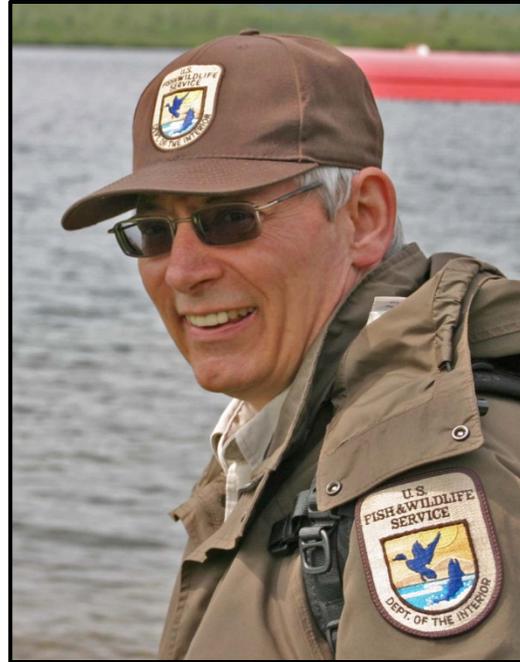


Dear reader:

Welcome to our annual report for 2012. The Kodiak National Wildlife Refuge was established in 1941, "... for the purpose of protecting the natural feeding and breeding ranges of the brown bear and other wildlife..." After 40 years, the Alaska National Lands Conservation Act added to this purpose by including other wildlife especially salmonids, marine mammals and migratory birds; fulfilling international treaty obligations; providing for subsistence; and maintaining water quality and quantity. We believe that we have been fulfilling this purpose. Brown bears, salmonids, marine mammals and migratory birds among other wildlife occupy the refuge in their natural diversity,



and there are ample opportunities for subsistence users and the general public to stay in a cabin on the Refuge and to take or otherwise enjoy these creatures. This report details how we are fulfilling the purpose of the Refuge through our daily activities. Initially, I highlight some of the major accomplishments of the year and then our Comprehensive Conservation Plan provides the framework for our activities. This will be my last Refuge annual report as I will be retiring on December 31, 2012, after about 6 years of leading the Refuge. Kodiak NWR is an amazing place. We have kept it in good shape, and building upon the work of previous Refuge employees, we have learned much about the plants and animals that occupy the Refuge. I hope that it will be a productive place and will benefit people and wildlife for many years to come.

Sincerely,
Gary Wheeler
Wildlife Refuge Manager

TOP ACCOMPLISHMENTS OF KODIAK REFUGE FOR 2012

We inputted records for 1,720 species documented to occur in the Refuge. Review of records submitted by Alaska NWRs indicated that Kodiak NWR ranked first in number of catalogued mollusks (22), second in vascular plants (576), and third in birds (248), bryophytes (258), and total species (1,720). (1.1)

Three Kittlitz's murrelet chick carcasses were submitted to the National Wildlife Health Center (NWHC) in Madison Wisconsin for examination for cause of death. Saxitoxin, one of the toxins responsible for paralytic shellfish poisoning, was found in in all three chicks from 2012 and 4 chicks from 2011. (1.4)

We surveyed for New Zealand mud snail (*Potamopyrgus antipodarum*), Didymo alga (*Didymosphenia geminate*), and the whirling disease pathogen (*Myxobolus cerebralis*) in three river systems (Buskin, Karluk, Lower Uganik) that receive extensive recreational sport fishing use. No New Zealand mudsnails were observed. Native Didymo algae was observed in all rivers and most sampling sites ($n=80$). We failed to capture and collect specimens (yearling rainbow trout) necessary whirling disease assessment in the lab. (1.5)

Three cooperatively-sponsored graduate research projects neared completion. Mat Sorum, student at University of Idaho, studied brown bear resource selection. Jenna Cragg, student at University of Victoria, B.C., studied application of radar to assess murrelet abundance and flight behavior. James Lawonn, student at Oregon State University, studied Kittlitz's murrelet nesting ecology. (1.6)

Progress reports were completed for projects addressing brown bear resource use, mountain goat diets and feeding site selection, monitoring of lake temperature, Kittlitz's murrelet nesting ecology, and assessment of murrelet abundance and flight behavior via radar technology. Peer-reviewed goat, deer, and murrelet reports were submitted to ARLIS. (1.6)

At request of the Refuge, officials affiliated with NOAA's Climate Reference Network (CRN) surveyed sites on the Refuge for potential establishment of a climate monitoring station. If approved by NOAA, a Kodiak station would contribute data to a national network comprised of 135 planned stations. (1.7 c.)

We continued to implement a Western Alaska LCC-sponsored cooperative project involving all season, multi-depth monitoring of water temperature in Karluk Lake and Red Lake. (1.7 c.)

Surveys of bear stream use were conducted between July 9 and August 7 on tributaries of Karluk Lake, and the southwest Kodiak network of streams. The average number of bears counted in the southwest network was 48 bears/survey, which was 33% lower than the average in 2011, and 88% lower than the long-term average (1985-2002). Single bears composed a larger fraction of the sample population than the long-term average (76% vs. 46%). Maternal sows comprised only 9% of composition, substantially less than the long-term average of 18%. We suspect that the population of brown bear in southwestern Kodiak Island has declined based on reduction in maternal sows and cubs observed over the past six years. (2.2 b.)

We continued study of brown bear movements and habitat preference in the area surrounding the Karluk Lake Basin. Between June 3 and 7 we captured 20 bears (19 females, 1 male). GPS/VHF transmitters were deployed on 18 adult female bears. The technology used to monitor movements consisted of collars fitted with a GPS transmitters and Iridium satellite uplink connection. Location data was periodically downloaded during summer to an office computer in Kodiak. Most GPS transmitters and/or satellite connections failed during mid- to late summer. Consequently, we issued a command of collar release in early October and, following negotiations with the manufacturer, we were fully reimbursed for purchased collars. (2.4 a.)

We initiated cooperation with University of Montana on investigation of bear-salmon relationships in southwestern Kodiak with Will Deacy as graduate research assistant. Will obtained approval for a thesis project entitled “The Influence of Salmon Run Abundance and Timing on Kodiak Bear Ecology”. Primary project objectives include a characterization of salmon runs and their habitat in headwater spawning streams in three watersheds (Ayakulik, Frazer, Karluk), and evaluation of salmon-brown bear interactions. Will, accompanied by volunteer assistants Tyler Tran and Caroline Cheung, implemented his project during June-September. (2.4 a.)

The year 2012 was the first year of a “Voluntary Camping Closure” on the Uganik River. The Service is attempting to protect the brown bear concentration of the lower Uganik River in September. This year campers were asked to locate their camps along the river corridor above the concentration area; and to not set up camp below Mush Creek. Approximately half of all campers participated. (2.4 c.)

We completed a pilot study to assess the feasibility of quantifying deer abundances in non-forested areas of Kodiak using a distance sampling approach applied to aerial line transects. Results indicated that this method performed well and could be used to determine deer abundances with statistical confidence. We completed an Alaska Refuges Report with the survey results, which was distributed to Refuge managers and ADF&G biologists. (3.3 b.)

We completed the second summer season of field work on mountain goat diet and feeding site selection. We collected goat pellet samples for microhistological analysis, and we conducted vegetation surveys at feeding sites and random locations. We collected approximately 200 fecal samples and sampled over 350 vegetation transects. We sent fecal samples to Washington State University’s (WSU) Wildlife Nutrition Lab to determine plant composition. Results from 2011 indicated that mountain goat summer diets were primarily composed of sedges and forbs. Fern rhizomes and grasses were important in early summer (June), but diminished in importance with the onset of seasonal herb growth. Mountain goat selected feeding sites were those that contained abundant selected forage in areas close to escape terrain. We found no apparent relationship between diet and feeding site selection and population density and the duration of occupancy among three study sites. Results are pending analysis for evaluation of nutritional quality of plants consumed by goats (available Feb. 2013). This summer, we added an additional component to the study by collecting plants at feeding sites and random alpine locations to assess and compare relative quality of forages at goat use and random sites. We collected samples of plants that represented >5% of mountain goat summer diets and mailed them to WSU for laboratory analyses to determine nutritional content. We clipped plants at feeding and random sites, sorted the samples by species, and weighed each species, to determine the available biomass of potential forage. These data will be used to develop a statistical model to quantify nutritional carry capacity of mountain goat range on Kodiak Island. (3.4)

Surveys based on the National Park Service’s Southwest Alaska Network (SWAN) Nearshore Marine Bird Survey were continued along the northern portion of the Kodiak Archipelago from Marmot Bay to Shuyak Island in summer 2012. The 2012 survey covered 2030 km of coastline with transects sampling about 20% of the 3600 km² study area. The most commonly counted species were black-legged kittiwakes, glaucous-winged gulls, tufted and horned puffins, marbled murrelets, pelagic cormorants, pigeon guillemots and harlequin ducks. (5.1 c.)

The Refuge's harlequin duck banding program resumed in 2012. Fifty harlequin ducks were captured in three different locations including Blue Fox and Foul Bay on Kodiak Refuge's Afognak Unit, and Kalsin Bay near the city of Kodiak. In addition to harlequin ducks, we banded 49 Barrow's goldeneye at a site in Blue Fox Bay. (5.4)

This summer was the fifth year of a field study of Kittlitz's Murrelet (KIMU) breeding ecology on Kodiak National Wildlife Refuge. The team successfully located 21 active nests. Of those 21 nests, 14 survived the nestling stage, and nine successfully fledged a chick. Chick provisioning, nest depredation and egg abandonment were recorded at 20 nests using remote cameras. Funding for the 2012 field season was provided by the National Fish and Wildlife Foundation Alaska Fish and Wildlife Grant, USFWS Ecological Services, and the U.S. Geological Service's Alaska Science Center. (5.5 a.)

In June 2012 the Refuge completed the Alaska Landbird Monitoring Survey (ALMS) plot on Uganik Island established in 2010. The team was able to survey 19 of the 23 accessible points in the pre-selected grid. Birds detected included three species of conservation concern, Gray-cheeked Thrush, Yellow Warbler, and Orange-crowned Warbler. (5.5 c.)

In 2012 the refuge received funding from the Region 7 Avian Health and Disease Program to take blood samples from sea ducks for contaminants analysis. We are interested in determining polychlorinated biphenyl (PCB) and trace metal (lead, selenium, mercury, cadmium, and copper) levels to establish baseline information for both species and to compare ducks banded at remote locations on the refuge to ducks banded at bays close to town of Kodiak where exposure to contaminants may be higher. In August, blood samples were collected from 31 harlequin ducks and 20 Barrow's goldeneye and will be analyzed in the laboratory this winter. (5.7)

We continued approved IPM actions on orange hawkweed in the Camp Island vicinity, oxeye daisy at Refuge Headquarters, and Canada thistle at Garden Island. We initiated IPM action including herbicide use on creeping buttercup at Akalura Cannery, southern Kodiak Island. We continued to document plant responses to IPM management on permanent plots located in and adjacent to treatment areas. In collaboration with the Kodiak Soil and Water Conservation District, we surveyed for waterweed (*Elodea* spp.) in Lily Lake and reed canarygrass (*Phalaris arundinacea*) in the Buskin River watershed. Surveys revealed no waterweed in Lilly Lake, but there are infestations of reed canary grass along the Buskin River. (6.1 a.)

In 2012, volunteers Stacy Studebaker and Mike Sirofchuck surveyed flora at four study sites in and adjacent to Uganik Bay and Passage including Village Islands, Little River Lake, southern Uganik Island, and the headwaters of Quartz Creek. A total of 286 specimens were collected and shipped to University of Alaska's Herbarium in Fairbanks for identification, entering into a computer database, curation, and archiving. Concurrent with survey fieldwork we addressed requests for specimens of rhododendron, skunk cabbage, and moonwort to facilitate taxonomic studies. (6.2 c.)

In cooperation with the University of Montana, we deployed cameras to assess salmon abundance in 12 streams in the Karluk, Red, and Frazer Lake watersheds. Nine units consisted of time-lapse cameras mounted on tripods overlooking white background panels. Three additional sites were designated as calibration streams. Paired systems provided bases for

assessing accuracy of time-lapse counts derived from different sampling frequencies and deriving computations for estimating total salmon passage from time-lapse observations. (7.2)

Refuge staff contacted bear viewers and anglers at the Frazer fish pass. Brown bear viewing activity is a growing use on Refuge lands. Frazer Fish Pass is averaging between 1,000 and 1,200 visitors each season. (10.1)

Refuge staff contacted 102 visitors along the Uganik River corridor or at the public use cabin. Staff educated the public about the normal leave no trace practices, bear safety, and how not to monopolize public resources. New, this season was the implementation of a “Voluntary Camping Closure” of the lower Uganik River. This effort was designed to protect the seasonal concentration of brown bears that use the lower river to fish for salmon during the fall. The voluntary closure was not well received by some returning visitors and only approximately half of all campers participated. (10.1)

During FY2012 Wildlife Officer (WO) Rees transferred to Kodiak in July. Rees spent the remainder of the field season completing flight training and getting familiarized with the refuge. Rees patrolled the Uganik River in September investigating unauthorized commercial enterprises on the refuge, as well as hunting, fishing and wildlife regulations. (10.3)

Kodiak Refuge staff and the YCC crew performed trail maintenance on the O’Malley Bear Viewing Trail. The work keeps the trail defined as the approved route to access the O’Malley River bear viewing platform. (10.4)

A condition assessment of each cabin was made during the summer, and cabin maintenance needs were scheduled for accomplishment. Several maintenance fixes were completed during 2012. (10.6)

We installed artist-rendered information signs designed by Galaxy Graphics with staff review in public use cabins at Viekoda Bay, Uganik Island, North and South Frazer Lake, and Deadman Bay to enhance visitor experience. Facility enhancement funds from the region paid for the signs. (10.6)

Refuge staff developed a map of the Uganik River and handout showing recommended campsites, good camping practices, and bear safety measures for parties transported by air taxis. The handout was given to air taxis for distribution. (11.2)

Created and maintained pages on new FWS website for visitors, including Visitor Center, Environmental Education, and Public Use Cabin pages. Posted updates as needed on permits and public use guidance. (12.2)

Developed and filmed a series of short videos about Public Use Cabins and posted them on the new website. (12.2)

Maintained a Kodiak Refuge Visitor Center Facebook account to publicize refuge events; post photographs of refuge sponsored activities, research and programs; and engage visitors in Refuge related information. (12.2)

Kodiak Refuge has one of the top 10 Refuge volunteer programs in the nation. This year we had 94 volunteers who provided a total of 17,241 hours of work. (12.3 b.)

The Refuge hosted “Brown Bear Days,” a week of events celebrating the Kodiak Refuge and brown bear. Events included lectures, films, photo contest, kid’s night at the refuge, etc. (12.5)

We participated, presented, provided instruction to: Women in Science, Old Harbor Bear Awakening Celebration, Bear Paw Subsistence Camp, Dig Afognak Culture Camp, Cape Alitak Camp, Village Schools Alutiiq Weeks and Community Celebrations. (12.5)

Hosted 2012 Refuge Week, including the film Green Fire, Kid’s Night at the Refuge, brown bag lunch on Kodiak Refuge, etc. (12.5 a.)

Planned, sponsored and facilitated the Alaska Envirothon Competition in April, 2012. This was the largest program to date with 70 students participating. Kodiak area villages were also included in the event by participating in every Envirothon lecture in the Kodiak High School Natural Resources class via webinar. Village students also had the opportunity to participate in the daylong event. (12.5 c.)

Our YCC program continues to develop, improving in quality of education and opportunities each year. This year we had four Kodiak teens and a Student Temporary Employment Program crew leader. The program lasted for 9 weeks and included on refuge and Visitor Center experiences. (12.5 d.)

We developed and delivered a program featuring brown bear safety to all village schools, 8th grade classes, and a homeschool group. Additional school visits featured Refuge subsistence resources and migratory bird education. (12.7)

Staff and volunteers coordinated and presented a number of public talks and outreach efforts regarding Refuge programs, mission and research. (12.8 a.)

Coordinated with Alaska Maritime NWR regarding Ferry Naturalist program, which provided information and interpretation about the Kodiak Refuge and Kodiak Refuge Visitor Center to users of the Alaska Marine Highway System between Homer and Dutch Harbor (with stops in Kodiak) during the summer season. (12.8 a.)

We hosted an open house and traveling exhibit display on the Ursa Major II at the communities of Old Harbor and Ahkiok. (12.8 a.)

We hosted, publicized, and promoted 27 weekly free lectures for the public at the Refuge Visitor Center (Brown Bag Lunch Series). (12.8 a.)

The summer of 2012 marked the third season of the Kodiak Refuges' Monitoring Avian Productivity & Survivorship Program (MAPS) near Refuge Headquarters on the Buskin River State Recreation Area. This season, Refuge employees and volunteers banded 164 birds representing 13 species, and recaptured 71 birds including 24 birds banded in previous years. In general resident (non-migratory) and short distant migrants had higher capture and return rates and higher productivity compared to long-distance migrants. Despite the early morning hours, we had 30 volunteers from the Kodiak community. (12.8 a.)

We presented two biannual Refuge activity reports to the KARAC including publishing reports in the meeting booklet. We attended the KARAC meetings and answered questions about animal populations and Refuge operations. (15.1)

We produced and distributed a newsletter to village communities and land neighbors. We completed 17 trips to village communities to address a variety of mission goals including outreach, environmental education, Tribal Wildlife Grant assistance, and subsistence resource management. (15.4)

A safety inspection was completed with regional safety office staff to ensure compliance with OSHA regulations. Issues identified have been, or are being addressed. (16.3)

Refuge pilots safely flew over 350 hours of mission requirements despite being without one pilot for most of the field season. RO Rees arrived in July. (16.4)

Completed the review of Big Game Guide Prospectus applications and provided recommendations to the Refuge Manager. Refuge Manager took recommendations from the review panels, interviewed the best qualified applicants and selected a big game guide for each area. (16.10)

Considerable effort was expended in working on a compatibility determination for a proposal by the Kodiak Regional Aquaculture Association for fertilization of Karluk Lake to increase the size and abundance of sockeye salmon smolt. The thought was that a CD should be done before a NEPA document to provide a cost savings if the use was found not compatible. In December of 2012, before the CD was completed, the Regional Director decided that he would make the decision on the project. He determined that the NEPA document would be written before the CD. (16.10)

Kodiak National Wildlife Refuge

Annual Work Plan/Accomplishment Report FY-2012

Purposes of Kodiak National Wildlife Refuge

On August 14, 1941, President Franklin D. Roosevelt signed Executive Order 8857 establishing Kodiak National Wildlife Refuge A. . . for the purpose of protecting the natural feeding and breeding ranges of the brown bears and other wildlife on Uganik and Kodiak Islands . . .

Under the Alaska National Interests Lands Conservation Act, the purpose of Kodiak Refuge was expanded beyond that identified in the original establishing order. Section 303(5)(B) of ANILCA states: The purposes for which the Kodiak National Wildlife Refuge is established and shall be managed include:

- (i) to conserve fish and wildlife populations (and) habitats in their natural diversity including, but not limited to, Kodiak brown bears, salmonids, sea otters, sea lions and other marine mammals and migratory birds;
- (ii) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and other habitats;
- (iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the refuge.

Refuge Vision Statement

The Kodiak Refuge staff has developed the following statement about what they believe the Refuge will be in the future given the mission of the Refuge System, the specific purposes of Kodiak Refuge, and other relevant Service mandates:

Brown bear, fish, and other wildlife populations will continue to thrive on the Kodiak National Wildlife Refuge in their natural diversity, living in pristine habitats. Refuge management will blend public and private partners in a dynamic alliance that fulfills the purposes and goals of Kodiak Refuge. The Refuge will provide a long and lasting legacy of resource stewardship for the enjoyment of current and future generations.

Refuge Goals, Objectives, and Accomplishments

The Refuge vision statement and the Refuge purposes provide the framework for developing goals and objectives for managing the Refuge. Goals are broad statements of desired future conditions. Objectives are concise statements of what the Refuge wants to accomplish.

Objectives identified for one goal are often applicable to other goals. To avoid unnecessary duplication, each objective is listed only under the goal that represents the clearest connection. Objectives are numbered and organized in priority order under each goal.

GOAL 1: Increase our knowledge of fish and wildlife populations, their habitats, and their interrelationships. Subsequently, update the inventory and monitoring plan annually with a regional review and sign off by the Alaska Refuge Chief every five years.

- 1.1 Within two years of approval of this plan, complete a step-down plan to integrate and direct inventory and monitoring of plants, fish, and wildlife.

Development of the inventory and monitoring plan, other than databases and protocols, was deferred pending the expected issuance of revised Service policy in 2013.

In spring 2012 we provided input to a new national database established by the national Inventory and Monitoring Program to document and describe inventory, monitoring, and research surveys (projects) conducted by NWRs. Each Refuge-unique subset of the database is expected to form an integral part of a Refuge's inventory, monitoring, and research plan, consistent with national policy revision.

At request of Refuge Management, we drafted a biological program update. This update addresses status of progress toward accomplishment, as well as changes approved, in biological objectives and strategies of the Refuge's Revised Comprehensive Conservation Plan of 2007. It also proposes an additional goal and related objectives pertaining to climate change assessment since this key subject and issue was not considered in the Revised Conservation Plan. [PYLE]

The protocol for survey of brown bear abundance, referred to as the Intensive Aerial Survey or IAS, is in its final stages of development and will be submitted for review and approval in 2013. Completion of the protocol pertaining to survey of bear stream use is pending results of a USGS review of analysis procedures. [LEACOCK]

In response to a Regional Office request, we inputted data to the Species Information Service, another new database established by Inventory and Monitoring Program. Specifically we inputted records for 1,720 species documented to occur in the Refuge. Review of records submitted by Alaska NWRs indicated that Kodiak NWR ranked first in number of catalogued mollusks (22), second in vascular plants (576), and third in birds (248), bryophytes (258), and total species (1,720). [PYLE]

- 1.2 Collaborate with the Alaska Department of Fish & Game (ADF&G) when monitoring and conducting research on State of Alaska trust species within the Refuge.

We collaborated with ADF&G on mountain goat summer population surveys. We consulted with ADF&G in development of a research plan focused on quantifying

mountain goat resource selection patterns and improving population composition surveys. We arranged a visit by ADF&G research biologist, Kevin White, to Kodiak. He presented his research results on mountain goats to the public at the Refuge Visitor Center, joined the mountain goat research team in the field to assess our efforts, and helped draft a collaborative proposal to fund mountain goat research on Kodiak. [COBB]

After receiving clarification on FWS policy regarding applying for non-federal funding, we applied for funding to support the mountain goat research through the Safari Club International (AK chapter and national), Pope and Young Club, and Grand Slam Club Ovis. [COBB]

We cooperated with ADF&G's Wildlife Conservation Division in the Brown Bear Working Group of the Northern Forum, Kodiak Unified Bear Subcommittee (KUBS), and in research projects that variously involved the Service's contaminants program, Washington State University, University of Idaho, and University of Montana. We also assisted ADF&G-led bear capture and collaring on Afognak Island. [LEACOCK]

We consulted with ADF&G Commercial Fisheries and Research Divisions regarding design of protocols for quantifying salmon runs on Red Lake River and tributaries of Red Lake, Frazer Lake, and Karluk Lake. [LEACOCK]



Sockeye salmon spawning run, Meadow Creek, Karluk Lake watershed.
Caroline Cheung/USFWS

In cooperation with KUBS, we supported organization and operation of a Brown Bear-Viewing Guide course at Kodiak College. We presented on Refuge-led research and monitoring, and recruited Dr. Sandy Talbot, USGS, to present a lecture. [LEACOCK]



Students and instructors of the KUBS bear-viewing guide course. Harry Dodge

1.3 Curate wildlife study records using professional database-management standards and methods so data and reports may be readily accessed and understood by future Refuge biologists and others.

1.3.a. Create Portable Document Files (pdf) of biological publications and final reports and archive these electronic documents on the refuge's network.

We continued to research the technical literature and to build an archive of scientific papers that variously address condition, dynamics, status, and interrelationships of Refuge resources. We continued to create pdf files of scientific papers and annual reports. We added approximately 200 additional biological publications to the EndNote database. We completed an annual report on the mountain goat research project, and we completed a final report on the feasibility of quantifying Sitka black-tailed deer abundances using distance sampling applied to aerial survey methods. In cooperation with Region 7's Inventory and Monitoring Division, we established relational databases addressing climatic and water temperature data management needs. [COBB, PYLE]

1.3.b. Create ArcGIS and Microsoft Access databases of current and historical spatial data pertaining to Kodiak.

We updated existing ArcGIS databases housing locational data collected on GPS-transmitted brown bear, as well as existing ArcGIS and MS Access databases with data collected in 2012 related to the mountain goat research project, mountain goat surveys, and deer surveys. [LEACOCK, COBB]

- 1.4 In cooperation with ADF&G, monitor for fish, wildlife, and avian diseases that may affect the Kodiak ecosystem, including chronic wasting disease and West Nile virus.

Avian diseases were not studied directly in 2012. However, due to Kittlitz's murrelet chick mortality discovered on the long-term nesting ecology study on southwestern Kodiak Island, three carcasses were submitted to the National Wildlife Health Center (NWHC) in Madison Wisconsin for examination for cause of death. Saxitoxin, one of the toxins responsible for paralytic shellfish poisoning, was found in the gastrointestinal (GI) contents of the two chicks examined. Due to these findings samples from the upper GI content, liver, and kidney from all three chicks were sent to Dr. Elizabeth Frame at NOAA Northwest Fisheries Science Center (Seattle, WA) for marine toxin analysis. Additionally, because we had documented eight unexplained chick deaths during the 2011 Kittlitz's murrelet nesting ecology project, carcasses that had been collected in the previous season were also sent to NOAA for analysis. High levels of saxitoxin were present in all three chicks from 2012. Only five of the six chicks from 2011 could be analyzed, and four tested positive for saxitoxin but at levels slightly lower than the 2012 samples. In addition, the two carcasses from 2012 examined at the NWHC tested negative for West Nile and avian influenza viruses and no significant pathologic bacteria were isolated from multiple organs cultured. Two nematodes were present in the proventriculus/gizzard of one of the chicks. [CORCORAN]

We collaborated with ADF&G and the Region 7 Environmental Contaminants Program on a Service-supported study of PCBs in brown bear of the Kodiak Archipelago. We fully met objectives for sampling tissues of bears harvested by recreational sport hunters in spring and fall 2012. Tissue samples have been submitted for laboratory analysis. [LEACOCK]

- 1.5 In cooperation with ADF&G, other external partners, and other programs within the Service, monitor for aquatic invasive species such as green crab, mitten crab, Atlantic salmon, New Zealand mudsnails, crayfish, amphibians, and aquatic weeds. With these same partners, participate in the development and distribution of effective education and outreach materials.

Supported by a small grant, we surveyed for New Zealand mud snail (*Potamopyrgus antipodarum*), Didymo alga (*Didymosphenia geminata*), and the whirling disease pathogen (*Myxobolus cerebralis*) in three river systems (Buskin, Karluk, Lower Uganik) that receive extensive recreational sport fishing use. We researched and adapted existing sampling protocols. No non-native New Zealand mudsnail was observed. Contrastingly, native Didymo algae was observed in all rivers and most sampling sites ($n=80$). The concern with this native alga is that it has wreaked havoc where it has been inadvertently introduced to riverine aquatic habitat outside its native range. Despite substantial trapping effort we failed to capture and collect specimens (yearling rainbow trout) necessary whirling disease assessment in the lab. [PYLE]



Theresa Tanner and Doug McBride of the Anchorage Fisheries Resource Office use a kick net to sample for New Zealand mudsnail on the Buskin River. Bill Pyle/USFWS

We surveyed for waterweed (*Elodea* spp.) in Lily Lake, the primary freshwater site used to moor floatplanes in Kodiak. No waterweed was observed. [PYLE]

- 1.6 Strive to publish results from Refuge-sponsored research in peer-reviewed journals. Report routine fish and wildlife survey results regularly in publicly accessible reports.

We co-authored a manuscript submitted for publication consideration in the Canadian Journal of Zoology. The manuscript addresses results of assessment of diet of brown bear ascertained by isotope analysis of tissue and hair samples collected from hunter-harvested animals. [LEACOCK]

Three cooperatively-sponsored graduate research projects neared completion. Mat Sorum, student at University of Idaho, studied brown bear resource selection. Jenna Cragg, student at University of Victoria, B.C., studied application of radar to assess murrelet abundance and flight behavior. James Lawonn, student at Oregon State University, studied Kittlitz's murrelet nesting ecology. Over the course of the year, Jenna Cragg gave six professional presentations and James Lawonn gave four professional presentations. All students are scheduled to graduate and issue copies of theses within a fall 2012-winter 2013 timeframe. [CORCORAN, LEACOCK]

Progress reports were completed for projects addressing brown bear resource use, mountain goat diets and feeding site selection, monitoring of lake temperature, Kittlitz's murrelet nesting ecology, and assessment of murrelet abundance and flight behavior via

radar technology. Peer-reviewed goat, deer, and murrelet reports were submitted to ARLIS. [COBB, CORCORAN, LAWONN, LEACOCK, PYLE]

1.7 Contribute to implementation of the Service's strategic plan for responding to accelerated climate change.

1.7.a. Participate in meetings and conferences pertaining to climate change involving Refuge interests.

Refuge staff participated in various planning meetings held by the Western Alaska Landscape Conservation Cooperative.

1.7.b. Evaluate information needs pertaining to climate change assessment on the Refuge.

In October 2011 we received the report "Climate Change and the Karluk River Watershed: a Workshop to Identify Research Needs" from the Alaska Science Center/USGS. This report, authored by workshop leader Erik Beever of USGS, presents research recommendations submitted by managers and scientists that participated in the Kodiak-based, USGS grant sponsored, May 2010 workshop. [PYLE]

We drafted an update on status of progress toward accomplishment of biological objectives of the Refuge's Conservation Plan revision of 2007. The update also proposes a new goal and associated objectives to address climate change concerns. Although the Service currently recognizes climate change as a primary conservation issue, it did not a few years ago and, consequently, the issue was not addressed in the 2007 plan revision. [PYLE]

1.7.c. Collaboratively address identified priority information needs.

At request of the Refuge, officials affiliated with NOAA's Climate Reference Network (CRN) surveyed sites on the Refuge for potential establishment of a climate monitoring station. If approved by NOAA, a Kodiak station would contribute data to a national network comprised of 135 planned stations. [PYLE]

We continued to implement a Western Alaska LCC-sponsored cooperative project involving all season, multi-depth monitoring of water temperature in Karluk Lake and Red Lake. As planned, monitoring arrays were visited in late spring to summer to retrieve data and check on array and data logger integrity. Preliminary results revealed that temperature differed among depths and lakes across the year in correspondence with variation in air temperature. Annual minimums, and minimum temperature fluctuation, were observed during December and March when lakes were covered with ice. Peak annual temperature was observed near lake surfaces in mid-August, and early to mid-September at lowest lake depths (35 m in Red Lake, 110 m in Karluk Lake). We observed a turnover event in Red Lake during mid-September. This event, apparently



NOAA personnel evaluate Booth Lake vicinity as candidate for siting a climate monitoring station. The site currently hosts an automated fire weather station (left center). Bill Pyle/USFWS

triggered by sustained strong winds, was characterized by high magnitude variation in temperature at mid to low lake depths with end consequence of reduction in temperature difference through the water column. Cooperating refuges generated a summary report addressing array establishment. In response to Kodiak Refuge's request, the Inventory and Monitoring Program developed a database management tool to facilitate organization, summary, and archiving of this large and expanding multi-refuge dataset. [PYLE]

GOAL 2: Ensure that Kodiak brown bears continue to flourish throughout the Refuge and congregate at traditional concentration areas and that this unique population continues into the foreseeable future.

- 2.1 In cooperation with ADF&G, continue to use all available knowledge to monitor and evaluate trends in bear population size, composition, and mortality associated with recreation, subsistence, research, defense-of-life-or-property (DLP), and illegal kills.

We documented mortality of 127 bears within the (legislative) Refuge boundary between 1 July 2011 and 30 June 2012. Recreational sport hunting accounted for 89% of bear mortality, and bears harvested in the Refuge accounted for 70% of the total harvested by hunters in the archipelago. Sixty-one percent of harvest occurred in the spring hunting season, and males comprised most (69%) of the overall harvest. DLPs (4) and other sources (10) accounted for 14 mortalities documented within the Refuge [LEACOCK]

2.2 In cooperation with ADF&G, maintain surveyed bear densities no lower than 10 percent below the lowest number within the following ranges: southeastern Kodiak and southwestern Kodiak 0.69–0.76 bears per square mile; northwestern Kodiak 0.64–0.72 bears per square mile.

2.2 a. Monitor trend in bear population size.

Due to unfavorable conditions, trend in bear density was not assessed as planned in the area encompassing the Karluk Lake Basin. ADF&G successfully assessed bear density of Sitkalidak Island, a first, including an empirical establishment of a sightability correction factor based on standard mark-recapture methods. [LEACOCK]

2.2 b. Monitor trend in use and composition of bears that utilize salmon-spawning streams of southwest Kodiak Island.

Surveys of bear stream use were conducted between July 9 and August 7 on tributaries of Karluk Lake, the southwest network of streams (Southeast Creek, Red Lake River, Connecticut Creek, Pinnell Creek, Sturgeon River, and East Sturgeon River), and the Dog Salmon River. Seven complete surveys were conducted on the southwest network of streams, compared to the long-term average of eight surveys per season.

The average number of bears counted in the southwest network was 48 bears/survey, which was 33% lower than the average in 2011, and 88% lower than the long-term average (1985-2002). Single bears composed a larger fraction of the sample population than the long-term average (76% vs. 46%). Maternal sows comprised only 9% of composition, substantially less than the long-term average of 18%. We suspect that the population of brown bear in southwestern Kodiak Island has declined based on reduction in maternal sows and cubs observed over the past six years. [LEACOCK]

2.3 Increase frequency of bear density estimates to improve bear population–trend monitoring in areas of high public use or special management concern (e.g., Karluk Lake vicinity).

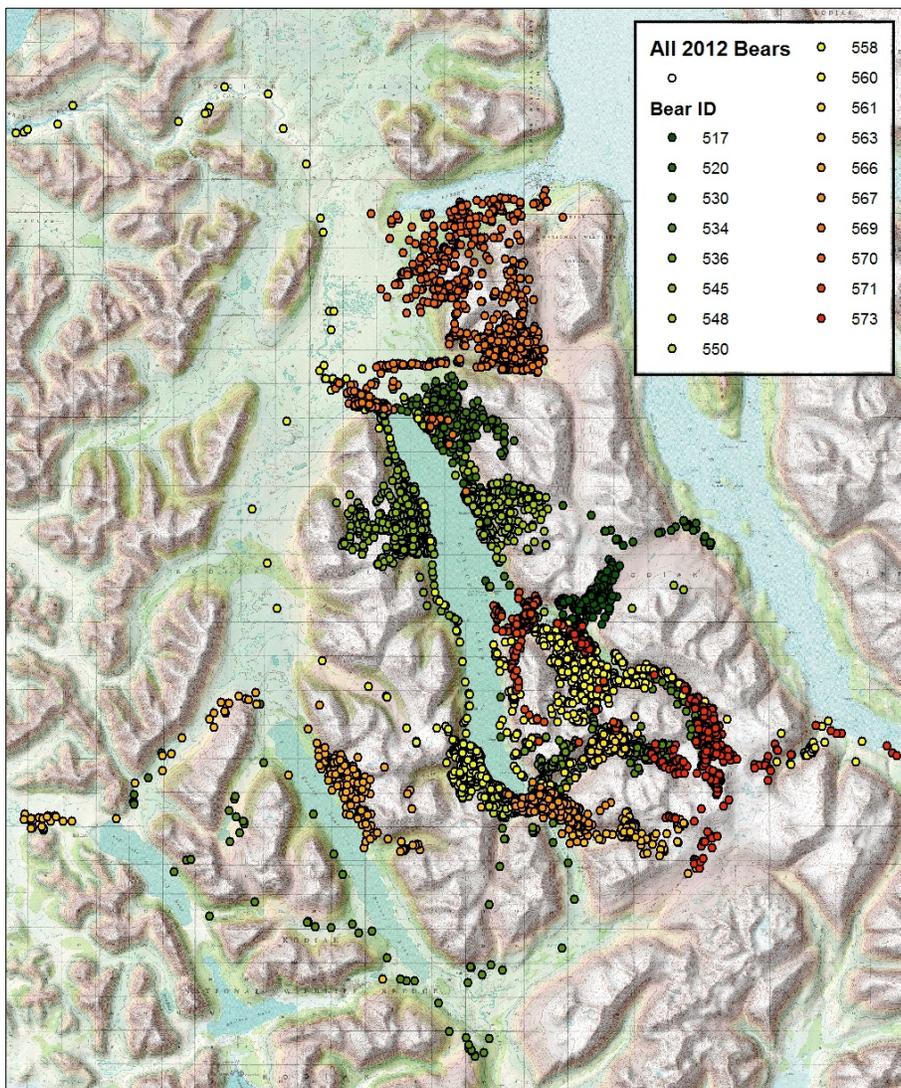
The Refuge, in cooperation with ADF&G, has strived to meet this objective based on an approach of back-to-back surveys. However, this approach has not worked for a variety of reasons: the time window for survey completion is limited (e.g., 10 days) due to late den emergence of sows with cubs coupled with rapid onset of spring leaf-out; unreliable weather conditions; and a lack of a sufficient number of survey aircraft and pilots. Consequently, consistent accomplishment of objective 2.3 will require concurrent operation of surveys in two areas, which will require a minimum of four pilot/observer teams – a worthwhile, but challenging goal. Level or reducing refuge budgets also may make this objective unattainable. [LEACOCK]

2.4 Monitor and evaluate bear use, human use, and bear–human interactions at bear concentration areas that have established public use. Specifically study bear use, bear movements, and bear–human interactions in the O’Malley River area. Apply results to guide adaptive management in these bear concentration areas using an open planning process with ample opportunities for stakeholder involvement.

2.4 a. Study bear movements and habitat preference.

University of Idaho was a primary cooperator on brown bear research conducted during 2010-11 in the vicinity of the Karluk Lake Basin. Mat Sorum, graduate research assistant affiliated with the University, was charged with addressing 2010-11 project results. In 2012, we contributed to completion of Mat's graduate research. [LEACOCK]

We continued study of brown bear movements and habitat preference in the area surrounding the Karluk Lake Basin. Between June 3 and 7 we captured 20 bears (19 females, 1 male). GPS/VHF transmitters were deployed on 18 adult female bears. Captured bears were in generally poor to fair condition, and overall condition averaged 2.2 (1=poor; 5=excellent; range 1-4). Five females were accompanied by one-year old cubs. One young male was captured because he was mistaken for a female. One subadult female was captured and not collared due to her small size. All of the bears



Record of movements of GPS-collared adult female brown bear, June-July 2012.

recovered well from capture and subsequent flights and telemetry revealed that all bears were still alive, active, and family groups had remained intact. The technology used to monitor movements consisted of collars fitted with a GPS transmitters and Iridium satellite uplink connection. Location data was periodically downloaded during summer to an office computer in Kodiak. Evaluation of data transmissions during mid-summer revealed a systemic issue. Most GPS transmitters and/or satellite connections failed during mid- to late summer. Consequently, we issued a command of collar release in early October and, following negotiations with ATS, the manufacturer, we were fully reimbursed for purchased collars. [LEACOCK]

We initiated cooperation with University of Montana on investigation of bear-salmon relationships in southwestern Kodiak Island. The University enlisted Will Deacy as graduate research assistant, and Will obtained approval for a thesis project entitled “The Influence of Salmon Run Abundance and Timing on Kodiak Bear Ecology”. Primary project objectives include a characterization of salmon runs and their habitat in headwater spawning streams in three watersheds (Ayakulik, Frazer, Karluk), and evaluation of salmon-brown bear interactions. Will, accompanied by volunteer assistants Tyler Tran and Caroline Cheung, implemented his project during June-September. A progress report is scheduled for release in winter 2013. [LEACOCK]



Photo of migrating sockeye salmon in Moraine Creek taken by time lapse camera on tripod.

2.4 b. Monitor human-bear interactions at the O'Malley Bear Viewing Area.

The O'Malley River Bear Viewing Special Use Permit was not utilized in 2012. Refuge staff entered the closure area frequently to conduct research objectives, provide trail maintenance and establish a human presence on the trail and viewing platform. [LEACOCK, OLES, KLAUSNER]

2.4 c. Work in visits to other concentration areas.

The year 2012 was the first year of a "Voluntary Camping Closure" on the Uganik River. The Service is attempting to protect the brown bear concentration of the lower Uganik River in September. This year campers were asked to locate their camps along the river corridor above the concentration area; and to not set up camp below Mush Creek. The voluntary closure was not well received by some returning visitors and approximately half of all campers participated. [OLES, KLAUSNER]

Refuge staff contacted both guided and un-guided bear viewers and anglers at Frazer fish pass. Wildlife viewing continues to increase on the Refuge and Frazer fish pass is experiencing use around 1,000 visitors per year. [OLES, HUPP, KLAUSNER]

- 2.5 Evaluate the management utility of the bear stream surveys using appropriate cross-comparisons with bear density survey data, climatic data, fish escapement data, and biological modeling efforts. Complete evaluation with assistance of Alaska Biological Science Center, U.S. Geological Survey, by 2007.

USGS evaluation in progress. [LEACOCK]

- 2.6 Investigate population size, movements, and habitat use of bears on Afognak Island. Develop a method for indexing trends in population size by 2008 and complete research on movements and habitat use four years after funding is obtained.

In cooperation with ADF&G and Afognak Native Corporation, we successfully captured eight bears (5 females, 3 males) on Afognak and Ban Islands June 1–2. Females were fitted with Telonics GPS collars. ADF&G monitored and documented movements of collared bears via periodic overflights and GPS data downloads. [LEACOCK]

- 2.7 By 2006, complete assessment of the genetic diversity of the Kodiak brown bear so as to understand gene flow between the southern and northern Archipelago, the vulnerability of Kodiak brown bears to wildlife diseases, environmental stresses, and parameters of population viability.

Report and objective completed in 2006. Related publication manuscripts are presently under preparation by USGS Alaska Science Center, in cooperation with Refuge. [LEACOCK]

- 2.8 By 2010, develop and implement a method of monitoring the supply of berries suspected of being essential to the welfare of the Refuge's brown bear population.

No action was accomplished during FY-2011 due to a lack of staff and funding. [LEACOCK]

GOAL 3: Manage nonnative species to minimize impacts on native resources, while continuing to provide opportunities for harvest.

- 3.1 To facilitate population and habitat management, monitor—in collaboration with ADF&G—trends in summer distribution, size, and productivity of the mountain goat population on the Refuge. By 2008, initiate monitoring of trends in winter distribution of the mountain goat population.

ADF&G completed a partial island-wide survey of mountain goats on Kodiak in August. They counted a total of 1,265 goats. The data indicated that population has continued increase in central/southern Kodiak Island, but was relatively stable numbers in northern Kodiak Island. The continued increase in goats in southern Kodiak Island continued to be a substantial management concern. In response, the Kodiak Fish and Game Advisory Committee reconvened its mountain goat subcommittee composed of the general public, ADF&G biologist, and Refuge biologists. The subcommittee was in agreement that the growth rates observed in the southern Kodiak mountain goat population was concerning, and to slow this growth rate through increased harvest pressure, drafted and submitted a regulation proposal which, if approved by the AK Board of Game, would increase mountain goat harvest pressure in this area. Specifically, the proposal called for an increase in the mountain goat bag limit in Hunt Area 480 from one to two goats, but only one goat per trip. Additionally, mountain goats harvested in 480 would not count toward a hunter's mountain goat bag limit in other hunt areas. Concern about this same population segment also prompted research action by the Refuge, as addressed under objective 3.4, and an ADF&G funding proposal to instrument mountain goats with radio-telemetry collars. [COBB]

- 3.2 By 2008, design and implement studies to evaluate habitat use and preference of deer on Kodiak Island to facilitate understanding of deer influence on the condition of winter range habitat.

No action was accomplished during FY-2011 due to a lack of staff and funding.

- 3.3 By 2008, develop methods, in partnership with ADF&G, to monitor deer population trends on Kodiak Island to facilitate harvest and habitat management.

3.3 a. Monitor trend deer harvest via cooperation with ADF&G on its hunter harvest survey.

This year, ADF&G transitioned from a paper-based deer harvest questionnaire to an online-based harvest reporting requirement. ADF&G did not initially include questions related to hunter harvest on federal lands this year, but we have had discussions with them to include these questions in the future. [COBB]

3.3 b. Continue to survey trend in deer overwinter mortality until the method is replaced with another a more direct, accurate, and informative method of population trend assessment.

We completed a pilot study to assess the feasibility of quantifying deer abundances in non-forested areas of Kodiak using a distance sampling approach applied to aerial line transects. The results indicated that this method performed well and could be used to

determine deer abundances with statistical confidence. We completed a peer-reviewed Alaska Refuges Report with the survey results, which was distributed to Refuge managers and ADF&G biologists. [COBB]

- 3.4 By 2010, evaluate and report habitat use and preference of mountain goats to improve understanding of goat influence on habitat conditions.

We completed the second summer season of field work on mountain goat diet and feeding site selection. Between May and August, we collected goat pellet samples for microhistological analysis, and we conducted vegetation surveys at feeding sites and random locations. We collected approximately 200 fecal samples and sampled over 350 vegetation transects. We sent fecal samples to Washington State University's (WSU) Wildlife Nutrition Lab to determine plant composition. Results from 2011 indicated that mountain goat summer diets were primarily composed of sedges and forbs. Fern rhizomes and grasses were important in early summer (June), but diminished in importance with the onset of seasonal herb growth. Mountain goats selected feeding sites were those that contained abundant selected forage in areas close to escape terrain. We found no apparent relationship between diet and feeding site selection and population density and the duration of occupancy among three study sites. Results are pending analysis for evaluation of nutritional quality of plants consumed by goats (available Feb. 2013). This summer, we added an additional component to the study by collecting plants at feeding sites and random alpine locations to assess and compare relative quality of forages at goat use and random sites. We collected samples of plants that represented >5% of mountain goat summer diets and mailed them to WSU for laboratory analyses to determine nutritional content. We clipped plants at feeding and random sites, sorted the samples by species, and weighed each species, to determine the available biomass of potential forage. These data will be used to develop a statistical model to quantify nutritional carry capacity of mountain goat range on Kodiak Island. [COBB]

- 3.5 In cooperation with ADF&G, annually monitor trends in distribution, size, and composition of the elk population on Afognak Island. Maintain the sample of marked animals to enable this population monitoring by assisting with funding and logistics related to animal-capture operations.

ADF&G conducted aerial surveys of elk on Afognak and Raspberry Islands. Herds were initially located by homing on representative radio-collared elk. Results indicated that the elk population was stable at approximately 700-750 elk. The bull: cow ratio remained highly skewed, with approximately 20 bulls:100 cows. [COBB]

- 3.6 By 2012, develop an objective understanding of the effect of deer on supply of berry-producing shrubs of primary importance to brown bears of Kodiak Island.

No action was accomplished during FY-2012 due to a lack of staff and funding.

- 3.7 Assess trends in reindeer population abundances and productivity.

No action was accomplished during FY-2012 due to a lack of staff and funding.



Heidi Helling, Refuge Biological Technician, harvests vegetation in a sample plot situated at a mountain goat feeding site on Kodiak. Ian Petkash/UFWs

GOAL 4: Continue to improve understanding and management of furbearing and nongame mammals that use Kodiak Refuge.

- 4.1 By 2007, in cooperation with the Region 7 (Alaska) Marine Mammals Management Office, develop and implement a sea otter survey to annually index population trends. Provide staff support for periodic, Archipelago-wide surveys conducted by Marine Mammals Management Office staff.

Marine Mammals Management (MMM) is still in the process of reevaluating the aerial sea otter survey method that has been used to monitor population trend of sea otter in Alaska including the Kodiak area. Sea otter will not be surveyed until a revised protocol is available. [COBB]

- 4.2 In cooperation with the Region 7 Marine Mammals Management Office, expand communication on sea otters with the Alaska Sea Otter Commission, village councils, and others.

We served as the liaison between MMM and Kodiak's villages concerning sea otter tagging. [COBB, LEE]

- 4.3 In cooperation with ADF&G, develop a method for monitoring trends in river otter populations, modify the existing ADF&G trapper questionnaire to capture information on refuge-specific furbearer harvest, and document estimated furbearer harvest and population trends in the annual refuge narrative report.

No action was accomplished during FY-2012 due to a lack of staff and funding.



River otters can sometimes be seen in marine areas, here on Afognak.
Robin Corcoran/USFWS

4.4 Initiate study of habitat ecology of snowshoe hares by 2012.

No action was accomplished during FY-2012 due to a lack of staff and funding.

4.5 During cabin maintenance and management of derelict structures, take precautions to minimize damage to native bat populations.

Precautions were taken to minimize damage to native bat populations.

GOAL 5: Monitor populations of resident and migratory birds as indicators of ecosystem health.

5.1 Continue to monitor coastal populations of environmentally sensitive resident birds in winter, spring, and summer for general information on species composition, distribution, and population trends to use as indices of marine and coastal resource health.

5.1 a. Conclude the evaluation of the winter seabird and waterfowl procedure.

We are continuing to incorporate minor edits into the existing draft report (Population Trends and Annual Density estimates for select Wintering Seabird Species on Kodiak Island, Alaska) and are researching options for publishing as grey literature. The

protocol used for the surveys apparently has certain biases. At this point in time there is no request from managers to conduct or redesign the survey. [CORCORAN]

5.1 b. Evaluate and prescribe survey design and analysis methods for estimating trends of selected bird and mammal species from data collected on the summer coastal survey.

The evaluation was directed by former Region 7 biometrician Joel Reynolds with Alice Shelly, contract biometrician. Joel has consulted with his replacement, Nathan Roberts, and is working to finalize a report soon to be delivered to the Refuge. [CORCORAN]



Marbled murrelets are one of the most common bird species found around Afognak.
Robin Corcoran/USFWS

5.1 c. Continue Regional Summer Nearshore Marine Bird Monitoring Survey as a replacement for summer harlequin duck coastal survey to monitor coastal bird populations.

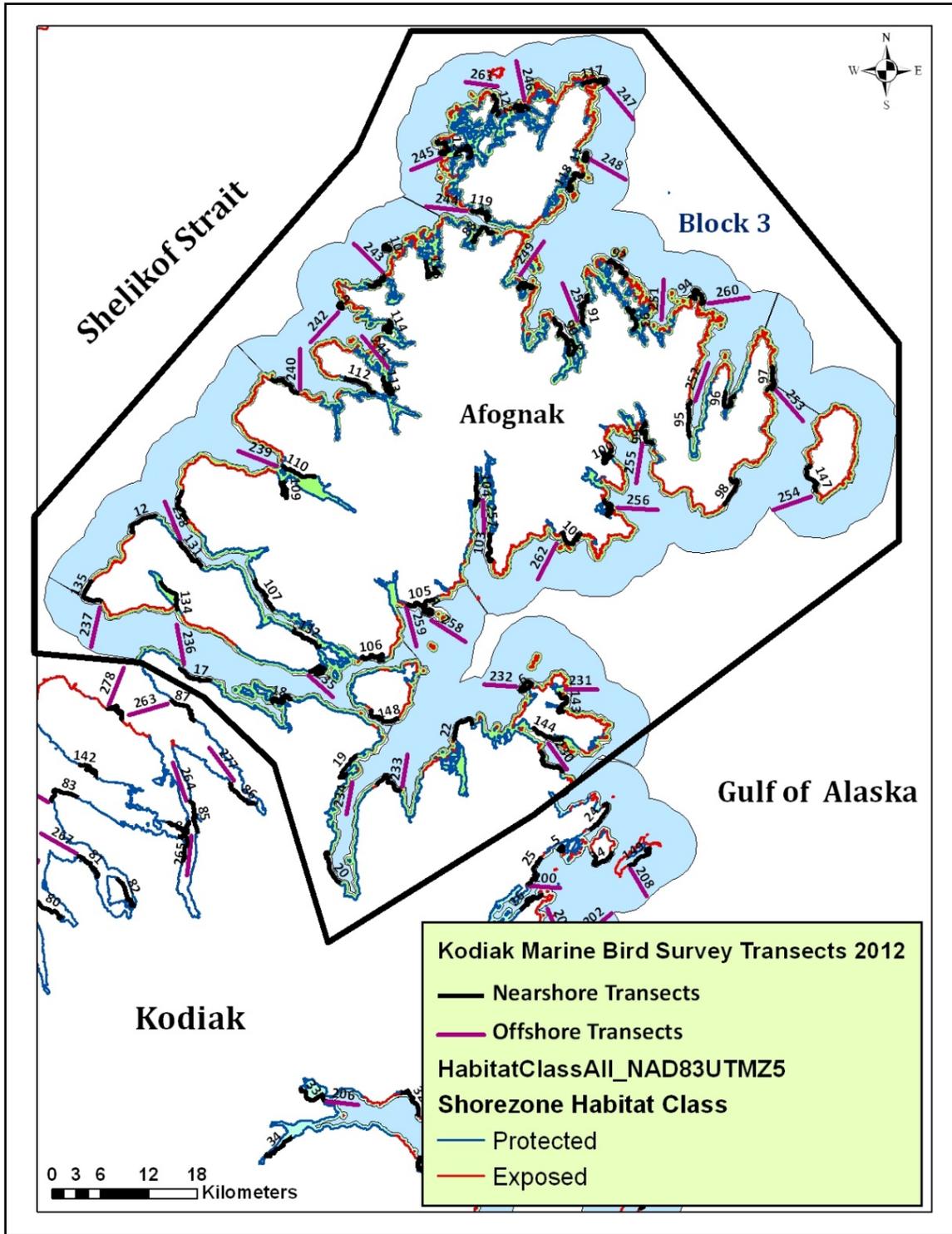
Surveys based on the National Park Service's Southwest Alaska Network (SWAN) Nearshore Marine Bird Survey were continued along the northern portion of the Kodiak Archipelago from Marmot Bay to Shuyak Island in summer 2012. This multispecies survey has been conducted at Katmai (2006-2010) and Kenai Fjords National Parks (2007-2010) and uses methods comparable to those developed to monitor the nearshore bird community in Prince William Sound over the past two decades. Modifications to the

SWAN survey for Kodiak include addition of offshore transects to 5km, distance estimation to determine species detectability, and multiple with-in season surveys. The

2012 survey covered 2030 km of coastline with transects sampling about 20% of the 3600 km² study area. The most commonly counted species were black-legged kittiwakes, glaucous-winged gulls, tufted and horned puffins, marbled murrelets, pelagic cormorants, pigeon guillemots and harlequin ducks (Table 1). Field operations were supported by Jeff Lewis, who piloted the M/V Ursa Major II, and volunteers Katie Studholme, Rhea Pulizzi, Jenna Cragg, and Marie McCann. [CORCORAN]

Table: Population estimates for marine birds and mammals surveyed on the northern Kodiak Archipelago in June and August 2012. SE = Standard Error, CI = 95% Confidence Interval

Species	June 2012				August 2012			
	Population Estimate	SE	Lower CI	Upper CI	Population Estimate	SE	Lower CI	Upper CI
Nearshore Transects								
Harlequin Duck	2441	603	1260	3623	7348	1210	4977	9719
Barrow's Goldeneye	68	22	25	111	151	72	11	292
Black Oystercatcher	776	109	562	990	1643	366	926	2361
Nearshore & Offshore Transects								
Pelagic Cormorant	8058	2248	3653	12463	2784	613	1583	3986
Red-faced Cormorant	371	161	55	688	214	80	58	371
Glaucous-winged Gull	34362	6993	20657	48068	34851	6158	22781	46920
Black-legged Kittiwake	34700	10554	14014	55386	74106	29232	16812	131400
Common Murre	359	103	157	562	2549	829	923	4174
Pigeon Guillemot	14382	1476	11489	17274	18095	1738	14687	21502
Kittlitz's Murrelet	6	6	-6	19	225	56	115	334
Marbled Murrelet	13447	1481	10544	16349	51599	7509	36881	66318
Tufted Puffin	15171	3511	8288	22053	17083	3034	11135	23030
Horned Puffin	3957	609	2764	5151	8728	1360	6063	11393
Marine Mammals								
Harbor Seal	5898	2866	281	11515	2572	556	1483	3661
Sea Otter	11540	1507	8586	14494	15576	2095	11470	19682
Steller Sea Lion	300	89	126	475	225	91	46	403



Map of skiff-based transects completed along the north end of the Kodiak Archipelago (Block 3) for the Nearshore Marine Bird Survey, June and August, 2012.

- 5.2 Continue to monitor populations of wintering waterfowl to provide information to the State of Alaska and the Alaska Migratory Bird Co-management Council in support of sound management of recreation and subsistence harvest of waterfowl. Monitoring should emphasize species such as black scoter, harlequin duck, and Barrow's goldeneye, which make up much of the waterfowl harvest in the Archipelago.

No action was accomplished in 2012 due to a lack of staff and funding. At this point in time there is no request from managers to conduct or redesign the winter seabird survey. [CORCORAN]

- 5.3 Continue periodic monitoring of trends in distribution, size, and reproductive success of the Refuge's population of nesting bald eagles. By 2007, determine appropriate frequency and sample sizes for long-term monitoring.

Joel Reynolds, former Region 7 Biometrician, and contracted Biometrician Alice Shelly, issued a final report "Study Design Assessment for Surveys of Bald Eagle Nesting and Productivity on Kodiak NWR". The Refuge is still waiting on a companion report assessing monitoring frequency and the ability to detect trends. Manuscript reviewers on this report and the 2002 Refuge Biological Review concluded that productivity surveys were not warranted unless: (1) surveys indicated declines, or (2) relevant covariates explaining the high degree of variability in productivity were included in the survey. Given this assessment, Refuge managers and biologists agreed to discontinue annual productivity surveys. If funding permits we intend to adopt the regional Migratory Bird Management Coastal Bald Eagle Survey in the near future. [CORCORAN]

- 5.4 By 2007, develop a banding program to monitor trends in survival and productivity with a focus on sea duck species (black scoter, harlequin ducks, and Barrow's goldeneye) that make up much of the local waterfowl harvest. Areas along the Kodiak road system and adjacent to the villages would be given priority for the program.

The Refuge's harlequin duck banding program resumed in 2012. Fifty harlequin ducks were captured in three different locations including Blue Fox and Foul Bay on Kodiak Refuge's Afognak Unit, and Kalsin Bay near the city of Kodiak. Over 1,300 harlequin ducks have been banded on Kodiak since 1996. These data have provided an opportunity for the Refuge to evaluate annual survival rates. Hunter-killed band returns also provide information on local movements by ducks, harvest patterns, and hunter demographics. Hunters from over 20 states outside Alaska have harvested banded harlequins in the Kodiak area, indicating popularity of this area and quarry among non-residents. In addition to harlequin ducks, we banded 49 Barrow's goldeneye at a site in Blue Fox Bay. Although Barrow's goldeneye is a common breeding bird on Kodiak, generally they are known to molt at other locations, particularly on large freshwater lake complexes in the interior boreal forest. Blue Fox Bay, where the group of females have been banded for three years (2006; 2010; 2012), is one of very few cases where molting has been documented in the marine environment. [CORCORAN]



Volunteer Marie McCann preparing to band a Barrow's goldeneye in Blue Fox Bay, Kodiak NWR. Jenna Cragg/University of Victoria, B.C.

- 5.5 Identify important habitat areas on the Refuge for bird species of conservation concern, including bald eagles, Steller's eiders, harlequin ducks, emperor geese, marbled and Kittlitz's murrelets, red-throated loons, gray-cheeked thrush, orange-crowned warblers, and yellow warblers. Develop habitat maps by 2010.

5.5 a. Study nesting ecology of Kittlitz's murrelet.

This summer was the fifth year of a field study of Kittlitz's Murrelet (KIMU) breeding ecology on Kodiak National Wildlife Refuge. Three full-time volunteers, Marie McCann, Bob Taylor, and Sonia Kumar, assisted wildlife science technician Heather Mackay with KIMU field research during 10 May-10 September. Between early-June and early-August, the team successfully located 21 active nests. Of those 21 nests, 14 survived the nestling stage, and nine successfully fledged a chick. Chick provisioning, nest depredation and egg abandonment were recorded at 20 nests using remote cameras. In addition to characterizing nest sites, dead chicks and un-hatched eggs were collected for disease and contaminants analysis. The total of 74 KIMU nests studied over the five years will contribute important data for the listing determination for this candidate species under the Endangered Species Act. Funding for the 2012 field season was provided by the National Fish and Wildlife Foundation Alaska Fish and Wildlife Grant, USFWS Ecological Services, and the U.S. Geological Service's Alaska Science Center.

This project continues to be a cooperative effort involving the U.S. Fish and Wildlife Service (Kodiak Refuge and Ecological Services), the U.S. Geological Service Alaska Science Center, and Oregon State University (OSU). James Lawonn, graduate research

student under Professor Dan Roby of OSU, completed a co-authored progress report in September 2012, and is scheduled to complete his thesis and Master of Science degree in December 2012. Over the course of the year, James gave four professional presentations. Venues included the Alaska Marine Science Symposium, Pacific Seabird Group annual meeting, North American Ornithological Conference, and Oregon State University Research Advances in Fisheries, Wildlife, and Ecology. [CORCORAN, PYLE]



Volunteers Sonia Kumar and Bob Taylor and biological technician Heather Mackay measure a Kittlitz's Murrelet chick. Marie McCann/USFWS

5.5 b. Radar monitoring of *Brachyramphus* murrelets on Kodiak Island.

In cooperation with Alan Burger and Jenna Cragg of the University of Victoria, British Columbia (B.C.), the Refuge facilitated completion of the third season of field data collection investigating diurnal, seasonal, and spatial patterns of inland flight behavior of Kittlitz's and marbled murrelets using radar. Marine radar is a commonly used tool to study marbled murrelets throughout B.C. and south along the west coast of the U.S., and has shown high statistical power to detect population trends. This is the first effort in Alaska to use radar for monitoring murrelets. Field work in 2012 involved a combination of radar, acoustic, and at-sea surveys. A combination of shore stations and boat based radar surveys (M/V Ursa Major II) were conducted between June 1 and July 24. Thirty-two radar counts (194 hours) were completed at 15 sites in the northern Kodiak Archipelago (northern Kodiak, Afognak, and Shuyak Islands) yielding 11,081 murrelet detections. Higher daily counts recorded in 2012 compared to previous seasons demonstrated stronger and more consistent diurnal activity patterns. Song meters were

deployed at seven sites and were programmed to record for two hours before sunrise, with a total of 294 hours recorded. The maximum number of daily detections occurred on 24 July at Monashka Bay, with 160 marbled murrelet detections. Murrelet data from the SWAN nearshore marine bird survey (5.1 c.) will be used to relate radar counts to at-sea abundance and distribution. Over the course of the year Jenna gave six professional presentations. Venues included the Alaska Marine Science Symposium, Pacific Seabird Group annual meeting, Pacific Ecology and Evolution Conference, and two graduate student symposia at the University of Victoria, B.C. [CORCORAN]



Dawn murrelet radar survey on Kodiak Island. Jenna Cragg/University of Victoria, B.C.

5.5 c. Alaska Landbird Monitoring (ALMS) Program

In June 2012 the Refuge completed the Alaska Landbird Monitoring Survey (ALMS) plot on Uganik Island established in 2010. Volunteer Cindy Trussell and Kodiak Refuge volunteer coordinator Lisa Hupp conducted the survey from the Uganik Island public use cabin and spent June 20-23 surveying birds according to protocols developed by the USGS for this region-wide program. The team was able to survey 19 of the 23 accessible points in the pre-selected grid. Birds detected included three species of conservation concern, Gray-cheeked Thrush, Yellow Warbler, and Orange-crowned Warbler. The Refuge intends to survey this plot every other year according to ALMS guidelines. [CORCORAN]



Volunteer Cindy Trussell locating an Alaska Landbird Monitoring Survey (ALMS) point on Uganik Island. Lisa Hupp/USFWS

- 5.6 Continue collaboration with the Migratory Bird Management Office, Alaska Region, on periodic monitoring of wintering Steller's eider populations to contribute to monitoring and recovery efforts under the Endangered Species Act. Expand this effort to include monitoring of emperor geese.

If funding permits, we intend to complete aerial surveys of the east-side of Kodiak in cooperation with the Migratory Bird Management Office every five years. We are scheduled to conduct the next survey in winter 2015. [CORCORAN]

- 5.7 Develop baseline contaminants information for environmentally sensitive resident birds by 2010.

In 2012 the refuge received funding from the Region 7 Avian Health and Disease Program to take blood samples from sea ducks for contaminants analysis. We are interested in determining polychlorinated biphenyl (PCB) and trace metal (lead, selenium, mercury, cadmium, and copper) levels to establish baseline information for both species and to compare ducks banded at remote locations on the refuge to ducks banded at bays close to town of Kodiak where exposure to contaminants may be higher. Kodiak includes a major harbor for marine vessel traffic including a year-round commercial fishing port ranked as one of the largest in the United States, and also has many contaminated sites primarily as a legacy of its military history. Refuge biologists partnered with Chris Latty and Micah Miller of the USFWS Fairbanks Field Office

Contaminants Program to help collect and analyze the samples. In August, blood samples were collected from 31 harlequin ducks and 20 Barrow's goldeneye and will be analyzed in the laboratory this winter. [CORCORAN]



Blood sample being collected for contaminants analysis from a Barrow's goldeneye captured in Blue Fox Bay in August 2012. Robin Corcoran/USFWS

- 5.8 Facilitate annual operation and completion of two breeding bird surveys in the Kodiak vicinity.

Established in the early 1980s, both road-based surveys were successfully completed by volunteers Cindy Trussell (observer) and Rich MacIntosh (data recorder, navigator) in June 2012. Results were issued to USGS in July. [CORCORAN]

GOAL 6: Maintain and restore native plant populations, communities, and habitats.

- 6.1 Develop and conduct reconnaissance surveys for invasive plants—particularly orange hawkweed (*Hieracium aurantiacum*), a known invasive on Kodiak Island—every five years in the vicinity of villages, private lands within the Refuge (e.g., lodges, canneries), and Refuge sites subject to routine use by people. Where invasive plants are detected, initiate collaborative control and eradication actions.

- 6.1 a. Continue implementation of 2010 invasive plant management plan.

We continued approved IPM actions on orange hawkweed in the Camp Island vicinity, oxeye daisy at Refuge Headquarters, and Canada thistle at Garden Island. We initiated

IPM action including herbicide use on creeping buttercup (*Ranunculus repens*) at Akalura Cannery, southern Kodiak Island. We continued to document plant responses to IPM management on permanent plots located in and adjacent to treatment areas. In collaboration with the Kodiak Soil and Water Conservation District, we surveyed for waterweed (*Elodea* spp.) in Lily Lake and reed canarygrass (*Phalaris arundinacea*) in the Buskin River watershed. Surveys revealed no waterweed in Lily Lake, but there are infestations of reed canary grass along the Buskin River. Other areas surveyed for invasive plants included the vicinities of Village Islands, Little River Public Use Cabin, and Uganik Island Public Use Cabin. Volunteers again proved invaluable: 13 individuals collectively contributed 905 hours of labor in support of invasive plant management field operations including training, surveys, treatment site preparation, control, monitoring, and presentations. With exception of Refuge HQ, primary funding support was provided by a grant from the Service's Invasive Management with Volunteers program. [PYLE]

- 6.2 By 2008, describe species composition of plant communities for selected areas of the Refuge, with special emphasis on the Kodiak Refugium and areas likely to contain endemic plants.

6.2 a. Survey soils and ecological sites of selected watersheds of Kodiak NWR and vicinity.

In cooperation with the Refuge, the Natural Resources Conservation Service surveyed the vicinity of the Spiridon Peninsula during late July and early August. Because of Refuge support, combined with survey requests submitted by Native Corporations, a sufficient survey subsample was acquired to permit defensible extrapolation of results to most, if not all, Refuge lands within legislative boundaries. The NRCS survey report is scheduled for publication in 2015. In addition to the survey report, the Refuge will be provided with associated GIS databases containing model results, as well as databases containing sample plot data on site characteristics, soils and plant species composition. [PYLE]

6.2 b. Survey alpine vegetation utilized by mountain goat in summer.

As a part of a study of mountain goat feeding selection, we conducted vegetation surveys of alpine habitat across three study sites on Kodiak (Hepburn Peninsula, a region northeast of Uyak Bay, and the Hidden Basin area). We quantified vegetation diversity and composition in over 5,000 plots, each 20x50 cm. We published the results of this work as an Alaska Refuges Report (2012-1). [COBB]

6.2 c. Survey flora of selected sites in Uganik Bay vicinity, western Kodiak Island.

The Refuge has annually sponsored cooperative floristic surveys since 2005. In 2012, volunteers Stacy Studebaker and Mike Sirofchuck surveyed native and non-native flora in the vicinity of four study sites in and adjacent to Uganik Bay and Passage including Village Islands, Little River Lake, southern Uganik Island, and the headwaters of Quartz Creek. A total of 286 specimens were collected and shipped to University of Alaska's Herbarium in Fairbanks for identification, entering into a computer database, curation, and archiving. Concurrent with survey fieldwork we addressed requests for specimens of

rhododendron, skunk cabbage, and moonwort to facilitate taxonomic studies. A series of photo points was established within each of the study sites. A project report is scheduled for completion in winter 2013. [PYLE]



2012 Mountain goat research team at Hepburn Peninsula. Left to right: Ian Petkash (Volunteer), Eric Torvinen (Volunteer), Aarin Sengsirirak (Volunteer), Heidi Helling (Biological Technician), and McCrea Cobb (Wildlife Biologist). Kevin White/ADF&G

6.2 d. Organize Refuge herbarium.

We re-organized the Refuge's database, a subset of the ARCTOS database created and managed by the University of Alaska's Herbarium in Fairbanks (UAF). The Refuge's



Stacy Studebaker, Volunteer Botanist, processes plant specimens collected following a day of survey. Bill Pyle/USFWS

reference collection presently houses 895 vascular plant specimens representing 476 species in 61 families. The collection derives from specimens acquired on surveys operated during 2005-2011.

- 6.3 By 2010, develop a monitoring program to evaluate major plant communities in the vicinity of remote weather stations.

No action was accomplished in FY-2012 due to a lack of staff and funding.

GOAL 7: Conserve the abundance of natural salmonid populations for continued human and wildlife use and to ensure the diversity of species as indicators of the health of the Refuge's ecosystem.

- 7.1 In collaboration with ADF&G, annually monitor escapement of salmon by means of aerial surveys and weir counts to ensure adequate escapement for future production and to support important commercial, recreation, and subsistence fisheries.

The 2012 Kodiak Area Salmon escapement counts were classified as medium to weak. There are five systems on Kodiak Refuge lands and two systems on Federal submerged lands administered by Alaska Maritime Refuge (Litnik and Buskin River systems) which monitor returning adult salmon via the use of a weir. Of the five systems on Refuge lands, sockeye salmon escapement goals were not met on one of the system (Upper Station early run). Over all, of all the salmon populations that were monitored in 2012, all except one were above the 2011 populations estimates.

Over the past 5 years the Chinook salmon population within the Karluk River drainage has been poor and despite specific management measures taken to reduce harvest in sport, commercial, and subsistence fisheries this stock has continued to be poor. Due to the poor health of this stock the Alaska Board of Fisheries declared it as a 'Stock of Concern' under the State's Sustainable Salmon Fisheries Policy (SSFP) (5 AAC 39.222) in 2011.

In an effort to try to understand the poor Chinook salmon returns, a joint study between Koniag, Inc., Alaska Department of Fish and Game – Sport Fish Division, and the Kodiak National Wildlife Refuge, was initiated in the spring of 2012. This project was a pilot study which was developed to determine the feasibility of implementing a large scale telemetry project to identify critical spawning habitat and collect age, sex, and length data from Chinook salmon migrating into the Karluk River drainage.

This pilot project was designed to capture and mark 10 adult Chinook salmon at the Karluk weir located at the mouth of the Karluk River. On June 13, 2012, 5 transmitters were implanted in Chinook salmon with the intention of implanting an additional 5 transmitters at the end of June. There were 2 telemetry flights flown each month, starting in July and ending in September. After the completion of each flight, a ground crew rafted the Karluk River, attempting to pin-point the locations of tagged Chinook salmon. The rafting trip would be a two day trip, with the crew using ground telemetry equipment to locate Chinook salmon. GPS locations of Chinook salmon were recorded in addition

to habitat type of the river, i.e. pool, riffles. Data collected would include if Chinook salmon has been paired up or are single individual fish. Through the season, an attempt will be made to recover tags from all mortalities.

ADF&G will analyze the data collected from each Chinook salmon caught and provide support for ground tracking rafting trips. The U.S. Fish and Wildlife Service will provide logistical support for telemetry flights as well as partial rafting trips. [VAN HATTEN]

- 7.2 Monitor salmon escapement in streams on the Refuge that are key seasonal feeding areas for brown bears and bald eagles and work collaboratively with ADF&G to maintain escapement levels that reflect wildlife needs.

In cooperation with the University of Montana, we deployed cameras to assess salmon abundance in 12 streams in the Karluk, Red, and Frazer Lake watersheds. Nine units consisted of time-lapse cameras mounted on tripods overlooking white background panels. Three additional sites were designated as calibration streams. Two of these sites were additionally outfitted with video recording technology, while the third, utilized ADF&G personnel at the Frazer Fish Pass weir. Paired systems provided bases for assessing accuracy of time-lapse counts derived from different sampling frequencies and deriving computations for estimating total salmon passage from time-lapse observations. [LEACOCK]



Will Deacy, University of Montana, sets up salmon monitoring system on Connecticut Creek. Tyler Tran/USFWS

- 7.3 Annually review commercial, recreation, and subsistence harvest of salmon by means of ADF&G commercial harvest reports, special use permit reports, creel censuses, and subsistence reporting. Harvest data, along with escapement data, will be used to monitor productivity of salmon populations that occur in waters within Refuge boundaries.

The Kodiak Refuge Information Technician (RIT) continues to provide subsistence harvest data from Kodiak villages. The information collected by the RIT was provided to the Fishery Biologist which was then summarized into a weekly report and submitted to the Office of Subsistence Management. ADF&G has released catch sampling results for 2011 and is working on releasing catch sampling results for 2012. [VAN HATTEN, LEE, SUNDSETH, WHEELER]

- 7.4 Continue to review management plans and harvest regulations that may affect exploitation of fish populations located within the Refuge. Make recommendations to ADF&G, regional advisory councils, the Federal Subsistence Board, local advisory committees, and the Alaska Board of Fisheries, as needed, for modifications to existing plans and regulations and/or for new plans and regulations.

The Alaska Board of Fisheries provided a list of proposals for changes to the state's fishing regulations. No proposals or changes to existing policies were submitted to the Board of Fisheries for the Kodiak Management Area. [VAN HATTEN]

- 7.5 Work with ADF&G to evaluate the need for steelhead escapement goals for Karluk, Ayakulik, and Sturgeon rivers. Additionally, recommend to ADF&G management actions or regulatory proposals that foster conservation of population structure and productivity of stocks that use these rivers.

There are currently no escapement goals for steelhead within the Kodiak Management Area. The Kodiak Refuge office has consulted with ADF&G – Sport Fish Division to start the process in establishing escapement goals for various systems. Although there is no escapement goals established within Refuge boundaries, our office has been contacted by Koniag personnel to study the steelhead population on Karluk River. There is concern by Koniag, that with the decline in Chinook salmon populations, lodges and subsistence users are focusing their attention on steelhead. We have also been contacted by ADF&G – Sport Fish Division to see if the steelhead population in the Dog Salmon (Frazer Lake drainage) is being targeted by lodge and subsistence user groups. [VAN HATTEN]

- 7.6 Assess and monitor populations to gather baseline data on noncommercial fish species such as Arctic char in Karluk Lake, Dolly Varden char, and resident rainbow trout. Use study methods such as mark-recapture, radio-tagging, weirs, video, and creel surveys with assistance of the Service's Anchorage Field Office and ADF&G.

A genetics study was conducted by the Genetics Lab in Anchorage to look at Dolly Varden, rainbow/steelhead trout, and other resident species within the Frazer Lake drainage. The results from their project are still being analyzed at this time.

- 7.7 Continue to require ADF&G to implement monitoring programs for Kodiak Regional Aquaculture Association (KRAA) enhancement projects conducted on the Refuge, as outlined in specific refuge management plans (i.e., Spiridon and Hidden lakes

enhancement management plans). Annually review project reports provided by ADF&G to ensure that biological parameters continue to meet management plan criteria, which will ensure protection of wild salmon stocks, char populations, and wildlife within the project area.

At this time our office has not received any reports from the Kodiak Fisheries Biologist for the ADF&G – Division of Commercial Fisheries outlining the results from 2012 Spiridon and Hidden Lake studies. A report, Limnological Assessment of Kodiak and Alaska Peninsula Salmon Lakes, 2011 has been submitted by Heather Finkle, Fisheries Biologist III for ADF&G – Commercial Fisheries Research Division. [VAN HATTEN]

- 7.8 Through a collaborative effort with ADF&G, evaluate situations when fish populations are determined not to be meeting escapement goals or management targets. When weak stocks are identified (e.g., the early run of sockeye in Akalura Creek) develop strategies to improve and stabilize runs, which may include implementation of specific management actions and research or rehabilitation projects, while maintaining genetic integrity of these fish populations.

In an attempt to continue to protect the Chinook salmon returning to the Karluk River, the Alaska Department of Fish and Game followed their 2010 action plan for the 2012 fishing season. This action would affect commercial fishermen fishing the westside of Kodiak Island. When the Chinook salmon escapement is projected to be below the lower escapement goal, non-retention restrictions will be placed on commercial fishermen that fish from the inner Ayakulik section north to Cape Kuliuk. Fortunately, the Karluk and Ayakulik River Chinook salmon escapements were above their lower escapement and very little restrictions were placed on commercial fishermen during the 2012 fishing season. [VAN HATTEN]

- 7.9 Complete data collection and write a report describing and classifying genetic characteristics of salmon populations in the Kodiak Refugium by 2008.

The Anchorage genetics lab has made multiple trips to Kodiak during the 2012 field season and collected Arctic Char and coho salmon samples from Frazer Lake. It is unknown if there will be funds available to collect sockeye salmon samples in the future.

- 7.10 In cooperation with ADF&G, document and describe genetic characteristics and variability of natural fish populations that are important indicators of the diversity on the Refuge for both human and wildlife use.

Due to staff and funding constraints, neither the Refuge nor the Kodiak ADF&G office is in the process of collecting any genetic data on various salmon populations within the Kodiak Management Area. See 7.9 for alternate agency for genetic characteristics.

- 7.11 Through a coordinated effort with ADF&G, evaluate salmon spawning and rearing habitat to determine productivity of salmon-producing systems within the Refuge.

No action was taken during 2012 due to staff and funding constraints.

- 7.12 Through a collaborative effort among ADF&G, the Refuge, and the Anchorage Fish & Wildlife Service Field Office, use escapement, habitat, and other pertinent data to establish sustainable or biological escapement goals—subject to review by the Alaska Board of Fisheries—for all species of salmon within the Refuge.

No action was taken due to staff and funding constraints.

- 7.13 Establish and implement monitoring plans for streamside areas to ensure salmon and Arctic char rearing and spawning habitats remain productive.

No action was taken due to staff and funding constraints.



The Coast Guard airlifted a skiff from Karluk Lake to Larsen Bay during October 2011 to allow us to make repairs in Kodiak over the winter. Gary Wheeler/USFWS

GOAL 8: Provide the opportunity for local residents to continue their subsistence uses on the Refuge, consistent with the subsistence priority and with other Refuge purposes.

- 8.1 Coordinate with ADF&G and the Federal Subsistence Board to issue special actions, as authorized under federal in-season management, when necessary to ensure conservation of healthy fish stocks and to provide for subsistence uses (subject to Title 8 of ANILCA) of fish in federal waters. Efforts will be made to minimize disruption to resource users and existing agency programs, as agreed to in the Interim Memorandum of Agreement for Coordinated Fisheries and Wildlife Management for Subsistence Uses on Federal Public Lands in Alaska.

After appropriate coordination, we issued a special action expanding the area of subsistence salmon fishing in Afognak Bay effective June 11, 2012. We presented two biannual Refuge activity reports to the Kodiak and Aleutian Regional Advisory Council (KARAC). There were no applications for positions on the KARAC to review this year. We attended a tribal consultation hosted by the Service's Office of Subsistence Management, and we were available to address any concerns raised by tribal representatives. We routinely provided input to OSM-authored weekly reports pertaining to the status of subsistence fishing between June and August.

[COBB/LEE/PYLE/WHEELER/SUNDSETH]

- 8.2 Continue to coordinate with and assist the Division of Migratory Bird Management in completing the annual Migratory Bird Harvest Survey in rural communities surrounding Kodiak Refuge.

No survey was conducted in 2012. [LEE]

- 8.3 Coordinate with ADF&G and the Service's Office of Subsistence Management to complete subsistence use surveys as needed.

The Federal Subsistence Board approved a proposal submitted by the ADF&G Subsistence Division for research of salmon subsistence harvest practices in the Kodiak area. Field research, scheduled to initiate in January 2013, will engage the Refuge in a nominal survey and meeting coordination role. [LEE]



An Old Harbor subsistence bear is tagged by McCrea Cobb and Tonya Lee. Rolph Christiansen

GOAL 9: Improve baseline understanding of natural flowing waters on the Refuge and maintain the water quality and quantity necessary to conserve fish and wildlife populations and habitats in their natural diversity.

- 9.1 In coordination with the Service’s Fisheries and Ecological Services and the Water Resources Branch, in the Regional Office, ensure the Kodiak Electric Association complies with instream-flow requirements of the Terror Lake Project agreement and the Federal Energy Regulatory Commission license. Additionally, monitor and maintain water quantity and water quality that could be affected by future hydroelectric or other water development projects.

The Refuge has monitored instream flows in the Terror River this year. In November 2011, leaking in the outlet works pipe, flooding of the outlet works valve house, and loss of valve control resulted in instantaneous and daily low-flow deviations. KEA completed emergency repairs to the outlet works pipe in January 2012, and ongoing repairs to the outlet works valve system continued in 2012. KEA installed a new remote-control actuator on the emergency shutoff butterfly valve located between the lake and the outlet works pipe. This new actuator is an important safety component to the restored outlet works system. The purpose of this safety valve actuator is to allow an immediate closure of the outlet pipe for safe tunnel access and quicker repair in an emergency failure mode situation, such as the pipe failure that occurred in late 2011. This situation resulted in a number of instream low flows in the Terror River. The experimental period allowing a 7.5% instantaneous deviation from the instream flow requirement as long as the daily rolling average met the instream flow requirements was extended for an additional 5 years because of the number of changes that have been made to the system. The experimental period is due to expire at the end of 2018. [WHEELER, SUNDSETH]

Refuge Management continued to participate in planning meetings and review documents related to a proposed hydropower project for the community of Old Harbor. [WHEELER, SUNDSETH]

- 9.2 By 2009, complete the Five-Year Plan of Study for the Water Resources Inventory and Assessment on the Kodiak Refuge and, in coordination with the Service’s Water Resources Branch, quantify and file for instream water rights for the maintenance and protection of fish and wildlife habitats.

Water Resources Division completed fieldwork in 2009. Data analysis performed for Upper Karluk River, Ayakulik River, Olga Creek, and the Dog Salmon River is presently under final review. A data report is scheduled for release in 2013. [SUNDSETH]

- 9.3 In cooperation with ADF&G and the Anchorage Fish & Wildlife Service Field Office, initiate limnological studies at lakes and streams within the Refuge that provide important habitat for fish and wildlife. Specifically, begin studies at Karluk, Ayakulik (Red Lake), Frazer, Akalura, Uganik, Sturgeon, Spiridon, and Little River systems.

ADF&G continued its long-term limnology studies of lakes that serve as rearing habitat for sockeye salmon of the highest commercial importance in the Kodiak area. In 2012, the Refuge periodically provided logistical support for limnology study of Karluk Lake.

We also continued to lead implementation of a Western Alaska LCC-sponsored project pertaining to all-season, multi-depth monitoring of lake temperature, as described in objective 1.7.c. [VAN HATTEN, PYLE]

GOAL 10: Provide opportunities for quality public use and enjoyment of Refuge resources through compatible fish- and wildlife-dependent recreation activities, including hunting, fishing, wildlife observation, and photography.

These are the numbers of big game animals harvested by hunters on the Kodiak Archipelago during FY-2012. The numbers were obtained from ADF&G and they differentiate between federal and non-federal land where possible. Kodiak Refuge comprises about 2/3 of the Archipelago.

Bear – 181 133 on Refuge

Elk - 41 1 on Refuge.

Deer - 5,000* *Estimated harvest on Archipelago due to computer malfunction.

Mountain Goat – 145 92 goats taken on Refuge.

Caribou/Reindeer - 14

10.1 Improve monitoring and continue appropriate onsite management of seasonal aggregations of public use at Ayakulik River, Karluk River, Frazer fish pass, and Uganik River and expand to other areas as use develops.

Ayakulik River: Alaska Department of Fish and Game floated the Ayakulik River in June of 2012. Their staff posted the “Voluntary Camping Closure” signs at popular fishing holes along the Ayakulik.

Karluk River: Visitor Services staff were scheduled to monitor the river in a support capacity for the Chinook telemetry project lead by Koniag, Inc. This project experienced several delays and use of the river was not monitored in 2012.

Frazer Fish Pass: Refuge staff contacted both guided and un-guided bear viewers and anglers at the fish pass. Brown bear viewing activity is a growing use on Refuge lands. Frazer Fish Pass is averaging between 1,000 and 1,200 visitors each season.

Uganik River: Refuge staff contacted 102 visitors along the river corridor or at the public use cabin at the head of Uganik Lake in 2012. Staff educated the public about the normal leave no trace practices, bear safety, and how not to monopolize public resources. New, this season was the implementation of a “Voluntary Camping Closure” of the lower Uganik River. The public was informed that the Refuge was asking campers to not camp below Mush Creek. This effort was designed to protect the seasonal concentration of brown bears that use the lower river to fish for salmon during the fall. This fall concentration has been identified as the tenth largest concentration of bears on the Refuge. The voluntary closure was not well received by some returning visitors and only approximately half of all campers

participated. Law enforcement was notified of potential regulation infractions of users and made contact.

[KLAUSNER/OLES/LAWSON/HUPP/ESCHENBACER/LINDAUER]

- 10.2 In cooperation with ADF&G, Koniag, Inc., Akhiok-Kaguyak, Inc., and Old Harbor continue to implement and manage easement agreements to minimize impacts of public use on fish, wildlife, and habitat; to ensure compatibility with Refuge purposes; and to provide for sustainable fish, wildlife, and wildlands recreation.

Staff provided information to the public, when requested, regarding access on conservation easement lands.



Occasionally wildlife officers are called on to tag marine mammal parts.
Gary Wheeler/USFWS

- 10.3 In 2007, develop an operations plan encompassing all aspects of law enforcement to be completed by 2008. Annually monitor commercial activities on the Refuge, including compliance with special use permit conditions and operation plans. Expand law-enforcement outreach to include education programs and media releases regarding Refuge regulations, and increase the number of field patrols to protect resource values and to enhance visitor experiences on Refuge and conservation easement lands.

During FY2012 Wildlife Officer (WO) Rees transferred to Kodiak in July. Rees spent the remainder of the field season completing flight training and getting familiarized with the refuge. He participated in the July patrol aboard the M/V Ursa Major II, visiting many of the permitted setnet cabin sites on refuge lands with Lewis, Wheeler, and Sundseth. Rees patrolled the Uganik River in September investigating unauthorized commercial enterprises on the refuge, as well as hunting, fishing and wildlife regulations. [REES]

- 10.4 Assess the nature of visitor experiences available in different types of bear-viewing settings to support the design and development of viewing programs at O'Malley River and other potential sites. Complete the assessment(s) in advance of the implementation of any new bear-viewing program(s).

The O'Malley River Bear Viewing Special Use Permit was not utilized in 2012. Refuge staff entered the closure area frequently to conduct research objectives, provide trail maintenance and establish a human presence on the trail and viewing platform. [LEACOCK/OLES/KLAUSNER]

Kodiak Refuge staff and the YCC crew performed trail maintenance on the O'Malley Bear Viewing Trail. The work keeps the trail defined as the approved route to access the O'Malley River bear viewing platform. [OLES/KLAUSNER/YCC]

- 10.5 Using rigorous social science methods assess the nature of visitor experiences, significant influences on those experiences, and public acceptability of potential management actions at Frazer fish pass. Use results of the study as input to visitor-use management and potential visitor-capacity decisions at that site.

No action was taken during 2012 due to staff and funding constraints.

- 10.6 Manage the public use cabin system to support a variety of compatible recreation activities by carefully considering the location of all current cabins and potential future additions to the system.

The system continued to be managed to support compatible recreational activities. No cabins were added to the system this year. A condition assessment of each cabin was made during the summer, and cabin maintenance needs were scheduled for accomplishment. Several maintenance fixes were completed during 2012. [KLAUSNER/SUNDSETH]

Enhanced the Public Use cabin brochure to include journal entries from cabin log books and more photos. [LAWSON/ALLARD]

We installed artist-rendered information signs designed by Galaxy Graphics with staff review in public use cabins at Viekoda Bay, Uganik Island, North and South Frazer Lake, and Deadman Bay to enhance visitor experience. Facility enhancement funds from the region paid for the signs. [KLAUSNER]

- 10.7 Continue to monitor use of 17(b) easements and implement management actions as necessary to prevent resource impacts to the easements. (Also see Goal 1.)

No action was taken during 2012 due to staff and funding constraints.

- 10.8 By 2008, assess off-road vehicle (ORV) use on conservation easements lands.

This has been accomplished in past years, and it is a part of patrolling use of conservation easement lands; but it was done to a limited extent in 2012 due to a shortage of LE personnel.

- 10.9 Initiate assessment of snowmachine use on the Refuge.

No action was taken during 2012 due to staff and funding constraints.

GOAL 11: Improve management of commercial use opportunities that are compatible with Refuge purposes, provide quality public use opportunities, enhance visitor experiences, and ensure compliance with provisions of ANILCA.

- 11.1 To accommodate an increasing number of permittees, review the current process for administrating special use permits and develop a simplified, more time-efficient system for receiving applications, issuing permits, processing use reports, and distributing billings.

The permit process is constantly reviewed to increase efficiencies.

[KLAUSNER/MONSON]

- 11.2 By 2008, develop an education program for commercial operators to inform permittees of refuge requirements, goals, and regulations. As a part of this, provide updated information on bear safety and awareness for distribution to clients.

Leacock participated as instructor and content developer in the KUBS commercial bear viewing course at Kodiak College. Target audience is existing or would-be Refuge permittees. [LEACOCK]

- 11.2 By 2008, develop an education program for commercial operators to inform permittees of refuge requirements, goals, and regulations. As a part of this, provide updated information on bear safety and awareness for distribution to clients.

Refuge staff developed a map of the Uganik River and handout showing recommended campsites, good camping practices, and bear safety measures for parties transported by air taxis. The handout was given to air taxis for distribution. [KLAUSNER/OLES]

- 11.3 By 2007, obtain stakeholder input, determine if the 1987 Management Plan for Commercial Fishing Activities needs to be revised, and update this plan if warranted.

Plan was revised in 2011. We issued temporary 1-year permits for the first time this year in accordance with the management plan. Three permits were available. One permit was

issued in mid-summer for a beach seine operation in Telrod Cove as a result of our setnet checks. [REES/SUNDSETH/WHEELER]

GOAL 12: Provide outreach, environmental education, and interpretive programs that increase a sense of stewardship for wildlife, cultural resources, and the environment and that enhance visitor experiences on the Refuge.

12.1 Plan, design, and construct a Refuge visitor center in the vicinity of downtown Kodiak to be complete by 2009.

Completed in 2007.

12.1 a Draft Standard Operating Procedures for visitor center operation, visitor center volunteer training, Alaska Natural History Association (ANHA) Scope of Sale and coordinate ANHA sales branch in sync with grand opening in Fall 2007.

Updated and maintained SOP's for visitor center operation.

[KAHN/ESCHENBARGER]

Reviewed and evaluated new product for bookstore, assuring product relevance to Refuge mission and Kodiak geographic location. [KAHN/KLAUSNER]

12.2 By 2007, provide better access to Refuge information on topics such as bear safety, campfire safety, permits, and public use cabins through a Web site and other electronic media. Information would also be available through a variety of non-electronic sources.

Created and maintained pages on new FWS website for visitors, including Visitor Center, Environmental Education, and Public Use Cabin pages. Posted updates as needed on permits and public use guidance. [HUPP]

Updated KNWR Visitor Center website with current information about displays, environmental education programs, and volunteer projects. Migrated all information from Visitor Center site to new FWS site in April, 2012. [HUPP]

Developed and filmed a series of short videos about Public Use Cabins and posted them on the new website. [HUPP/TAU/KLAUSNER]

Managed summer use of Public Use computer to incorporate streaming video of a remote wildlife camera placed at the Frazer Fish Pass. [HUPP/KAHN/SEASONAL STAFF]

Maintained a Kodiak Refuge Visitor Center Facebook account to publicize refuge events; post photographs of refuge sponsored activities, research and programs; and engage visitors in Refuge related information. [LAWSON/HUPP/KAHN]

Created a refuge blog that will be utilized to share lesson plans, nature inspired art, youth programs and more. [LAWSON/ALLARD]

Added reference library materials, including donations to VC library. [KAHN]

Provided ongoing updates to VC seasonal staff and volunteers working the front desk to better inform the public concerning bear safety and other topics. [KAHN]

We developed and delivered a Kodiak brown bear (education) kit to six villages and numerous town venues. [LEE]

- 12.3 Increase visitor center staffing to allow the center to be open seven days per week during peak visitor use season (dependent on funding).

12.3 a. Provide visitor center staffing year-round.

Coordinated visitor center staffing year-round with combined use of permanent staff, Student Conservation Association interns, volunteers and seasonal staff. [KAHN/HUPP]

Supervised, trained, and mentored two seasonal park rangers, one summer SCA volunteer, two fall Refuge volunteers, one full-time winter Refuge volunteer for visitor center staffing. Recruited, scheduled, coached and assisted various volunteers for visitor center staffing at the front desk, high visitation cruise ship staffing assistance and several special events. [KAHN]

Planned and coordinated a two week seasonal training for Visitor Services staff. Part of the training included topics such as bear safety and the Visitor Services program at the Refuge (which includes public use cabins, permits, etc.) The trainings provide staff with the knowledge and tools to better inform the public about a variety of Refuge and other information. [KAHN]

12.3 b. Recruit volunteers for participation in visitor center staffing and Refuge programs and continue to broadly recruit across Kodiak and elsewhere.

Kodiak Refuge has one of the top 10 Refuge volunteer programs in the nation. This year we had 94 volunteers who provided a total of 17,241 hours of work. [HUPP]

Scheduled and tracked volunteer docent shifts for staffing information desk and roving Visitor Center in support of regular operations and special events. [HUPP/KAHN]

Volunteer Coordinator served as central contact for 13 Visitor Center docents; recruited and trained 3 new local volunteers; assigned special projects as needed; supported retention through regular phone calls and appreciation. [HUPP]

Advertised for temporary volunteer docent position through the Friends of Alaska National Wildlife Refuges and acted as liaison for the regional group. [HUPP]

Schedule volunteers and provide volunteer t-shirts, etc. for International Migratory Bird Day events. [KAHN]

Coordinated volunteer docent and temporary staff training in Alaska Geographic policies and procedures. [SULESKI/HUPP/KAHN]

Recruited and supervised four volunteers who contributed over 3,520 hours of valuable work. Volunteers included a diverse range of ethnic and gender groups. [LEACOCK]

- 12.4 Acquire base funds for the Kodiak Summer Science and Salmon Camp base camp and village outreach project through Refuge System funding processes to avoid depending on annual fund-raising.

Acquired funding through a variety of resources. [LAWSON/KLAUSNER]

12.4 a. Seek Challenge Cost Share funding (\$20,000.00) to continue community education efforts through Kodiak Summer Science & Salmon Camp (now entering its 13th year).

We sought and received \$20,000 science camp funding through region funds and application process. [LAWSON]



Volunteers Caroline Cheung, Will Deacy, and Tyler Tran helped with bear research.
W.B. Leacock/USFWS

- 12.4 b Collaborate with Alaska Geographic on generating our annual appeal letter (a.k.a., donation letter) in support of Salmon Camp.

We collaborated with Alaska Geographic staff to generate the annual Salmon Camp appeal letter. We also wrote thanks to certain donors. [LAWSON]

12.4 c Bring Salmon Camp to Kodiak City and all 6 of Kodiak’s remote villages.

Salmon Camp made it to all six Kodiak Area Villages. In addition to our Salmon Camp programming, the crew participated in the 4th of July celebration at Old Harbor village. We had a float in the parade and a refuge and natural resource education booth at the carnival. [LAWSON/ESCHENBACHER/SALMON CAMP CREW]

12.4.d Conduct Salmon Adventure Camp for middle school students in the summer of 2008.

Salmon Camp Adventure Camp continued successfully this summer. The students learned leave no trace ethics and self-reliance techniques for this five day camp that includes a three day camping trip. [LAWSON/ESCHENBACHER/SALMON CAMP CREW]



Salmon Camp float in the 4th of July parade in Old Harbor. Salmon Camp Instructors Rory Pstotka and Ali Sutton appear with EE Coordinator Shelly Lawson. USFWS

12.5 Annually sponsor, co-sponsor, or participate in community events, festivals, and programs (e.g., Migratory Bird Day, Crab Fest, Whale Fest) to build awareness of the Refuge and Kodiak ecosystems.

Created, coordinated and hosted International Migratory Bird Day events in conjunction with Audubon. [KAHN/HUPP]

Coordinated with staff to host “Brown Bear Days,” a week of events celebrating the Kodiak Refuge and brown bear. Events included lectures, films, photo contest, kid’s night at the refuge, etc. [KLAUSNER/KAHN/LAWSON/HUPP/ESCHENBACHER]

Coordinated and hosted local artists to participate in community Art Walk with Kodiak Arts Council. [HUPP/LINDAUER/KAHN]

Created, coordinated and hosted International Migratory Bird Day events in conjunction with Audubon and the Alaska Bird Treatment and Learning Center in Anchorage. [KAHN]



Best in Show Image from first Brown Bear Days photo contest. Brandon Hoffman

Coordinated, hosted and promoted Crab Fest event in the Visitor Center (Kodiak Island Drummers) to coincide with Kodiak Chamber of Commerce Crab Fest programming and events. [KAHN]

We participated, presented, provided instruction to: Women in Science, Old Harbor Bear Awakening Celebration, Bear Paw Subsistence Camp, Dig Afognak Culture Camp, Cape Alitak Camp, Village Schools Alutiiq Weeks and Community Celebrations. [LEE]

We supported Old Harbor’s Tribal Wildlife Grant with education and leadership in Old Harbor’s Spring Bear Awakening Celebration (*Nuniah Esgarlluku Taquka’aq*). [LEE]

12.5.a Sponsor National Wildlife Refuge Week, planning, promoting and presenting public talks in support of the National Wildlife Refuge System.

Hosted 2012 Refuge Week, including the film Green Fire, Kid’s Night at the Refuge, brown bag lunch on Kodiak Refuge, etc. [KAHN/LAWSON/HUPP/ALLARD]

12.5.b Participate in WhaleFest 2008, both in planning (planning begins Winter 2007) and in facilitating environmental education efforts in the K-6 schools, home school groups and informal interpretive programs for all ages.

Conducted Whale themed Families Understanding Nature Program and a number of Whale themed programs for school groups to coincide with Whalefest.
[LAWSON/ESCHENBACHER]

Participated in WhaleFest team committee in coordinating and promoting WhaleFest 2012 events and schedule. [KAHN]

Provided whale design from visitor center exhibits for 2012 Whale Fest hoodie/shirts.
[KAHN]
Scheduled two BBLs speakers on whale-related topics to occur during WhaleFest.
[KAHN]

Whale-oriented FUN program and EE programs for school groups were planned and presented to coincide with WhaleFest schedule. [LAWSON/ESCHENBACHER]



Chad Cook's photo of brown bear cubs fighting was the Favorite Staff Photo at the first Brown Bear Days Celebration photo contest. Chad Cook/USFWS

12.5 c. Develop a Kodiak Envirothon event to foster environmental awareness and scientific skills in high school students..

Planned, sponsored and facilitated the Alaska Envirothon Competition in April, 2012. This was the largest program to date with 70 students participating. Kodiak area villages were also included in the event by participating in every Envirothon lecture in the Kodiak High School Natural Resources class via webinar. Village students also had the opportunity to participate in the daylong event. [LAWSON/HUPP]

This year we had the addition of a refuge station at the event and the creation of two education and informative videos were created as a result of this collaborative event. [LAWSON/LEE/HUPP/ESCHENBACHER]



In April 2012, the Kodiak Refuge coordinated the 4th annual Envirothon. This year's event was the largest to date with 70 high school participants including students from the villages of Karluk and Old Harbor.

12.5 d. Develop the Kodiak Youth Conservation Corps program to allow Kodiak high school students to gain a glimpse of what it is like to work for the FWS and to help with the Secretary's emphasis on youth hire.

Our YCC program continues to develop, improving in quality of education and opportunities each year. This year we had four Kodiak teens and a Student Temporary Employment Program hire Crew Leader. Some of the many programs they participated in include:

Three weeklong trips in the field:

Camp Island to work with ADFG on limnology of Karluk Lake, maintain the O'Malley Bear Viewing Trail, and assist bear research crew.

[KLAUSNER/OLES]

3rd and final year to participate with the clean up of Halibut Bay within the Kodiak Refuge in collaboration with Island Trails Network. [LAWSON]
Trip to Frazer Lake/Dog Salmon River to work with ADFG field crew learning about salmon research and to work with refuge staff on bear viewing improvements for the public. [OLES/LAWSON]

6 weeks of work in town:

Providing environmental education in collaboration with KANA's Explore the Rock program, 100th Anniversary of Girl Scouts Refuge patch event and Salmon Camp. [LAWSON/ALLARD]

Staffing the Visitor Center and contacting thousands of cruise ship passengers. [LAWSON/ALLARD]

Filming and editing four videos about refuge outreach, research, and programs.

[LAWSON/ALLARD]



Refuge YCC students Lachlan Kirven, Iris Blakeslee, Anelise Zimmer and Shane Davis pose in front of the Visitor Center map. USFWS

12.6 By 2008, work within the community to increase partnerships and volunteers to form a friends group for Kodiak Refuge.

12.6 a. Provide staff liaison to state-wide friends group.

Volunteer Coordinator attended regional Friends Annual Membership and Board Meetings via webcast and served as Refuge Liaison during regular teleconference meetings. Coordinating with FANWR to plan for 75th anniversary photo exhibit. Requested and received funding for photo exhibit logistics. [HUPP]

Provided an orientation slide presentation on Kodiak Refuge to the FANWR teleconference. [WHEELER]

- 12.7 As staff and funding allow, conduct workshops with schools and teachers across Kodiak Island to enhance curriculum and outreach dealing with Refuge resources, issues, and opportunities.

Hosted Learner Gatherer (learners of Alutiiq language preservation planning) sponsored by the Native Village of Afognak. [KAHN]

We developed and delivered a program featuring brown bear to all village schools, 8th grade classes, and a homeschool group. Additional school visits featured Refuge subsistence resources and migratory bird education. [LEE]



An element of the bear education kit presented to young students to facilitate discussion of encounter situations and best safety practices. Tonya Lee/USFWS

We presented Refuge research and monitoring efforts at three Kodiak High School biology classes. [COBB]

- 12.8 Expand opportunities for individuals, organized groups, and families to learn about the Refuge through on- and off-headquarters programs, environmental education, nature walks and interpretive programs.

Facilitated update of interpretive and educational displays in Refuge Headquarters kiosk. [LINDAUER/HOLZMAN/KAHN]

Created a temporary display about the Kittlitz's murrelet research project for the main exhibit hall in the visitor center. [HUPP]

- 12.8 a. Plan, publicize and present public talks, radio and newspaper interviews and press releases informing the public about building/exhibit progress, mission and public involvement.

Radio interviews: Coffee with a Ranger [KAHN/HACKER]_Happy Trails [KAHN/LINDAUER] Summer interpretive programming, Far North Film Festival (live). [KAHN], Kodiak Brown Bear Days (live): [WHEELER]

Newspaper interviews: Art Walk, Conservation Film Series, Far North Film Festival, International Migratory Bird Day, Refuge volunteers [KAHN/ HUPP], National Wildlife Refuge Week, Coffee with a Ranger program, Happy Trails program [KAHN]

Planned, publicized and presented a wild variety of public talks and events:

Cruise ship interpretive programming: [HOLZMAN/LINDAUER/HACKER/KAHN]

Mission related interpretive talks: [HOLZMAN/HACKER/LINDAUER/KAHN]

Road Scholars programs: [KAHN/HOLZMAN/HACKER]

Fall/Winter Conservation Film Series: [KAHN/ESCHENBACHER/PENNINGTON]

Far North Conservation Film Festival: [KAHN/ESCHENBACHER]

Kodiak Brown Bear Days: [KLAUSNER/VC STAFF]

National Wildlife Refuge Week: [KAHN/ALLARD/LAWSON]

International Migratory Bird Day: [KAHN/AUDOBON SOCIETY/STUDEBAKER]

Gave presentations to Kodiak High School drafting class, Kodiak Rotary Club, Kodiak College english/other classes, and other groups. VC tours to a variety of different groups. [KAHN]

Conducted a number of mission related public talks, events, and radio or newspaper interviews including:

Field Notes articles written about:

Adventure Camp connecting teens with nature [ESCHENBACHER]

YCC bonding through hard work with a purpose [ALLARD]

Salmon Camp summer report article [LAWSON]

Far North Film Conservation Series [KAHN/ESCHENBACHER]

YCC live on air interview with Kodiak public radio [LAWSON/ALLARD/YCCs]

Presentation to Kodiak High Natural Resource classes [LAWSON/LEE/CORCORAN/COBB]

100th Anniversary of Girl Scout Kodiak Refuge Patch Event [LAWSON/
ALLARD/LINDAUER/YCC]

Staff and volunteers coordinated and presented a number of public talks and outreach efforts regarding Refuge programs, mission and research. These included:

Fall Conservation Film Series [ESCHENBACHER/KAHN]

Kodiak YCC public presentation [LAWSON/ALLARD/YCC]

Refuge mission related interpretive talks by Visitor Center staff [HACKER/
HOLZMAN/ LINDAUER]

Coordinated with Alaska Maritime NWR regarding Ferry Naturalist program, which provided information and interpretation about the Kodiak Refuge and Kodiak Refuge Visitor Center to users of the Alaska Marine Highway System between Homer and Dutch Harbor (with stops in Kodiak) during the summer season. [KAHN]

Scheduled, hosted and promoted numerous programs and community events that occurred at the Refuge Visitor Center that built awareness of Refuge and Kodiak ecosystems such as:

Sea of Change (ocean acidification), Marine Stewardship Club; Alaska Marine Conservation Council: Ocean Acidification; Tools of Bushcraft-Jim Dillard; iMovie workshop for Kodiak Outdoor film festival-ITN; Getting Steep with Vision, First Ascent and Misadventures from Alaska to Pakistan-Orion's Sports; Dr. Jack Stanford; COASST beached bird survey volunteer training; Senator Begich community meeting, Chamber of Commerce, KPLA energy workshop; NOAA/EVOS Exxon-Valdez Trustee Council public, many others. [KAHN]



Officer Isaac Bedingfield speaks to a village school class. Lee/USFWS

We hosted an open house and traveling exhibit display on the Ursa Major II at the communities of Old Harbor and Ahkiok. [LEWIS/KLAUSNER/HUPP](#)

We hosted, publicized, and promoted 27 weekly free lectures for the public at the Refuge Visitor Center (Brown Bag Lunch Series). [\[COBB\]](#)

The summer of 2012 marked the third season of the Kodiak Refuges' Monitoring Avian Productivity & Survivorship Program (MAPS) near Refuge Headquarters on the Buskin River State Recreation Area. MAPS is a nation-wide program established in 1989 to monitor landbird survivorship and productivity through mist netting and banding. The Refuge initiated the program to complement the two road-side Breeding Bird Surveys conducted annually on Kodiak and to connect the public with conservation issues through bird banding. This season, Refuge employees and volunteers banded 164 birds representing 13 species, and recaptured 71 birds including 24 birds banded in previous years. In general resident (non-migratory) and short distant migrants had higher capture and return rates and higher productivity compared to long-distance migrants. Cooperators from the community included Cindy Trussell, biology professor at Kodiak College, and Rich MacIntosh, a retired biologist with NOAA Fisheries and local bird expert. Despite the early morning hours this summer we had 30 volunteers from the Kodiak community participate. [\[CORCORAN\]](#)



Pine grosbeak ready to be released after banding during the Monitoring Avian Productivity & Survivorship Program in 2012. Robin Corcoran/USFWS

We developed and delivered a Kodiak brown bear (education) kit to six villages and numerous town venues. [LEE]

GOAL 13: Conserve cultural and archaeological resources of the Refuge.

- 13.1 Identify priority areas to inventory for archaeological and other cultural sites and conduct surveys as time and personnel permit. Perform surveys at a level sufficient to evaluate, without a follow-up visit, eligibility of sites identified for inclusion on the National Register of Historic Places. While actual surveys will be conducted as funding and personnel become available, the identification of priority areas and overall planning for surveys should be completed by the end of 2007.

No action was accomplished in FY-2012 due to a lack of staff and funding.



A student investigates snow in a program an environmental program about snowflakes. USFWS

- 13.2 Formalize the existing partnership with the Alutiiq Museum by the end of 2006. This agreement should spell out participation of the Refuge, the Service's Regional Office in Anchorage, and the Museum in terms of both funding and tasks. Seek out and develop partnerships with Native corporations, universities, other government agencies, etc., to cooperatively inventory, manage, and protect cultural resources.

The Alutiiq Museum has taken the lead in developing partnerships to protect cultural resources. The Refuge remains a vital entity in protecting these resources.

- 13.3 Identify and acquire archaeological, historical, and ethnographical archival resources to provide the necessary background material to support archaeological and historic site

protection, public interpretation, and paleobiological information useful in wildlife and habitat management.

Information was provided to the Refuge about an area exposed to removal of cultural resources. LE is investigating this information.

- 13.4 Provide Archaeological Resources Protection Act training to Refuge law-enforcement personnel. Provide basic cultural resource training to Refuge staff. Identify sites or areas at risk for vandalism and monitor with periodic law-enforcement patrols.

Attended cultural resources training. [WHEELER]

- 13.5 Strengthen and expand the Alaska Heritage Resource Stewardship program for site monitoring and evaluating site conditions on Kodiak Refuge.

No action was accomplished in FY-2012 due to a lack of staff and funding.

GOAL 14: Conserve special and unique features of the Archipelago ecosystem within the Refuge.

Note: Most of the objectives listed under Goals 1 through 7 are also objectives related to the special and unique features of the Archipelago ecosystem.

- 14.1 With public involvement, develop a management plan for the Mount Glottof Research Natural Area that identifies conservation and monitoring measures to preserve and document featured values and identifies how management under the plan may influence public use and access.

No action was accomplished in FY-2012 due to a lack of staff and funding.

GOAL 15: Promote close working relationships through effective coordination, interaction, and cooperation with other federal agencies, state agencies, local communities, tribes, organizations, industries, the general public, and landowners adjoining the Refuge whose programs affect, or are affected by Refuge management activities.

- 15.1 Routinely report results of biological and subsistence management, monitoring, and research to external audiences, including Kodiak Fish and Game Advisory Committee, Kodiak-Aleutian Regional Advisory Council, tribal councils, and other interested groups and individuals.

We presented two biannual Refuge activity reports to the KARAC including publishing reports in the meeting booklet. We attended the KARAC meetings and answered questions about animal populations and Refuge operations. [COBB/ PYLE/SUNDSETH/WHEELER]

- 15.2 Use and assist in the fish and game regulation process through interaction with ADF&G, local fish and game advisory committees, state Boards of Fisheries and Game, Federal

Subsistence Board, Kodiak-Aleutians Federal Subsistence Regional Advisory Council, and the Alaska Migratory Bird Co-Management Council.

We presented an overview and 2011 highlights of the Refuge's wildlife research and monitoring activities to the Kodiak Fish and Game Advisory Committee. We were also participated in the Advisory Committee's mountain goat subcommittee, which submitted a proposal for changes to the recreational sport hunting regulations in response to a rapidly growing population. (See 3.1) [COBB/PYLE/LEACOCK/SUNDSETH/WHEELER]



Island Trails Network was provided with the Regional Director's Conservation Partner of the Year Award for their work in 2011. Pictured are Andy Schroeder and Patrick Saltonstall (ITN) and Refuge Manager Gary Wheeler. USFWS

- 15.3 Use public processes as necessary to encourage stakeholder involvement in implementation of this Conservation Plan.

We attended all meetings and worked closely with KUBS, Kodiak Bear Trust, Koniag, and Larsen Bay. [LEACOCK/OLES/KLAUSNER/SUNDSETH/WHEELER]

- 15.4 Continue the Refuge Information Technician program to enhance information exchange with local communities on refuge issues, particularly those dealing with subsistence and bear management (such as bears killed in defense-of-life-or-property).

We produced and distributed a newsletter to village communities and land neighbors. We completed 17 trips to village communities to address a variety of mission goals including outreach, environmental education, Tribal Wildlife Grant assistance, and subsistence resource management. [LEE]

Village	No. Visits (Length of Stay)	Purpose
Old Harbor	6 (13 days)	<ul style="list-style-type: none"> • TWGrant Support, Meetings and Education in School • Introduced Refuge Ranger/LE program • Old Harbor Bear Awakening Celebration • Subsistence Bear Permits • Alutiiq Week Education in School & community celebration • Sea Otter Tagger Contacts • Ursa Major II Traveling Tour
Akhiok	4 (11 days)	<ul style="list-style-type: none"> • Subsistence Bear Permits • Kodiak Brown Bear Kit • Sea Otter Tagger Contact • Ursa Major II Traveling Tour • Akhiok Kids Camp – Cape Alitak
Larsen Bay	3 (5 days)	<ul style="list-style-type: none"> • Sea Otter Tagger Contacts • Subsistence Brown Bear Permit • Kodiak Brown Bear Camp
Karluk	2 (3 days)	<ul style="list-style-type: none"> • Kodiak Brown Bear Kit in school • Bird Migration Education • Sea Otter Education • Meeting with Managers
Ouzinkie	1 (3 days)	<ul style="list-style-type: none"> • Kodiak Brown Bear Camp
Port Lions	1 (3 days)	<ul style="list-style-type: none"> • Kodiak Brown Bear Camp



Tonya Lee, Refuge Information Technician, maintaining good relations in Old Harbor.
USFWS

- 15.5 Participate in interagency activities, cooperative agreements, data sharing, and sharing of equipment and personnel to accomplish mutual management goals and objectives.

In collaboration with the Kodiak Soil and Water Conservation District, we surveyed for waterweed (*Elodea* spp.) in Lily Lake and reed canarygrass (*Phalaris arundinacea*) in the Buskin River watershed. Surveys revealed no waterweed in Lilly Lake, but there are infestations of reed canary grass along the Buskin River. [PYLE]

Refuge representative for the USFWs Institutional Animal Use and Care Committee.
[LEACOCK]

We provided boat operator Jeff Lewis to assist with emergencies on the Alaska Peninsula/Becharof vessel Arluk wintering in Kodiak harbor. We also provided storage space for items to retrofit the Arluk. [LEWIS]

We continued to implement a Western Alaska LCC-sponsored cooperative project involving all season, multi-depth monitoring of water temperature in Karluk Lake and Red Lake. As planned, monitoring arrays were visited in late spring to summer to retrieve data and check on array and data logger integrity. Preliminary results revealed that temperature differed among depths and lakes across the year in correspondence with variation in air temperature. Annual minimums, and minimum temperature fluctuation, were observed during December and March when lakes were covered with ice. Peak

annual temperature was observed near lake surfaces in mid-August, and early to mid-September at lowest lake depths (35 m in Red Lake, 110 m in Karluk Lake). We observed a turnover event in Red Lake during mid-September. This event, apparently triggered by sustained strong winds, was characterized by high magnitude variation in temperature at mid to low lake depths with end consequence of reduction in temperature difference through the water column. Cooperating refuges generated a summary report addressing array establishment. In response to Kodiak Refuge's request, the Inventory and Monitoring Program developed a database management tool to facilitate organization, summary, and archiving of this large and expanding multi-refuge dataset. [PYLE]

- 15.6 When requested, partner with community members to address bear-management concerns at villages, remote cabins, and lodges.

We continued coordination with Old Harbor's environmental program to address bear management concerns. We focused on educating village students about Kodiak brown bear safety and awareness in cooperation with ADF&G, village tribal councils and community members. [LEE]

We partnered with the KUBS group to write a public service message on bear safety that was broadcast on Kodiak radio stations. [WHEELER]



Part of a Refuge Manager's job is leading information trips. Pictured are Biologist Bill Leacock, Senator Mary Landreau, Refuge Manager Gary Wheeler, Pilot Kevin VanHatten, Senator Lisa Murkowski, and Chief of Refuges Mitch Ellis.

GOAL 16: Provide for safe, efficient, cost effective administration and maintenance of refuge facilities and programs.

- 16.1 Provide for a permanent and seasonal staffing pattern necessary to meet existing and future program management needs as identified in approved management plans.

We met with Refuge Supervisor Tracey McDonnell and Regional Refuge Chief Mitch Ellis to discuss our staffing structure and management capability. [WHEELER/SUNDSETH]

At the start of fiscal year 2012, Hans Klausner started work as our Supervisory Park Ranger for Visitor Services (vice Glaspell). In May, we converted SCEP Maintenance Worker Mike McAllister to full time (vice King). We also started the recruiting process for our lead Maintenance Worker position (vice Leatherman). In July, we were joined by our new LE Officer/Pilot Kurt Rees (vice Bedingfield). [SUNDSETH]



Senator Begich conducted a meeting at the Visitor Center during Comfish this spring. Pictured are Alaska Geographic Store Manager Jone Suleski, EE Specialist Shelley Lawson, VC Manager Ava Kahn, RM Gary Wheeler, and Senator Begich. USFWS

- 16.2 Oversee AWP and budget process including budget tracking, automated data processing, document preparation and control, time and attendance, travel administration, personnel records, and purchasing.

Managed budget entry/tracking/reconciling process. Provided manager with updates upon completion of monthly reconciliation. For budgeting the region moved to the FBMS system this year, and there were a number of uncertainties. Despite these, the Refuge ended the year in the black and close to our budget target. [CASTONGUAY]

Document preparation, time and attendance, personnel records, and purchasing were accomplished in accordance with regulations and guidance. [CASTONGUAY, CHILDERS]

Captured and entered travel, completed travel requests, authorizations, and travel vouchers and accomplished travel management through GOV.Trip. [CHILDERS, CASTONGUAY]

- 16.2 Work with ITRM to provide a seamless, robust, secure ITRM system useful to Kodiak users and compliant with national and regional mandates.

ITRM supported the refuge this year, and Gerri Castonguay served as liaison between IRTM and Refuge personnel. New desktop computers were ordered for the Visitor Center personnel. [CASTONGUAY]

- 16.3 Provide a pro-active safety program in accordance with the Station Safety Plan and other Service and OSHA policies and regulations.

A safety inspection was completed together with regional safety office personnel to ensure compliance with OSHA regulations. Issues identified have been, or are being addressed. [OLES/MCALLISTER/SUNDSETH]

Continued holding regular Safety Committee meetings. Finalized an evacuation plan for the Kodiak NWR Visitor Center. [COBB/OLES/HUPP/MCALLISTER/SUNDSETH]

An annual safety assurance statement was completed on schedule. [SUNDSETH/MCALLISTER]

- 16.4 Develop and implement an aviation program to support Refuge biological, visitor services, law enforcement, and maintenance programs.

During 2012, aviation was understaffed for much of the field season due to one pilot moving to a different area and that position not being filled until mid-summer. The pilot on staff flew in excess of 300 hours in both aircraft, to support all biological, visitor, and maintenance programs for the Refuge. [VAN HATTEN]

The Aviation Management Plan that was developed in and signed off in 2010 was reviewed and updated with new policies that were adopted at the national level. In addition, aviation safety plans were signed off by management for the different biological studies conducted on the refuge. [VAN HATTEN]

WO Rees quickly gained his DOI “Blue Card” and began conducting law enforcement patrols and supporting the other refuge programs. He flew about 52 hours this year, mostly in training. [REES]

- 16.6 Utilize the FWS fire program to enhance habitat, where possible, and to minimize damage to infrastructure on the Refuge and on adjacent lands.

There were no fires on the Kodiak Refuge this year.

- 16.7 Conduct refuge LE program in cooperation with community, state and federal authorities with emphasis on prevention and education.

WO Rees continued to build upon previous relationships with Alaska Wildlife Troopers, Alaska State Parks, NOAA Law Enforcement, and private partners (see also section 10.3). [REES]



We acquired a Beaver from Yukon Delta Refuge this year with a larger cargo door.
Gary Wheeler/USFWS

- 16.8 Maintain and replace equipment and facilities and effectively use and update real and personal property records, SAMMS, and MMS databases.

A comprehensive survey of public use cabins was conducted in late June. Each cabin was visited and surveyed for maintenance needs. [MCALLISTER/OLES/KLAUSNER/TITUS/SUNDSETH/VAN HATTEN]

Through a contract, major kitchen renovations were made to the Bunkhouse and Buskin housing units #2, #4 and #5.

- 16.9 Complete annual RAPP report with accuracy, consistency, and timeliness.

RAPP was completed on schedule in August 2012. [SUNDSETH]



Snow at the headquarters building in February is pretty, but it makes a lot of work for the maintenance crew. Many deer on the Island suffered winterkill, and due to poor hunting some members of the public suggested lowering the bag limit on deer. Gary Wheeler/USFWS

- 16.10 Manage the Refuge special use permit (SUP) program to ensure that refuge uses are appropriate, compatible, and have minimal impact upon refuge resources.

Completed the review of Big Game Guide Prospectus applications and provided recommendations to the Refuge Manager. Refuge Manager took recommendations from the review panels, interviewed the best qualified applicants and selected a big game guide for each area. [WHEELER/SUNDSETH/KLAUSNER/OLES]

Continue to maintain a SUP program that ensures compliance with Regional and Refuge special conditions. [MONZON/KLAUSNER]

Considerable effort was expended in working on a compatibility determination for a proposal by the Kodiak Regional Aquaculture Association for fertilization of Karluk Lake to increase the size and abundance of sockeye salmon smolt. The thought was that a CD should be done before a NEPA document to provide a cost savings if the use was found not compatible. In December of 2012, before the CD was completed, the Regional Director decided that he would make the decision on the project. He determined that the NEPA document would be written before the CD.

[WHEELER/SUNDSETH]

Permits issued included:

- 24 Big Game Guiding
- 6 Air Transporter
- 8 Commercial Filming and Photography
- 15 Sport Fish Guiding (General)
- 14 Sport Fish Guiding (Prospectus)
- 7 Small Game & Waterfowl
- 22 Wildlife Viewing and Photography
- 14 Other (Research and Other Activities)

110 Total Active Permits, not including setnet sites. There are 24 long-term setnet site permits and there was 1 annual permit issued for a beach seiner.



Robin Leatherman receives his award for 30 years of service with the government. Robin is flanked by Deputy RM Kent Sundseth and RM Gary Wheeler. USFWS

16.10 Maintain file system in accordance with Service standards.

Continue to follow Service standards for file retention and disposal. [L. MONZON]

- 16.11 Manage the Refuge's digital and slide images to facilitate their effective use in Refuge programs and by the Public.

Digital images are saved to a shared network allowing all Kodiak staff access to images for creation of a variety of reports, fliers, videos, slide shows and presentations. We added a server this year to only handle digital images.

- 16.12 Utilize the Refuge vessel *Ursa Major II* and other watercraft in support of Refuge programs and activities.

Outfitted as a boat-based visitor center, the *M/V Ursa Major II* paid a visit to Old Harbor and Akhiok. Refuge staff provided information regarding Refuge resources to local residents. [LEE/LEWIS/CORCORAN/KLAUSNER]

The *Ursa Major II* completed seabird and waterfowl work. The northern third of the archipelago including Afognak and Shuyak Islands were surveyed for marine birds. [LEWIS, CORCORAN].

A fuel haul was conducted in mid-June in conjunction with the Coast Guard airlifting our repaired skiff from Larsen Bay to Karluk Lake. [LEWIS/WHEELER/VAN HATTEN]

Commercial fishing set net sites were surveyed for compliance in Uyak and Uganik Bays in July. [LEWIS/WHEELER/SUNDSETH/REES]

- 16.13 Continue to acquire private lands inside the refuge boundary in accordance with the Land Conservation Plan as opportunities arise from willing sellers.

No lands were acquired to add to Kodiak NWR this year.

- 16.14 Assist the Regional Office realty division when land actions or program action activities occur.

Negotiations with the Old Harbor Native Corporation over a conservation easement on Sitkalidak Island seemed to cease this year with no agreement. Negotiations with Koniag Inc. over changes to the conservation easement along the Karluk River and lake and the Sturgeon River for the second 10-year period were very active this year. The Refuge played a major role in negotiations. [WHEELER/SUNDSETH]



Lecita Monzon receives her award for 20 years of service with the government. Lecita is flanked by Visitor Services Manager Hans Klausner and RM Gary Wheeler. USFWS

PERSONNEL

- | | |
|---------------------------|---|
| 1. Gary Wheeler | Wildlife Refuge Manager |
| 2. Kent Sundseth | Deputy Refuge Manager |
| 3. William Pyle | Supervisory Wildlife Biologist |
| 4. Robin Corcoran | Wildlife Biologist – Birds |
| 5. William Leacock | Wildlife Biologist – Bears |
| 6. McCrea Cobb | Wildlife Biologist – Ungulates/subsistence |
| 7. Tonya Lee | Refuge Information Technician |
| 8. Jeffrey Lewis | Small Craft Operator |

9. Hans Klausner	Supervisory Park Ranger	EOD 10/6/11
10. Ava Kahn	Visitor Center Manager	
11. Michelle Lawson	Environmental Education Specialist	
12. Lisa Hupp	Volunteer Coordinator	
13. Lecita Monzon	Administrative Technician (Permits)	
14. Jason Oles	Park Ranger	
15. Jose Monzon	Custodial Worker	
16. Isaac Bedingfield	Refuge Officer/Pilot	LDD 2/11/12
17. Kurt Rees	Refuge Officer/Pilot	EOD 7/1/12
18. Kevin Van Hatten	Fisheries Biologist/Pilot	
19. Gerri Castonguay	Administrative Support Assistant	
20. Cinda Childers	Refuge Clerk	
21. Robin Leatherman	Maintenance Worker	LDD 4/20/12
22. Michael McAllister	Maintenance Worker	EOD 5/20/12

SUMMER BIOTECHNICIANS AND PARK RANGERS

1. Heather Mackey	Biotechnician
2. Heidi Helling	Biotechnician
3. Kari Eschenbacher	Salmon Camp Director
4. Caryn Hacker	Park Ranger
6. Heather Holzman	Park Ranger
7. Liz Allard	YCC Crew Leader