachers and youth leaders. This focused adult leadership training by Refuge staff greatly multiplies the educational efforts of Refuge staff. Two Refuge staff worked with 97 educators, who taught 2,740 youth, greatly increasing the impact of the Refuge environmental education programs.

#### 4. Interpretive Foot Trails

The Public Use staff planned a series of events for National Trails Day. An evening presentation by Backcountry Ranger Scott Slavik provided trip planning information and equipment demonstrations for a "standing room only" crowd interested in the Swan Lake and Swanson River canoe trails.

Other events included a film about minimal impact hiking and camping , a naturalist-led hike on the new universal access portion of the Keen-Eye Trail, and a work project on the Kenai River Trail.



For National Trails Day Scott Slavik teaches the public how to portage a canoe.



The YCC crew worked on the Burney Dunn trail.

The YCC crew, with assistance from the Backcountry crew, constructed a new "family-accessible" trail originating at Hidden Lake campground. The .6-mile trail leads to a knoll with a panoramic vista of Hidden and Skilak Lakes. The trail will be dedicated in 1996, in memory of David "Burney" Dunn, a University of Alaska, Fairbanks graduate student and researcher who studied lynx and snowshoe hare relationships in the area. Refuge staff, their families, and friends of Burney gathered in late August to put finishing touches on the trail.

#### 6. Interpretive Exhibits/Demonstrations

In April, the Refuge public use staff participated in the Kenai Peninsula Sportsman's Show. Rangers Duffy and Ward developed a new Refuge specific recreation exhibit for the show which lent an eye-catching, professional look to our booth. Our booth made contacts with over 1,000 of the 2,500 people who visited the show.

In May, Ward working with Fruland/Bowles completed minor rehabilitation projects for Alaska Stream Life and Alaska Refuges exhibits for the Refuge Visitor Center.

In September, Kivi, Marrs, and Ward transported and set up a mobile display depicting legal and illegal moose antler configurations at Soldotna's Kenai Peninsula Mall. The public was fascinated by the display, and people enjoy quizzing one another on "which racks are legal."

Ward continued work with Regional Graphic Arts Specialist, Patti Gallagher, on modular posters for Refuge bulletin boards. Themes include bear safety, boating safety, Refuge regulations, and watchable wildlife. Posters are planned for completion in spring 1996.

#### 7. Other Interpretive Programs

##### Visitor Center & "Keen Eye" Trail

The year-round weekend wildlife film series continued to be one of our most popular programs, attracting 4,750 of the Visitor Center's 20,850 visitors in 1995. Local newspaper and radio stations have provided excellent, free advertising for the series.

A total of 545 people from community organizations used the Visitor Center for wildlife-oriented meetings and programs. These groups included Kenai Peninsula Community College, Alaska Bowhunters, Scouts, Campfire Kids, 4-H clubs, summer youth camps, church youth organizations, seniors groups, mental health services, tour groups, and day care programs.

##### Visitor Contact Station (VCS)

The VCS operates Memorial Day to Labor Day each summer and is the first Refuge facility that visitors encounter when crossing our eastern boundary enroute from Anchorage to Soldotna, at mile 58 of the Sterling Highway. The VCS gives visitors general orientation, fishing, hiking, and wildlife viewing information.

During the summer of 1995 the VCS was closed due to construction work to expand parking and upgrade restroom facilities.

Field Interpretive Programs



SCA Sara Banks leading a nature walk.  
7/95 RKJ

Student Conservation Association (SCA) resource assistants Sarah Banks, Mandy Dunlap, Shannon Wadsworth, and Leigh Wallace hosted the Refuge's summer interpretation program. Fire Tech Amy George and Rangers Candace Ward and Maddy Duffy also assisted in leading interpretive programs. They collectively conducted nature walks, discovery hikes, children's programs, and campfire programs. One-thousand-five-hundred-twenty-five visitors attended their entertaining and informative programs.

In June, ranger staff lead interpretive programs for youth and adults at the Kenai River Festival. This community event coordinated by Alaska State Parks brought resource agencies, non-profit, and business groups together

in helping the public learn about the unique natural history of the Kenai River and techniques for safeguarding it.

### 8. Hunting

Sheep, goat, and small game seasons opened on August 10. Full-curl ram restrictions remained in effect. Thirty-seven rams were taken in Game Management Unit (GMU) 7 and GMU 15 in 1995 including 4 sub-legal rams. Goat hunters harvested 145 animals on the Kenai Peninsula. The total includes 89 males, 54 females, and two of unknown sex. Sheep and goat harvests are summarized in Tables 27 and 28, respectively.

Table 27. Total Dall's sheep harvest on the Kenai Peninsula, 1990-95 (source: Alaska Wildlife Harvest Summary, ADF&G).

<u>GMU</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>
7 <sup>a</sup>	8	14	5	7	4	
15	25	26	28	26	28	37**
Ewe Hunt <sup>b</sup>				8	5	8
Total				34	33	45

<sup>a</sup> GMU 7 sheep harvest is off-Refuge

<sup>b</sup> Round Mountain drawing permit hunt, 20 permits issued for ewes only

Table 28. Goat harvest on the Kenai Peninsula, 1990-95 (source: Alaska Wildlife Harvest Summary, ADF&G).

	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>
	<u>♂/♀</u>	<u>♂/♀</u>	<u>♂/♀</u>	<u>♂/♀</u>	<u>♂/♀/unk</u>	<u>♂/♀/unk</u>
GMU 7 <sup>a</sup>						
Drawing	15/10	22/ 8	37/15	39/29	29/14	34/18/1
Registration	17/ 8	27/13	33/15	16/10	27/6/1	22/14/1
Tier II		2/ 0	3/ 1		2/ 1	0
TOTAL (by sex)	32/18	51/21	73/31	55/39	58/21/ 1	56/32/2
TOTAL	50	72	104	94	80	100
GMU 15B						
Drawing	2/0	4/2	0/3	4/1	2/2	2/2
Registration	3/3		1/0	3/0	1/0	2/2
TOTAL (by sex)	5/3	4/2	1/3	7/1	3/2	4/4
TOTAL	8	6	4	8	5	8
GMU 15C						
Drawing	19/ 8	18/ 7	17/ 5	15/12	13/8	10/7
Registration	3/ 1	15/ 4	18/ 7	26/15	13/5	15/8
Tier II	1/ 4	11/ 0	16/ 4	5/ 1	19/5	4/3
TOTAL (by sex)	23/13	44/11	51/16	46/28	45/18	29/18
TOTAL	36	55	67	74	63	47

<sup>a</sup> goat harvest is off-Refuge

State and Refuge Officers and volunteers contacted sheep and goat hunting parties at Emma Lake, Green Lake, Twin Lakes, and Round Mountain. The Dall's sheep ewe season remained in place and 20 ewe permits were again issued; eight ewes were reported harvested during the permit hunt.

The 1995 calendar year brown bear harvest in GMU 15 reported five bears harvested. The fall brown bear season was closed by an emergency order to avoid over harvest; several brown bears were taken in defense of life and property (DLP) or were killed by managers and are included in the totals found in Table 29. A total of eight bears were taken in GMU 7 (spring and fall), including four sows and four boars.

Table 29. Brown Bear Harvest on the Kenai Peninsula, 1990-1995.

	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>
GMU 7*						
Boars	1	0	4	3	1	0
Sows	0	1	5	0	2	2
DLP	0	0	0	1	1	1♂
TOTAL	1	1	9	4	4	3
GMU 15A						
Boars	0	0	1	3	0	0
Sows	1	2	2	0	2	2
DLP	0	0	1	2	0	1♂
TOTAL	1	2	4	5	2	3
GMU 15B						
Boars	2	2	1	2	2	0
Sows	1	1	1	4	2	0
DLPS	0	0	0	2	2	0
TOTAL	3	3	2	8	6	0
GMU 15C						
Boars	3	4	7	3	2	2
Sows	3	1	2	1	1	0
DLP	0	0	2	1	5	5, 2♂, 3♀
TOTAL	6	5	11	5	8	7
GMU 7 & 15						
TOTALS	11	11	26	22	20	13

Black bear harvest in GMU 7 and 15 totaled 287 animals. The Refuge issued 23 special use permits for black bear baiting stations; 7 black bear (4 females and 3 males) were harvested at bait stations on Refuge lands (see Table 30). The black bear baiting season was delayed until May 1, 1995, by the State to reduce the possibility of defense of life or property kills of brown bears and to reduce the amount of unattended bait in the field.

The following summarizes the Refuge black bear baiting program for the past six years. In general, the number of permittees has declined steadily since 1991. Most black bears are harvested after the brown bear season (May 10-25). For the past five years, females have made up 46 percent of the harvest. Hunter success in 1995 was the highest ever.

Table 30. Black bear harvest on the Kenai Peninsula, 1989-1996.

<u>GMU</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993*</u>	<u>1994</u>	<u>1995</u>
7						
Boars	33	63	75	56	70	76
Sows	12	15	47	33	19	27
Unknown	1	2	4	3	1	-
15						
Boars	86	72	103	109	81	125
Sows	30	39	49	58	25	59
Unknown	1	4	7	2	2	-
DLP	0	0	0	1	4	4
Total	117	115	159	170	112	188

\*Bag Limit Reduced from 3/year to: 1 bear/spring and 1 bear/fall  
Includes road kill, illegal and DLP.

The regular GMU 7 and 15 moose hunt began on August 20 and continued through September 20. Moose hunter check stations were not staffed along Swanson River Road and other Refuge locations during 1995.

The GMU 15B (east) late season moose hunt continued until October 15. Eleven trophy moose were sealed during the early hunt and 13 during the late hunt for a total of 24 trophy moose taken in GMU 15B east in 1995. Several other sub-legal moose were reported in GMU 15B.

Five special use permits were issued to mobility-impaired hunters for entry on Refuge roads otherwise closed to vehicles. These special access areas were on oil field roads in the Marathon and Swanson River Road areas. Two of the permittees harvested moose. This success rate is considerably higher than the  $\pm 17$  percent for the general hunt.

The limited entry cow moose hunt in the Skilak Wildlife Recreation Area had 40 Permittees reporting 7 cows harvested. An additional 20 spike/fork antlered permits were issued for this area with 1 moose harvested.

For the third consecutive year, a large number of mistakes or illegal take of cow and sub-legal antlered moose occurred in GMU 15 and 7. Thirty-two incidents were documented, which included 8 cows. The large increase in the number of illegal takes which continued during 1995 is believed to be due to the longer season and perhaps the early season when antlers are partially obscured by velvet. The illegal harvest represented a decrease from 1994, which is believed to be the result of overall poor moose survival rates in the 1994/95 winter rather than improved hunter decision making. Moose harvest is summarized in Table 31.

Table 31. Total moose harvest on the Kenai Peninsula, 1990-95 (source: Alaska Wildlife Harvest Summary, ADF&G).

<u>GMU</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>
15A	90	174	135	222	238	117
Skilak Loop <sup>a</sup>	7	11	6	10	13	8
TOTAL	97	185	141	232	251	125
15B						
WEST	54	39	48	46	56	35
EAST	31	38	26	24	21	24
TOTAL	85	77	74	70	77	59
15C	200	294	184	271	308	192
Cow hunt	-	-	-	-	-	16
Illegal Take						
Cows	5	9	9	21	17	9
Bulls	25	34	20	32	36	23
TOTAL	30	43	29	53	53	32

<sup>r</sup> Season extended to 32 days

<sup>a</sup> Special season cow hunt by permit only and spike/fork moose hunt 1995 only.

<sup>b</sup> Illegal take not broken down by subunit and is included in subunit totals

Table 32. Total caribou harvest on the Kenai Peninsula, 1990-94 (source: Alaska Wildlife Harvest Summary, ADF&G).

<u>Herd</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>
Kenai Mountains	7	16	15	29	28	18
Kenai Lowlands	3	4	1	6 <sup>a</sup>	3	-
Killey River					11	8
Fox River						5

<sup>a</sup> No legal season after 1992, number is road kills and/or illegal take

Table 33. Big game harvest on the Kenai Peninsula, 1995.

<u>Species</u>	<u>Game Management Unit</u>				<u>7</u>	<u>Total Harvest</u>
	<u>15A</u>	<u>15B</u>	<u>15C</u>	<u>Total 15</u>		
*Brown bear	2	0	2	4	2	6
*Black bear	-	-	-	184	103	287
Caribou						
Mountain Herd		8	5	-	18	31
Lowland Herd	-	-	-	-	-	0
Dall's sheep	-	-	-	-	-	45
Mountain goat	-	-	-	-	-	155
Moose**						
General	117	35	192	344	42	386
Drawing	8	24	16	48	9	57

\*Does not include 7 additional defense of life and property kill, road and illegal kills.

\*\*Preliminary data - harvest report returns not complete

Source: Alaska Department of Fish and Game

Table 34. Black bear baiting summary for 1995 on the Kenai National Wildlife Refuge.

	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>
Total Permittees	74	63	49	32	23
Reporting Permittees	68	60	47	31	21
Reporting Permittees who hunted	33	22	28	25	13
Hunter Success Rate	24%	18%	39%	28%	46%
Total Harvest	12	6	14	9	7
Harvest Composition	5♀, 7♂	5♀, 1♂	7♀, 7♂	2♀, 7♂	3♀, 4♂
Dates of Harvests					
April 15-22	0	0	0	0	0
April 23-30	0	0	0	0	0
May 1-9	2	0	2	0	0
May 10-25	CLOSED FOR BAITING DURING BROWN BEAR SEASON				
May 26-31	3	3	6	3	2
Jun 1-7	3	1	3	3	1
Jun 8-15	4	2	3	3	4
Total Black Bear					
Observed	59	29	58	66	31
Total Brown Bear					
Observed	10	1	7	22	8

#### Subsistence Hunting

The subsistence issue hit the Kenai in a big way in 1995. Following a number of meetings by the South-Central Advisory Council (Council), recommendations went forward to the Federal Subsistence Board (Board) to establish positive customary and traditional use (C&T) determinations for some Kenai Peninsula communities for most species occurring on the Peninsula. After intense debate and heated community meetings, the Council and Board adopted C&T for Ninilchik, Port Graham, Seldovia, and Nanwalek for preferential access to moose in Game Management Subunits (GMS) 15B and 15C. A season was established from August 10-20 on federal lands within GMS 15B and 15C (the Kenai NWR) to provide for the mandated "preference." Antler restrictions were retained despite the Council's objections. In their actions, the Board deferred on a finding for GMS 15A. The Ninilchik Traditional Council (NTC) promptly filed suit against the Board requesting the removal of the antler restrictions and the granting of positive C&T in GMS 15A. In a negotiated settlement between the Board and NTC, the NTC was awarded permits for the Skilak Loop moose hunt (10 cows and 10 spike/fork bulls) in GMS 15A but retained the antler restriction in GMS 15B and 15C.

Permits for a fall 1995 subsistence season were issued from the Kenai NWR office in Soldotna and the Alaska Maritime NWR office in Homer. Kenai Refuge staff also traveled to Ninilchik in order to make permits available. One-hundred seventeen (117) permits were issued and one moose was taken during the hunt. Seventy-two (72) permittees returned reports with 40 of those reporting that they actually hunted.

The subsistence issue has evolved rapidly on the Kenai with tremendous public controversy. A timeline of significant events which occurred in 1995 follows.

- FEB 28: South-Central Council develops C&T recommendations for GMU's 7 and 15.

- MAR 6: Compatibility discussions with respect to Kenai NWR purposes are discussed internally.

- APR 13: The FSB proposes: 1) adopting C&T for seven peninsula communities with respect to six big game species; 2) establishing an August 10 moose season in GMU's 15B and 15C for four Peninsula communities; and 3) retaining Spike/Fork - 50" moose management.

- MAY 9: Proposed Rule published in Federal Register dealing with GMU's 7 and 15 C&T determinations and the 1995 moose hunt.

- JUN: Series of eight public hearings held around the Kenai area to take comment on the Proposed Rule. Two hundred nineteen people attend the Soldotna meeting. Support for the Board's proposals is scarce.

- JUL 7: ADF&G comments on the Proposed Rule questioning the rationale behind the C&T determinations.

- JUL 10: FWS comments on the Proposed Rule. Questions are raised as to the C&T findings.

- JUL 12: South-Central Council meets in Anchorage. Council decides to defer all actions except that for moose for the communities of Ninilchik, Port Graham, Nanwalek, and Seldovia. Council recommends: 1) C&T for Ninilchik and Seldovia in 15A,B and C; C&T for Port Graham and Nanwalek in 15B and C; 2) no antler restrictions; and 3) a season of August 10 - September 20.

JUL 13: The FSB: 1) adopts C&T for the four communities in 15B and C for moose; 2) defers any action on 15A; 3) sets a season of August 10 - September 20; and 4) maintains the spike/fork - 50" - three brow tine antler restrictions.

JUL 27: NTC files Request for Reconsideration (RFR) of the Board's action to defer 15A and maintain the antler restrictions.

AUG 2: NTC files suit in U.S. District Court. The suit requests the court to issue an injunction against the Board imposing the antler restrictions until the Refuge is closed to all other moose hunters, and that the court remand to the Board an order to authorize a hunt in GMU 15A.

AUG 9: Judge Sedwick denies NTC request to eliminate antler restrictions. He also determines that the court can not proceed with the pending action prior to exhaustion of administrative remedies.

AUG: FSB and NTC reach a settlement to allow some opportunity in 1995 without disruption of the entire moose hunting season.

AUG 29: Judge Sedwick, in considering the settlement agreement, determines that a stay of the NTC suit until administrative remedies are exhausted is more appropriate than a dismissal of the case. Judge Sedwick accepts the FSB/NTC settlement. Provisions are: 1) grant 10 permits for spike/fork bull moose and 10 permits for cow moose in the Skilak Loop Management Area to NTC for the 1995 moose hunt; 2) stay further proceedings until the NTC RFR is dealt with by the Board; 3) withdrawal of the preliminary injunction request by NTC and agreement not to file additional motions for preliminary relief with respect to the 1995-96 subsistence regulations for GMU 15; 4) the agreement does not constitute evidence or precedent in further or future proceedings; and 5) the agreement does not constitute an admission by the defendants that plaintiffs are entitled to any attorney fees or preclude the plaintiffs from seeking attorney fees for this action.

- AUG & SEP: Permits are issued for a 1995 subsistence moose hunt in GMS 15B and C.

- AUG & SEP: Subsistence hunt and general moose hunts proceed on the Kenai.

## 9. Fishing

*NOTE: Reported fishery harvests are compiled from Alaska Department of Fish and Game (ADF&G) data, reported the year after harvesting.*

The Kenai Peninsula's fresh water fisheries supported 592,176 angler-days, of sport fishing effort during 1994 (Mills, 1995). The Kenai River supported 334,130 of these angler-days.

The effects of intensive sport fishing activity on fish and wildlife populations and habitats continues to be evaluated in long and short term planning. Emergency closure authority to protect Kenai River shoreline habitat was used for the first time in the Kenai Refuge history in order to protect riverbanks from being impacted by salmon sport anglers (see Section C.2). Following a general trend of the past several years, the Russian River second run anglers appear to be increasingly using main stem Kenai destinations causing late run effort to be less.

As part of a river-wide increasing effort to protect riverbank habitats, the Refuge fenced off several access points along the Sterling Highway, between river miles 71 and 75. Anglers were asked to voluntarily avoid this area in order to evaluate closure compliance and effectiveness on protecting riverbanks. Compliance was probably 95 percent, however, damage still occurred to certain bank habitats. Low grassy banks are particularly susceptible to erosion even with very light bank angling pressure.

The Russian River early run escapement of sockeye salmon was 28,603 and the early harvest was 23,572 with approximately 31,011 man-days of effort. The early catch-per-hour ratio during 1995 was .190. Approximately 74 percent of the harvest and 69 percent of the effort occurred at, or just below, the

Kenai/Russian confluence. The second run total harvest was 11,986 and the escapement was recorded as 61,982. The catch-per-hour-ratio was .169.

The second run approximate man-days of effort totaled 17,781. Approximately 83 percent of the harvest and 81 percent of the effort occurred at, or just below, the Kenai/Russian confluence (see Table 36).

Table 35. Sport fishing effort and catch for waters on and adjacent to the Kenai National Wildlife Refuge during 1994 (Mills 1995).

Location	Species caught							
	Angler days	Chinook salmon	Coho salmon	Sockeye salmon <sup>a</sup>	Pink salmon	Rainbow trout	Dolly Varden <sup>b</sup>	Lake trout
<b>Kenai Peninsula Freshwater</b>								
	592,176	53,106	115,303	120,209	8,701	51,594	61,423	5,525
<b>Refuge Sport Fisheries</b>								
Kenai River	334,130	27,108	86,711	93,616	8,101	1,576	8,486	403
Russian River	65,996	0	6,682	108,897	671	11,744	4,443	0
Kasilof River	27,969	20,555	4,852	3,719	184	778	4,718	202
Hidden Lake	3,014	0	54	*426	0	271	102	1,272
Canoe Routes	9,793	0	2,305	967	0	17,244	1,681	0
Skilak Lake	1,586	0	154	716	0	614	772	302
Tustumena Lake	1,586	0	41	250	0	166	596	152

<sup>a</sup> Includes kokanee.

<sup>b</sup> Includes Arctic char.

<sup>c</sup> Sport fisheries on the Kenai Refuge or supplemented with Refuge produced fish.

<sup>d</sup> Swanson River and Swan Lake canoe routes.

Table 36. Estimated sockeye salmon harvest, effort and success rates on Russian River, 1973-1995

Year	Harvest			Total Effort (Man-Days)	Catch Per Hour	Census Period
	Early Run	Late Run	Total			
1973	6,740	8,930	15,670	30,690	0.102	06/08-08/19*
1974	6,440	8,500	14,940	21,120	0.131	06/08-07/30*
1975	1,400	8,390	9,790	16,510	0.140	06/14-08/13*
1976	3,380	13,700	17,080	26,310	0.163	06/12-08/23*
1977	20,400	27,440	47,840	69,510	0.168	06/18-08/17
1978	37,720	24,530	62,250	69,860	0.203	06/07-08/09
1979	8,400	26,830	35,230	55,000	0.136	06/09-08/20*
1980	27,220	33,490	60,710	56,330	0.245	06/13-08/20
1981	10,770	23,720	34,440	51,030	0.156	06/09-08/20
1982	34,500	10,300	44,820	51,480	0.261	06/11-08/04**
1983	8,360	16,000	24,360	31,890	0.117	06/08-08/09**
1984	35,880	21,970	57,850	49,550	0.238	06/04-08/19**
1985	12,300	58,410	77,710	50,770	0.286	06/13-08/16**
1986	35,099	30,813	66,012	51,400	0.240	06/14-08/20**
1987	154,189	40,575	194,790	113,012	0.431	06/08-08/20
1988	50,820	19,540	70,356	72,023	0.264	06/13-08/09*
1989	11,290	55,210	61,500	60,569	0.284	06/09-08/20*
1990	30,215	56,175	86,390	84,710	0.255	06/12-08/20*
1991	65,390	31,450	97,840	96,161	0.290	06/01-08/20
1992	30,512	29,646	60,158	60,449	0.238	06/12-08/18
1993	37,261	38,289	75,550	57,491	0.277	06/11-08/20
1994	48,723	26,375	75,298	65,814	0.279	06/11-08/17
1995	23,572	11,986	35,558	48,792	0.179	06/11-08/20

\* Census period was not continuous during these years due to emergency closures required to increase escapement levels.

\*\* Census period was not continuous during these years due to negligible fishing effort after completion of the early run and prior to the end of the late run.

Table 37. Kenai Peninsula freshwater sport fisheries, 1994.

	<u>Days Fished</u>		<u>Est. % occur. on KNWR</u>
	<u>(non-guided)</u>	<u>(guided)</u>	
Kenai River: (Soldotna Bridge to Moose River)	56,898	14,542	10%
Kenai River: (Moose River to Skilak Outlet)	33,339	5,883	15%
Kenai River: (Skilak Inlet to Kenai Lake)	52,602	6,696	70%
Russian River	65,996		70%
Kasilof River	50,819		3%
Swanson River	5039		75%
Other Rivers	3,220		20%
Swanson River/Canoe Lake System	2,498		100%
Swan Lake/Canoe Lake System	1,295		100%
Other Lakes	15,670		40%
Tustumena Lake	1587		100%
Skilak Lake	1,805		100%
Hidden Lake	5,030		100%
Rainbow Lake	519		100%
Stormy Lake	1,089		25%

The statistics in Table 37 represent survey data for 1994 published during 1995.

#### 10. Trapping

The Refuge issued 57 special use permits for trappers during the 1994-95 trapping season. Thirty-four Permittees returned their trapping harvest reports on time. Reminder letters were sent via certified mail to the 23 persons who had not reported. A total of 56 harvest reports were received by October 1, 1995. Twenty-four Permittees did not trap on the Refuge.

Twelve of 32 trappers who reported trapping on the Refuge were unsuccessful. The other 20 trappers succeeded in harvesting 35 mink, 18 ermine, 23 coyotes, 5 beaver, 11 wolves, 2 otter, and 4 wolverine. Activity averaged 39.0 days and 11.1 sets per trapper.

Most of the trapping pressure occurred near Skilak Lake, Swanson River/Swan Lake Roads, Moose River, Kasilof River, Slikok/Coal Creeks, and Tustumena Lake.

The Refuge Trapper Orientation course was presented on November 2 at the Refuge Headquarters. Thirty-eight trappers attended. Ted Spraker (ADF&G area game biologist) and Reuben Hanke (president of the local chapter of the Alaska Trappers Association) were guest speakers. Other presenters

included Wildlife Biologist/Pilot Ernst, Acting Refuge Manager Chase, and Refuge Officer Johnson.

Table 38. Reported aquatic furbearer harvest on the Kenai National Wildlife Refuge for 1995.

<u>Season</u>	<u>Total Permits</u>	<u>Reports Received</u>	<u>Beaver Total</u>	<u>Otter Total</u>	<u>Muskrat Total</u>	<u>Mink Total</u>
1990-91	52	52	7	4	5	16
1991-92	55	55	13	6	10	63
1992-93	63 <sup>a</sup>	40	31	11	6	27
1993-94	70 <sup>b</sup>	66	16	5	1	70
1994-95	58 <sup>c</sup>	57	5	2	0	35

<sup>a</sup> averages based on 40 permits (returned harvest reports)

<sup>b</sup> averages based on 66 permits (returned harvest reports)

<sup>c</sup> averages based on 57 permits (returned harvest reports)

Table 39. Total reported land furbearer harvest on the Kenai National Wildlife Refuge in 1995.

<u>Season</u>	<u>Total Permits</u>	<u>Reports Received</u>	<u>Coyote Total</u>	<u>Wolverine Total</u>	<u>Weasel Total</u>	<u>Wolf Total</u>
1990-91	52	52	22	0	6	3
1991-92	55	55	35	3	3	0
1992-93	63 <sup>a</sup>	40	21	1	0	7
1993-94	70 <sup>b</sup>	66	22	1	24	13
1994-95	58 <sup>c</sup>	57	23	4	18	11

<sup>a</sup> averages based on 40 permits (returned harvest reports)

<sup>b</sup> averages based on 66 permits (returned harvest reports)

<sup>c</sup> averages based on 57 permits (returned harvest reports)

## 11. Wildlife Observation

Many Refuge visitors make inquiries regarding wildlife viewing opportunities during stops at the Visitor Contact Station and the Visitor Center. They are encouraged to get an early start and stay out late to have the best chances of seeing critters.

Spruce Grouse are readily seen along Refuge roads; Dall sheep can be seen with the Refuge-provided spotting scopes at the Russian River Access Area; and moose can be encountered at any time of the year on roads and trails throughout the Refuge. Brown and black bears, while not always visible, make their presence known along Refuge trails with their droppings and claw marks on trees. Black bears are occasionally seen along the Skilak Loop Road and the Swanson River/Swan Lake Roads.

Beaver viewing has been significantly enhanced as a result of trapping restrictions at roadside lakes and day-use trails. A spotting scope at the

end of the Keen-Eye Trail at the Visitor Center allows visitors to view loons, gulls, and an occasional Bald Eagle. Eagles are also readily seen along the upper Kenai River during the fall and winter, as they feed on the last of the salmon.

The Refuge maintains a variety of roadside wildlife/wildland observation points along roadways. Swans, moose, beaver, eagles, waterfowl, passerines, and other wildlife can be seen at these locations. Overlooks/observation points have been established on Skilak Loop Road at two sites: 1) overlooking the Kenai River inlet into Skilak Lake, and 2) at a site overlooking Engineer Lake, the west end of Hidden Lake and the west face of Hideout Mountain. Both locations have commercial-grade spotting scopes installed during the summer season. Wildlife observation opportunities can be excellent at these sites, and as funds become available, we will install interpretive signing to aid visitors' wildlife/wildland viewing.

#### 12. Other Wildlife-Oriented Recreation

A busy canoeing/boating season began in earnest in May, as visitors took to the waters in pursuit of recreational activities. The traditional Memorial Day weekend "opener" for summer activities saw all Refuge launch sites, campgrounds, and canoe trails at capacity. The traditional Memorial Day weekend denotes the start of the "crazy time," while Labor Day marks its' end.

The Swan Lake and Swanson River Canoe Trails continue to be popular areas for Refuge visitors; an estimated 5900 visitors pursued Refuge recreation opportunities within the two systems. Canoeists generally participate in multiple activities while on the canoe trails, including camping, fishing, wildlife observation, and hunting (during the moose season). Facility maintenance and monitoring within the systems was conducted by the back country crew throughout the summer. Their patrols were augmented by Youth Conservation Corps (YCC) spike camps along designated portions of the routes.

Dan Quick, of Northlite Inc., completed a guide to the canoe systems. The comprehensive guide to these popular wilderness trails has rapidly become a "must have" for system users. It is carried as a sales item in our cooperating association sales outlets.

#### 13. Camping

This year, more than 62,000 visitors spent the night on the Refuge in campgrounds or back country areas. Although our developed campgrounds remain popular with the recreational vehicle and car-camping set, the back country trails are also receiving substantial use. Many of the more popular campsites within the canoe trail systems and along the Swanson and Kenai Rivers have been heavily impacted. It is likely that some restrictions may be imposed to limit adverse impacts. The Public Use Management Planning Team has identified this as an issue to be addressed.

Hidden Lake Campground continued to be a popular destination for visitors and the improved Upper Skilak Campground also proved popular. These are the only campgrounds where user fees were collected this year.

The Kenai/Russian River Access Area continued to be a popular recreation area during the year. The Refuge Concessioner collected fees from 11,763 vehicles using this area during his 60 days of operation. No fees were collected after the concessioner ceased operation of the ferry at the end of the sockeye run. Visitor use and revenue data for this area are displayed in Section H.19.

Planning continued for rehabilitation of the Lower Skilak Campground this year. The Interagency Brown Bear Team (IBBT) raised concerns regarding migration corridors in the area which will influence the level of development at this site. At years' end, a "compromise" initial level of development was agreed upon which will allow for increased parking area for boat trailers. The U.S. Fish and Wildlife Service, ADF&G, and the National Parks Service will conduct a study which will hopefully provide data which will be used to determine the final level of development. Details of the study are found in Section D.5, Research and Investigations.

#### 14. Picnicking

This activity generally occurs as an aside to other visitor activities, such as fishing, wildlife observation, and environmental education.

#### 15. Off-Road Vehicles

Snowmobile use in general appears to be increasing at most locations on the Refuge including Caribou Hills.

Ice fishing utilizing highway vehicles on frozen lakes where vehicles can enter and exit via a developed boat ramp appears to be a very popular program. "Copy cat" use by others driving vehicles on frozen lakes open for ice fishing access only and on unsafe lakes such as Skilak remains a problem.

Unauthorized off-road vehicle use has accelerated near Torpedo Lake where control of access is difficult and Native lands predominate. Unauthorized use below mean high water on this section of the Kenai River is of particular concern. Other areas that are being monitored closely are several Refuge rights-of-way, Tustumena and Skilak Lake inholder access routes, Caribou Hills, Mystery Creek Road, and Chicklagoon estuary on the western beach access.

At years' end, the 1995/96 snowmobile use season had not been opened due to lack of snow.

Table 40. Snowmobile operation opening and closing dates on the Kenai National Wildlife Refuge from 1976 to 1996.

<u>Winter</u>	<u>Opening date</u>	<u>Closing date</u>
1976/77	December 20, 1976	April 30, 1977
1977/78	January 25, 1978	April 30, 1978
1978/79	December 7, 1978	April 30, 1979
1979/80	December 14, 1979	April 30, 1980
1980/81	NOT OPENED	
1981/82	December 1, 1981	April 5, 1982
1982/83	December 1, 1982	March 23, 1983
1983/84	January 6, 1984	March 17, 1984
1984/85	March 6, 1985	April 26, 1985
1985/86	NOT OPENED	
1986/87	January 10, 1987	April 1, 1987
1987/88	December 1, 1987	April 22, 1988
1988/89	December 1, 1988	April 19, 1989
1989/90	December 1, 1989	April 16, 1990
1990/91	December 5, 1990	April 12, 1991
1991/92	December 1, 1991	April 27, 1992
1992/93	December 4, 1992	January 27, 1993
1993/94	January 5, 1994	February 27, 1994
1994/95	December 1, 1994	April 30, 1995
1995/96	not opened in 1995	

#### 16. Other Non-Wildlife Oriented Recreation

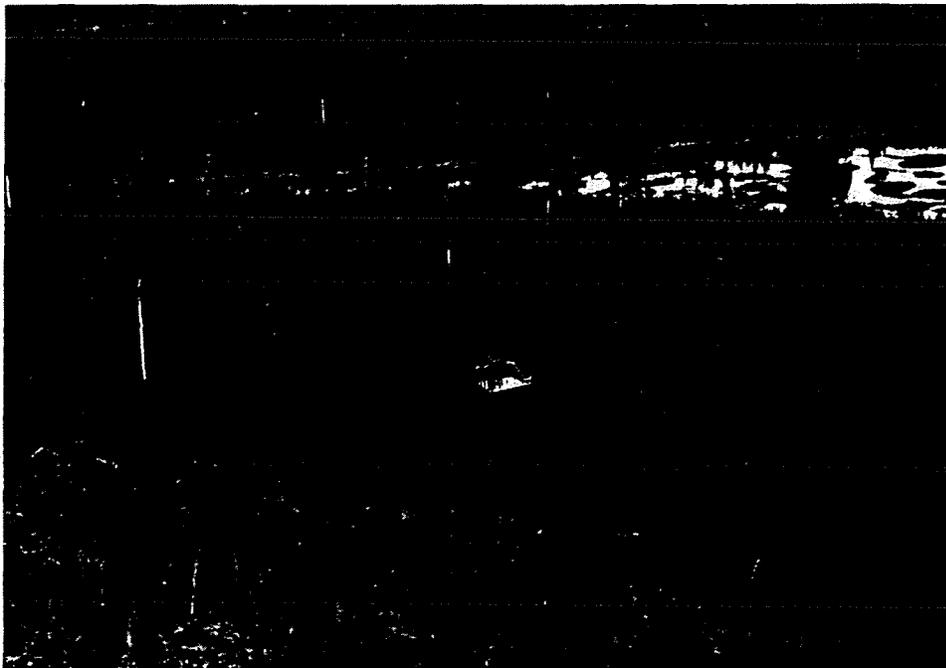
Cross-country skiing is a popular Refuge activity during the winter. There are 14 miles of Refuge-maintained trails around the Visitor Center. Many times during the season the parking lot was full of vehicles whose occupants were utilizing these trails. Additionally, skiers utilized hiking trails and open areas on the Refuge.

#### 17. Law Enforcement

The Refuge had three permanent Refuge Officers which include Refuge Officer Johnson, Ranger/Pilot Johnston, and ARM Chase. Additionally, three seasonal commissioned officers were on staff in 1995. Rob Barto and Mike Welsh returned as seasonal Law Enforcement Officers and Greg George returned after working one season with Alaska State Parks.

Chris Johnson assisted with firearms instruction at the annual in-service law enforcement training at Davis Monthon Air Force Base in Arizona. Chris obtained his instructor training in Pressure Point Control Tactics and also assisted with the defensive tactics sessions at the annual law enforcement (LE) in-service.

Mark Chase assisted with patrols during the moose hunting season. Rick Johnston added air support to the LE program as well, and his experience and many contacts contributed to several cases.



A large tree stand was discovered near Flat Lake. An increase in illegal tree stands has been a growing concern of Refuge officers. RKJ

On January 26, 1995, two Refuge-permitted trappers working together in the area of Mystery Creek and the gas pipe line north to Chickaloon Flats, reported two of their traps had been stolen. They also reported they had observed snowmobile tracks circling the area where the traps had been set. In one of the trap locations they observed wolf tracks with drag marks from the grapple drag on the trap and a skinned carcass of a wolf. Alaska Department of Fish & Game was alerted and notified and wolf sealing agents in Soldotna, Homer, and Anchorage were asked to look for anyone attempting to seal a wolf that was taken in the Mystery Creek area. On January 27, 1995, Officer Chris Johnson was informed that a suspect had attempted to seal a wolf he had killed near Trapper Joe Lake on January 20, 1995. On February 17, 1995, Officer Johnson interviewed a suspect regarding the details of the wolf he had sealed. The suspect admitted taking a wolf and leaving the skinned carcass along the gas pipe line and transporting the (illegally taken) wolf to Knights Taxidermy in Anchorage. The defendant was charged with Lacey Act violations and paid fines of \$250 for each violation.

There were 201 violation notices issued in 1995. Sixty-four percent of those were fishing related infractions. There were a number of big game hunting cases handled by the Refuge; 10 Notices of Violation were issued for various big game hunting violations (see Table 41 ).

Table 41. Kenai National Wildlife Refuge violations 1987-1995.

<u>Violation</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>
Snagging fish.....	7	21	31	33	31
Fishing closed waters.....	36	15	12	5	16
Overlimit fishing.....	17	16	14	8	14
Fishing without a license.....	11	9	16	7	5
Other fishing violations.....	69	51	59	46	64
Snowmachine violations.....	0	3	3	0	3
Motor boat closed area.....	4	1	0	0	6
Unauth. use of motor veh. ....	7	8	15	6	10
Illegal parking.....	19	19	5	25	0
Illegal aircraft landing.....	0	0	3	0	1
Illegal fireworks.....	1	2	0	0	0
Weapons violation.....	3	0	2	0	7
Violation of big game regs. ....	10	5	10	2	8
Migratory Bird Hunting Act.....	4	18	8	2	9
Littering.....	3	1	0	1	1
Unauthorized structure.....	0	1	1	0	0
Illegal woodcutting.....	4	2	0	3	3
Speeding.....	1	4	1	3	2
Unattended fire.....	3	0	0	4	0
Interference with officer.....	1	0	1	0	1
Destruction of property.....	0	0	0	0	1
Permit violations.....	1	4	4	1	0
Violation Coast Guard regs.....	8	3	3	7	5
Violation Refuge Spec. regs.....	5	2	2	6	1
Trapping violations.....	5	2	3	0	1
Lacey Act.....	0	0	2	1	2
Violation of control. subs. ....	0	0	9	9	5
Violation of bear baiting regs...	1	2	2	2	0
Theft.....	0	0	0	0	1
Violation of traffic code	5	0	1	4	4
Total	225	190	212	170	201

#### Officer Assault

While conducting a law enforcement surveillance in the area of the origin of the Kasilof River near Tustumena Lake within the Kenai National Wildlife Refuge, Officer Johnson observed five people fishing illegally. Two of the people he recognized from past contacts as LARRY KEEN and his thirteen-year-old son. Johnson contacted the group and was confronted by LARRY KEEN, who was armed with a revolver in a shoulder holster. KEEN refused to give up his gun and put his hand on the weapon and dared Officer Johnson to take it from him. Officer Johnson attempted to secure evidence of the fishing violations and a scuffle over KEEN's fishing poles ensued, ending when KEEN picked up a metal pipe with which Officer Johnson believed he was going to use to strike him. The other four people were also uncooperative but were not combative. The subjects got in KEEN's boat. They were told

if they attempted to leave they were going to be arrested. They all left in KEEN's boat.

KEEN turned himself in to the Alaska State Troopers the next day and was interviewed by Service Special Agents from Anchorage. LARRY KEEN plead guilty to 18 USC 111, assaulting a Federal Officer and received a \$4,000 fine and three years probation. During probation, he is not allowed to possess a firearm. The other four people involved received \$200 fines for their illegal fishing activities.

#### Other Incidents

On June 6, the Refuge was contacted by the Alaska State Troopers regarding an incident at Bottenintnin Lake. Troopers received a report that a woman had sustained an injury, possibly from a stray bullet fired from or near Bottenintnin Lake area. The woman had apparently sustained a gash in the back of the head while looking through binoculars. Investigation revealed that the woman's husband had struck the woman on the back of the head with a rock while she was looking through some binoculars and then he made up the story about the stray bullet. The man was charged with Assault in the Third Degree in State Court. The man and woman fled the State and the case was dismissed.

On June 20, Officer Welsh received a report from the construction contractor at Jims' Landing that there were several subjects that appeared to be under the influence of alcohol. When Officer Welsh arrived, he observed three vehicles leaving the area that matched the description of the subject's vehicles. Officer Welsh stopped the vehicles and ran record checks on the drivers. Welsh started to do sobriety checks when one of the subjects identified as JOHN WALSH took off running. Officer Welsh pursued but was not able to catch the subject; he returned and completed his sobriety tests on the other two. One of the subjects was found to be under the influence and arrested. Shortly after the subject was arrested, WALSH was captured and also placed under arrest and charged with driving while under the influence in State Court.

Hidden Lake Campground again was a popular party area for local youth in the spring. Several special patrols were made in an effort to keep things under controll. The Alaska State Troopers assisted Refuge Officers on two occasions helping to control the young partiers. On several evenings all the vehicles entering the campground were stopped and the occupants of the vehicles were warned about the use of alcohol by minors. All occupants of the vehicles that were contacted were asked if there was any alcohol in the vehicle. If the occupants of the vehicles were minors they were given a chance to voluntarily give up their alcohol without being cited for minor in possession of alcohol. Three cases of beer were seized as a result. Despite the special patrols and vehicle checks, a beer keg did surface one night. One individual was arrested and a number of individuals were cited for under-age drinking. There was some minor resource damage done to some of the campsites and there were some reports of stolen coolers.

There was a great deal of heated debate regarding the subsistence moose hunt that took place on the Refuge. There were also threats of physical

violence against Refuge employees if the hunt took place, but none of the threats were carried out. Several special patrols were conducted for the subsistence hunt but no significant cases were made.

This year seemed to be a particularly bad year for illegal road hunting activities along Skilak Loop and Swanson River Roads. There was an increase in grouse hunting activities due to weather conditions and the abundance of birds along the roads. Skilak Loop area, which is only open to hunting small game with a bow and arrow, seemed to have a high incidence of illegal firearms hunting evidence by the amount of spent casings found along the road and reports from the public and Officers in the area. Fifteen Notices Of Violation were issued for various road hunting violations, with the most common and dangerous violation being shooting from, on, or across the road. One technique we used to combat the problem was to patrol the roads until a live grouse was observed in the road the officers would then either drop off an officer or, if working alone, the officer would find a location to hide his vehicle. Then they would stake out the live birds until the birds left or somebody stopped to shoot at the birds. Approximately 95 percent of the time somebody came along and shot at the birds while the officers were present, the shooter shot from the road. In 1996, Refuge Officer Chris Johnson plans on using decoy grouse to combat this dangerous problem.

Refuge Officers made five arrests in 1995. Four arrests on outstanding State of Alaska warrants; one of which was for an outstanding felony warrant for violation of parole conditions. One subject was also arrested for disorderly conduct when he pulled down his pants on the Russian River Ferry and wiggled his endowment at a Refuge Officer and the rest of the ferry passengers. All the prisoners were taken to Wildwood State detention center and booked into jail.

#### 18. Cooperating Associations

Final 1995 sales for the Refuge's Alaska Natural History Association (ANHA) cooperating sales outlet (Kenai branch) totaled \$20,072.

Proceeds from cooperating association sales were used for volunteer awards and were especially instrumental in creating honorariums for outstanding volunteer contributions in 1995. Association funds were used for conducting environmental education workshops for teachers and youth leaders. Without ANHA funds, these programs would be severely limited.

Proceeds from sales were used to publish "Refuge Reflections," a summer visitor information newspaper. In addition, the Refuge, through ANHA proceeds, created a "Kenai Keepers" salmon-shaped pin given as a reward to visitors who did positive acts on the Refuge, thus becoming caretakers or "keepers" of the Refuge.

#### 19. Concessions/Commercial Operations/Special Use Permits

Tawah Trading Company's contract to operate the Russian River Ferry and collect fees at the Kenai/Russian River Access Area was renewed in 1994 due to the urgent need for management of the adjacent Sportsman's Lodge

property. The property was purchased in 1993 by the State using Federal Aid (Dingel-Johnson) funds and the Regional Director signed a lease agreement to provide for Service operation in conjunction with the Russian River Ferry/Access Area. The present contract (No. 1448-0007-94-6744) includes a clause allowing for cancellation of the contract if improvements to the Sportsman's property are completed by June, 1996. Under those conditions, a new contract will be developed and put out for bid.

A total of 11,763 vehicles were accommodated and \$60,631 in access fees were collected. The concessioner's ferry transported 31,853 passengers for user fees of \$123,441. The concession contract includes a clause exempting Tawah from paying a percentage of gross receipts to the government; in return, the concessionaire provides free ferry passage for State and Refuge employees and pays for toilet pumping/dumpster service during the time the ferry is in operation. The contractor also collected \$4,815 in boat launching fees on the State-owned Sportsman's Lodge property. The State allows the contractor to retain these fees in exchange for "administration of the fee program."

Permitees were again required to have permit application requests to the Refuge by April 1. The application was again revised and updated for prospective permittees.

Most Special Use Permits (SUP) for various commercial visitor services were issued by June 1; a total of 80 individuals or businesses obtained annual permits, and provided approximately 17,633 visitor days of use. This figure does not include Russian River Campground and/or ferry use or clients accompanying most Kenai River guides on Refuge portions of the middle Kenai River below Skilak Lake. An additional 28 individuals obtained incidental permits for the upper Kenai River (see Table 42). All visitor service permits were reviewed for compatibility with Refuge purposes as part of the Service-wide effort to insure the compatibility of Refuge uses.

A request to conduct a sockeye salmon fishing derby was received from Robert Siter of Gwinn's Lodge. Refuge Manager Doshier was not supportive of the proposal. The derby was never held.

The remaining two years of an original five-year big game guiding permit was offered for competitive application. The permit had been held by Duncan Kishbaugh, but was relinquished. Bruce Willard of Willard's Moose Camp, the historical operator in GMU 15C, was the successful applicant. Willard had failed to apply for the area during the five-year prospectus offering in 1992 and had been attempting to continue his big game guiding/outfitting business.

Special Use Permits were issued or are current for the following activities: commercial firewood (33), trapping (58), guide/outfitter (66), 3-day incidental (28), cow moose hunt (40), bull moose hunt (20), use OEC (22), air taxis (12), tent camps (3), transporters (3), cut poles (4), bear baiting (33), mobility impaired hunters (5), fish studies (6), dog sled racing (1), gravel use (2) military exercises (1), rights-of-way (3), antler collection (2) seed collection (1), surveys (3), audiovisual (2)

aircraft tiedowns (3), dog trials (1), big game guide (1), phone booth (1), inholder access (1), aircraft salvage (1), inholder firewood (1). The total number of permits issued in 1995 was 357.

Table 42. Upper Kenai River annual permit total and guided recreational visits on the Kenai National Wildlife Refuge for 1984-1995.

Year	<u>Guided Sportfishing</u>		<u>Scenic Floats</u>	
	<u>No. Special Use Permits</u>	<u>No. Visitors</u>	<u>No. Special Use Permits</u>	<u>No. Visitors</u>
1984	11	597	3	950
1985	13	581	3	866
1986	12	580	5	826
1987	20	*	*	*
1988	20	*	*	*
1989	20	1400	*	1129
1990	20	1500	*	2430
1991	20	1700	*	2800
1992	20	2200	14	3200
1993	20	3298	15	6463
1994	20	3817	15	6519
1995	18	4402	16	7005

\* data not available

<sup>1</sup> guided sportfishing permits capped at 20

Table 43. Guided recreational visits occurring on Kenai National Wildlife Refuge, 1995.

	<u>Number Permits</u>	<u>Number Visitors</u>	<u>Total Visits</u>
Upper Kenai River			
Sport Fishing	18	4378	4402
Upper Kenai River			
Scenic Floats (Rafting)	16	6952	7005
Lower Kenai River			
Sport Fishing	11	3500	3600
Fly-in Tent Camps	3	238	894
Guides/Outfitters	5	9	45
Big Game/Transporters	9	76	189
<u>Other</u>	<u>28</u>	<u>1003</u>	<u>1498</u>
*Total	90	16,157	17,633

\*Several permittees utilized multiple Refuge areas, so column total exceeds total 1995 permits issued.

Several unauthorized design features on fly in tent camps that were discovered in a 1994 inspection were corrected [REDACTED]

Table 44. Tent camp use from 1990 to 1995.

	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>
<u>KETCHUM</u>					
SNAG (3 camps)					
People	32	36	44	31	11
Days	86	118	116	77	26
*Total	258	450	280	142	66
McLain (2 camps)					
People	6	8	8	130	27
Days	28	45	59	205	86
*Total	154	350	404	278	194
Wilder.					
People	23	31	39	43	30
Days	61	85	110	105	77
*Total	183	245	215	178	221
<u>RUST</u>					
Bird					
People	41	35	37	19	11
Days	115	92	129	54	29
*Total	230	166	236	102	55
Tangera					
People	11	13	9	3	1
Days	25	36	25	11	2
*Total	50	75	95	22	2
King**					
People			5	24	25
Days			14	69	61
*Total			26	125	114
<u>AK BUSH CARRIER</u>					
Mull (2 camps)					
People	38	41	12	18	25
Days	112	120	24	54	75
*Total	224	240	48	152	150
Bedlam (2 camps)					
People	26	29	14	13	16
Days	116	118	58	39	46
*Total	232	236	144	83	92
<u>Alaska Air Guides</u>					
King***					
People					13
Days					34
*Total					69

\* Total use days per tent camp site.

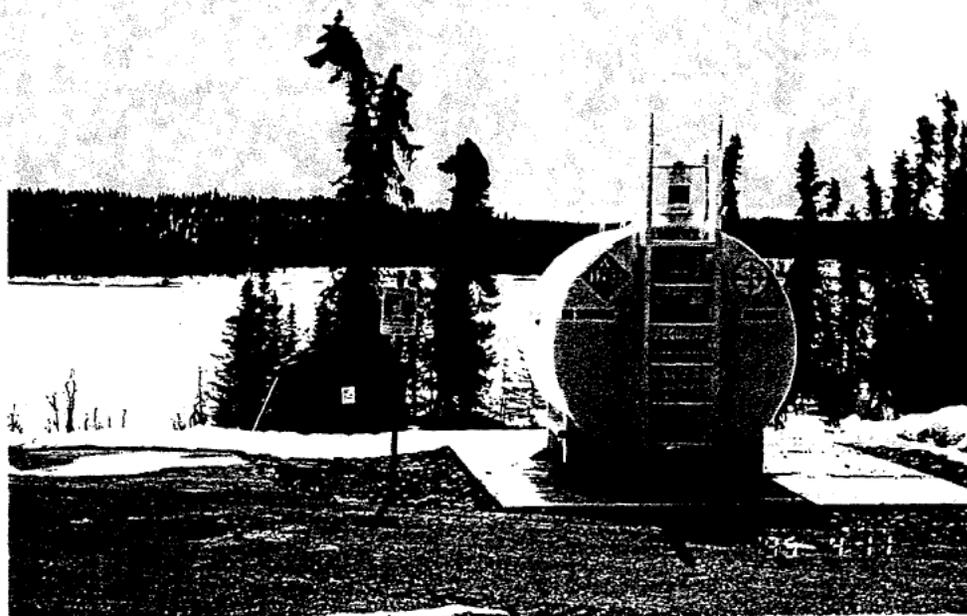
\*\* Scenic Lake closed due to swans, camp moved to McLain Lake in 1986 season.

\*\*\* King Lake only one camp after 1994.

## I. EQUIPMENT AND FACILITIES

### 1. New Construction

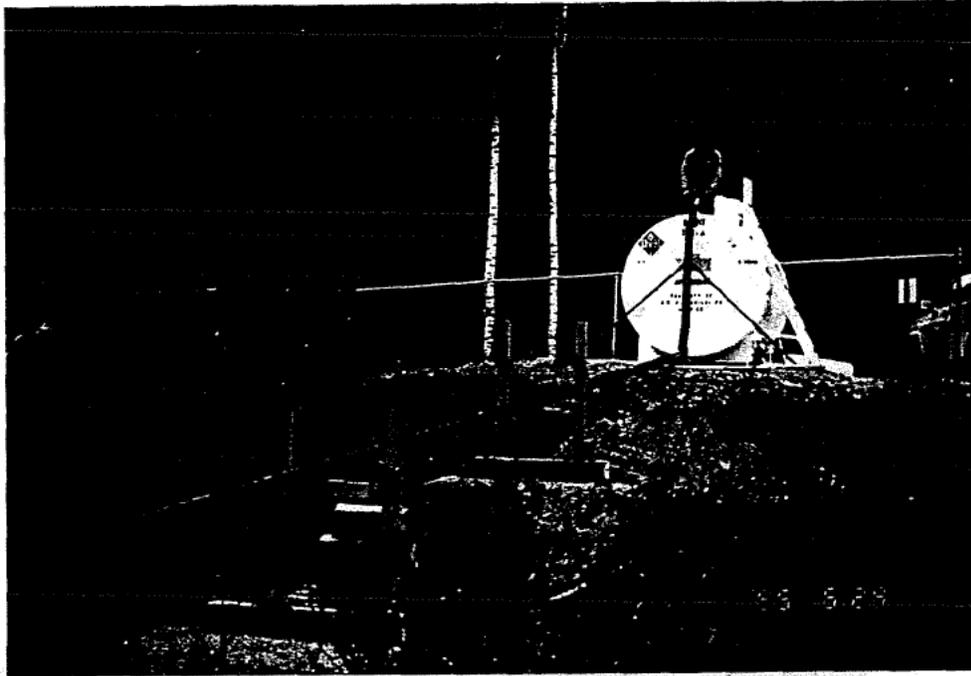
A new 1000-gallon above ground aviation fuel tank was installed at Headquarters Lake. The dispensing pump was relocated from the lakeside "fuel shack" and wired directly to the new tank. Fitted with all the latest "bells and whistles," the unit replaced an old 2000-gallon underground tank removed in 1993. The area was later secured with a 10-foot high chain link fence as one of several Youth Conservation Corps (YCC) projects.



New 1,000-gallon aviation fuel tank at Headquarters Lake replaced the old 2,000-gallon underground tank at same location. JF.

A 16-foot-x-12-foot wooden beam loading dock was constructed in the boneyard to provide a dedicated space for storage of fuel drums as well as other hazardous materials being held for disposal.

The concrete outhouse, installed at the recreational vehicle (RV) dump station on Skilak Loop in the fall of 1994, was finally completed and made ready for use in June.



Mechanic Al O'Guinn "engineered" a creative fuel dispensing system for the 80-foot span between the tank and fuel pump along the shore of Headquarters Lake. JF

## 2. Rehabilitation

### Jims' Landing

Following a multi-year process to rehabilitate the Jims' Landing facility, a contract for construction was finally awarded in 1995. The process began years ago when the Refuge began an Environmental Assessment to determine what Jims' Landing should look like and how it should function. Almost all involved agreed that the best use of the facility was as a boat take-out and put-in; limited upland real estate at the site prevented Jims' from being "all things to all people." In a nutshell, substantive changes resulting from the process included upgrading the access road, construction of a large vehicle turnaround, and the elimination of overnight camping in order to relieve congestion. The construction contract was awarded to D&L Construction of Cooper Landing and work began with the spring thaw. The roadbed was completely rebuilt, campsites were converted to parking spaces, a new vehicle turnaround loop was constructed to within four-feet of the Kenai River's north bank, and a worker removed material from the Refuge to place in an unpermitted wetland fill in Cooper Landing. This was all done, or so we're told, in compliance with the contract specifications. Ensuing heated debates among the public, within the Service, between the Service and contractor, the Refuge and the public, the public and the press, the Refuge and the press, and the Service and its partners followed. In the new era of protecting the Kenai River, the Service had permitted

construction of a hard-surfaced road (see section D.1) within four-feet of the River's bank. Needless to say, we managed to look silly (see photo).



Turnaround loop roadbed constructed to within four feet of the River's edge at Jims' Landing.

RKJ

Following construction, planning began on "righting the wrong" and extensive discussions ensued among the Refuge, Engineering, Contracting, Ecological Services (WAES), Alaska Department of Fish and Game (ADF&G), Department of Natural Resources (DNR), and others. Almost all agreed that the road next to the river had to be moved and the bank reclaimed. In September, heavy rains caused significant flooding throughout the Kenai River system and, as predicted, the first flood did in fact wash away the 175 feet of bank between the river and the turnaround loop road (see photo). Holdouts for the idea that the road might stay were swayed and attention focused on reclamation and bank stabilization of the site. Numerous meetings were held throughout the fall of 1995 and early winter of 1996 in order to develop site treatments for the various impacted sections of the north bank of the Kenai River within the Jims' Landing footprint. Rehabilitation work will be completed in 1996 using Refuge staff for labor with funding from a Fish and Wildlife Service (FWS)-ADF&G challenge grant.

#### Sportsman's Lodge Property

Planning efforts to rehabilitate the Sportsman's property were accelerated in 1995 in order to make the area more manageable. The Sportsman's property is owned by the State of Alaska but managed, under a cooperative agreement, as an adjunct unit of Kenai NWR. Lack of organization within

the site causes perennial traffic flow problems which need to be rectified. After several meetings, headed by Regional Engineering staff, it became apparent that both the Service and the State (ADF&G) had internal disagreements among divisions of what the Sportsman's property should actually look like and how it should function. Following impacts to the site by the fall flooding, it became apparent that little progress could be made until ADF&G provided the Service with a position on what exactly they wanted out of the Sportsman's site. No further progress was made by year's end.

Alaska Roadbuilders, Inc., was awarded a contract for repairing a section of badly frost-heaved asphalt at the Kenai Hangar. A 90-foot-x-3-foot strip was removed just inside the doors and resurfaced. New pulleys and cables were installed in the two bi-fold doors.

Under a negotiated agreement between Arco Alaska, Inc. and Unocal Corporation, the 3500 foot airstrip along the eastern boundary of the Swanson River Field was rehabbed by "feathering" perimeter vegetation, stockpiled top soil and other organic debris across the strip. The strip had been used exclusively by industry in support of oil and gas operations since the late 1950's and through the "boom" years of the 1960's. Nearly 20,000 cubic yards of gravel was salvaged from the strip prior to reclamation and used to resurface the Swan Lake Road and in construction of the access road into Arco's Bufflehead wildcat well north of the Swanson River Field. The action was in compliance with the Swanson River Long-Term Lease Agreement whereby facilities no longer required for oil and gas operations would be rehabilitated to as natural a state as possible.



Before...3500 foot Swanson River Airstrip following excavation of usable gravel for resurfacing Swan Lake Road. JF



After... spreading of perimeter debris stockpiled along edge of strip during construction in late 1950's and early 1960's.

### Fire Equipment

Since FWS Engine 870's twelve-thousand-gallon water tank is deteriorating away, with rust chunks that occasionally stop-up the nozzles, a new tank or surplus tank was sought. City of Seward Fire Department was discovered to have a military surplus 1200-gallon tank truck they no longer needed. A deal was cut that would allow them to keep their truck for other purposes and we would remove the tank at Seward. Forestry Technician Reese and Mechanic O'Gwinn cut and unbolted the tank and transported it by trailer to the Refuge shop

A "parts" truck from military surplus was screened and transported to the Refuge as a source of future parts for the four military 3/4 ton pick-ups acquired in 1994 and being used in the Refuge fire programs.

### 3. Major Maintenance

A contract was awarded to a local painting firm to completely restripe the Refuge Headquarters/Visitor Center parking lot. Handicapped parking locations were identified and marked, as were fire lanes, staff, and recreational vehicle parking. This was a Fiscal Year 1995 Maintenance Management System (MMS) project. Another MMS project was the replacement of the old three-phase converter (rotophase) at the Refuge headquarters.

Other MMS projects involving equipment replacement are discussed in the following section.

#### 4. Equipment Utilization and Replacement

Our 10-year-old Caterpillar 130 road grader underwent major surgery after having performed several years of relatively maintenance-free operations. Mechanic O'Guinn and Operator Kivi spent considerable time rebuilding the turntable, replacing bushings and installing new grease fittings in the lifter arms. Considerable work was also done to the snow wing with the rebushing and rebuilding of the wing brackets.

After numerous delays, the long-awaited 5-yard dump truck (MMS funded) finally arrived in time for snow removal operations. The F-800 Series 4x4 diesel unit came with factory installed snow plow brackets and a 10-foot Gledhill angle-blade plow. At least two modifications were made to the plow to prevent snow from blowing back onto the windshield at maximum plowing speed of 40 miles per hour. This unit replaced the old (1976) International 5-yard dump truck.



New Ford five-yard 4X4 dumptruck with 10-foot Gledhill angle snow blade. This unit enabled us to cut our snow removal time on the Swan Lake Road by 50 percent, and reduced fuel consumption by 75 percent.

A new 50,000 pounds capacity Strict lowboy trailer was received during the year and immediately put to use in Refuge operations. The trailer,

equipped with air brakes, replaced the old Birmingham 20,000- pound rated trailer with electric (unsafe and frequently unreliable) brakes. This was also an MMS funded project.

Other MMS funded projects included replacement of two Zodiac boats, and the replacement of the old PROCON wire feed welder with the latest state of the art Cobramatic-mig 260.

#### Weather Stations

The Refuge fire staff manages two Remote Automatec Weather Station (RAWS) stations, one in the Swanson Oil Fields and one on the Mystery Creek burn project.

With the assistance of a Bureau of Land Management (BLM) Alaska Fire Services RAWS weather station mechanic, the two RAWS stations were maintained. Numerous field trips to the Mystery Creek RAWS were made to diagnose problems and re-establish the FM-activated synthesized voice data transmissions after being off the air for two years.

#### Fire Equipment

A surplus 1976 Air Force fuel delivery truck with a 1200-gallon aluminum tank was acquired during the year to haul gasoline or diesel for the helitorch/terra torch fuel. The vehicle will be a highly sought after piece of equipment for fuel storage on project fires in southcentral Alaska.

A North American Treaty Organization style 1976 four-hundred-and-fifty-gallon 8X10 wheel drive aircraft crash truck (engine) was acquired in 1995. Major plumbing problems lead to the decision to remove the old system and tank, and install a recently acquired 1500-gallon tank onto this heavy duty truck. The attaching of a new pump, plumbing, and cabinetry is continuing by Refuge Mechanic O'Gwinn this winter.

A self-contained breathing system for the dozer was requisitioned, received, and installed in 1995.

#### 5. Communications Systems

A new Federal Telephone System (FTS) line was added to our phone system. This makes four lines in our FTS pool. We now have four FTS lines available for outgoing and incoming calls. These lines are used by 20 permanent personnel and up to 40 temporary personnel during the summer months.

Annual radio maintenance was done by our Regional IRM staff and a service contract radio technician out of Fairbanks on the headquarters' base station, Hideout Mountain repeater, and Swanson River Road repeater. Plans were initiated for designating a site and obtaining hardware for a third repeater to acquire radio communications in the Tustemena Drainage.

## 6. Computer Systems

Our old Novell network file server was replaced during April 1995. The new file server is much more reliable with a greater capacity for data storage and improved back-up capability.

This new file server has two mirrored 1.2GB hard drives. It has a 20-user capacity with two network laser printers connected directly to the server. One HP color printer and two dot matrix printers are connected using workstations as a print server.

We presently have an outdated BNC cabling system that tends to be unreliable. When it rains steadily for a day or two, the downstairs portion of the network works intermittently. We aspire to get new cabling with MMS money someday.

Nine of the 22 computers in the office are capable of running Windows. Only four of the nine are 486 machines. Consequently, we are locked into keeping DOS based software as an office standard. Unfortunately, this keeps the rest of the Windows-based world from sharing information with us.

## 7. Energy Conservation

Table 45. Energy use comparisons, 1994 - 1995

Product	Unit of Measure	Energy Use Comparisons		%Chg.
		1994	1995	
Electricity	Kilowatt hours *	124,969	120,072	- 3.9
Natural Gas	100 Cubic Feet	18,225	18,123	-
Vehicle Gas	Gallons	14,420	13,329	- .6
Aviation Gas	Gallons	5,221	5,933	+ 1.4
Propane	Gallons	300	460	+53.3
Diesel Fuel	Gallons	4,380	4,201	- 4.1

\* reflects fiscal years

## 8. Other: Oil and Gas Operations

### Swanson River Field (Unocal Corp.-Unit Operator)

Union Oil Company of California (dba as Unocal) began its third year as Unit Operator of the Swanson River Field after taking over from Arco Alaska, Inc. in 1992. Unocal continued to focus on the distribution of Hemlock Zone rental gas to their sister company, Unocal Agricultural and Chemical Division-Nikiski Plant.

One of the more significant corporate maneuvers in 1995 was the ratification of an Exchange Agreement between Unocal and Marathon Oil Company. As a result of this agreement, effective December 1, 1995, Marathon conveyed to Unocal: 1) all of Marathon's interest in one Swanson River Field oil and gas lease; 2) all of Marathon's interest in the Swanson

River Gas Pipeline System and Rights-of-Way; 3) all of Marathon's interest in the Swanson River Field Natural Gas Rental Agreement with the exception of 73 billion cubic feet (BCF) of natural gas described in the 1994 Swanson River Natural Gas Redelivery and Exchange Agreement.

One of the major accomplishments in 1995 was the successful rehabilitation of the 3500-foot Swanson River Airstrip, in use since the late 1950's, in support of oil and gas exploration and development of the original Standard Oil Company of California Lease. Unocal had no further use for the airstrip in supporting their operations, and wished to be relieved of further liability for maintenance and upkeep. All usable gravel was removed from the strip and used on Refuge roads and in the construction of Arco's Bufflehead wildcat well access road, north of the present lease boundary. The Refuge coordinated the gravel removal and helped negotiate an agreement between Unocal and Arco, Alaska Inc. for the use of heavy equipment to cover the strip with organic debris.



Before...Airport Road leading to the Swanson River Airstrip following removal of usable gravel. JF



...After...covering of roadbed with adjoining organic debris. This will be the ultimate fate of most roads within Swanson River Field once oil and gas activities are suspended.

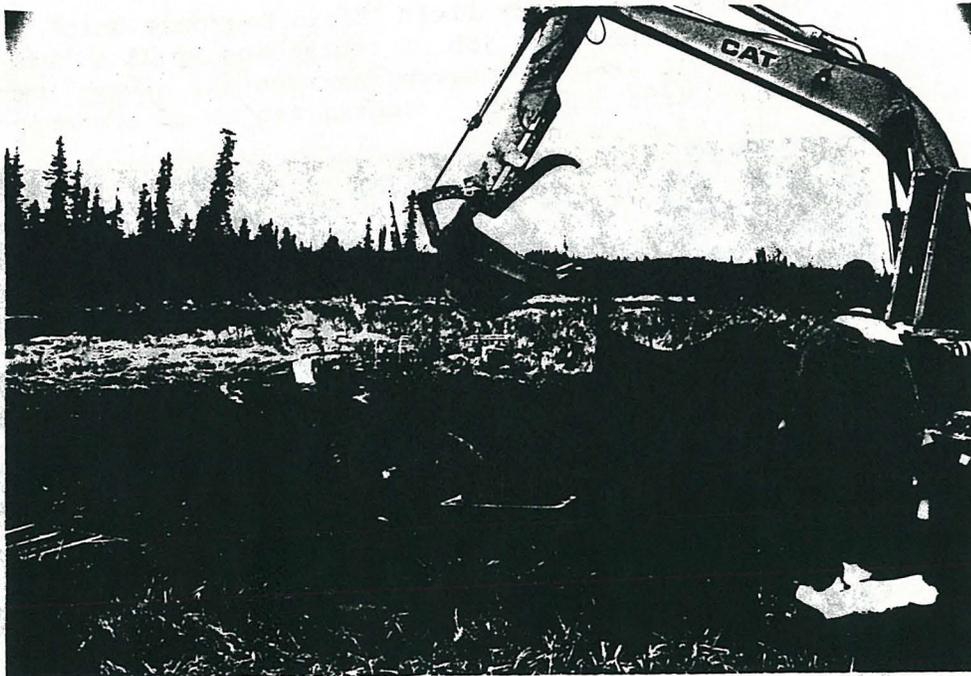
JF

Unocal continued soil and groundwater remediation efforts started by Arco prior to 1992. Contaminated sites receiving treatment were the Pipe and Supply Yard (P & S) and the 3-9 Tank Setting. The P & S Yard has been treated for groundwater contamination since 1990. The date of this spill has never been determined, but probably occurred in the early 1970's when a storage tank containing the lighter ends of the hydrocarbon chain (mostly xylene) was released into an auxiliary drainage system of the Swanson River. To date the treatment method has been to intercept ground water within the confined aquifer, pump it through an air diffusing system and discharge it into a secondary drain field system. While the system has worked quite well in purifying the effluent liquids, sufficient residual contamination exists in the aquifer to preclude major progress with clean up, at least in the near future. Recognizing the futility and expense with the present system, Unocal will be proposing an accelerated remedial process consisting of soil removal and above ground aeration. Plans should be ready for agency review and comment by early 1996.

Bioventing hydrocarbon contaminated soil at the 3-9 Tank Setting continued throughout the year, and was further expanded to include additional hydrocarbon contamination at the nearby 3-9 Flare Stack. This is still considered a pilot study, and if successful, will be used at the other six tank settings and flare stacks within the field.

While the field did not experience a major oil spill in 1995, we did experience a few anxious moments during the early morning hours of May 17 when a field worker noticed crude oil pooling in a marshy area less than 100 feet from the Swanson River. Quick action by the field staff resulted in an immediate shut in of the six-inch crude oil flow line coming from the 3-9 Tank Setting. A clean-up crew was on site in less than an hour with absorbent pads and booms, further confining the oil to an area approximately 30-foot-x-10 foot. As a result of a highly trained response crew, no crude entered the nearby Swanson River. A new line was cut in and laid above ground to bypass the ruptured line and the contaminated soil was transferred to the solid waste disposal site. The break proved to be a hairline crack in the old six-inch line and while a quantifiable loss of crude could not be determined, it was believed to be less than five barrels.

Because of this incident, and the concern expressed by the Refuge over future leaks from old lines, Unocal accelerated their efforts to insert polyethylene liners the several miles of old lines within the field. Over five miles of lines are scheduled for the secondary insertion process in 1996.



Workers trying to locate source of leak in a six-inch crude oil pipeline near the Swanson River. An estimated 200 gallons of crude were released before line was shut-in, but provided some anxious moments due to its proximity to the Swanson River.



The Swanson River Field "Rapid Response Unit" did an excellent job of containing spill within a small area and preventing what has always been our worst nightmare - contamination of a portion of the Swanson River. JF



Two Osprey chicks were successfully fledged from the artificial platform erected in 1994 near production headquarters within the Swanson River field.

The 40-foot high pole with a 4-foot-x-4-foot platform, erected in 1994 in an effort to lure a pair of nesting Ospreys from a nearby energized 24.9KV transformer pole, proved successful. The pair arrived in late May and immediately began to build on the "man made" nest of sticks. Two young Osprey fledged in late August, making this the first documented Osprey production within the Swanson River Field in over 30 years.

#### Beaver Creek Production Facility (Marathon Oil Co.)

Downsizing of Marathon's Cook Inlet Operations resulted in the Beaver Creek Field going to unmanned night operations beginning in December of 1994. While this action was met with some concern, security being a prime consideration, operations ran quite smoothly throughout the year. All systems (individual well flow rates, flow pressures, leak detection, tank volumes, compressor and power generation status) were integrated through a microwave transmission system displayed at the Kenai Gas Field, 18 miles away. Only one incident of vandalism/theft was noted, however, security will be improved with the planned installation of a second gate at No Name Creek.

The Beaver Creek facility has been struggling to maintain contract (deliverability) commitments of gas production, but with the successful production from their new well, BCU #9, drilled in 1994, Marathon is confident that production levels will be maintained and even improved with the workover of two additional wells.

No major spills occurred in 1995, and clean up of a 1990 diesel spill continued throughout the year by recovering free product from five monitoring wells. A risk assessment was completed by a private contractor, and all agency representatives believe the data to indicate no migration of hydrocarbon into groundwater is occurring.

#### Other Oil and Gas Activities (non-unitized areas)

##### Bufflehead Wildcat Well

Since 1991, Arco Alaska, Inc. (Arco) and the Cook Inlet Regional Corporation (CIRI) have maintained a high profile interest in an area north of the present Swanson River Field within a known geological structure (KGS)-part of the northern anticline of the once oil rich Hemlock Production Zone. Combined Arco and CIRI funding was finalized in late 1994 when the Refuge was presented with a Plan of Operations. Construction of the 1.2-mile access road to the drill pad began in mid-July with gravel coming from the old Swanson River Airstrip. The rig was moved on site on September 13, and drilling began on September 16. Total downhole vertical depth of over 10,000 feet was reached in early December, and the rig was released on December 15. To date, neither Arco nor CIRI has made a public announcement of drilling results, however, rumors filtering through the oil field network indicate that no producible quantity of gas or oil was found. Under the terms of their Special Use Permit, Arco has up to three years to further evaluate drill logs and assess the well's potential.

One of the positive spin-off's of this project was the Arco/CIRI funded (\$15,000) study to conduct a pre-disturbance biological inventory of the area affected by the access road and drill pad. The FWS contribution to the study was \$10,000.

Refuge staff biologists designed a study to determine pre-and post-construction species composition and the relative abundance and/or absolute densities of resident and neotropical migrant landbirds and small mammals using the site for feeding and breeding purposes. Home ranges of small mammals and birds were also studied in addition to quantifying the amount of devils club (an important black bear food source) removed in the area of construction. A final component of the study was to determine the ages, species composition and structure of trees, the fire frequency, and spruce bark beetle history of the upland mature forest stand within the affected area.

Both Arco and CIRI are to be commended for their willing participation in securing base-line biological information in oil and gas exploration and development activities. The Refuge is frequently at a loss to provide meaningful biological data for specific impact producing projects because of funding restrictions and lack of sufficient lead time between project conception and commencement of construction activities. As the project continues in 1996, the Refuge should be gaining the type of information badly needed for making better decisions concerning future environmental assessments for oil and gas development.

#### Geophysical Exploration

A Houston, Texas based firm, Union Texas Petroleum Corp., was issued two Special Use Permits to conduct a Gravimetric Study and Surface Gas Analysis over CIRI's subsurface entitlement lands. All activities were completed in accordance with permit stipulations.

#### Contaminants (non-oil and gas field related)

##### Contaminated Soil-Maintenance Shop

Our attempt to have a small amount of gasoline-contaminated soil cleaned up at the maintenance shop facility proved about as frustrating in 1995 as it was in 1994. The contaminated soil resulted from a small leak in the gasoline dispensing system and was discovered when the tank was removed in 1993. A contract was awarded to a local firm, Nessco, Inc. for clean up. Nessco, we soon learned, not only had some serious internal management problems, but had failed to provide an acceptable remediation plan to the Alaska Department of Environmental Conservation (ADEC). Nessco eventually lost their contract for non-performance, and a new contract was awarded to GeoEngineers of Anchorage. By early November a new remediation plan was approved by ADEC, and an additional 100-cubic yards of soil was removed from the site and stockpiled nearby. Air will be pumped through the pile in the summer of 1996 with a process called on-site bio-ventilation.

#### Pentachlorophenol (PCP) Site (Moose Pens Fencing Project)

The PCP site was initially identified as a hazardous waste site following a Refuge-wide inventory of potential sites in 1991. This area, known as the Swan Lake #1 exploratory well drill site, was used as a fence post treatment site in the 1960's and 1970's during construction of perimeter fencing at the nearby Moose Research Center a cooperative moose research effort between the USFWS and the ADF&G. During this period, pre-cut spruce posts were soaked in a mixture of Pentachlorophenol (PCP) and diesel fuel. The process consisted of soaking the butt ends of the poles in sealed concrete culverts for several days prior to being placed into the ground.

The FWS conducted a preliminary sampling program in 1991, and tests revealed that residual PCP contamination was present in both surface and subsurface soil samples. Further investigations have been conducted to characterize the site in terms of distribution and quantification of PCP's and diesel range organics. This past year, Foster-Wheeler Consultants conducted further tests in addition to completing a risk assessment for both human and ecological concerns. ADEC has yet to complete their review and offer comments, but if no snags develop, we should be looking at site closure sometime in 1996.

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J. OTHER ITEMS

4. Credits

All staff contributed to the completion of the report.

Refuge Clerk Marsters compiled and formatted the report.

Assistant Refuge Manager Chase edited the report.