Kanuti National Wildlife Refuge Annual Report

Fairbanks, Alaska
Calendar Year 2005

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Refuge Manager *Date*

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Refuge Supervisor, N. Refuges *Date*

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Regional Office Approval *Date*

Kanuti National Wildlife Refuge: The Year 2005 at a glance…

Calendar Year 2005 marked a year of continuing contrasts at the Refuge. No sooner was the vacant Refuge Manager (and Pilot!) position filled in March, than the Deputy Refuge Manager position became vacant in November. No sooner had the site of the burned bunkhouse (2004) in Bettles been cleaned up, than we were cleaning up an oil spill at the borrowed bunkhouse we were intending to buy outright. No sooner had we received three agency awards for environmental excellence, than we received a departmental award as well! No sooner had the 2004 fire season (i.e., largest on record for Alaska) ended, than 2005 saw the state's third largest season (with over 25% of the Refuge burned in the two years). No sooner had the long-awaited Biological Review Report been completed, than we were working to complete our draft revised Comprehensive Conservation Plan. And finally, once we had gotten caught up with our Annual Narratives (1998-2004), then we were starting on another one for 2005!!

Beavers (and their dams!) are major ecological drivers on the Refuge.
(photo by C. Harwood)

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Introduction

Kanuti National Wildlife Refuge (NWR; Fig. 1) straddles the Arctic Circle in north-central Alaska, encompassing an area slightly larger than Delaware. The Alaska National Interest Lands Conservation Act of 1980 (ANILCA) set aside millions of acres of public land in Alaska, including 6,625 km^2 (or 1.637 million acres) for Kanuti NWR. According to ANILCA, the Refuge was established for the following four purposes, which serve as guiding principles for refuge management:

1. To conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, white-fronted geese and other waterfowl and migratory birds, moose, caribou (including participation in coordinated ecological studies and management of the Western Arctic Caribou Herd), and furbearers;
2. To fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats;
3. To provide, in a manner consistent with the purposes set forth in subparagraphs (1) and (2), the opportunity for continued subsistence uses by local residents; and
4. To provide, in a manner consistent with the purposes set forth in paragraph (1), water quality and necessary water quantity within the refuge.

Kanuti NWR is one of 16 refuges in Alaska and 545 nationwide. This network of refuges forms the National Wildlife Refuge System (System), which is administered by the U.S. Fish and Wildlife Service. The mission of the System is: *to preserve a national network of lands and waters for the conservation and management of the fish, wildlife, and plants of the United States for the benefit of present and future generations.* The vision for the System stresses the following principles: 1) wildlife comes first; 2) ecosystems, biodiversity, and wilderness are vital concepts in refuge management, 3) refuges must be healthy; and 4) growth of the System must be strategic.

The mission of Kanuti NWR is three-tiered, mindful of: 1) the refuge purposes set forth in ANILCA, 2) the mission of the System, and 3) the following Kanuti NWR draft vision statement, developed by the staff:

> *Kanuti National Wildlife Refuge will be managed for its natural unaltered character, biological integrity, and scientific values as driven by biological and physical processes throughout time. Stewardship of Kanuti Refuge will strive to conserve fish and wildlife populations and habitat in their natural diversity by maintaining ecosystem integrity, while providing for subsistence opportunities. Management will foster partnerships with, but not limited to, government agencies, tribes, organizations, and the public, including local communities. As appropriate, the Refuge will facilitate compatible, wildlife-dependent recreation. Inventory and monitoring of wildlife populations and habitats important to Alaska, the United States, and the world will be the focal points of research and management efforts. Studies will focus on the physical and biological components of the boreal forest region, their ecological relationships, and their response to human activity.*

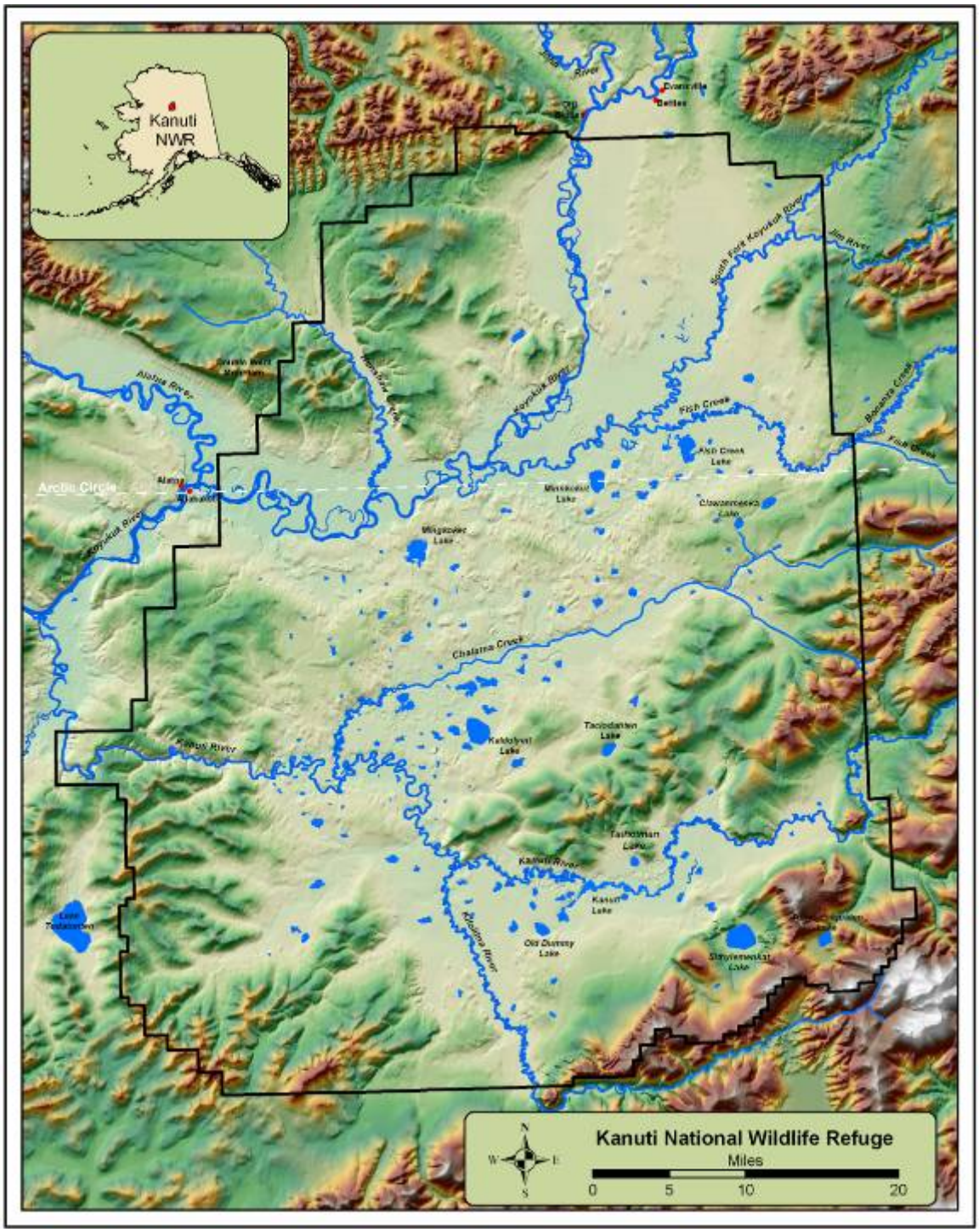


Figure 1. Map of Kanuti NWR, including major topography and hydrography.

Highlights for 2005

• New Refuge Manager/Pilot Mike Spindler started March 6, filling a six-month vacancy. (page 33)

• Contract pilot Harley McMahan conducted a wolf survey on the Refuge in March, the first in four years. (page 22)

• Alaska's first documented prairie bluet damselfly (*Coenagrion angulatum),* collected on the Refuge in 2004, was verified. (page 16)

• Clean-up of debris from the January 2004 Kanuti Bunkhouse fire in Bettles was completed in April. (page 60)

• Biological Technician Laura Kennedy compiled two multi-year Annual Narratives (1998-2001 and 2002-2004) to bring the Refuge up to date. (page 32)

• Park Ranger Jody DeMeyere was recruited as a Fire Information Officer Trainee for the Alaska Fire Service during activities fighting the Chapman Creek fire near Coldfoot. (page 9)

• The perimeter of the Old Dummy fire eventually reached nearly 192,000 acres within Kanuti's boundary, contributing to Alaska's third largest fire season on record. (page 8)

• Wildlife Biologist Lisa Saperstein and crew completed habitat surveys of nearly four mini-grids in the Kanuti Biological Inventory. (page 13)

• Multiple staff members were co-recipients of a team Star award for their completion of the draft revised Comprehensive Conservation Plan ahead of schedule. (page 36)

• The Refuge's communications system was overhauled and upgraded with digital equipment, including relocation of a repeater and installation of three new base station radios (in Bettles, Coldfoot, and at Kanuti Cabin); however, an attempt to establish first-ever radio communications between the Refuge and Fairbanks was unsuccessful. (page 65)

• Refuge Manager/Pilot Spindler and Wildlife Biologist Harwood completed the Refuge's assigned areas of the statewide Trumpeter Swan survey in August. (page 19)

• Regional Refuge Biologist Eric Taylor completed and distributed Kanuti's long-awaited Biological Program Review final report in September. (page 10)

• Considerable improvements were made to the Kanuti temporary bunkhouse, VOR Lake float pond facilities, and Kanuti Lake Cabin site. (pages 60-64)

• Approximately 500 people celebrated National Wildlife Refuge Week in Fairbanks by

attending the second annual Far North Conservation Film Festival, sponsored by the Arctic, Kanuti, and Yukon Flats NWRs and the University of Alaska Fairbanks. (page 54)

• Kanuti received four awards for environmental excellence and leadership in 2005, including the "Refuge of the Year Award" and the Department of the Interior's "Environmental Achievement Award." (page 35)

• Refuge Manager/Pilot Spindler, Wildlife Biologist Harwood, and Biological Technician Knight assisted in completing the annual Kanuti moose survey. (page 21)

• Deputy Refuge Manager Merry Maxwell transferred in November to Pahranagat NWR in Nevada to become its Refuge Manager. (page 33)

• Considerable progress was made in preparation of building the proposed Bettles Nature Trail, which will border VOR Lake at the Refuge's northern boundary. (page 52)

• Completion of the cleanup of a long-time underground heating oil tank leak that occurred at the Bettles School District residence (Kanuti's temporary bunkhouse) paved the way for the Realty Division to begin the formal process of transferring the property from the school district to the Service. (page 60)

• Biological Technician Curtis Knight won the prestigious Regional Director's Excellence Award for "Workplace Improvements." (page 36)

(R to L) Refuge Manager (RM) Spindler, Deputy RM Maxwell, and Northern Refuges Supervisor (Region 7) Stroebele show off three of Kanuti NWR's environmental awards. (USFWS photo)

Climate

Overview

The Refuge's climate is cold and continental, with slightly higher precipitation than other areas of interior Alaska. Low and high temperatures range between -56°C and 34° C (-69°, 93°F). Periodic flooding of the Koyukuk and Kanuti rivers is an important hydrological driver of the ecosystem. Temperatures and topography are quite conducive to extraordinary summer lightning activity, and consequently an active wildfire regime. The nearest weather station to the Refuge is the National Weather Service Station at Bettles Field, three miles outside the Refuge's northern boundary; however climatic conditions on the Refuge often vary from those of Bettles, as well as throughout the Refuge itself.

Periodic flooding and wildfires help drive the Kanuti ecosystem.
(photos by R. Brown [Fairbanks Fisheries Office; top] and C. Harwood)

2005 Climatological Highlights

Table 1. Monthly Temperature and Precipitation summaries (highs in red, lows in blue), Bettles Field, Alaska, 2005.

	Temperatures (°F)				Precipitation (inches)			
Month	Max.	Min.	Avg.	Depart.	Precip.	Depart.	Total Snowfall	Snow Pack (month's end)
January	22	**-57**	-14	-6	1.46	+0.62	17	33
February	25	-48	- 4	+4	1.22	+0.61	**27**	**43**
March	36	-19	11	+7	0.70	+0.15	8	39
April	59	-12	21	-1	0.89	+0.51	11	20
May	74	28	50	+5	1.44	+0.59	0	0
June	**86**	37	61	+3	1.49	+0.06	0	0
July	81	40	59	-1	**3.12**	**+1.02**	0	0
August	81	31	54	0	1.59	**-0.95**	0	0
September	58	26	43	+2	2.79	+0.97	0	0
October	47	-13	22	+4	1.19	+0.11	18	8
November	14	-37	- 9	-8	**0.63**	-0.27	16	15
December	34	-30	4	+11	1.37	+0.50	19	19
Totals					**17.89**	**+3.92**	**116**	

Hydrology Review

Breakup for Koyukuk River was May 4 and 5 for Bettles/Evansville and Allakaket, respectively. A flood watch alert was announced for the upper Koyukuk River basin on May 17. Heavy rainfall over the Koyukuk basin during May 15-16 resulted in significant rises in some of the Koyukuk River tributaries. The combination of rainfall and record levels of snow melt caused river levels to rise to flood stage, threatening the villages of Bettles/Evansville, Allakaket, and Hughes. The first ice reported on the Koyukuk River at Allakaket was October 10 (not monitored this year for Bettles/Evansville).

The Koyukuk River broke up on May 5, 2005, at Allakaket. (photo by B. Whitehill)

Snow Markers

Record snow depths and density were set in many areas of interior Alaska during the winter of 2004 – 2005. The deepest snow recorded on the Refuge was 50.5 inches at snow marker 2, located at Minnkokut Lake (Table 2). About 25 inches of snow persisted at some markers by the end of April. Average percent snow density was measured at marker 2 and marker 4 (Nolitna) on March 31. Density data were previously collected at snow marker 5, but this lake was too small to access reliably. Density averaged 29.4% at marker 2 and 26.2% at marker 4, the highest recorded at the markers since the Refuge started collecting snow data in 1998. The intention has been to move snow marker 6 at Taiholman Lake due to consistently windblown conditions; however, attempts to do so in the summers of 2004 and 2005 were thwarted by persistent smoke from wildland fires that prevented flights to the Refuge.

Table 2. Aerial estimates of snow depth (inches) at snow markers (SM), 2005.

Date	SM1	SM2	SM3	SM4	SM5	SM6
2/16/05	26.5	50.5	42	42.5	35	12
3/31/05	22.5	44.5	36	37.5	36	2
4/28/05	8.5	25.5	25	25.5	16	0
11/2 – 11/4/05	14	12	9	9	9.5	5
12/2/05	18	20	19	17	15.5	8

Biological Technician Knight inspects one of the six Refuge snow markers. (Photo D. Sowards [Arctic NWR])

Wildland Fires Review

Three large lightning-caused wildland fires burned in and around Kanuti NWR in 2005. The Old Dummy Fire and the North Bonanza Fire burned, in part, within the Refuge boundary (Fig. 2). The Chapman Creek Fire burned north of the Refuge, but still involved actions by Kanuti fire management personnel. Fire activity, particularly persistent smoky conditions caused by these and other fires within interior Alaska, greatly influenced staff activities both on and off the Refuge.

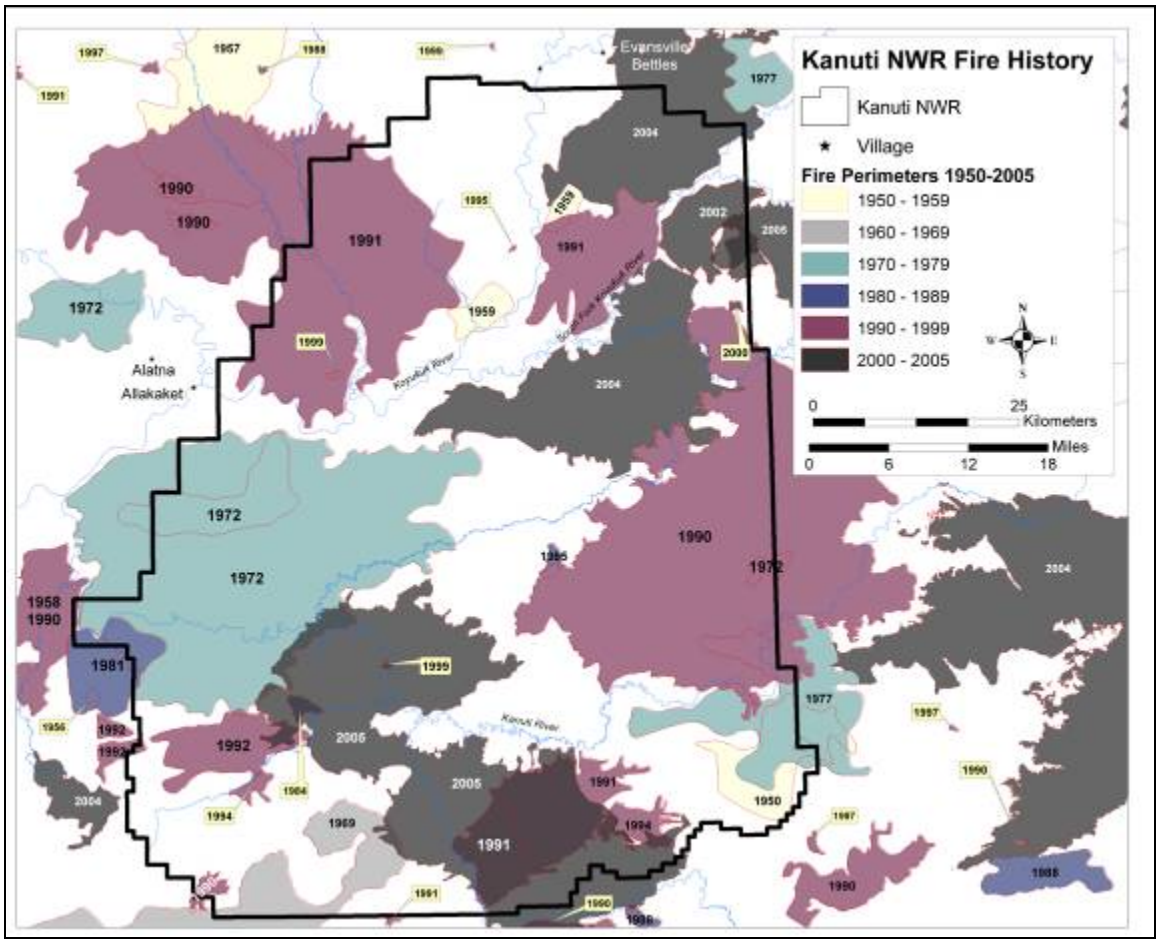


Figure 2. Fire history map of Kanuti NWR, current as of 2005. (Note: 2005 Old Dummy and North Bonanza fires are located to south and northeast, respectively.)

The Old Dummy Fire started on June 16 near the confluence of the Kanuti and Kilolitna rivers and eventually burned 231,822 total acres, including 191,444 acres of USFWS lands, 17,094 acres of Doyon. Ltd. Native Corporation lands, 757 acres of individual Native allotments, and 22,527 acres of Bureau of Land Management (BLM) lands (off Refuge; all others within Refuge boundary). The Old Dummy fire was initially only monitored by air, but as the fire spread, protection actions were initiated to defend 20 private allotments within the Refuge boundary, as wells as the Refuge's administrative cabin at Kanuti Lake. Eight of the allotments were successfully defended, but 12 were burned during very smoky conditions which hindered the movements of fire crews. Three crews of four to eight smokejumpers were successively deployed between July 4

and August 29 in defensive activities. While what appeared to be "season-ending" rains largely dampened fire activity in mid-July, a return of hot, dry, and windy weather reactivated some fires by month's end. The Old Dummy Fire burned through late August; it was officially declared out by September 30, but was largely inactive by September 1 after receiving heavy rainfall for several days.

The North Bonanza Fire similarly started on June 16 on BLM lands east of the Refuge. It spread westward and eventually included a small portion of Refuge lands. The North Bonanza Fire burned 190,942 acres in total on both sides of the Dalton Highway, east of the Refuge. The fire included only 5,297 acres of Refuge lands along the Jim River. There were no known allotments involved within this fire.

The Chapman Creek fire burned north of the Refuge along both sides of the Dalton Highway, and threatened the village of Coldfoot at one point. Park Ranger DeMeyere, already stationed near the fire at the Arctic Interagency Visitor Center in Coldfoot, was assigned the job of Fire Information Officer Trainee for BLM's Alaska Fire Service. In addition to her regular outreach duties at the visitor center, she prepared daily news releases on the status of the fire and the ongoing suppression activities, as well as helped coordinate two public meetings which explained suppression strategies and specific tactics. These public information efforts were especially appreciated by local residents who were concerned about the fire's close approach to various cabins and properties in the Dalton Highway corridor. The fire ultimately burned some 162,900 acres, with efforts by firefighters and mid-July rains combining to stop the fire's spread.

Approximately 4.6 million acres burned statewide in 2005, making it Alaska's third largest fire season on record. This is just on the heels of the 2004 fire season which at 6.6 million acres burned, was the largest fire season on record for Alaska. Some 25% of the Refuge has burned in just these last two years, combining this year's acreage with the some 216,000 acres that burned in 2004.

Green-tongue liverwort (*Marchantia polymorpha*) and fireweed (*Chamerion angustifolium*) quickly colonize a recent fire. (photo by R. Craig)

Natural and Cultural Resources

Overview

The primary ecological drivers shaping the habitats and wildlife of Kanuti NWR are hydrology, fire, and climate. The mosaic of different vegetation types on the Refuge is the visible culmination of complex interactions among the drivers mentioned above, along with other factors such as topography, soils, permafrost, and flooding. Vegetation plays a role in determining the distribution of wildlife species, but the activities of herbivores such as moose, hares, insects, and beaver also can have a profound influence on vegetative patterns. One hundred twenty-eight species of birds, 37 species of mammal, and 15 species of fish are known to occur on the Refuge. Some of these are migratory and can only be found at certain times of the year. For example, of the 128 species of birds, only about 20 are year-round, permanent residents. Likewise, caribou, which occasionally number in the thousands in winter when the Western Arctic Caribou Herd migrates from northern calving grounds, are virtually absent from the Refuge during summer.

Fall foliage along the Kanuti River highlights a mosaic of habitat types.
(photo by B. Raften)

Biological Planning

Biological Review
The final report on the Refuge's 2002 biological review was released on September 1,

2005 (Heglund et al. 2005). Completion of the report was spearheaded by Regional Refuge Biologist (RRB) Eric Taylor, following the departure of the previous RRB, Pat Heglund, shortly after the biological review meeting was conducted in July 2002. The executive summary from the report is reproduced in its entirety below:

- This report summarizes the findings and recommendations of the Kanuti National Wildlife Refuge biological program review conducted by a 14-member panel of invited research and management scientists on 24-25 July 2002, in Fairbanks, Alaska. The review will help ensure that the Refuge's biological program supports the establishing purposes and that studies being conducted or proposed are appropriate, relevant, and attain stated objectives.

- The principal ecological drivers of the Kanuti National Wildlife Refuge ecosystem are hydrology, fire, and climate. The complexity and interrelationships of these factors and their influence on the distribution, abundance, and productivity of fish, wildlife and plants require Refuge staff collaborate with research scientists affiliated with other agencies, institutions and universities. The Kanuti NWR biological program review panel developed the following recommendations:

- The Refuge Geographic Information System (GIS) should be further developed and supported by the Refuge to better manage biological, sociological, and geophysical data.

- The Refuge staff should develop and implement a Long Term Ecological Inventory and Monitoring Program by 2006 to examine the abundance and distribution of plants, terrestrial and aquatic invertebrates, fish, and wildlife resources and assess the environmental processes that may influence them. Kanuti NWR should review and adopt (if appropriate) current inventory and monitoring protocols developed by other agencies (e.g., National Park Service).

- The draft ecological systems model should be revised and updated to: (1) provide a greater understanding of environmental processes that may influence distribution and abundance of fish, wildlife, and plants and (2) identify and prioritize new studies.

- High-resolution aerial photography or satellite imagery should be procured to revise existing land cover classifications to better evaluate specific wildlife and habitat objectives.

- In concert with Service's Regional Fire Ecologist and the Interior Alaska refuges' Fire Management Officer, supplement the existing fire history database provided by the Alaska Fire Service with data on fire history prior to 1950 and other information that provides insight to the Refuge's fire regime.

- Refuge staff should address potential effects of hydrology on fish and wildlife habitat by: (1) developing a hydrological model to predict stream discharge and the spatial extent of flooding; (2) designing and implementing an inventory of select rivers,

streams, and wetlands to address physical, chemical and biological characteristics; and, (3) based upon inventory data, design and implement a monitoring plan to examine potential change in water quality and abundance, and distribution and species richness of invertebrates and vertebrates.

- The 1993 Kanuti Refuge Fishery Management Plan should be implemented to: (1) determine the seasonal distribution of whitefish (*Coregonus* sp.) and northern pike (*Esox lucius*); (2) map the spatial distribution of spawning and wintering areas for priority species of anadromous and resident fish; and (3) determine migratory characteristics of whitefish.

- Kanuti NWR should continue to:

  – collaborate with Alaska Department of Fish and Game (ADF&G), Bureau of Land Management (BLM), and the National Park Service (NPS) to conduct moose (*Alces alces*) population trend surveys at 5-year intervals and annual moose composition surveys;

  – conduct surveys to monitor beaver (*Castor canadensis*) caches as an index to beaver distribution and relative abundance;

  – conduct off-road landbird point counts and breeding bird surveys in cooperation with the U.S. Geological Survey and Boreal Partners in Flight;

  – collaborate with Migratory Bird Management and interior Alaska refuges to monitor mid-continent greater white-fronted geese (*Anser albifrons*) via the annual aerial molting survey and banding program, and/or other method(s) deemed more effective by the Greater White-fronted Goose Working Group.

Burned Area Emergency Response (BAER) Plan Proposal

The Refuge submitted a proposal for BAER funds in November 2005 to investigate the 2005 Old Dummy Fire (see "Wildland Fires Review" section [page 8] for additional fire details). The proposal consisted of two plans, a Burned Area Emergency Stabilization Plan and a Burned Area Emergency Rehabilitation Plan. The stabilization plan addressed issues such as: 1) a spring assessment to assess fire effects, 2) collection of fire severity data, 3) removal of hazardous trees from burned portions of a winter trail, 4) inventorying burned areas for the introduction of non-native invasive plant species, and 5) determining if cultural resources were affected by the fire. The rehabilitation plan addressed issues such as: 1) determining fire effects on rare or sensitive plant communities, 2) continued monitoring of safety hazards on the winter trail, and 3) additional monitoring for invasive species in subsequent years, should such plants be detected in 2006. Initial discussions between the USFWS Alaska regional fire program and the Boise Interagency Fire Center indicated that funding was likely to be approved for all proposed activities. Actual funding levels for BAER projects will be released in January 2006.

Joint Fire Science Proposals

A proposal for a project entitled, "Movements, distribution, and foraging responses of moose to fire-induced changes in browse availability and quality on federally managed lands in interior Alaska," was submitted to the Joint Fire Science Program (JFSP) in December 2004. Principal investigators included staff from the University of Alaska Fairbanks, the Refuge (namely, Wildlife Biologist Saperstein), and Yukon-Charley Rivers National Preserve. After learning that the project had not been funded in spring 2005, investigators met in the fall to discuss the possibility of modifying and resubmitting the proposal for the JFSP 2006 call for proposals. Based on comments received following the initial proposal, they determined that the JFSP was not the appropriate funding source for the project and agreed not to re-submit the proposal.

In November, WB Saperstein contacted Dr. Feng Sheng Hu at the University of Illinois about a JFSP project to investigate the fire regime in the Kanuti NWR area through the use of lake coring. Dr. Hu was interested in the project, but a decision was made to submit a proposal in 2007, following a preliminary investigation of lakes in summer 2006 to determine if ones of suitable depth were present in the desired sampling areas.

Climate Change

Wildlife Biologist Saperstein participated in a workshop on September 1-2 in Fairbanks that was sponsored by the U.S. Geological Survey (USGS) to develop a program for climate change research and monitoring in the Yukon River drainage basin. The workshop brought together climate change researchers from around the country to discuss a framework for collaborative research and monitoring. Progress on this effort will be dependent on USGS acquiring funds for the program.

Boreal Partners in Flight (BPIF)

Wildlife Biologist Harwood's two-year term as co-chair of BPIF ended in December of 2005. BPIF is the Alaska/Northwest Canada chapter of *Partners in Flight*, an organization of professionals and amateurs dedicated to the conservation of landbirds (e.g., songbirds, raptors, owls, woodpeckers, upland game birds) in the Americas.

Inventory and Monitoring Surveys

Project: Kanuti NWR Integrated Biological Inventory

Based on recommendations from the 2002 biological program review (see Biological Planning section above), and in recognition of the Refuge's mandate in ANILCA to "…conserve fish and wildlife populations and habitats in their natural diversity…," the biological staff initiated a refuge-wide inventory of its breeding birds, vegetation, small mammals, terrestrial insects, and fire history in 2004.

Much of the historical inventory work done on the Refuge has occurred in some of the more accessible (e.g., via floatplane or boat), waterfowl-rich, and/or unique (e.g., Kanuti Canyon) locations, somewhat neglecting other areas of the Refuge. For the inventory program, a pre-existing, systematically random sampling scheme, originally developed for the statewide Alaska Landbird Monitoring Survey (ALMS; Handel 2003), was

adopted to ensure widespread, unbiased, refuge-wide coverage. This resulted in an array of 64 "mini-grids," separated by intervals of 10 km, that will be surveyed over the next 10 – 20 years (Fig. 3), given current staffing and funding levels. Each mini-grid consists of 12 survey points, arranged in a 3 x 4 array. Mini-grids were stratified by elevation (39 lowland [≤250 m elevation] and 25 upland [>250 m elevation] mini-grids) to allow completion and analysis of one elevation type within a shorter time period (i.e., rather than having to wait for all 64 to be completed). Lowland mini-grids will be surveyed first because wetland habitat was one of the reasons for establishment of the Refuge.

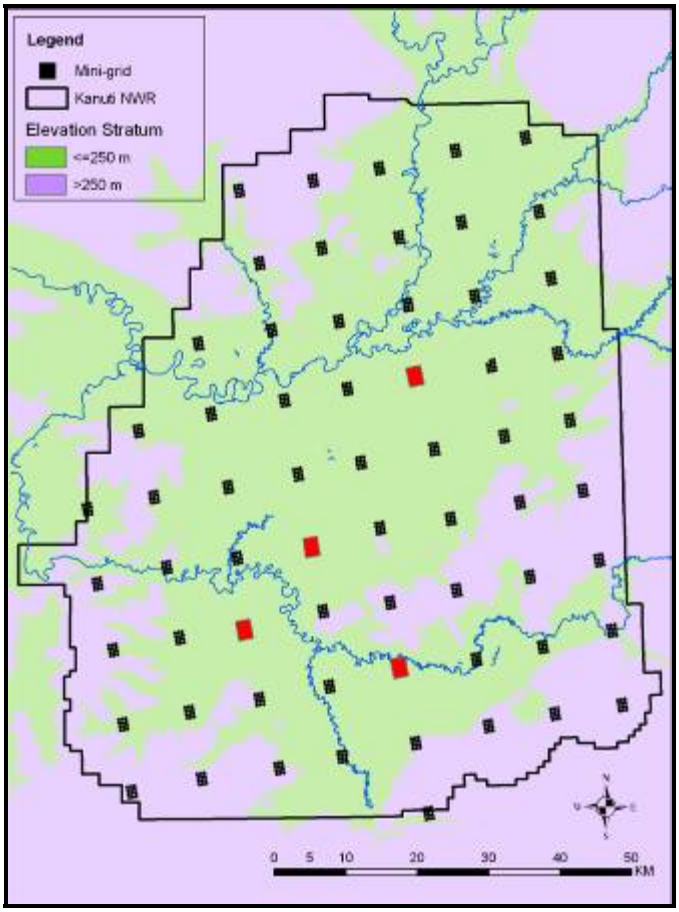


Figure 3. Location of inventory plots by elevation type (stratum). Red mini-grids have already been surveyed.

Survey methods were "borrowed" from several sources. Bird point-count survey methods and an associated habitat protocol were adopted from ALMS. The Refuge also adopted more rigorous vegetation survey methods developed for the Central Alaska Network of National Parks and Preserves (Roland et al. 2004), with minor modifications. Small mammal and insect collection techniques were garnered from a variety of sources, including recommendations from the University of Alaska Fairbanks (UAF) museum. Trees are aged from increment borings from large trees or trunk cross-sections from smaller trees that are felled. Age is generally presumed to be the time since the last fire. For plots that have burned within the last two years, fire severity data are collected using the standardized Composite Burn Index (Key and Benson 2004).

In 2004 and 2005, both considered pilot years of the inventory program, Refuge personnel completed breeding bird surveys for three of the mini-grids (near Kanuti, Big Kaldoleyeit, and Minnkokut lakes, respectively). The fourth mini-grid, Dune Lake, was surveyed for birds in 2004 and for habitat in 2005. Much of the mini-grid had burned in early July 2005, courtesy of the Old Dummy Fire. The fire flared up unexpectedly later in the month while a crew was conducting habitat work, causing them to evacuate the site with four points left unsurveyed. The mini-grid will be revisited in 2006 to resurvey the birds post-fire and to finish the remaining points.

Progression of smoke/fire conditions from the Old Dummy Fire (clockwise from top left) which precipitated an emergency helicopter evacuation of the crew at the Dune Lake mini-grid on July 26, 2005. The fire came within 100m of camp. (photos by R. Craig)

Results from the inventory program thus far are minimal, pending acquisition of a National Park Service vegetation database, development of an ALMS habitat database, and further analysis. Fifty, 37, and 42 species of birds were recorded on or near the Kanuti Cabin, Dune Lake, and Big Kaldolyeit Lake plots, respectively, in 2004. The number of species recorded only during surveys proper averaged about 30% lower. Forty-four species were recorded at the 2005 Minnkokut plot. Small mammal results are preliminary, pending species verification from the UAF museum. Initial counts of tree rings indicate that average tree age, all points combined, ranged between 57-89 years.

The oldest tree was a paper birch (*Betula papyrifera*) from the Minnkokut mini-grid with a preliminary estimate of 134 years. This tree was killed and felled in the 2004 Clawanmenka fire.

Despite setbacks and limited coverage, the inventory has resulted in two notable findings so far. A new bird species for the Refuge, a Palm Warbler holding song territory, represents one of Alaska's only two breeding season records for the species. A new species of damselfly for Alaska, the prairie bluet (*Coenagrion angulatum*), was collected at Kanuti Lake. This discovery marks a large expansion over its previously documented range.

Rigorous sampling methods, including nested quadrats (top) and point intercept, are employed by Wildlife Biologist Saperstein in the vegetation survey aspect of the biological inventory. (photos by C. Knight (top) and C. Harwood)

Project: Alaska Landbird Monitoring Survey (ALMS)

Based on requests by *Boreal Partners in Flight* and other biologists, researchers with the Alaska U.S. Geological Survey designed a survey to better monitor landbird populations on a statewide level. Using data derived from road-based Breeding Bird Survey and "Off-road Point Count" routes run for the last decade, the new sampling scheme employs: 1) a random deployment of 200 routes throughout the state (initially targeting federal land units, such as refuges and parks), 2) a biennial visitation frequency, 3) distance estimation, and 4) a habitat component to address bird-habitat relationships. The survey was designed to detect a decline of 50% over a 25-year period. Based on land mass, Kanuti NWR has been tasked with surveying two of the 200 plots (i.e., one of the two will be visited every year). An ALMS plot is comprised of 25 count points, in a 5 x 5 array, with 500-meter spacing between points.

Wildlife Biologist Harwood surveys for birds at one of the myriad wetlands.
(photo by R. Craig)

In 2005, Kanuti staff surveyed one ALMS plot at Minnkokut Lake, which we had also visited in 2003. Twelve of the 25 ALMS points comprise one of the Refuge's inventory mini-grids, discussed previously. Both bird and habitat data were collected at this location in 2005, which burned in the 2004 "Clawanmenka" fire. Plans were to revisit another ALMS plot, dubbed "Four Corners," which was first surveyed in 2003. Wildlife Biologist Saperstein and a local contract pilot attempted to access the plot by a Beaver on floats and nearly got stuck, as the landing lake was much shallower than in 2003. The "Four Corners" plot was deemed not a viable option for long-term monitoring.

Presently there is no specific funding source for ALMS, so participating land units have had to fund their effort with station funds, which have been dwindling since ALMS began.

These two photos, taken from the same count point on the Minnkokut ALMS plot in June 2003 (top) and June 2005, illustrate habitat alteration from the 2004 Clawanmenka fire. (photos by C. Harwood (top) and R. Craig)

Project: Breeding Bird Surveys (BBS)

Wildlife Biologist Harwood and Biological Technician Knight scouted the Kanuti Lake BBS and Kanuti Canyon BBS routes on June 9 and 10, 2005, respectively. An extensive logjam (>100 feet long) beyond stop #44 of the Kanuti Lake BBS route required relocating stops #45 – 50. The Kanuti Canyon BBS route was run on June 11. Harwood served as observer while Knight served as boat driver. They recorded 577 individuals of 39 species. The Kanuti Lake BBS route was run on June 12. They recorded 627 individuals of 41 species. Unlike 2004, no motor problems and/or delays occurred. The most dramatic observation (while traveling between routes) was that of a Golden Eagle grabbing and then later eating a Greater White-fronted Goose gosling at shore.

The Canyon route was established in 1993, the Lake route in 2004. Establishment of second route still appears to be prudent, given that it is on the way to the Kanuti Canyon route and so there is relatively little added expense. The second route does require additional money for gas, groceries, and perhaps overtime pay, but these are comparatively minor expenses when one considers that we have doubled the number of routes run. The routes differ in their habitats, and at times in the birds using those habitats. For example, the Canyon route exhibits some relic sage/juniper steppe habitat and not coincidentally is the only known place on the Refuge where Townsend's Solitaires breed. Meanwhile, the Kanuti Lake route exhibits more typical riparian boreal forest and seemingly supports higher numbers of boreal denizens like Olive-sided Flycatcher and White-winged Crossbill.

Wildlife Biologist Harwood (left) records count point location on a GPS, while Biological Technician Knight drives the boat, during 2005 Breeding Bird Survey.

Project: Statewide Trumpeter Swan Survey

Refuge Manager/Pilot Spindler and Wildlife Biologist Harwood participated in the statewide Trumpeter Swan aerial survey, conducted every five years in interior Alaska, from August 30 to September 1. Within the Refuge, they observed 233 adults and 72 young, up from 112 and 17, respectively, in 2000. The increase in adults is due in part to more flocked birds in 2005 (100 versus 16 in 2000); more importantly, numbers of pairs were up by almost 50% (45 in 2000, 64 in 2005). Territorial pairs, more so than flocked birds, should represent a more stable part of the population when comparing between

years. Additionally, the number of broods tripled from 2000 to 2005 (21 versus 7), and average brood size was up 1 cygnet from 2000 (3.4 versus 2.4). While swans observed in interior Alaska are presumed to be Trumpeters, a survey some 15 years ago showed that Tundra Swans also occurred/bred on Kanuti NWR (approximately 65% Trumpeters, 35% Tundras at that time). The present ratio of Trumpeters to Tundras on the Refuge has not been investigated.

The Refuge's fall foliage observed during the swan survey makes it worthwhile being crammed in the back of a small airplane for eight hours a day! (photo by C. Harwood)

Project: Greater White-fronted Goose monitoring effort

2005 was not a banner year for Refuge surveys of Greater White-fronted Geese (GWFG). The annual 4-day aerial survey of molting GWFG on the Refuge was cancelled for the second summer in a row. Widespread, persistent smoky conditions during early July, primarily attributable to the Old Dummy fire on the Refuge, blanketed much of the Refuge and thwarted any attempt to even reach the Refuge, let alone survey.

Additionally, Wildlife Biologist Harwood was scheduled to assist USFWS-Migratory Bird Management researchers with GWFG age-composition surveys in the Delta Junction agricultural fields (80 miles southeast of Fairbanks) on August 21-22. Because smoky conditions on the Refuge continued to delay the higher priority statewide swan survey in which he was scheduled to participate, Harwood was unable to assist in the Delta Junction survey. We have offered to participate again next year.

Project: Kanuti NWR Moose population survey

Refuge Manager/Pilot Spindler, Wildlife Biologist Harwood, Biological Technician Knight, Pilots Don Carlson (Arctic NWR) and Colin Brown (Yukon Eagle Air), and Area Biologist Glenn Stout (Alaska Department of Fish and Game) cooperated in a moose population survey of the Refuge, conducted on October 30 – November 4. Results of this and previous surveys are displayed in Figure 4. There were an estimated 1,025 moose on the Refuge in fall 2005, resulting in a density of 0.38 moose/mile^2. This marks an increase from 2004, but the 2005 estimate was associated with less precision (that is, possibly more error) and likely does not represent a significant change in the population (Fig. 4). Because of funding limitations, the Refuge was not stratified into high and low moose density survey units immediately prior to surveying randomly selected units in 2005, as it had in previous years; stratification from the 2004 survey was used again. This likely contributed to the high imprecision associated with the estimate.

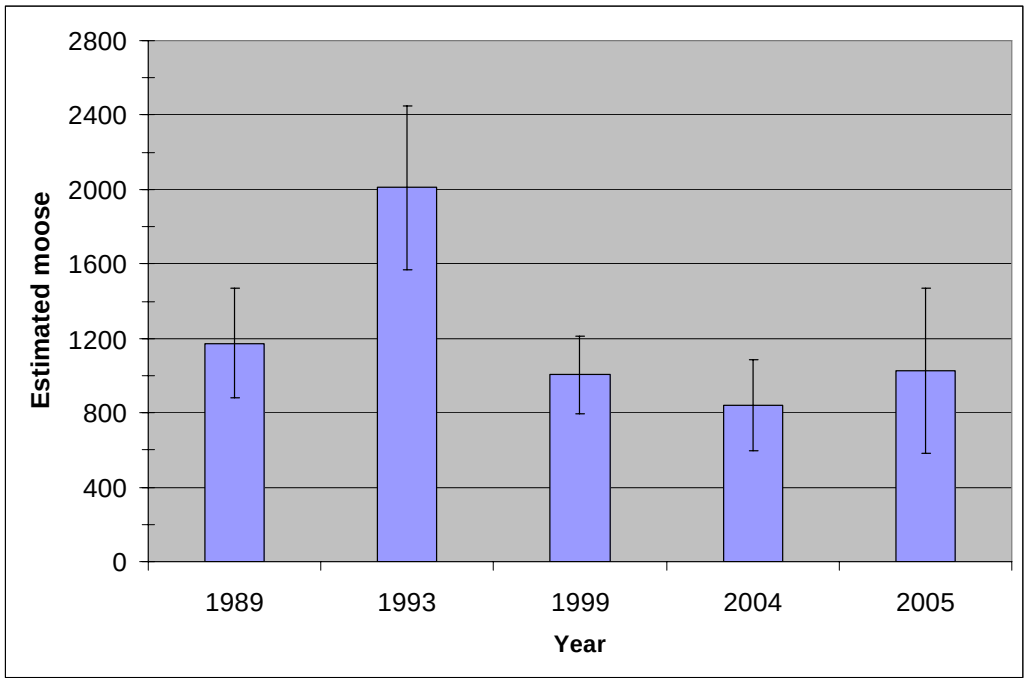


Figure 4. Moose population estimates for Kanuti National Wildlife Refuge, 1989 – 2005. Error bars represent the range of the 90% confidence interval.

These three bull moose were observed during the November aerial moose survey.
(photo by G. Stout [ADF&G])

Project: Aerial Wolf Survey

An aerial wolf survey was conducted on the Refuge and immediately adjacent areas March 23-27 using the "Stephenson" survey method (Stephenson 1978). This method provides a *minimum* count of wolves and represents a "snapshot in time" for when the survey was conducted. Accuracy of results depends on pilot and observer skills and tracking conditions. The 2005 survey was conducted by Harley McMahan, a charter pilot/observer with excellent tracking abilities.

The survey area encompassed 3,949 mi^2, but only 2,848 mi^2 had adequate snow conditions to track wolves; tracking conditions in this section were considered good to excellent. After adjusting the number of observed wolves to account for situations where tracks originated in the survey area but packs were located outside of it, 48 wolves were deemed within the survey area. Estimated wolf density is therefore 17 wolves/1,000 mi^2, which is typical for areas of interior Alaska without predator control. A more detailed report of the survey is available at the Refuge (Saperstein 2005).

This single wolf was observed excavating muskrat push-ups.
(photo by G. Stout [ADF&G])

Project: Fire severity estimation

A satellite-derived burn severity map of the 2004 Clawanmenka Fire was ground-truthed July 12 - 17 by a four-person crew comprised of three Student Conservation Association volunteers (hired by the regional fire program) and Biological Technician Knight. The burn severity map was developed by comparing pre- and post-fire satellite imagery of the area. Ground-truthing in the field is necessary to assess if burn severity was classified accurately on the map. A standardized field method (developed by the National Park Service; Key and Benson 2004), was used to determine the Composite Burn Index at points classified at different burn severities on the satellite map. This method provides a site rating between 0 to 3, with 0 being unburned and 3 being severely burned, based on fire effects on vegetation and soil characteristics. Results of this project are not yet available from the regional fire program.

Project: Non-native, invasive plants reconnaissance

From July 13 – 16, areas burned during the 2004 Evansville and Clawanmenka fires were surveyed for invasive plant species as part of Burned Area Emergency Response (BAER)

activities. Work was contracted out to the Alaska Natural Heritage Program (AKNHP). Surveys focused near areas of human activity, such as trails and private allotments, which were considered to be at higher risk of colonization by invasive plants.

AKNHP botanists Matt Carlson and Helen Cortes-Burns inventoried the boundaries of nine allotments that were burned in 2004, as well as approximately 50 river-miles of the South Fork Koyukuk River that flow through the burn. The latter included a portion of the Winter Road that intersects the river. No non-native plant species were encountered within the Refuge at any of these sites. However, non-native, invasive plant species were found growing along the shores of the Bettles floatplane lake and near the airfield. These included: lambsquarters (*Chenopodium album*), Foxtail barley (*Hordeum jubatum*), pineapple weed (*Matricaria discoidea*), common plantain (*Plantago major*), spreading bluegrass (*Poa subcoerulea*), and common dandelion (*Taraxacum officinale* ssp. *officinale*). Floatplanes using the lake could serve as a vector for spreading seeds onto the Refuge proper. A full report of the invasive plant survey can be found in Carlson and Cortes-Burns (2005).

Alaska Natural Heritage Program botanist Helen Cortes-Burns surveys a burned site adjacent to the South Fork Koyukuk River for invasive plant species.
(Photo by M. Carlson)

Research Studies and Investigations

Project: A radio telemetry and traditional ecological knowledge study of the seasonal migrations and important habitats of humpback and broad whitefish in the Kanuti National Wildlife Refuge

Fishery Biologist Randy Brown (Fairbanks Fish and Wildlife Field Office) and colleague, David Andersen (Research North, Fairbanks), are seeking to identify seasonal migrations and three important habitats (spawning, over-wintering, and feeding) of humpback and broad whitefish in the upper Koyukuk River drainage. The approach is two-fold: 1) seasonal locations of radio-tagged fish (Brown) and 2) traditional ecological knowledge (Andersen; not reported here).

In 2005, radio tags were implanted in 64 fish in the South Fork Koyukuk and Kanuti River wetlands. Similar to 2004, broad whitefish were very scarce so most of the transmitters were deployed on humpback whitefish. Transmitters were deployed on a large group in feeding habitats of the lower South Fork Koyukuk River in late May. Another group was tagged in early September on the upper Kanuti River spawning area that was discovered in 2004.

In 2004, the transmitters were programmed to run for about 13 months, providing a year-long position record. This programming allowed use of a remote station to monitor fish passage in and out of the Kanuti River and to locate fish at regular intervals and get a feel for within-year movements. In 2005, the transmitters were programmed to run for brief periods that correspond to life cycle changes in habitat use: feeding (May and June), spawning (September and October), and overwintering (January and February) habitats. Doing this extended the transmitter lifespan to encompass two full years. With this schedule we will address issues of between-year habitat fidelity and spawning frequency for these fish.

Radio-tagged fish were located during late September and early October in the fall spawning period. Most of the South Fork Koyukuk River fish were located in a concentrated group in a swiftly flowing, gravel bottom stream reach in the South Fork Koyukuk River, just downstream from the mouth of the Jim River. This is clearly a spawning area. None of the humpback whitefish tagged in the South Fork Koyukuk River migrated to the Alatna River spawning area that was identified in 2004. Humpback whitefish tagged in the upper Kanuti River spawning area in early September were subsequently located again on the spawning area in late September. The purpose of tagging that group of fish on the spawning area was two-fold: 1) we knew they were of a single spawning stock and we want to know if they will spawn two years in a row; and 2) most of our tagging to date has been in mixed stock feeding aggregations and we discover spawning areas by tracking them, this approach is opposite, where we tag single stock spawning fish and identify the distribution of those stocks into overwintering and feeding habitats. Those data will be collected in subsequent aerial survey flights during the next two years.

Broad whitefish with radio tag implanted in abdomen. (USFWS photo)

Project: Characterization of mercury contamination at Peavey mining site

On September 24, 2005, Contaminants Specialist Keith Mueller (Fairbanks Fish and Wildlife Field Office) and crew visited the historical (circa 1900) mining town sites of Peavey (along the main stem Koyukuk River, 25 miles downstream from Bettles) and Union City (three miles south of Peavey, along the South Fork Koyukuk River). The project's purpose was to complete site characterizations to assess the possible presence and extent of mercury contamination (mercury amalgam was widely used in that era to recover gold dust during placer mining). If mercury contamination were present, habitat quality would be decreased, toxic exposures might exist to wildlife and subsistence users, and the site might be unsafe for archeological personnel.

Reconnaissance of the Peavey site uncovered a small amount of old junk equipment and three pits, one of which suggested an old building site. Sediment from inside and outside the three pits was sampled and will be analyzed for mercury content; results should be available by summer 2006. At Union City, the crew found pieces of a very old pump but no other sign of human habitation; hence, further sampling was not warranted.

Old pump discovered at historical Union City mining town site. (photos by K. Mueller)

Cultural Resources

Burned Area Emergency Response (BAER) funding for the 2004 fires included a cultural resources component (see Biological Planning section, page 12). According to historical maps, two turn-of-the-century mining camps, Seaforth and Soo City, were within the 2004 Clawanmenka fire burn perimeter, although these sites had never been located to the best of our knowledge. Regional Archaeologist Debbie Corbett (Anchorage) and Wildlife Biologist Saperstein attempted to locate the sites on August 22-24 to see if the fire had exposed and/or damaged any mining artifacts. The sites were not located, and no other cultural resource issues were identified in the burn.

Cultural resources include not only the more commonly recognized historical sites, but also areas that are important to the present culture of the Refuge's users. Favored hunting, fishing, trapping, and even berry picking areas need to be identified. (Bog cranberries at Fish Creek Lake; photo by C. Harwood)

Management

Overview

The management of Kanuti NWR is guided by a Comprehensive Conservation Plan (CCP) developed in 1987; however, we are in the midst of revising it, and hope to release a public review draft in 2006. The process of developing a vision statement, goals, objectives, and a range of alternatives, helped us focus ourselves on the main management priorities. These priorities were again revisited in the fall when we re-evaluated our staffing in the context of recent turnover and threatening declines in future budgets. We aim for high-quality land stewardship based on sound science, to involve, coordinate, and cooperate with neighbors and stakeholders, and to be responsive to local, regional, and national clienteles.

Revision of the Kanuti NWR Comprehensive Conservation Plan

Significant progress in a draft revision of the Refuge's Comprehensive Conservation Plan (CCP) continued through early 2005. The Refuge has been operating under the original CCP since 1987. Regional Planner Pete Wikoff (Anchorage), who was assigned to compile the Kanuti CCP, made several visits to Fairbanks to assist with individual writing assignments of Refuge staff members. Because so few of the staff had any formal training or experience with CCPs, Regional Planner Helen Clough (Juneau) was invited to conduct two much-needed and appreciated workshops on both the general CCP process, as well as CCP requirements specific to the Refuge.

On March 21, Deputy Refuge Manager Merry Maxwell briefed Regional Director (RD) Rowan Gould on three proposed management alternatives for the revised Refuge CCP. In attendance were Assistant RD Todd Logan, Chief of Planning George Constantino, CCP Team Leader Ken Rice, Planning Social Scientist Brian Glaspell, and Regional Planners Wikoff and Rob Campellone. Discussions focused on: 1) possibly changing some "moderate" management areas of the Refuge to "minimal" management, 2) choosing among the three alternative management categories, and 3) setting a deadline for in internal draft. The three draft alternatives include : 1) a "no-action" alternative (i.e., maintaining the status quo in which approximately 67% and 33% of Refuge lands are in "minimal" and "moderate" management, respectively; see Fig. 5); 2) one in which 100% of Refuge lands would be in "minimal" management; and 3) hybrid of the previous two in which approximately 86% and 14% of Refuge lands are in "minimal" and "moderate" management, respectively.

Refuge staff assignments for an internal draft CCP were submitted to Planner Wikoff by no later than mid-May, thus beating the May 31 deadline imposed by the Regional Office. Eight Refuge staff members were recognized with a team "STAR" award (see Awards section, page 37) for their excellent and timely work in preparation of the internal draft. With the draft revised CCP still under review by the Regional Directorate, Planning Division, and others through December 2005, little further CCP work in 2005 was required of Refuge staff, other than some editorial work in August.

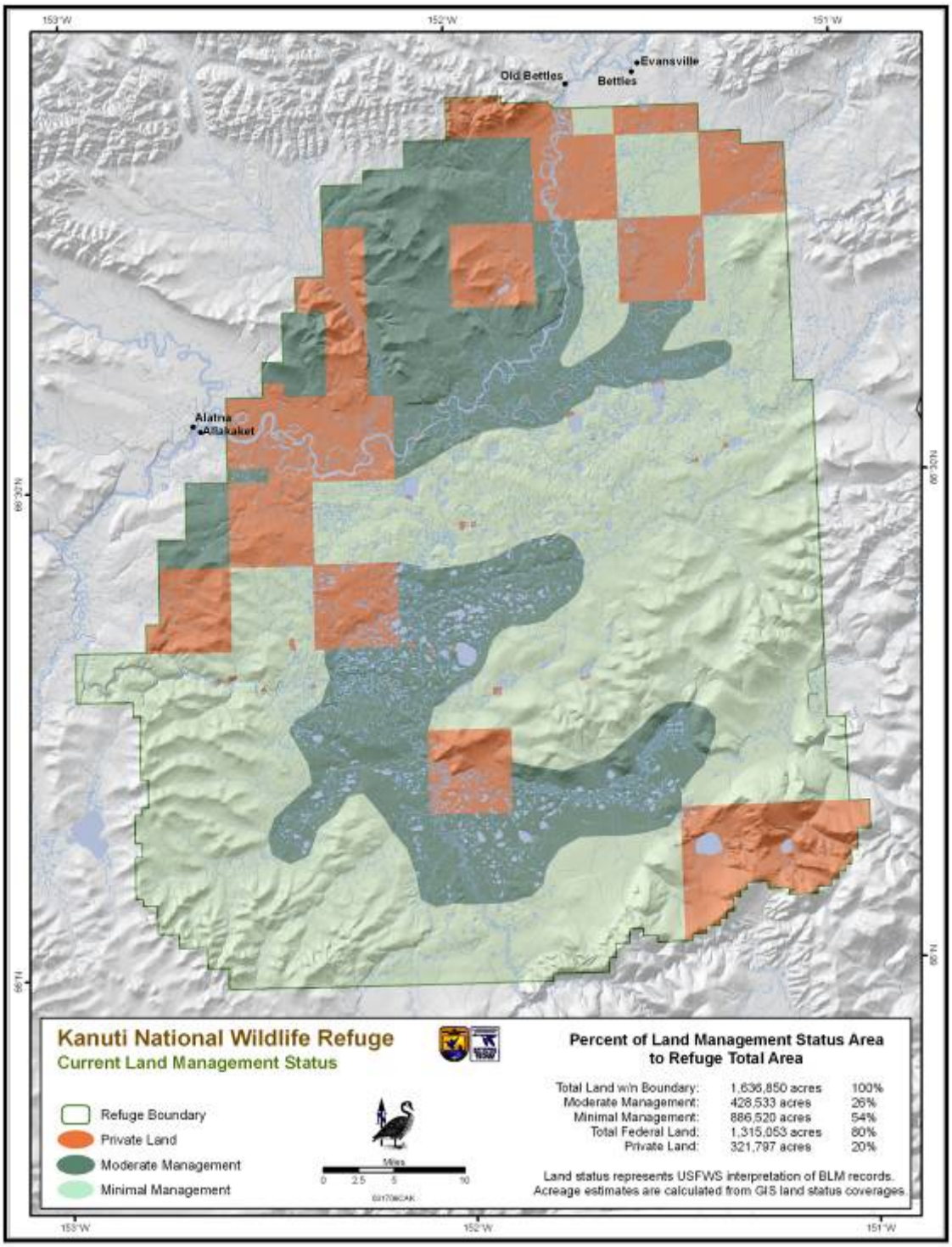


Figure 5. Federal lands within Kanuti NWR have been managed as above since 1987, when the first Comprehensive Conservation Plan (CCP) was adopted. This represents the "no-action" alternative in the draft revised CCP.

The Refuge staff held a half-day planning retreat on September 22. Management priorities discussed included: the continuation of science-based land stewardship practices; being user-friendly and accessible to our local, regional, and national clienteles; educating the public about resource sustainability, especially as regards subsistence; and cooperation with stakeholders to find collective solutions to resource management problems. Staff also discussed the need to: improve village outreach efforts; focus on maintenance of infrastructure and equipment that helps us get our job done; increase Refuge staff's presence in the field; and implement recommendations from the 2002 biological review.

Fire Management

The draft Kanuti NWR Fire Management Plan was reviewed by the Regional Office and returned to Fairbanks Fire Management Officer (FMO) Patten in early September 2005. Editorial comments and suggestions were subsequently addressed by the FMO by month's end. Refuge Manager (RM) Spindler reviewed the revised document for the first time in early October (former RM Schulz and Deputy RM Maxwell had completed their reviews prior to the previous submission to the Regional Office). To date, RM Spindler has reviewed the document and the FMO is working on editorial revisions. Once the revisions are complete, the plan will be resubmitted to the Regional Office for final review and signature. We anticipate this prior to the 2006 fire season.

Protection of some of some of the Refuge's remaining lichen areas for wintering caribou is just one aspect of the draft Fire Management Plan. (photo by R. Craig)

The village of Allakaket again requested USFWS funding in 2005 to support an additional 10-acre Wildland Urban Interface (WUI) thinning project surrounding several newly built houses on the ridge south of the village. The Regional Office is considering this request, but other village WUI projects may receive higher priority. Three successfully completed thinning projects in Allakaket have already been funded since 1997, while similar requests from other villages remain pending.

Interagency/Tribal Cooperation

Deputy Refuge Manager (RM) Maxwell and RM Spindler cooperated with the Allakaket Tribe on several issues during 2005, including information and education about the wildland fires near the village (see above) , and regarding a proposal by the State of Alaska and Tanana Chief's Conference (TCC) to mark the Allakaket-to-Tanana winter trail. The latter issue proved to be somewhat complicated in that the Tribe, the State and the Refuge all wanted the trail to be routed safely; however, the Tribe and the Refuge did not want a Special Use Permit to be issued for trail staking if it meant that the State would gain further justification for asserting an RS2477 claim to the right of way. In the end, because an agreement was reached in which the trail was staked, except for the parts that crossed the Refuge near the lower Kanuti River, no permit was issued by the Refuge**.**

The Refuge also coordinated with the Evansville Tribe on the location and routing of a proposed nature trail around VOR Lake, just southeast of Bettles (see page 52).

Permits

Four Special Use Permits were issued in 2005:

1. Air Taxi Transporter, Brooks Range Aviation, Bettles, March 9, 2005
2. Subsistence Log Cutting, Evelyn Esmailka, Allakaket, May 5, 2005
3. Trapping Cabin permit (renewal), Mike Johnson, Fairbanks, May 5, 2005
4. Helicopter access and research, Alaska Natural Heritage Program, June 27, 2005.

In addition, we received a request from Alaska Power and Telephone for a Special Use Permit to use heavy equipment for hauling several pre-fab electric generator modules across the winter trail from Bettles to Allakaket. Refuge Manager Spindler field-checked the trail in November 2005 and determined that several hundred trees would have to be cleared to allow the heavy equipment to pass. The request was referred to the Division of Realty for a Right-of-Way Permit. Realty Specialist Susan LaKomski met with the company representatives and explained the permitting process. At year's end, the company decided not to pursue the permit. We had informed them that tree clearing to allow passage of heavy equipment on a snowmobile trail would probably be incompatible with Refuge purposes.

Annual Narratives

In March 2005, Biological Technician Laura Kennedy finished the final draft of the combined 1998-2001 Annual Narratives for Kanuti NWR. The last narrative done by the station was for 1996 (albeit completed in December 2004!). Before departing in late May, Kennedy had also largely compiled the 2002-2004 narrative, leaving only minor editing for completion. The value of Kennedy's work should not be underestimated: aside from the institutional information which can be lost when narratives are not done annually or at least regularly, the lack of current narratives for much of the last decade was likely a detriment to orientation of staff members, none of whom were on staff when the last narrative was done on time (circa 1995). Quite poignantly, one person pointed out during scoping of our Comprehensive Conservation Plan that he could not comment on recent activities on the Refuge because of the absence of annual narratives. With the Refuge essentially up-to-date, Wildlife Biologist Harwood was made responsible for compiling single-year narratives on time, beginning with this 2005 report.

The wood frog is the only amphibian occurring on the Refuge. They are thought to hibernate in mud-bottomed wetlands. (photo R. Craig)

Administration

Budget

Table 3. Funding for Kanuti NWR, Fiscal Years 2001-2005.

Year	Total Funding	Refuge Operations	Maintenance/ Construction	Fire	Subsistence	Challenge Cost Share
2001	$ 845,000	$769,000	$ 18,000	$20,000	$26,000	$12,000
2002	$ 973,000	$905,000	$ 24,000	$18,000	$26,000	--------
2003	$ 916,000	$825,000	$ 42,000	$18,000	$27,000	$ 4,000
2004	$1,044,000	$876,000	$103,000	$19,000	$27,000	$19,000
2005	**$1,010,000**	**$871,000**	**$ 80,000**	**$23,000**	**$26,000**	**$10,000**

Personnel

Staffing

While the biological, administrative, outreach, and even seasonal staffs remained generally stable over the past year, the managerial staff featured dramatic changes (Table 4). Mike Spindler, long-time Refuge Manager (RM)/Pilot at Koyukuk/Nowitna NWRs, assumed the same positions at Kanuti NWR in the spring. Meanwhile in the fall, Deputy RM Merry Maxwell transferred to Pahranagat NWR (Desert NWR Complex) in Nevada to become its Refuge Manager.

Mike Spindler filled two vacancies for the Refuge in March 2005: Refuge Manager *and* Pilot! (photo by B. Raften)

Table 4. 2005 Kanuti NWR Staff (includes permanent, shared, Student Temporary Employment Program [STEP], seasonal, temporary, and emergency hire positions).

Employee Name Title	Entered on Duty	Departed
Mike Spindler		
Refuge Manager/Pilot	03/06/05	
Merry Maxwell		
Deputy Refuge Manager	11/23/97	11/16/05
Lisa Saperstein		
Wildlife Biologist (Supervisory)	09/27/98	
Chris Harwood		
Wildlife Biologist	03/10/03	
Jody DeMeyere		
Park Ranger	10/22/02	
Almeda Gaddis		
Administrative Officer[1]	10/26/97	
Lorna Young		
Administrative Support Assistant[1]	10/21/03	
Kimberly Robinson		
Administrative Support Assistant[1]	10/21/03	
Lou Maloney		
Administrative Support Assistant[1]	11/15/04	
Wennona Brown		
Subsistence Coordinator[2]	12/30/01	
Sam Patten		
Fire Management Officer[2]	01/13/02	
Nancy Reagan		
Information Technology Specialist[3]	10/05/03	
Carlette Smith		
Information Technology Specialist[3]	07/16/00	
Curtis Knight		
Biological Technician (STEP)	05/19/02	
Rachel Craig		
Biological Technician (STEP)	05/01/04	08/12/05
Laura Kennedy[4]		
Biological Technician (seasonal hire)	05/05/04	05/20/05
Shanna Patterson		
Receptionist (temporary hire)	08/07/05	10/02/05
Doug Holton		
Maintenance Worker (emergency hire)	09/16/05	10/16/05

[1] position paid by Kanuti NWR, but shared with Arctic and Yukon Flats NWRs
[2] position paid by Yukon Flats NWR, but shared with Arctic and Kanuti NWRs
[3] position paid by Arctic NWR, but shared with Kanuti and Yukon Flats NWRs
[4] position alternately shared and paid by Yukon Flats and Kanuti NWRs

Volunteers

The work of the Refuge also greatly benefited from the fine efforts of these volunteers:

- Roger Wieland (Maintenance/Construction) contributed at least 720 hours while constructing two sheds at the Kanuti Lake administrative cabin, building kiosks and benches for the Bettles Nature Trail, maintaining the Bettles bunkhouse and Fairbanks hangar, among many other things;

- Nita Niver (Visitor Services) contributed 657 hours in Coldfoot, Alaska assisting the Arctic Interagency Visitor Center staff and maintaining the BLM campground there, among other things;

- Larry Smith (Maintenance/Construction) contributed 120 hours in helping build the new fuel shed at the Kanuti Lake administrative cabin;

- Larry Phillips (Observer) contributed 4 hours as an aerial survey observer during a flight to check snow markers.

The efforts of Volunteers Roger Wieland (L) and Nita Niver were indispensable.
(photos by B. Raften (L) and D. Niver)

Awards

Environmental Awards

Kanuti NWR received four environmental awards in 2005. The awards were presented to the Refuge because of: 1) efforts to "green" the offices of the three Fairbanks-based refuges, 2) development of an innovative stair/trail system at Kanuti Lake, 3) replacement of single-walled fuel tanks and older boat motors, 4) development of mobile spill response kits, 5) environmental outreach work focused on minimizing land-use footprints, 6) energy-efficient solar-powered system implementation, and 7) environmentally-friendly building practices. The Refuge was recognized with "Environmental Achievement" and "Environmental Leadership" awards, as well as the

USFWS "Refuge of the Year" award. Kanuti NWR also received a Departmental "Environmental Achievement" award, which was presented to Deputy Refuge Manager Maxwell at a Department of Interior (DOI) ceremony in Washington, D.C.

DRM Maxwell (center) receives the Refuge's DOI "Environmental Achievement" award from Secretary Norton (left) and Assistant Secretary Scarlett. (DOI Photo)

Team "STAR" award

Deputy Refuge Manager Maxwell, Wildlife Biologists Saperstein and Harwood, Park Ranger DeMeyere, Subsistence Coordinator Brown, Administrative Officer Gaddis, and Biological Technicians Knight and Craig were recognized with a team "STAR" award by Refuge Manager Spindler and the Regional Office for their respective roles in the completion of the draft revised Comprehensive Conservation Plan. The team not only met, but beat, the ambitious spring deadline for an initial draft submission to the Regional Office.

Regional Director's Excellence Award

It was announced during the "Employee Appreciation Day" luncheon on December 1 that Biological Technician Curtis Knight had won the prestigious Regional Director's Excellence Award for "Workplace Improvements." Wildlife Biologist Saperstein was nominated for the Science Excellence award. Knight's nomination read, in part:

> "During 2005, Curtis Knight was largely responsible for major improvements to overall safety, function, and appearance of the Kanuti NWR administrative cabin site. The cabin's boat ramp and floatplane dock had deteriorated, creating safety hazards and

requiring costly annual repairs. Curtis designed and constructed several facilities that will improve employee safety and reduce repairs costs…Curtis' initiative and cost-effective solutions greatly improved the safety and efficiency of all of Kanuti Refuge's field operations occurring along the Kanuti River. These relatively inexpensive improvements made an outstanding contribution to the safety of employees working at Kanuti Lake Cabin."

Curtis Knight receives his Regional Director's Excellence Award for "Workplace Improvements." (photo by C. Harwood)

Training

All staff completed all mandatory training for their respective positions. Supplemental training for several staff members included:

- DeMeyere: Basic Incident Command System (fire); Dispatch Recorder (fire)
- Harwood: Refuge Management Training Academy; "Pinch Hitter" aviation
- Knight: Hazardous Waste Operations and Emergency Response; Service Asset Maintenance Management System
- Maxwell: Compatibility Determination; Stepping Up to Leadership
- Saperstein: Applied Supervision; Advanced GPS
- Young: Contracting Officer Representative

Professional Affiliations

In addition to their Kanuti-specific duties, several staff members dedicated work time in 2005 as members in complementary national and regional programs, organizations, committees, etc.

- Refuge Manager Spindler: USFWS Pilot Mentor program
- Wildlife Biologist Saperstein: national "Fulfilling the Promises" habitat subcommittee; "Regional Biologist Workshop" planning committee; northern representative for Alaska chapter of *The Wildlife Society* (TWS); member planning committee for 2006 national TWS conference in Anchorage
- Wildlife Biologist Harwood: co-chair for *Boreal Partners in Flight*; member *Alaska Shorebird Group*
- Park Ranger DeMeyere: Alaska representative to USFWS "National Fire Outreach Team;" branch manager of *Alaska Natural History Association*

Microhabitat like this sundew on *Sphagnum* is by no means overlooked by Wildlife Biologist Saperstein's national "Fulfilling the Promises" habitat subcommittee. (photo by C. Harwood)

Public Use

Overview

Pursuit of subsistence activities (e.g., hunting, fishing, trapping, berry picking) by local residents continues to be the primary public use of the Refuge. Given subsistence's prominence in the public use realm of the Refuge, considerable staff effort is expended in its behalf (e.g., moose and wolf surveys, law enforcement patrols, newsletters to village residents, village meetings, etc.). While the Refuge does not monitor use quantitatively, it is believed that non-subsistence usage is generally light; the Refuge's remoteness and general inaccessibility likely are major deterrents to recreational use by non-locals. Still, there is some sport hunting done every year by hunters flying in via their own aircraft or air taxi services, or by accessing the Refuge (e.g., jet boats, rafts, airboats) by rivers that intersect the Dalton Highway. Most, if not all, sport fishing, wildlife observation, and wildlife photography are likely done incidentally to sport hunting. The Refuge contributes one staff member to the recently erected Arctic Interagency Visitor Center (AIVC) in Coldfoot (260 mi/415 km north of Fairbanks) along the Dalton Highway. The AIVC is centrally located to inform public about not only Kanuti NWR, but also Yukon Flats and Arctic NWRs, Gates of the Arctic National Park and Preserve, and BLM-held lands such as the Dalton Highway Corridor and the National Petroleum Reserve Alaska. Considerable environmental education and interpretation is done in Fairbanks as well, in cooperation with such groups as Alaska Department of Fish and Game, Alaska Public Lands Information Center, University of Alaska Fairbanks, and non-governmental organizations like the Alaska Bird Observatory, Arctic Audubon, and Friends of Creamer's Field.

Subsistence

Subsistence Overview

Providing the opportunity for continued subsistence use by local residents is one of the ANILCA purposes of Kanuti Refuge. Title VIII of ANILCA further provides that rural Alaska residents engaged in a subsistence way of life be allowed to continue using Refuge resources for traditional purposes. Many aspects of subsistence management are regulatory in nature. The Federal Subsistence Board, through its rulemaking process, addresses seasons, harvest limits, and determinations on customary and traditional use. The Federal Subsistence Board's jurisdiction includes hunting (excluding migratory birds), trapping, and fishing. The Federal Board established regional advisory councils to provide for meaningful public input to the rulemaking process. Kanuti Refuge is within the area represented by the Western Interior Federal Subsistence Regional Advisory Council (Western Interior RAC), and under State authority, the area represented by the Koyukuk River Fish and Game Advisory Committee (Koyukuk River AC).

David and Kitty David of Allakaket had success moose hunting on the South Fork Koyukuk River in mid-September. (photo by B. Raften)

Concerns/Issues

1) Low moose numbers

The most frequently expressed concern of village residents throughout interior Alaska continues to be the low moose population and high number of wolves. Local residents continue to ask for predator control (intensive management) on both State and federal lands. They also have asked for wolf surveys on the Refuge and predator/prey relationship studies. Related concerns or possible contributing factors to low moose numbers, that have been expressed at recent subsistence meetings include the following:

- Global warming – local residents feel that warmer weather later into the fall is affecting moose movements. Moose are staying at higher elevations where they are less accessible during the fall hunting season.
- Low water conditions -- traditional hunting grounds along the rivers are inaccessible by boat because of protracted low water conditions later into the fall. River freeze-up is occurring later in the fall, which also affects access to traditional hunting and trapping areas.
- Snow depth – deep winter snow conditions are making moose more susceptible to wolf predation. Deep snow hampers moose movements decreasing their ability to escape or fight off wolf attacks.

- Illegal guiding – in some areas guides are illegally taking clients into closed areas. Local residents also feel that airborne outfitters, which are currently managed through the Alaska Department of Commerce, would be better managed if they were under Alaska Department of Fish and Game's oversight.

2) Senate Bill 85
In 2005, state Senator Ralph Seekins (R – Fairbanks) introduced a bill to open the Dalton Highway Corridor for off-road vehicle access. It should be noted that the highway is just eight miles east of the eastern Refuge border at places. Rural residents throughout northwest Alaska have expressed serious concerns that this will allow urban-based hunters easy access to remote wildlife populations. Concerns center on the absence of a definition for what constitutes an "ATV," which could allow anything from a four-wheeler to off-road trucks. In some areas, local residents are already seeing many caribou wounded and not retrieved, and they feel this situation would get worse with increased access.

3) "Windowed" fishing schedule
Commercial fishermen from the lower Yukon River have been advocating altering the "windows" (periods of time during which subsistence salmon fishing is closed, thus allowing salmon to move upriver toward spawning grounds without being subject to fishing pressure) or lifting them altogether when salmon runs appear to be good. In response to this movement, rural residents along the Koyukuk River and Kuskokwim River drainages stated that they feel the current "windowed" fishing schedule that allows salmon passage up the Yukon is working and should be continued throughout the season. They also have expressed concern about commercial fishing openings in lower Yukon River reaches. Some Koyukuk River residents feel that a start date for the windowed schedule should be stated in the regulations (proposal not adopted by the Federal Subsistence Board).

4) Fish escapement
Reduction in size of salmon that get upriver, reflecting a possible loss of genetic integrity, has become a widely discussed issue. Spin-off concerns include size of nets used (large mesh gear) and depths fished (large fish run deep) and commercial openings in lower river versus escapement and size of fish reaching upriver spawning grounds.

5) Federal regulations on Native lands
Some residents have expressed a concern that federal regulations do not apply to Native allotments or Native corporation lands, which are under State regulations. The effect is that to reach federal refuge lands, residents have to travel longer distances away from their villages to hunt under federal regulations, which in some instances are more liberal that State regulations. They feel that the Federal Subsistence Board should have jurisdiction over Native lands, rather than the State, because of the federal rural preference.

6) High gasoline prices
Some residents have expressed concern that the current high gasoline prices in rural

Alaska are affecting their ability to hunt and fish to provide for their subsistence needs.

7) Avian influenza
Some residents have expressed concern that it is not safe to harvest waterfowl.

Kitty David of Allakaket demonstrates skinning a caribou (photo by B. Whitehill)

Big Game Harvest and Hunting Regulations (Subsistence)
Subsistence harvest is typically under-reported under the State harvest system (via green mail-in cards). Most of the harvest on the Refuge is by subsistence users living in area villages. The Alaska Department of Fish and Game (ADF&G) Subsistence Division has conducted door-to-door harvest surveys in Koyukuk River villages, but the most recent report is from the 2002 – 2003 regulatory year (Brown et al. 2004). During this time period, the four area villages (Allakaket, Alatna, Evansville, and Bettles) reported a total harvest of 47 moose, all of which were taken within reporting units that were partially or entirely on the Refuge. Also during this time period, area residents reported harvesting 19 black bears that may have been taken on the Refuge. No brown bears were reported harvested. Caribou harvest is highly variable as it depends on whether caribou migrate into the area in winter. In 2002 – 2003, 139 caribou were harvested by Allakaket and Alatna residents. Of these, 76 caribou may have been taken on the Refuge.

Special regulations are currently in effect on the Refuge regarding moose hunting. The

State Board of Game established the Kanuti Controlled Use Area in 1981. In the Controlled Use Area, aircraft access for moose hunting is prohibited. In 1992, the Federal Subsistence Board closed federal lands within the Kanuti Controlled Use Area to non-residents of Game Management Unit 24, Anaktuvuk Pass, Galena, or Koyukuk, further restricting moose hunting in the western two-thirds of the Refuge.

One new hunting regulation became effective for the 2005/06 season. The new regulation gave the federal land managers some in-season management responsibility. Local managers now decide whether to open or close the September cow moose season in the area that includes the northwest corner of the Refuge, north of the Koyukuk River. Similarly, the authorization also gave the federal land managers the discretion to open the March season based on moose population estimates and in consultation with local advisory councils. Under this authority, Refuge Manager Spindler closed the 2005 fall cow moose season, consistent with State and other federal managers' actions. The former March 1-10 antlerless moose season was shortened by five days.

Western Interior Subsistence Regional Advisory Council, 2005 Allakaket Winter Meeting
(photo by Maureen Clark [Office of Subsistence Management])

Back row: Ray Collins (McGrath), Robert Walker (Anvik), Tom Kriska (Koyukuk), and Donald Honea, Jr. (Ruby)
Middle row: Benedict Jones (Koyukuk), Carl Morgan (Aniak), Mickey Stickman (Nulato)
Front row: Jack Reakoff (Wiseman), Ron Sam (Alatna)

In September 2005, residents of Allakaket submitted a Special Action Request to the Federal Subsistence Board and a companion Emergency Order request to the State Board of Game to extend the moose season in Unit 24 to October 1 because smoky conditions and low water levels prevented people from safely accessing hunting areas by boat. They also contended that many residents were deployed on fire crews late in the season and were unable to prepare for hunting season. Although a similar request was granted in 2004, the 2005 request was denied because many of the cited factors were no longer in effect once hunting season was underway. Several other villages within the Western Interior Region submitted similar requests to extend the moose season. All actions were denied by both federal and state boards. The Western Interior RAC members felt that the requests were rejected because they did not meet the criteria for consideration. The Western Interior RAC later submitted a formal proposal (WP06-34) to extend the moose season to October 1 for GMU 24 and parts of GMU 21.

Another proposed new federal hunting regulation pertinent to Kanuti NWR was reviewed and voted upon by the Western Interior RAC or the Koyukuk River Advisory Committee. Federal Proposal WP05-02 to reduce wolf hunting season length was submitted by Defenders of Wildlife, Anchorage. The Western Interior RAC voted to oppose the proposal. At its May 2005 meeting, The Federal Subsistence Board also voted down Proposal WP05-02.

In fall 2005, the Office of Subsistence Management undertook a review of closures on federal lands to non-local residents. These closure reviews were presented to the regional advisory councils at their fall meetings to get councils' views on whether these closures should have proposals to lift them. Four closure reviews were presented to the Western Interior RAC, but only one affects the Kanuti Refuge—closure of the Kanuti Controlled Use Area to non-residents of Unit 24, Anaktuvuk Pass, Galena, or Koyukuk. The Western Interior RAC voted to maintain the closure. For the other three closure reviews presented, the Western Interior RAC voted to either maintain status quo (keep it closed) or defer to the home region.

New hunting regulations reviewed by the Western Interior RAC for the 2006/07 cycle include the following:

- extending the bull season in Units 24, Unit 21B, Unit 21E, Unit 21A: limit 1 bull/season, opening dates to remain the same; all hunts to end October 1. Proposal to be submitted by Western Interior RAC to both State and federal boards.
- Subdividing Unit 24 into four subunits – ADF&G would submit this proposal to the Board of Game to be heard at the Board's meeting on statewide proposals January 2006. Western Interior RAC supported the proposal.
- Companion State proposal – set intensive management moose harvest objectives for each new subunit of Unit 24 -- ADF&G would submit this proposal to the Board of Game to be heard at the Board's meeting on Interior proposals March 2006. Western Interior RAC supported the proposal.

The Koyukuk River Moose Management Plan sunset in 2005. The Koyukuk River Moose Hunters' Working Group met in October 2005 to discuss how the group wanted to

proceed with moose management – whether they wanted to continue to operate under the Plan, revise/update the Plan, etc. ADF&G representatives reported that no State funding was available to support a new planning effort. Working Group members discussed how they felt the Plan was working and that it should remain in effect for two more years. They also discussed finding funding to review/revisit plan.

Fishing Harvest and Hunting Regulations (Subsistence)

Information on subsistence fish harvest is available for villages near the Refuge, but location of the actual harvest is not included, so some of the fish may be taken off-refuge. The most recent information about subsistence fishing is from 2003 (ADF&G 2005). Alatna harvested an estimated 69 salmon comprised of 50 chum, 7 coho, and 12 Chinook salmon. Allakaket harvested an estimated 4,893 salmon, with the following breakdown: 4,488 chum, 99 coho, and 306 Chinook. There was no reported salmon harvest by residents of Bettles and Evansville in 2003.

Estimated harvest of fish other than salmon was documented in Koyukuk River villages for 2002 (Andersen et al. 2004). Residents of Allakaket and Alatna harvested 8,559 and 443 fish, respectively, most of which were whitefish. Residents of Bettles and Evansville harvested 185 fish, most of which were grayling.

Salmon drying at a fish camp. (photo by W. Brown)

Subsistence salmon fishing opened in District 4 (including the Koyukuk River drainage) on June 12 on a 24 hours per day/7 days per week schedule. Fisheries biologists described the 2005 Chinook salmon fishing season as later than normal in timing and below average in run strength. Through the first half of June, the Chinook salmon run was low, exhibiting the same pattern as the poor runs in 1998 and 2000; however, the estimate by the end of the season was higher than either year, but lower than the good run

in 2004. The summer chum run was estimated at 2.5 million fish, well above the historic average. The fall chum run exceeded the 20-year historical record. All windows (periods of time during which subsistence salmon fishing is closed, thus allowing salmon to move upriver toward spawning grounds without being subject to fishing pressure) were lifted for both subsistence and commercial fishermen for fall chum.

Proposed new federal fishing regulations pertinent to Kanuti NWR that were reviewed and voted upon by the Western Interior RAC for the 2006/07 cycle include the following:

- Fisheries Proposal FP06-03: submitted by Western Interior RAC requesting that federal subsistence windows schedule be put in regulation to start on May 15; the proposal would affect Chinook gear only (6" stretch mesh or larger). Given the good 2005 fishing season, the Council felt that the proposal would not receive favorable review this year, so they voted to table the proposal.
- Fisheries Proposal FP06-04: submitted by Eastern Interior RAC requesting that in the Yukon River drainage all gillnets with greater than 6-inch stretch mesh be limited to a depth of 35-meshes. This subject received considerable discussion regarding reduction in size of fish seen upstream. Because the Western Interior RAC felt that this proposal would go nowhere with the Federal Subsistence Board, the members voted to oppose the proposal. However, the Western Interior RAC did vote to draft a letter to attach to this proposal, stating its frustration on this issue. The letter would also ask that studies be designed to address this issue and that it be transmitted through Office of Subsistence Management to ADF&G.

The Federal Subsistence Board will review these regulatory proposals at its January 2006 meeting.

Waterfowl Harvest and Hunting Regulations (Subsistence)

Though not governed as subsistence under ANILCA, spring harvest of migratory birds has been a long-standing tradition in rural Alaska. The 1916 Migratory Bird Treaties with Canada and Mexico failed to recognize Alaska's traditional spring/summer subsistence harvest. After years of negotiations, the treaties were amended in 1997 to recognize this customary and traditional harvest. Under the amendment terms, the Alaska Migratory Bird Co-Management Council (AMBCC) was formed, which includes representatives from the Alaska Native community, the Alaska Department of Fish and Game, and the U.S. Fish and Wildlife Service acting as equal partners. The AMBCC's specific purpose was to develop "recommendations related to the spring/summer subsistence harvest of migratory birds," and under this authority issued the first harvest regulations in 2003.

Eleven regional management bodies were created to provide crucial local input to the Council in developing the bird harvest list, regional season dates, methods and means and other annual regulatory recommendations. The AMBCC contracts with Tanana Chiefs Convention (TCC) as the regional management body for the interior Alaska region, which includes the Kanuti Refuge villages. However, interior villages have reported that TCC has failed to adequately represent them by not holding regional meetings to get local input for the process. The TCC representative to the AMBCC did not attend either the spring or fall AMBCC meeting. At its fall 2005 meeting, the AMBCC conducted a

closed executive session to discuss how to address the lack of representation by certain regional management bodies, one of which is TCC.

To assist with the regulatory and outreach process, Refuge staff works with the AMBCC to ensure that Interior villages are advised of regulatory changes and to gain their cooperation in harvest monitoring surveys. Subsistence Coordinator Brown participated in the AMBCC's Communication Outreach Team. The Team was formed to prioritize important information needs and standardize information delivered regarding those issues among the three Fish and Wildlife Offices that have responsibility for migratory birds. The issues identified were: steel shot use/clinics, participating in harvest surveys, closed species issues, and habitat damage from ATVs. Kanuti Refuge villages are scheduled for harvest surveys in 2006.

Steel shot clinics were identified as high priority for the AMBCC's Communication Outreach Team. (photo by B. Whitehill)

Arctic Interagency Visitor Center

Overview

The Arctic Interagency Visitor Center (Visitor Center) in Coldfoot, Alaska was open from May 27 through September 10 in 2005 (110 days). Overall visitation (independent and guided visitation combined) was down 6.4% from 2004. A total of 8,051 visitors passed through the center this season. Independent and guided visitors were down 9% and 11%, respectively; however this may have been due to coding youth and educational groups separately from guided tours this season. Several reasons may explain why visitation was down from 2004, including poor road conditions, smoke from nearby wildfires on the Dalton Highway, the high price of gasoline, and the fact that the Visitor Center's web site was taken offline in April 2005.

The Arctic Interagency Visitor Center in Coldfoot is a functional and visual delight.
[Notice how the roofline mirrors the profile of the nearby mountains]
(photo by L. Jodwalis [BLM])

Alaska Natural History Association (ANHA)

This year Park Ranger DeMeyere took over branch manager duties of the Alaska Natural History Association (ANHA) outlet at the Visitor Center. DeMeyere's ANHA duties were myriad, including training other staff members on ANHA's mission and operations, as well as managing budget, purchase, and sales. DeMeyere functioned as Branch Manager throughout the summer. In the fall she turned over ANHA duties to Visitor Center coordinator, Lisa Jodwalis of the BLM.

New Globe Display

A large half-globe, depicting in relief the topography of the earth's Arctic, was installed in the main entrance at the Visitor Center. The crown jewel of the circumpolar room, the globe has been positioned to be the first object your eye catches when you walk into the visitor center. This impressive display replaces the simpler two-dimensional depiction of the Arctic installed when the AIVC opened. Although the northern refuges are not labeled on this globe, tundra, mountain, and boreal forest regions represented by the refuges are easily noticeable on a model of this size. The boreal forest is beautifully illustrated in stark contrast with the flat North Slope. Visitors were drawn to the display and spoke highly of its quality.

The new half-globe of the Arctic is a dramatic display that greets visitors to the Arctic Interagency Visitor Center. (photo by J. DeMeyere)

Special Events

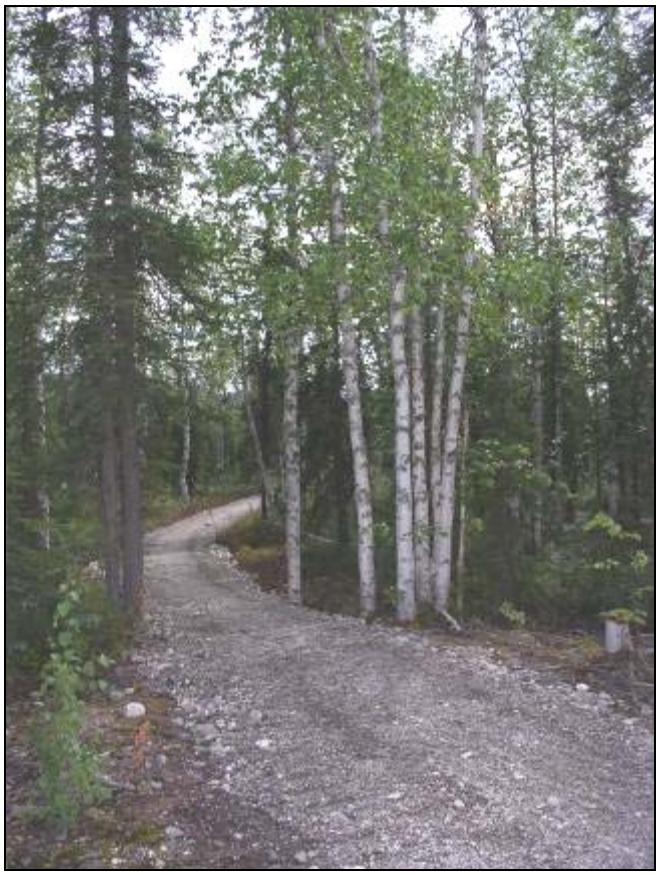
In August, the two authors of *Ballad of the Wild Bear,* Sandy Kogl and Pat Chamberlin, traveled to the Visitor Center for a book signing and sing-along. Park Ranger (PR) DeMeyere spent considerable time promoting the event by posting flyers around Coldfoot and Wiseman and talking directly with area residents. Sandy and Pat continued the promotion by visiting with local residents before the event. As a result, turnout was huge, with over 30 people in attendance, including every child from the community. Sandy and Pat did an excellent job discussing the proper ways to avoid food-conditioning bears and made it easy for everyone to follow along during the sing-along.

Ballad of the Wild Bear authors, Sandy Kogl and Pat Chamberlin,
had a book signing and sing-along at the AIVC. (photo by J. DeMeyere)

Near the end of the season, PR DeMeyere arranged for a special showing of the film *Winged Migration* as a farewell to the seasonal residents of the community. The turnout was not as large as expected, but those that came were thoroughly impressed with the film.

Trail Project

Two crews of volunteers from the Sierra Club helped complete three new interpretative trails at the Visitor Center. One trail connects the Visitor Center to the historical Coldfoot cemetery, one winds through the woods to the airport access road, and one terminates at the Trans Alaska Pipeline. BLM staff oversaw the project, with assistance from a Visitor Center volunteer. In addition to trail construction, the historical "Coldfoot Cemetery" sign was mounted on the new arch that was built last year. The sign was created in 1974 by a Fairbanks woodcarver who was working on the pipeline.



One of the three new interpretative trails at the Arctic Interagency Visitor Center. (photo by J. DeMeyere)

Wildlife Dependent Recreation and Education

Sport Hunting

Harvest
Estimating big game sport harvest (moose, caribou, and bear) on the Refuge is difficult because of the remote nature of the hunts. Hunters are required to submit mail-in harvest report cards for moose and caribou to Alaska Department of Fish and Game (ADF&G) within 15 days of fulfilling a bag limit or within 15 days following the close of the season. The hunter harvest reports do not accurately represent the Refuge because many of the ADF&G reporting units intersect the Refuge boundary making it impossible to determine if the animal was actually taken on the Refuge. These harvest data are not yet available for 2005. The most timely harvest information is from reports of air taxi operators who are required to obtain a special use permit to operate on the Refuge. In 2005, the one permitted air taxi operator reported flying five hunters to or from the Refuge and transporting three moose and one wolf.

Regulations
Two sets of hunting regulations apply to the Refuge; the general State harvest regulations

and federal subsistence regulations that only apply to federally qualified subsistence users on federal lands. Qualification as a federal subsistence user is based on residency in rural villages. In most cases, the State and federal regulations are the same, but there are exceptions. The most notable one is that most federal land within the Kanuti Controlled Use Area (CUA) is closed to moose hunting except by residents of Game Management Unit (GMU) 24 and residents of Anaktuvuk Pass, Koyukuk, and Galena. The CUA was originally created by the State as a no-fly zone during moose season, and it includes much of the Refuge. In 1992, the Federal Subsistence Board passed the regulation to restrict moose hunting on federal lands within the CUA. Another subsistence regulation is a March antlerless moose hunt, which is opened under the discretion of federal land managers, and closure of the fall cow season. The annual decision to open the March season or the fall cow season is based on the ability of the population to sustain a cow harvest and on the nutritional needs of local residents.

The ADF&G developed a proposal in 2005 to subdivide GMU into four subunits to facilitate management; the proposal will go before the State Board of Game early in 2006. Unit 24A covers areas adjacent to the Dalton Highway. Unit 24B includes the entire Kanuti Refuge, portions of Gates of the Arctic National Park, and the Kanuti CUA. Unit 24C includes the village of Hughes and the Hogatza River, and Unit 24D encompasses the high density moose habitat around Huslia and part of the Koyukuk CUA.

Sport Fishing

The Refuge does not have a mechanism in place to monitor subsistence or sport fishing activity on the Refuge. Much of the sport fishing is likely associated with fall hunting trips, but people occasionally visit the Refuge solely to fish. Northern pike and arctic grayling are probably the two most sought-after species for sport fishermen.

Wildlife Observation and Photography

The Refuge does not have a facility where visitors can check in or out of the Refuge. Therefore, tracking actual numbers of recreational visitors is difficult. Records of trips to Kanuti Refuge do not pinpoint locations or provide details on use patterns. Visitor numbers are so small that no systematic effort has been made to quantify them. It is assumed that most wildlife viewing and photography occurs incidentally when those already on Refuge lands are hunting, fishing, or floating rivers.

Environmental Interpretation

Bettles Nature Trail

For more than a decade, residents of Bettles have sought a recreational trail for their community. In March, Park Ranger DeMeyere and Deputy Refuge Manager Maxwell traveled to Bettles to brief community members on a possible Service-funded self-guided bird and plant identification trail system. Community members seemed excited about the funding possibility. As the project progressed, Biological Technician Knight and Bettles assistant mayor, Rich Thorne, “GPSed” the proposed trail which would skirt the south side of VOR Lake and extend just inside the external boundary of the Refuge.

Boardwalks, bridges, benches, kiosks, and a blind for wildlife viewing will be built during the 2006 summer. In addition to walking the trail in the summer, the trail could also be used in the winter for skiing and mushing. Funding, however, has gone away due to rescission.

Fairbanks Refuges Office Displays
On March 14, the Fairbanks Refuges hosted an appreciation ceremony for Brow Tine Taxidermy for donation of moose and wolf mounts to the Fairbanks refuges' offices. The donation exceeds $8,000. Park Ranger DeMeyere presented the taxidermist with a plaque thanking him for his generous donation. Photos of the two displays and an article on the ceremony were featured in the local *Daily News-Miner* the following day.

In August, Renowned wildlife artist, Robert Bateman, was the featured guest at the eighth annual Tanana Valley Sandhill Crane Festival. Brow Tine Taxidermy, which donated the moose and wolf mounts in the lobby outside the refuges' offices, had Bateman sign his moose print that accompanies the mount.

Brow Tine Taxidermy's award-winning moose mount, with autographed Robert Bateman print at back left, spruces up the lobby. (photo J. DeMeyere)

National Fire Outreach Team
Park Ranger DeMeyere resigned from the National Fire Outreach Team where she had been representing Alaska. While on the team, DeMeyere participated in the development of the USFWS National Fire Outreach Plan, drafted a national fire brochure, and contributed to the fire events and speaker bureau projects.

Alaska Refuges Friends Group
The "Friends of Alaska Refuges" group is in full swing. After the first face-to-face

meeting at the Kenai Refuge on November 5, the group now has a board of directors, consisting of: President – David Raskin (Homer), Vice President – Carla Stanley (Homer), Secretary – Penny Bauder (Anchorage) and Treasurer – Ginny Harris (Anchorage). A mission statement was also adopted: *Friends of Alaska National Wildlife Refuges is an independent, nonprofit organization dedicated to: promoting the conservation of the natural resources of the Alaska National Wildlife Refuges; fostering understanding and appreciation of these refuges; and engaging in activities that will assist the US Fish and Wildlife Service to meet its mandates.* The mailing address is: Friends of Alaska National Wildlife Refuges, 2440 E. Tudor Road, PMB 283, Anchorage, AK 99507-185. The email address is: akrefugefriends@gmail.com. The group is now in the process of recruiting members and collecting dues.

Logo for the new "Friends of Alaska Refuges" group.

Environmental Education

Film Festival

Approximately 500 people celebrated National Wildlife Refuge Week by viewing a selection of films about the conservation of wildlife and wild places around the world at the second annual Far North Conservation Film Festival in Fairbanks. The Arctic, Kanuti, and Yukon Flats National Wildlife Refuges and the University of Alaska Fairbanks (UAF) Student Activities Office sponsored the event, which was held at UAF on September 23-24. Numerous local conservation groups and agencies, including the U.S. Fish and Wildlife Service, set up displays and information booths that featured a variety of children's activities. The Blue Goose flew in for the occasion and enjoyed visiting with people and making new friends. An afternoon highlight was the family concert, "A Day at the Farm with Farmer Jason," performed by Jason Ringenberg, an alternative-country music sensation from Nashville, Tennessee. An engaging selection of children's films followed Farmer Jason's energetic performance, while evenings featured

a diverse line-up of conservation films geared more toward an adult audience. With music, children's activities, and films for all ages, the second annual Far North Conservation Film Festival was a big hit this year with kids and adults alike!

Farmer Jason and Wildlife Biologist Saperstein (disguised as the Blue Goose) were big hits at the Far North Conservation Film Festival (photo by S. Nelson).

International Migratory Bird Day (IMBD)
The three Fairbanks-based refuges once again participated in the 2005 IMBD Spring Migration Celebration. Instead of the usual cold, windy weather that often accompanies this event, staff and event participants were treated to a bright, sunny day. Over 500 people joined the celebration in which the USFWS partnered with the Alaska Bird Observatory, Friends of Creamers Field, Arctic Audubon, Alaska Department of Fish and Game, and National Park Service. The event included a variety of migration and bird related games, a migration puppet show, the Alaska Junior Duck Stamp awards ceremony, a bird calling contest, a bird song ID quiz, and much more.

Ice Carving Festival
On March 6, Park Ranger DeMeyere dressed as the blue goose and greeted the public during the opening of the annual Ice Carving Festival in Fairbanks. The festival featured a Service-sponsored entry depicting the Service emblem and a duck rising from a pool of water. Visitors stopped by the carving to pick up information on the Fairbanks-based refuges and to snap photos of the only blue goose known to reside in Fairbanks.

Another sure sign of global warming—the Blue Goose migrates to Fairbanks in March…

Outdoor Days
Deputy Refuge Manager Maxwell staffed the telemetry booth at Outdoor Days in May 2005. As kids passed through the station, she helped students find a hidden transmitter using radio telemetry techniques.

Creamers Field 5th Grade Bird Watch
This spring Deputy Refuge Manager Maxwell, Park Ranger DeMeyere, and Biological Technician Knight participated in the 5th Grade Bird Watch at Creamers Field. Fifth graders from local schools spent the day around the field at Creamers Field Migratory Bird Refuge learning how to use binoculars and scopes to see birds in the wild, methods used to identify birds, and what different bird behaviors mean.

Steel Shot Clinic
A Steel Shot clinic was conducted in Allakaket on May 5-6. Instructors were Orville Huntington (Koyukuk NWR), Patrick Madros, Jr. (Koyukuk NWR), and Barry Whitehill (Yukon Flats NWR). P.J. Simon of Allakaket assisted with the clinic and did an outstanding job. Twenty-six students from Allakaket and Hughes attended a two-hour gun safety class, and over 22 people attended the steel shot PowerPoint presentation. At the gun range, 40-50 people participated.

Refuge Information Technician Patrick Madros, Jr. (Koyukuk/Nowitna NWRs; center-back, tallest!!), assisted young hunters at the FWS-sponsored Steel Shot Clinic in Allakaket. (photo by B. Whitehill [Yukon Flats NWR])

Web Site

The Kanuti web site (http://kanuti.fws.gov) continues to be a place for potential visitors and those curious about the Refuge to get refuge-specific information. This site includes wildlife species lists, how to contact the Refuge, ways to access Refuge lands, a description of activities that take place on the Refuge, effects of fire and permafrost, and lots more. Minimal changes were made to the web site this year. We plan to offer this annual report via web distribution.

Newsletters

Two Kanuti newsletters were produced in 2005. The February newsletter highlighted staff changes at the Refuge, a new bird sighting, the fall 2004 moose survey, a whitefish radio telemetry project, and recently analyzed results from beaver cache surveys in 2002 and 2003. Highlights from the December newsletter covered summer activities, the fall 2005 moose survey, Deputy Refuge Manager Maxwell's transfer, and the Kanuti environmental awards. These newsletters are sent to every post office box in Allakaket, Alatna, Bettles and Evansville, all the Alaska refuge managers, as well as some folks in the Regional Office.

Law Enforcement

Refuge Manager Spindler and Zone Officer Bill Raften conducted a moose hunter patrol on the Refuge September 8-12. Prior to any hunter checks, they visited with Allakaket Tribal Chief Herbie Moses and with Western Interior Federal Subsistence Regional Advisory Council Chair Ron Sam. They also visited with hunting license vendor Steven Bergman to discuss recent changes to regulations and ensure that the correct harvest tickets were available in Allakaket (i.e., green for east of Kanuti Controlled Use Area (KCUA) boundary and gray for west of the KCUA boundary along the Koyukuk River).

When Spindler and Raften began their patrol on September 8, water levels were low but rising, due to prolonged rains the prior week. By September 14 the Kanuti River was very high after two more all-night rains. All of the Kanuti River's connected oxbow lakes were full. In mid-September one could travel nearly anywhere desired by boat due to the deep water.

For the first half of the season, hunting activity by non-local people was minimal. One airboat party was hunting at the confluence of the Jim River and South Fork of Koyukuk River. State Trooper Curt Bedingfield believed that the airboaters were from Fairbanks, and associated with a big camp upriver and off the Refuge. One party (from Wasilla, Alaska) in an outboard jetboat was seen turning from the South Fork and heading up Fish Creek. One party of rafters (an Alaska resident accompanied by his father from Washington) floated down the Kanuti River and were picked up by Brooks Range Aviation at Kanuti Lake. Another party was flown in by Brooks Range Aviation to a lake about 10 miles northeast of Kanuti Lake Cabin. We also looked for fly-in hunters on lakes both inside and outside of the KCUA, but found no others. On September 14 a non-local party was observed camped near the JimRiver/South Fork confluence

On the South Fork Koyukuk River, two boatloads of local hunters were checked and a third was observed from the air. Two of these three parties were successful. One boat was checked on the main branch of the Koyukuk River about 10 miles upriver from Allakaket. Two boats were seen near the cabins above the mouth of the Kanuti River, one boat was observed in Kanuti Canyon, and one boat was seen just below the mouth of the Kanuti Canyon. There were no local boats observed on the Kanuti River above the canyon during the patrol, however, in the third week of September a local boat did stop by Kanuti Lake. All hunters contacted had the proper licenses and harvest tickets, and no violations were documented.

RM Spindler on final approach, landing on the Koyukuk River at Allakaket. Spindler and Bill Raften, Southern Zone Law Enforcement (LE) Officer, briefed local folks on regulations and other LE issues. Educating our users is our best first step in successful LE. (photo by B. Raften)

User Conflicts

There were no reported user conflicts in 2005. In past years there have been reports of non-local hunters accessing the Refuge from the Dalton Highway using airboats and jetboats. At subsistence meetings, local hunters have complained about competition from non-local hunters, but patrols in September 2005 did not reveal any current conflicts.

Facilities and Equipment

Bunkhouses

On January 27, 2004 a fire destroyed the joint U.S. Fish and Wildlife Service (USFWS)/National Park Service (NPS) office, visitor center, and bunkhouse in Bettles. This had been the Refuge and Park's sub-headquarters in the field since 1985. Both NPS and FWS made temporary facility arrangements for the 2004 field season. Gates of the Arctic National Park and Preserve (NPP) staff converted employee housing into a temporary office, and with the help of AmeriCorps volunteers, built a small log cabin to serve as a visitor contact station for both Kanuti NWR and Gates of the Arctic NPP. To re-establish a temporary field station, the Refuge leased a three-bedroom house in Bettles from Yukon-Koyukuk School District. In summers of 2004 and 2005, this building served as a bunkhouse and field office.

For the fiscal year (FY)05 and FY06 budgets, FWS and NPS submitted emergency construction requests for replacement of the lost Bettles facility. FWS identified the replacement of the Bettles office/bunkhouse as its number-one regional construction priority, at an estimated cost of $6.85 million. To date there have been no appropriations resulting from these requests.

In late 2004 the Service also began considering acquisition of the School district residence because this house fit our immediate needs and was declared surplus by the Yukon-Koyukuk School District. The residence (located on Lot 19, Block 110, Bettles Airport, including Land Lease Agreement ADA-71368) was reportedly constructed by DOT in the late 1970s and was occupied by DOT staff for approximately 20 years. For about five years the home was occupied by the School District's Bettles school principal.

In November 2004, the Service accepted results of a pre-acquisition contaminant survey. The survey determined that the soil near the original underground heating oil tank was contaminated by fuel oil. Our consultant speculated that soil contamination came from continuous overfilling of the tank by the oil company (Platt Environmental Inc. 2004). To make matters worse, on March 21, 2005, approximately 400 gallons of oil were spilled on the ground near the tank when the fuel truck attempted to fill the tank (at the request of the Refuge). The Refuge staff and fuel contractor immediately installed a replacement above-ground tank and cleaned up and stockpiled contaminated snow around the tank site. The School District property manager and DEC visited the site shortly after the spill. In May 2005, the Service accepted responsibility for the March spill and initiated lasting cleanup efforts. Meanwhile, final clean-up of debris from the January 2004 bunkhouse fire was completed on April 2, 2005. Becker Trucking removed five loads of debris and transported them to Fairbanks. Removal was stalled several times when severe snow drifting closed the "Ice Road," which connects Bettles to the Dalton Highway (winter only), to all travel.

The Service contracted Hart-Crowser, Inc. to have the underground fuel tank and recently contaminated soil removed from the school district site. In July 2005 the tank was removed and it was discovered that the fill and vent pipes were improperly installed: both

90-degree elbow pipe joints on the vent and fill lines were cross-threaded and leaked. This meant that every time the tank was filled, these joints leaked heating oil into the ground. A total of 70 cubic yards of contaminated gravel was removed and placed in two land-farm holding cells established elsewhere on DOT lots leased by the Service. The consultant was unable to clean and remediate the entire site in the July 2005 effort (Hart Crowser 2005a).

In August 2005 Mr. Darren Mulkey, Environmental coordinator for Alaska DOT and Mr. Toivo Luick, Environmental Specialist, Alaska Department of Environmental Conservation (DEC) accepted the Refuge's proposal for a (hopeful) final effort at soil removal and site remediation. This would involve a larger, deeper excavation around the tank site and a thin land-spread of contaminated gravel on unoccupied airport lands south of the runway (because we were running out of space on the leased lots for gravel holding cells). On September 9, 2005 Hart-Crowser completed the soil removal and received authorization from DEC to back-fill the hole with clean gravel. A total of 230 cubic yards of soil was removed to the land-spread area for remediation. Most baseline samples from the tank excavation showed that we had achieved State cleanup levels except that minor contamination remained in some small areas near the building's foundation where removal was unsafe or impractical. (Hart Crowser 2005b), and DEC subsequently issued a letter requiring no further cleanup action on November 10, 2005.

During the cleanup process, FWS sought assurance from DOT that the final report documenting our assessment efforts would be accepted as a Baseline Contaminant Survey to ensure the United States is not held accountable for the prior contamination. DOT provided that assurance in writing on December 13, 2005. By year's end, FWS, School District, and DOT were exchanging documents to begin the property transfer process. The Refuge spent about $70,000 on cleanup efforts; however, in the process obtained a much-needed facility that has a replacement cost of over $500,000. Had the Refuge not stepped up to the plate to do the cleanup, there would still be a contaminated site in Bettles, and we would still be looking for a field station, while trying to compete for scarcer and scarcer construction dollars. In 2006 a final soil sample analysis will be needed in the land farm cells and land-spread areas will but that should not be too costly.

A tale of two spills: absorbent pads are deployed to soak up fuel from overflowing the underground fuel tank (top), while chronic leakage from faulty original installation was discovered when excavating the tank….nevertheless, it's a pretty functional bunkhouse!!! (photos by C. Knight (top) and B. Raften)

Kanuti Lake Administrative Cabin

There were quite a few improvements to the Refuge's administrative cabin this year. In June, Volunteers Roger Wieland and Larry Smith spent a week constructing a new fuel shed. Deputy Refuge Manager Maxwell and Pilot Don Carlson (Arctic NWR) helped with the project. A new fuel shed has long been needed, as the older shed lacked both proper ventilation and secondary containment for storing fuel. The new shed not only addresses these storage issues, but provides enough floor space to adequately work on small projects such as boat motor repairs. Volunteer Smith, a former U.S. Forest Service firefighter, also cleared considerable brush around the cabin to make it more "fire-wise."

Throughout September, Volunteer Weiland, Biological Technician Knight, and Maintenance Worker Holton completed three important safety-related projects at the cabin site: 1) a skid-proof aluminum sectional ramp to the floatplane dock that can be assembled easily each spring by two employees. (Spring floods/ice at Kanuti Lake have annually displaced and/or broken the original fixed wooden stairs. The new ramp can now be installed each spring, facilitating movement of supplies to/from the dock, including heavy fuel barrels); 2) a skid-proof aluminum sectional ramp for launching/retrieving boats. (Water levels in Kanuti River drop substantially over the summer, creating a dangerous muddy incline for launching/retrieving boats. This ramp can be extended/retracted as water levels change. It includes side rollers for sliding boats up/down, as well as Astroturf platforms for safely manipulating boats and motors. Previously, moving boats required stronger people, and was dangerous due to the slippery steep muddy river bank); 3) a custom-built dolly for carrying the motors and fuel barrels from the shed to the boat launch.

Projects that were started but not completed include: 1) an overhead trolley system in the new fuel shed, composed of a unistrut beam and pulley, for lifting heavy outboard motors off their stands and easily moving them across the shed; and 2) a shed to store tools and the batteries for the solar power system (to power the cabin), as well as poles and mounts for the yet-to-be-installed solar power system.

The support facilities for the Kanuti Lake Cabin received major upgrades in function and safety (clockwise from top left): 1) new fuel shed, 2) new ramp from cabin to lake , 3) new boat launch on Kanuti River, and 4) new storage/solar power shed (Volunteer Wieland and Maintenance Worker Holton pictured). (photos by staff).

Airplane/Airplane Support

After seeing considerable use during the summer, the Refuge's Scout N778AC was determined un-airworthy when metal corrosion was found on the airframe during inspection. The Refuge expects to receive a new Scout in 2006.

Engineering consultant firm, Reid Middleton (Anchorage), was contracted by Region 7's Division of Engineering to inspect the USFWS hangar in Bettles. Biological Technician (BT) Knight accompanied Reid Middleton's Al Findlay to Bettles for the inspection. The 4,100-square foot hangar was constructed with a 40-pound per square foot snow load capacity. Required snow load capacity for Bettles/surrounding area has been recently increased to 60 pounds per square foot, per the 2003 International Building Code. Reid Middleton provided Engineering with design solutions and cost estimates.

BT Knight, Maintenance Worker Doug Holton, and Deputy Refuge Manager Maxwell constructed a shelter over the 500-gal fuel tank and hose reel apparatus at VOR Lake in Bettles during the week of September 26. The shelter will protect the equipment from

weather and UV radiation. This completes the Refuge's float pond facility upgrade that was begun last summer. It also includes an 8'x 8'storage shed and a grated walkway to the floating dock.

"Alpha Charlie" (left) will never have the pleasure of frequenting the new facility at the floatplane pond in Bettles—the Scout was deemed un-airworthy due to a rusted airframe. (photos by B. Raften (left) and C. Knight)

Refuge Communications

On June 21 Regional Telecommunications Manager (RTM) Mike Lewis and crew initiated activities to upgrade the Kanuti's communications system with new digital equipment. Activities included: 1) removing the old building, tower, and batteries from the "1606" repeater site, and 2) removing the old Pope Creek dome repeater building and replacing it with a new one. All flight operations were suspended due to fire activity on June 25.

Beginning July 22, RTM Lewis and crew resumed upgrading the Refuge's communications system after smoky conditions, which had plagued the Refuge for nearly a month, abated. They constructed/tested a new repeater site off-refuge near Mt. Tozi in the Ray Mountains, to replace the old "1606" site within the Refuge. New radios were installed in the Kanuti bunkhouse in Bettles, the cabin at Kanuti Lake (along with 3 new solar panels), as well as the Arctic Interagency Visitor Center in Coldfoot, to take advantage of the repeater upgrades. Finally, Lewis' crew conducted an assessment of the Old Dummy fire for the biological crew working near Dune Lake on July 26. Lewis' helicopter was required immediately thereafter to evacuate the Dune Lake crew when fire restarted within the perimeter and threatened camp.

On August 10, Biological Technician Knight assisted Lewis and the BLM in installing a 20-foot 4-dipole antenna atop Ester Dome (just west of Fairbanks) in order to establish a radio path between Fairbanks and the new "1606" repeater (the name was maintained for logistical convenience) located on Mt. Tozi in the Ray Mountains. This first-ever attempt to establish radio communications between the Refuge and Fairbanks was unsuccessful, however, due primarily to the amount of radio traffic already existing on Ester Dome. Lewis suggested either moving the location of the antenna or installing additional

equipment in order to overcome the barrier. No further communications work was attempted thereafter in 2005.

SAMMS (Service Asset Maintenance Management System)

The Refuge began implementation of SAMMS this year. Deputy Refuge Manager Maxwell and Biological Technician Knight attended the SAMMS database training at the National Conservation Training Center. The purpose of the SAMMS database is to track 100% of all maintenance activities and costs associated with maintaining the Refuge's assets. At this time, the Refuge will be responsible for documenting all assets that require cyclical maintenance of some kind, along with developing and implementing a preventative maintenance schedule for those assets. Knight assumed responsibility of implementing and maintaining SAMMS when Maxwell transferred.

The Refuge's administrative cabin at Kanuti Lake - an asset well worth maintaining. (photo by B. Raften)

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While ostensibly "just another patch of open black spruce forest," this local area supported a singing Palm Warbler for three days in June 2004, only Alaska's second summer record for this species. This rare sighting highlights the value of the ongoing Refuge inventory program. (photo by C. Harwood)

Section Credits

The following individuals contributed text to this document:

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Brown, Wennona (Subsistence Coordinator): Subsistence

DeMeyere, Jody (Park Ranger): Public Use (AIVC, Wildlife Observation and Photography, Environmental Interpretation, Environmental Education)

Gaddis, Almeda (Administrative Officer): Budget, Staffing

Harwood, Chris (Wildlife Biologist): principal compiling/editing, all other sections not noted

Knight, Curtis (Biological Technician): Refuge and CCP maps, Kanuti Lake Administrative Cabin, Airplane/airplane support, SAMMS

Maxwell, Merry (Deputy Refuge Manager through November 2005): background material

Mueller, Keith (Contaminants Specialist): Research Studies and Investigations

Patten, Sam (Fire Management Officer): Wildland Fires Review, Fire Management

Saperstein, Lisa (Lead Wildlife Biologist): Snow Markers, Wildland Fires, Natural/Cultural Resources (Overview, Biological Review, BAER, Joint Fire Science, Integrated Inventory, Moose Survey, Wolf Survey, Fire Severity, Invasives), Cultural Resources, Public Use (some Subsistence, Sport Hunting, Sport Fishing), editing

Spindler, Mike (Refuge Manager/Pilot): Management (Overview, Interagency/intertribal cooperation, Permits), Public Use (Law Enforcement, User Conflicts), Bunkhouses, Feedback, editing

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Refuge Manager's Feedback

As I reflect on the year's accomplishment, I am in awe of the accomplishments of this small refuge staff, the acting manager, two biologists, one park ranger, two technicians, and a shared administrative team. It is the dedication of Kanuti's small staff, combined with the sharing of staff among the three Fairbanks-based refuges and Fairbanks Fish and Wildlife Field Office that allowed us to make so much progress in 2005.

Much of the activities and directions the Refuge staff would take for 2005 were already in motion when I arrived. For half a year Kanuti had been in the capable hands of the Refuge's deputy acting as its manager, and an experienced biological and administrative team. In the spring of the year, while I was preoccupied with the logistical challenges of moving from bush Alaska to Fairbanks, this small refuge staff continued with their routine activities *and* drafted nearly the entire Comprehensive Conservation Plan revision. They met the planning deadline with a week to spare, and then embarked on an ambitious field season. Their field work was made even more challenging by a very active fire season, smoke, and low water levels. In mid-summer, when my family was settled in, I was able to get out in the field and contribute by flying some surveys, working on the Bettles bunkhouse and contaminants cleanup, and conducting some moose hunter law enforcement.

The Fairbanks refuges' shared positions really augment the capability of the six natural resource professionals assigned to Kanuti. We benefit from the subsistence, law enforcement and fire management expertise of Yukon Flats NWR. From Arctic NWR we receive significant help from two computer technology experts, and maintenance and flying assistance from two pilots. We receive help in fisheries, contaminants, and endangered species investigations from the Fairbanks Fish and Wildlife Field Office. In return, Kanuti provides the administrative team to all three refuges; and the expertise of our park ranger who greatly enhances the Service's outreach efforts in Fairbanks and interior Alaska. With all the consideration of complexing and the consultant-driven workforce planning effort in the "Lower 48" refuges, some lessons can be learned from Fairbanks. Just recently stepping into this situation, I am impressed that we have been able to pool resources to combine several functions for efficiency, yet retain the autonomy and refuge-specific expertise that is essential for good land stewardship.