



Resource Management 2014



Dead trees, caused by a spruce beetle outbreak, provides a backdrop for a sow and cubs at Brooks Camp. Standing dead trees provide food and shelter for woodpeckers and other cavity nesters. As trees begin to fall down, bear trails may be re-routed and bear beds relocated to shadier areas. To learn more about research regarding the spruce beetle outbreak, see page 4. NPS Photo by Amy Miller.

Each summer, National Park staff working in Katmai National Park and Preserve, Aniakchak National Monument and Preserve and the Alagnak Wild River, spend time in the field to study, inventory and monitor cultural and natural resources. Summer is the time to do it: rivers are flowing, wildlife is active and study sites are accessible. With more than 4.73 million acres between the three park units, this is a busy time of year.

Resource Management falls under three main groups: cultural resources, natural resources, and inventory & monitoring. The cultural resource program focuses on the human history of this region, including archeology and anthropology. The natural resource program studies biological and physical resources such as wildlife, fish, plants, wilderness, and backcountry resources. The third group, inventory and monitoring, is part of a National Park Service effort to understand the status and trends of the parks' significant natural resources.

The Southwest Alaska Network (SWAN) Inventory and Monitoring Program cooperates with the parks to conduct various surveys to understand how resources may change over time.

In addition to work conducted by NPS staff, external researchers come to conduct studies. In 2013, 42 research permits were issued for work conducted in Alagnak, Aniakchak, and Katmai. Some of the projects being studied include investigations of the ongoing volcanism in the area, geological formations, climate change, fish ecology, plant health, and contaminant accumulation. The diversity of work helps to answer local management questions as well as those of greater interest to science. The parks are a vibrant living laboratory.

We hope that you enjoy reading about the many projects occurring in these remarkable parklands. See you in the field!

50 years of the Wilderness Act



This year marks the 50th anniversary of the Wilderness Act. Hillsides of Kamchatka rhododendron await exploration by those recreating in Katmai's wilderness. Photo courtesy of Katie Myers.

Most of Alaska seems to be wilderness and some of it is congressionally designated wilderness. In 1964, the Wilderness Act passed to allow designation of federal lands that best exemplified lands in their purest, unaltered by human, form. Fifty-years later, the eloquent definition of wilderness is still worth consideration.

A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Katmai's wilderness, designated in 1980, covers about 3.4 million acres, or about 80% of the entire unit. Additional lands in both Katmai and Aniakchak are considered eligible wilderness in that they meet all

the criteria of wilderness and have been recommended for addition, but they are still pending decision.

As land managers of wilderness, we strive to ensure that actions in these areas are first and foremost necessary in wilderness. Additionally, any action taken in wilderness must be accomplished in a way that minimizes impacts to wilderness character. The Wilderness Act lists prohibited actions in wilderness that can only occur as the minimum tool for the administration of the wilderness. These uses include commercial enterprise; roads; use of motor vehicles, motorboats, motorized equipment, or mechanical transport; landing of aircraft; or structures or installations. In Alaska, the Wilderness Act then gets relaxed in some respects by the Alaska National Interest Lands Conservation Act (ANILCA), which allows the use of traditional transport like fixed-wing aircraft and motorboats. As an example, although commercial enterprise is generally prohibited, an outfitter that is providing primitive recreation opportunities, such as a float trip with angling, could be authorized to provide this service. Alternatively, a seismic station, which is an installation, could be permitted to ensure the health and safety of people in a volcanically active area and to provide a benefit to our understanding of the natural character of the wilderness. Through this wilderness review and documentation, the National Park Service helps ensure that the lands of today will be just as wild for future generations seeking a wilderness experience.

Snow, Lake Ice and Glaciers

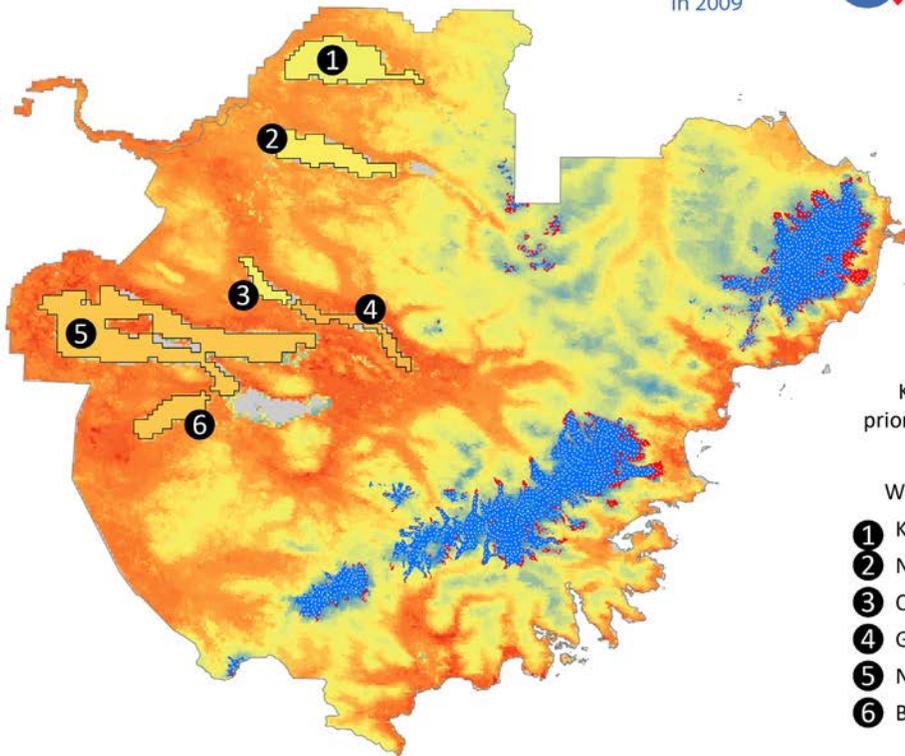
Snow cover is an important part of the global climate system, in part because snow accounts for the large difference between summer and winter land surface albedo, reflecting more than 80% of incoming solar radiation, where a snow-free surface might reflect less than 20%. Snow cover also represents an important heat sink within the Earth's climate system because it consumes large amounts of energy with very little change in temperature as snow melts into water. Lake ice cover affects important interactions between the atmosphere and underlying aquatic systems. Lake ice cover also supports human subsistence and recreation and wildlife movements. Glaciers are sensitive to temperature change over a range of timescales, so they are natural integrators of climate variability and provide some of the most visible evidence of climate change. Although glacier response varies by location and elevation, glaciers in Alaska have, for the most part, experienced widespread thinning and retreat since the end of the Little Ice Age (about 1900 AD). Changes to glaciers have both global and local consequences with impacts ranging from their contribution to global sea level rise to the transformation of scenic and recreational values for park visitors.

Remotely sensed data can be used to track both seasonal and long term changes in snow and lake ice cover and glacier extent. The Southwest Alaska Network (SWAN) is using Moderate Resolution Imaging Spectroradiometer (MODIS) satellite products to monitor snow and lake ice cover. Our method for monitoring snow cover involves acquiring daily satellite products and filtering out cloud cover. Derived metrics include date of snow onset and melt, length of the longest continuous snow cover, and the number of times there was continuous snow cover (in the Katmai region snow cover is often intermittent at lower elevations). Daily satellite imagery is interpreted manually to quantify lake ice cover. Lake ice cover metrics include dates for start of freeze-up (>10% ice), end of freeze-up (>90% ice), start of breakup (<90%), and end of breakup (<10% ice). NPS collaborators at the University of Alaska Fairbanks and Alaska Pacific University have recently completed a study that used aerial photographs and satellite imagery to document changes in glacier-covered area over the last 50-60 years in national parks in Alaska, including Katmai. New results from these projects are now available and some results are highlighted below.



Timing of Snowmelt

Median snowmelt date
Winter 2000/01 to 2012/13



Glacier Changes

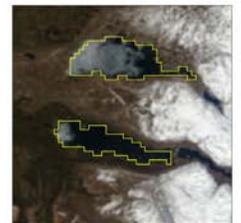
Change in glacier-covered area 1956-2009

Glaciers covered
908 km² (224,372 acres)
in 2009



147 km² (36,325 acres) of ice
has melted since 1956 -
a 14% loss

Timing of Lake Ice Breakup



Kukaklek and Nonvianuk lakes
prior to breakup on May 27, 2010

Median breakup date
Winter 2001/02 to 2010/11

- 1 Kukaklek: May 27 +/- 5 days
- 2 Nonvianuk: May 24 +/- 6 days
- 3 Coville: May 15 +/- 6 days
- 4 Grosvenor: May 5 +/- 6 days
- 5 Naknek: May 12 +/- 7 days
- 6 Brooks: May 9 +/- 6 days

Tree Rings Provide View into Pre-outbreak Conditions in Katmai's Forests

Over the last two decades, the spruce beetle (*Dendroctonus rufipennis*) has killed more than 1.5 million hectares (3.7 million acres) of forest in south-central Alaska in one of the largest outbreaks of the last century. In healthy and productive forests, the occasional dead or dying tree can provide important nesting, roosting, and foraging resources for many wildlife species, while the surrounding live trees support and shelter many others. But insect outbreaks that cause widespread mortality in a relatively short time significantly impact the forest environment. Spruce beetles have been present in our forests for hundreds of years, and tree-ring data show that similar, smaller scale outbreaks have occurred several times over the last 250 years. However, the recent outbreak appears to have been more severe than those historically, leaving us to ask three questions, 'What precipitated the current outbreak, why has it been so damaging, and what does this tell us about how forests will develop over the next 100 years?' To answer these questions, the Southwest Alaska Network (SWAN) has been working with collaborators from Humboldt State University, University of Arizona, and Nipissing University to study the conditions that leave trees susceptible to beetle attack. Tree cores from trees that died during the current outbreak reveal several patterns: 1) regional outbreaks often follow a series of warmer and drier than average years; 2) trees that are killed by the spruce beetle often show slower growth in the ten years prior to death than trees that survive; and 3) trees that are killed often appear more sensitive to local temperature and/or precipitation than trees that survive. For example, cores collected from a stand along the Valley of 10,000 Smokes Road suggest that warm spring temperatures may be enough to cause temporary drought stress, weakening trees at a time when beetles are emerging and taking flight. Continued warming could result in more years in which trees experience early-season water stress, and continued susceptibility to beetle attack. Ongoing work is focused on the effects of climate on tree establishment and growth, as well as the effects of canopy dieback on understory species, both of which may help us to predict how forests will look in the future.



A SWAN technician records cover for coarse woody debris in a beetle-kill stand in Katmai. A windstorm in 2012 brought down a number of dead trees around Lake Brooks, Naknek Lake and Coville Lake. A hazard tree assessment by the U.S. Forest Service was completed at Brooks Camp in the summer of 2013. NPS photo by Amy Miller.

Lichen Inventory

Lichens are an important component of biological diversity and are sensitive indicators of air quality and climate. Despite their ecological importance in southwest Alaska, there is a general lack of information regarding lichen occurrence in the Southwest Alaska Network (SWAN) parks. To address this information need, the SWAN partnered with Oregon State University to conduct a lichen inventory in Katmai National Park and Preserve. In July 2013, researchers from Oregon State University, Universität Graz (Austria), University of Bergen (Norway) and the National Park Service sampled hardwood forests and cliffs at Katmai Bay, forests and shorelines around Brooks Camp and Malone Lake, shrub and low alpine areas around Hammersly Lake and Mirror Lake, and a high alpine ridgeline above Contact Creek. To date, they have made several notable discoveries, including a species new to science that will be called *Rinodina pallidescens*. It is an



Erioderma pedicellatum, a globally endangered lichen in Katmai.

inconspicuous crustose lichen that was found on mature alder both on the coast and in the interior of the Park. Additionally, they found a globally-endangered lichen, *Erioderma pedicellatum*, approximately 24 km southwest of the only previously known location in the Park. Both sites where *Erioderma* occurs are in mature spruce forest that has been heavily



Rinodina pallidescens, a lichen species new to science, was found in Katmai National Park and Preserve in 2013.

impacted by the spruce beetle. Whether this rare lichen will persist in these stands without old, live trees is uncertain. In 2014, the team will sample a range of habitats in Lake Clark National Park, including coastal forest and alpine boulder fields.

Exotic Plant Management Team



Repeated manual treatments and reseeding efforts at the Brooks Camp cultural site have shifted the plant composition from primarily dandelion to mostly native species. NPS photos.

Invasive plants put the complex balance of plant and animal communities in Alaskan national parks at risk. Invasive plants are not native to an area, display rapid growth, and spread with little or no human assistance. They are a concern because they threaten the genetic integrity of native flora through hybridization, can out-compete native plant species for limited resources, and can change the structure and function of ecosystems. Establishment of invasive plants can also result in loss of habitat and food sources for native insects, birds, fish, and mammals.

Since 2005, Katmai has worked to inventory and control non-native plant species. A total of 14 invasive plant species have been documented on park lands with an additional 19 species growing on nearby lands. Many of these species are still restricted to disturbed areas, such as the trails at Brooks Camp, so the Exotic Plant Management Team (EPMT) works to control these infestations and prevent them from moving into more remote areas of the park. Katmai remains one of the most pristine parks with regards to invasive plant species, and it hopes to retain that distinction. The EPMT conducts outreach events to raise public awareness. Prevention is another critical component to the program's success. Boot brushes have been installed at key locations to reduce the risk of seeds being transported to new areas on footwear. Heavy equipment leaving for Brooks Camp undergoes cleaning and inspection. Finally, the team vigilantly searches during the growing season for new species.

Report suspicious terrestrial or aquatic species

If you observe species that seem out of place, please document your location (GPS location if possible); a description of the plant or animal; and take a range of pictures close-up to further away. Please do not remove the questionable species. Please then contact the park at (907) 246-3305. Additional identification materials are available from the park to help visitors identify species of concern.

Hallo Bay Marine Debris Cleanup

Last summer, Katmai joined forces with the GYRE project to remove over 4300 pounds of marine debris from Hallo Bay! From June 5-10, NPS staff collected and bagged trash along five kilometers of beach. On June 11, the GYRE team arrived onboard the M/V Norseman and the debris was removed from Hallo Bay.

All the debris collected at Hallo Bay was separated into general categories and weighed. By weight, floats and buoys accounted for 28% of the total debris with over 1200 lbs collected. Rope and line accounted for 23% of the debris, weighing in at over 1000 lbs. Over 600 lbs of cargo and drift nets were collected, both of which can be significant entanglement hazards to wildlife. Plastics were found all along the beaches; we removed 100 lbs of beverage bottles, 300 lbs of foamed plastic and over 800 lbs of other plastic items including flyswatters and personal care product containers.

Marine debris is an ongoing problem along the Katmai Coast, but removal is difficult without boat-based support to transport debris to landfills. The opportunity to work with GYRE helped Katmai improve wildlife habitat and enhance wilderness character. We look forward to future collaborative opportunities to clean up the coast!



GYRE, NPS and M/V Norseman crew make a chain to get marine debris out of Hallo Bay. Photo courtesy of Kip Evans, ©Kip F. Evans - GYRE.

GYRE art exhibition

Check out marine debris art inspired by the 2013 GYRE expedition at the Anchorage Museum from February 7 to September 6, 2014. More information on this collaborative effort between the museum and the Alaska SeaLife Center can be found at: <http://www.anchoragemuseum.org/galleries/gyre/>

Changes to Mussel Densities Observed Across the Gulf of Alaska



Kafia Bay mussel bed site in 2008 (left) dominated by mussels and in 2012 (right) dominated by barnacle spat. NPS Photo.

The Southwest Alaska Network (SWAN) nearshore marine study area spans from Katmai National Park and Preserve along the Alaska Peninsula east across the Kenai Peninsula to Prince William Sound. Our monitoring studies encompass the nearshore food web, from primary producers such as kelps and eelgrass to the primary consumers such as marine birds and mammals. In our study regions, mussels (*Mytilus trossulus*) are ubiquitous. They serve as an important link in the intertidal trophic web by filtering detrital and planktonic material from the water and providing a food resource for other invertebrates (sea stars, predatory snails) as well as for a variety of birds and mammals that reside in the nearshore environment. Additionally, by forming large mats (see photo on right), mussels provide habitat for other intertidal occupants that reside within or subsurface to mussel beds. Because mussels are so common in the intertidal and are a major food source, mussels can serve as a sentinel species to assess health and environmental change in the nearshore.

Since the monitoring program was initiated in 2006, with a specific focus on mussel beds beginning in 2008, we have observed substantial changes in mussel dynamics across our study areas in the Gulf of Alaska. We have observed reductions in numbers of mussels at mussel sampling sites in Katmai and western Prince William Sound; however, results vary more for Kenai Fjords National Park sites. There has been an apparent decrease in percent cover of mussels at the majority of the rocky intertidal sites over the course of our sampling. We have also observed a decrease in the proportion of mussels in sea otter diets in Kenai Fjords and western Prince William Sound during our study period, while it has remained low at Katmai during our study. Mussel trends suggest decreases in all areas studied, possibly affecting population density and consumption by sea otters and black oystercatchers, a nearshore bird species that relies heavily on mussels

as a food resource. A challenge is how to analyze multiple metrics to understand linkages among species in the ecosystem. Because we have observed high variation in mussels, we want to understand how that variability may affect other predators that rely on them as a food resource. Specifically, we have initiated studies that try to understand the role mussels play in black oystercatcher productivity and fledging success as well as understand the importance of mussels in sea otter diets.



Rocky intertidal shorelines provide habitat for mussels and a variety of other marine invertebrates. NPS photo.

Archeological Survey and Evaluation of Amalik Bay National Historic Landmark



Archeologists map an early settlement in outer Amalik Bay. Photo by Jillian Richie.

2014 will be the final season of a cooperative project with the University of Alaska Museum of the North to evaluate archeological sites in Amalik Bay National Historic Landmark. Previous archeological investigations confirm that Amalik Bay is the location of some of the earliest settlements on the North Pacific coast. Ancient camps and settlements occupy locations among the islands and coves of Amalik Bay that are accessible to important hunting/fishing areas, but many sites remain undiscovered and the sea is eroding others. The earlier sites in the outer bay are especially vulnerable to erosion from high tides and storm surges possibly due to sea level rise, lending urgency to evaluating potential loss of information about the early occupants of the Katmai Coast. Archeological research will address what natural and cultural factors allowed people to survive in Amalik Bay, and later caused them to shift their settlements to protected places in the inner bay. Materials recovered in excavations will be used to determine the age, technology and subsistence base of known sites. Newly discovered sites will be investigated and mapped.

Reindeer Herding Studies

Katmai continues to cooperate with the University Of Alaska Department of Anthropology on the DEER Study (Documenting the Ethnohistory and Ethnoarchaeology of Reindeer on the Alaska Peninsula), a five-year collaborative research project that explores the history and legacies of reindeer herding in the region. DEER Project staff work with elders in Igiugig, King Salmon, South Naknek, Port Heiden and Pilot Point to explore the history of reindeer herding on the Alaska Peninsula from 1904 –1950, and the migration of Inupiat to the central Alaska Peninsula in the early 1900s. This research addresses the cultural shift from hunting caribou to herding reindeer in Katmai and Aniakchak, a shift which occurred among traditional people from Norway through Siberia and all the way to the Alaska peninsula. Project staff continues to collect oral histories and to visit and record reindeer herding camps. Igiugig elders and students produced Yupik place name maps showing Yupik names for natural features in the Kukaklek Lake area and along the Alagnak Wild River. Project DEER staff will edit the



Port Heiden Residents and DEER Project staff view an old house feature at a reindeer camp near Port Heiden. Photo by Amber Lincoln.

2014 Journal of Alaskan Anthropology which will be dedicated to articles about reindeer herding from as far as the Seward Peninsula and Norway. Future project plans include

developing a museum exhibit and continuing to develop and update the DEER Study website, <http://www.uaf.edu/deer/>.

Bears and the Brooks Camp Experience



Bear 489 (locally known as Ted) spends most of the summer in and around the Brooks River. This adult male bear is easily distinguishable by a scar on his lower left side, the remaining evidence of an altercation with Bear 218 at the Brooks Falls in 2007. NPS photo.

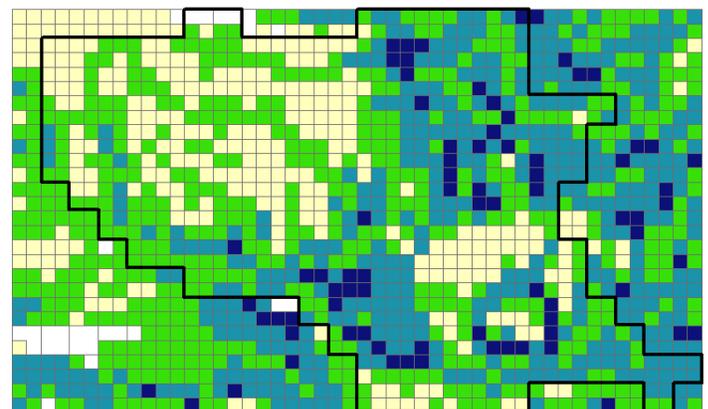
Long-term observational monitoring of bear and human use of Brooks River began in 2000 and will continue in 2014. Sampling includes recording bear use of river zones to the individual bear level. The detailed individual bear identification records that have been maintained have allowed researchers to recognize many of the bears that frequent Brooks River across study seasons and years. In 2013 there were 46 different bears identified regularly using the river during July, and 56 bears identified regularly using the river during the fall (each seasonal count includes some bears that were recognized in both seasons). 2013 was an interesting year at Brooks River. The Disney Corporation spent the summer at Katmai documenting the bears and some of their behaviors and day-to-day activities. They will be using this footage in the movie “Bears” scheduled for release in April, 2014. Visitors were delighted to see five sows with cubs, both spring cubs and yearlings. The bears at Brooks River can now be watched 24 hours a day anywhere in the world by visiting <http://go.nps.gov/bearcam>.

Brown Bear Den Surveys

News about conservation often quotes a basic statistic: the number of animals located in a given area. It sounds simple, but counting wild animals is actually quite difficult. Accounting for the number of animals that hide during the count is a problem that fills volumes of text books and journal articles. The usual solution to the problem is to have a known number of “marked” animals in the population of interest. It is then a relatively simple problem to estimate the number of unmarked animals missed during a count if you know the fraction of marked animals you saw during the same count. However, marking animals is invasive and expensive, making long term monitoring on a marked population difficult in remote Alaska. Therefore the use of unmarked animals or signs is required.

In 2012 and 2013 the Southwest Alaska Network (SWAN) and Katmai National Park and Preserve pilot-tested a method of evaluating the distribution and occupancy of brown bears wintering in Katmai using surveys of dens. We conducted the survey on an area North of Naknek Lake, and south of Katmai Preserve that was known to contain denning bears. Fifty 4.7 mi² sites were surveyed three times during the period of den emergence in May. We used occupancy analysis to estimate how many dens we missed during flights, determine the probability that sites were occupied by dens, and make maps of bear den distribution within the pilot study area.

We found that a bear den survey could be conducted in Katmai during a season by a single pilot-observer team, thereby significantly reducing the cost of bear monitoring surveys. In addition to working out the details and logistics of the survey flights, we found that we were better at detecting dens during later flights than during early flights. This result suggests that a combination of snow hiding the dens, and bear



Legend

Studyarea



Probability of Occupancy

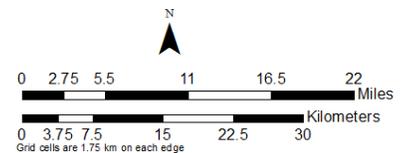
< 0.25

0.25 - 0.50

0.5 - 0.75

> 0.75

No Data



emergence affected our ability to see the dens. We also found that bears chose den sites on steep slopes. Using the model, we were able to predict the probability that bear dens exist at unsampled locations, and make a map of bear den habitat in central Katmai (above). The average probability of all sites occupied by bear dens 0.80 (SE 0.07) can be interpreted as the proportion of sites occupied by bear dens, which can be used as a surrogate metric of overall winter bear abundance. This low cost and high information content of this new den occupancy model makes it an attractive addition to the bear monitoring toolbox.

Time-lapse Photography Expanded to the Katmai Preserve



This photo (top) was taken on June 22, 2010 at Katmai Bay. Technicians zoom in on the photo to detect and mark bears (bottom). Five bears (circled in red) were recorded grazing in the sedge meadow in this photo. Katmai Bay is unique to this project as it does not attract regular groups of visitors for bear viewing.

Since 2007, Katmai National Park and Preserve has been working on a time-lapse photography project to gather baseline data on bear use patterns at backcountry feeding areas. The process is used to document trends in bear use over seasons, between years and in relation to other variables, including tide cycle, time-of-day, and the degree of human visitation.

Cameras were first installed at Geographic Harbor from 2007 to 2009 overlooking the mouth of Geographic Creek, a seasonal salmon stream known to attract bears. Geographic Creek attracts visitors for bear viewing and photography. In 2010 and 2011, cameras were installed at Katmai Bay, an area that does not currently attract high numbers of visitors. The Katmai Bay cameras were oriented toward sedge meadows. Unique differences have been observed between sites.

In general, bear use was higher at Geographic Harbor than Katmai Bay, as captured within the photo frame. At Geographic Harbor, the average number of bears recorded per photo were 3.1 in 2007, 1.4 in 2008, and 3.3 in 2009. At Katmai Bay, the average was 2.0 in 2010, and 1.3 in 2011. Differences between years were observed at both locations, but were more pronounced at Geographic Harbor. Smaller pink salmon runs have been consistently recorded on the Katmai Coast in even years, which would explain the lower number of recorded bears at Geographic Harbor in 2008, where bear activity is closely tied to the



Bears and people were recorded in this photo taken from Swikshak Lagoon on June 11, 2012 (top). Careful review of the photo (bottom) shows a group of approximately six visitors (circled in yellow) and three bears (circled in red). The study is designed so that visitor groups can be documented; however, individual people cannot be identified.

salmon run. Higher bear use at Katmai Bay in 2010 might be also be a factor of lower salmon run numbers — reliance on sedge meadows is likely higher during the even year decrease in salmon.

A distinct decrease in bear use was observed mid-day at Geographic Harbor. The decrease in bear use was noted to coincide with a peak in visitor use at the site. At Katmai Bay, a location without visitation, bears were observed in relatively similar numbers throughout the day. By understanding the degree of impact that visitor use may have on bears, the park can identify appropriate mitigation measures.

Since 2011, cameras have been installed at Swikshak Lagoon (2012 and 2013), a location with early season visitation, and reinstalled at Katmai Bay (2013). These most current photos have not yet been analyzed. Cameras will be set up at both of these locations again in 2014.

This summer, cameras will be installed for the first time in Katmai National Preserve at Moraine Creek and Funnel Creek. This area attracts high concentrations of bears during the salmon spawning season. Moraine and Funnel Creeks are also popular sport fishing locations. Bear viewing has become increasingly popular in the area in recent years. Expansion of this project into the Preserve will provide a unique perspective on bear use in an area with multiple user groups.

Internships

Each summer, Katmai provides internship opportunities to students and young adults interested in biological research and resource conservation. Interns assist with a variety of natural resource projects. Since the late 1990s, one to two students from Northwestern University have joined Katmai National Park natural resource staff each summer, as part of a field school internship program. In 2013, Erik Beck spent 12 weeks at Katmai as part of this program, and is happy to share his experience:

I had the opportunity to spend this past summer as an intern at Katmai National Park and Preserve. I had the good fortune to spend most of my summer working at Brooks Camp, Katmai's primary tourist destination and home to the best brown bear viewing in the world. For the month of July, my primary job was to survey the soundscape of Brooks Camp as part of the National Park Service's initiative to preserve natural sounds and to document human noise disturbances within park units. For these surveys, I conducted hour long logging sessions at various sites around Brooks Camp, cataloguing noise events on a palm pilot. I used this data to create audibility reports for Brooks Camp that gave the percent audibility (the proportion of a session that a type of sound was audible) of different types of sounds at different locations and different times of day. When I wasn't conducting soundscape logging sessions at Brooks Camp, I got to work on a variety of other projects, such as escorting uneasy visitors to the falls (getting to talk to some very interesting people on the way), conducting bridge closure surveys, stepping in as a bear tech or assisting interpretation staff, and making trail signs (with assistance from the maintenance staff).

In King Salmon, I primarily worked on the Swikshak Lagoon time-lapse photo project, but I also had many opportunities to get out of the office as well. I went on a week long backcountry patrol of the Savonoski Loop (a portage and kayak trip along Lake Grosvenor and the Savonoski River) to see some of the duties of rangers in the backcountry, as well as to get the experience of roughing it with only a kayak and whatever could be packed inside it. I also went out to Katmai's coast to change camera cards for time-lapse studies and to help conduct marine debris surveys. We had to cancel several missions due to inclement weather, but I got to fly around the park several times in small aircraft, which was an unforgettable experience.

In addition to work, I also had the opportunity to explore the park at great lengths, and to meet and spend time with many amazing people. I spent my weekends and down time fishing, watching the many brown bears at the river and the falls (as well as in camp from time to time), hiking up nearby mountains (not to mention backpacking out into Katmai's famous Valley of Ten Thousand Smokes), playing music (I had my saxophone shipped up as soon as I learned some of my co-workers had instruments), and hanging out with my co-workers (two of whom, I was surprised to learn when I arrived, were former



Northwestern University intern Erik Beck on a kayak patrol of Grovesnor Lake and the Savonoski Loop.

middle school teachers of mine). Furthermore, some unusually warm and sunny weather made for some especially pleasant days with opportunities to run and to swim in the normally frigid waters of both Naknek Lake and Lake Brooks.

This internship experience was absolutely incredible. I was able to work on some preliminary analysis of the Brooks Camp soundscape data and use the data I collected for further analysis in a biostatistics class. But more than that, during my tenure at Katmai I got to spend every day outdoors working with great people, I saw more bears up close than most people will see in their lifetimes, and I got to experience life in the Alaskan wild in a way that few people ever get to. I am extremely thankful for the opportunities I was given this summer, and I look forward to returning someday!

Working and volunteering in Katmai National Park

Every year, Katmai hires seasonal staff as Biological Science Technicians, Park Rangers and Maintenance Workers. All of our jobs are posted on the Federal Government's employment website at www.usajobs.gov during the fall and winter months.

Internship opportunities with Katmai's Exotic Plant Management Team and Visitor Services are recruited through the Student Conservation Association (www.thesca.org).

Volunteer opportunities with the Federal government are posted on www.volunteer.gov.

Volunteering at Katmai

Last summer, Nicole Kleponis joined Katmai's natural resource team as a volunteer to assist with a variety of projects. Nicole is an undergraduate student at Bucknell University in Lewisburg, Pennsylvania, studying animal behavior. Her summer at Katmai proved to be a rewarding experience:

Last summer I had the amazing opportunity to intern at Katmai National Park as a Biological Technician. I worked for wildlife biologist Sherri Anderson on a variety of projects. In King Salmon I worked on organizing the bear management data from 1989 to present which was really fun to see how the interactions with bears changed throughout the years.

In late June I moved to Brooks Camp, the center of visitation, which is accessible only by float plane or boat. I conducted bridge surveys, helped with bear management, and started the first trail escorts. The bridge surveys that I collected data for focused on bear and human interactions that will be used to make decisions about the floating bridge. I really enjoyed the surveys because I got to stand outside and watch the river for six hours a day. The bear interactions on the lower river were frequent and very exciting especially since I had never seen a bear in the wild before. I also had the opportunity to look at birds and the migrating salmon all day, as an Animal Behavior major I was thrilled to do so. This experience sparked my interest in birds and inspired me to take an Ornithology course. I am particularly interested in the migration and navigation aspect of animal behavior and it was a joy to be able to see what I had been learning about in my textbooks.

Escorting visitors on the Falls Trail allowed me to meet some really wonderful people and developed my interpersonal skills. It also helped calm nervous visitors as well as protect the bears. I had some pretty amazing jobs at Katmai but bear management was my favorite by far. Bear management works with both bears and people to keep bears



Volunteer intern Nicole Kleponis keeps the Brooks Camp staff informed about a 'trespassing' bear moving through camp. Photo by Landis Ehler.

out of Brooks Camp and give them clear paths so they can exit camp. Bears often run through camp to avoid interactions with other bears and bear management works to get bears out of camp while keeping people safe. I found myself in close proximity with enormous brown bears, clearing paths for them, and leading visitors off trail to avoid bears. I have never had so much excitement in a job; I loved the rush of shadowing a bear on the trail and communicating on the radios.

Working for Katmai National Park and living at Brooks Camp was a wonderful experience. The internship gave me the opportunity to collect and manage data, allowed me to develop essential interpersonal relationship skills, and gave me a close sense of community. This experience was beyond meaningful and I hope that I made a fraction of the impact on Katmai as it has made on me.

2014 Coastal Volunteers

If you are on the Katmai Coast this summer, say hello to our coastal volunteer rangers. Two 2-person ranger teams will be stationed at Katmai's most popular coastal sites. Rangers will be greeting visitors and conducting a wide variety of natural resource surveys.

Coastal visitors account for nearly one-fifth of Katmai's overall visitation. Bear viewing and photography are the most popular visitor activities on the coast where bears aggregate in high numbers to forage on seasonally available salmon, high protein sedges and intertidal invertebrates. Katmai is exploring new ways to reach out to our backcountry visitors, and we look forward to seeing you in the field!



Hallo Glacier provides a spectacular backdrop to Hallo Bay, Katmai's most popular coastal visitor use area. Photo courtesy of Corey Dooley-Pfeiffer.



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The National Park Service cares for the special places saved by the American people so that all may experience our heritage.

Katmai National Park & Preserve, Aniakchak National Monument & Preserve, and Alagnak Wild River

Katmai National Park was originally established as a monument in 1918 to preserve the Valley of Ten Thousand Smokes, created by the 1912 eruption of Novarupta. Since its creation, Katmai has undergone many expansions to preserve and protect the resources within this region. In 1931, the monument was expanded to protect brown bear, moose and other wildlife. In 1942, islands within five miles of the shoreline in the Shelikof Strait were added to protect marine mammals resting on the islands. The boundary was expanded in 1969 to include all of Naknek Lake. Another 1.4 million acres were added in 1978 to protect brown bear habitat and watersheds vital to red salmon spawning. In 1980, the Alaska National Interest Lands Conservation Act (ANILCA) redesignated 3.7 million acres as Katmai National Park. ANILCA also designated 308,000 acres as Katmai National Preserve.

Aniakchak National Monument was established in 1978 to preserve the Aniakchak caldera and its associated landscape, including the Aniakchak River and other lakes and streams, in their natural state. It was also created to assure continuation of the natural process of biological succession; and to protect brown bears, moose, caribou, sea lions, seals, and other marine mammals, geese, swans, and other waterfowl. It was redesignated as a Monument and Preserve in 1980 under ANILCA. The area is one of the least visited areas in the National Park System because of poor weather conditions typically hindering access.

Alagnak Wild River was established in 1980 through ANILCA to preserve the free-flowing condition of the river.