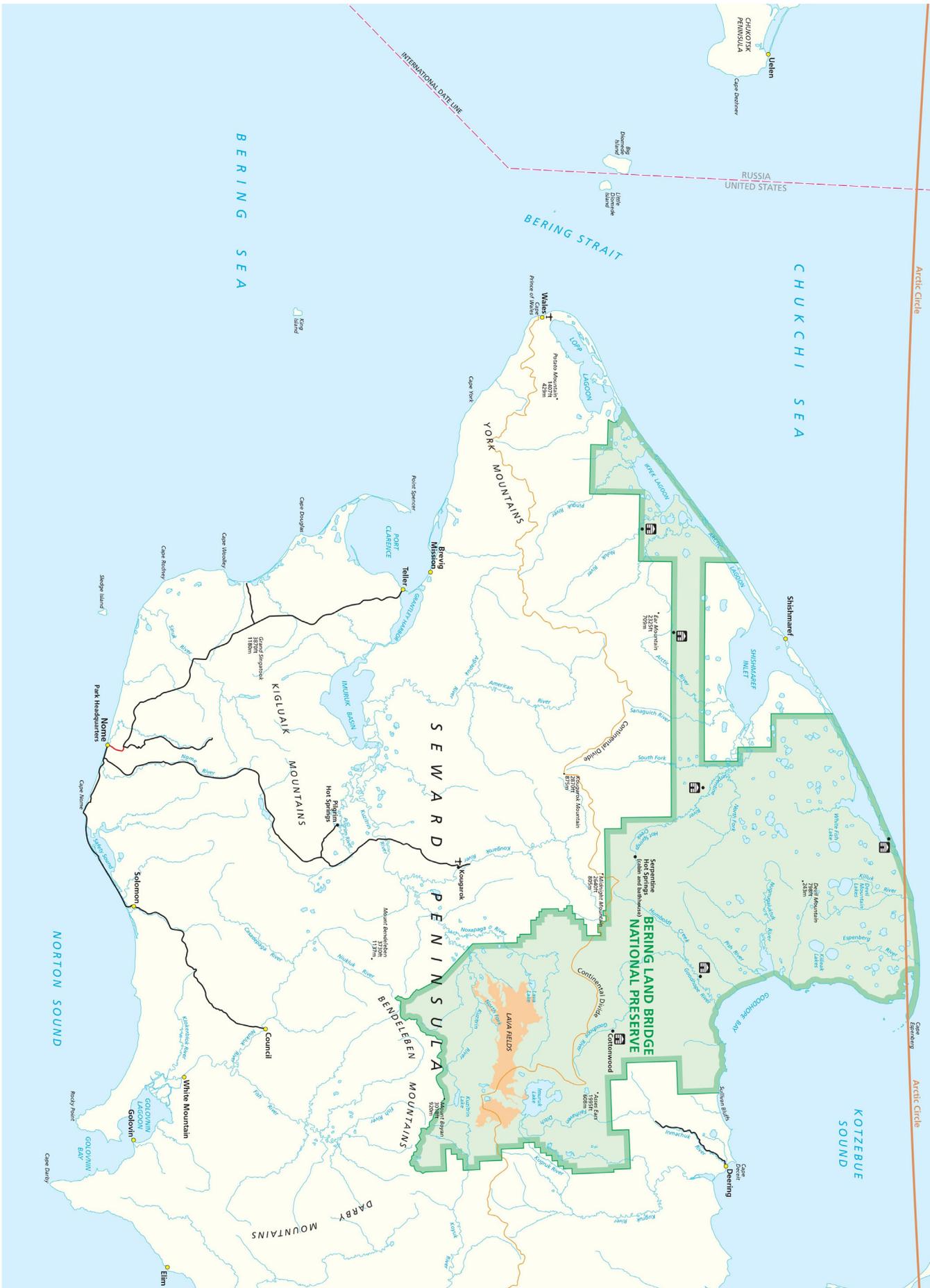




Fiscal Year 2012 Superintendent's Report





Map of Bering Land Bridge National Preserve. The park was set aside to preserve a remnant of the former land bridge. The buildings indicated on the map are shelter cabins. Not all cabins on the map are currently usable.

Superintendent's Summary

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For more information on any of these summaries please see:

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[facebook.com/BeringLandNPS](https://www.facebook.com/BeringLandNPS)

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[flickr.com/](https://www.flickr.com/)

The purpose of Bering Land Bridge National Preserve is to protect and provide the opportunity to study and interpret the landscape which contains an invaluable record of floral, faunal, and human migration between Asia and North America and which supports an ongoing traditional subsistence culture.

Superintendent's

Park Planning

Dear Friends,

FY12 was a year of new and special arrivals for me and the park. In October I had a baby boy named Michael and went on maternity leave, during this time, Ken Adkisson, Subsistence Program Manager, was Acting Superintendent. Three new employees started working for the park. In interpretation, Jennifer Thelen, Pathways student was hired to replace Nichole Andler, who became the Chief of Interpretation at Pinnacles National Park, as the park's interpretive ranger. Walker Gusse was hired as the park's new District Ranger, Walker was working at Klondike Gold Rush. The park also hired another full-time maintenance worker, Charles "Mick" Sela. Welcome to these new employees!

Projects in the preserve included:

- Serpentine Hot Springs Site Management Plan
- Started the Serpentine Hot Spring Bathhouse repair and rehab project
- Working on Big Game Guiding Environmental Assessment
- Nuluk Archaeological Survey Project near Ikpek Lagoon

Issues faced by park management included continued human wildlife interactions between musk oxen and brown bear, a 50% reduction of musk oxen in the preserve (unit 22E), reduced funding for shelter cabins and trail staking.

In April, 2011 my supervisor became Frank Hays, the new Superintendent of Western Arctic National Parklands in Kotzebue.

Serpentine Hot Spring Site Management Plan Underway

The Serpentine Hot Springs Site Management Plan project scoping with Regional office and Nome park staff has begun. A series of initial public meetings were done in Shishmaref, Wales, Deering, Nome and Kotzebue in 2011-2012. Based on community comments from these meetings, a range of alternatives were created. Public meetings were done in Nome and Shishmaref to review these alternatives as well as a call for comments online and through Facebook. Further meetings will be done to identify the preferred alternative and to discuss commercial services and potential flooding issues at the hot springs. The site management plan is expected to take another year to complete. The park will utilize in-person public meetings, Facebook and the internet to obtain comments. This project will provide needed direction for managing the Serpentine area.

Kividlo Cabin (Cowpack Shelter Cabin) Environmental Assessment and Construction at Cowpack Lagoon

This project is on hold due to lack of funding to complete both the environmental assessment and construction. This year, park staff applied for Transportation dollars to complete an Environmental Assessment of the Cowpack site, construct the replacement shelter cabin, and install tripod trail stakes from Shishmaref to the new cabin to Cape Espensberg. In 2009, BELA shipped 2 conex vans of construction materials for the rebuilding of the cabin and is leasing property next to the airport. In 2009, BELA had two meetings with the Native Village of Shishmaref, Shishmaref Native Corp, and the Shishmaref Emergency Services about the new location of the cabin at Cowpack Lagoon, building logistics and rebuilding of the cabin. An archaeological assessment was completed in

Park Planning

July of 2009. The park applied for Transportation funding in 2012 and is hoping to receive funding in 2014 or 2015.

Big Game Guiding Environmental Assessment (EA) Complete

The Preserve received funding to conduct an environmental assessment of big game guiding. The EA is complete and comments were received in November 2012. The NPS is working to answer the comments received. The NPS preferred alternative is Alternative C: Award up to three Guided Hunting Contracts for Separate Guide Areas in the Preserve (NPS Preferred Alternative). Under this alternative, the NPS would issue a prospectus to solicit offers for up to three guided hunting services with each guide operating in separate areas within the Preserve. One concessioner would be authorized to guide up to 10 clients each year in unit 22E (Guide Use Area 22-01), and the other one or two concessioner(s) would be limited to up to 10 clients each year in the remaining Guide Areas within the preserve: 22-03, 22-06, and 23-07. This alternative would provide for an average of 20 clients annually, or up to 200 clients over the ten-year contract period.



Maintenance

Serpentine Hot Springs Bathhouse is OPEN! Although not completely finished, the bathhouse is OPEN! The remodel project began late (end of September 2012) due to issues with receiving the materials. Though the project is not complete, the crew was able to complete most of the remodel, with only the qanichuck (arctic entry/changing room) needing completion. The park hired two seasonal employees from Shishmaref. The park consulted with the village of Shishmaref at their Annual Tribal Meeting. A turbine otter transported a majority of the bathhouse materials. The new Facility Manager, Nick Dougal for Western Arctic National Parklands in Kotzebue coordinated the purchase of materials and supervised workers. One maintenance employee from Nome and two from Kotzebue also worked on the project at the end of September. This project is expected to be completed by September of 2013.

New Employee

The park hired an additional maintenance employee. Previous to this, we had one full time subject to furlough employee and would use seasonal hire workers.

Painting Park Housing

New painting at the duplexes was completed in FY10 by a contractor, but the paint failed and the contractor returned the summer of FY11 and FY12 to address the paint issues. The park continues to work on upgrading to energy efficient lighting.

2012 Fuel Tank Replacement and Fuel Contamination Investigation Project at Backcountry Cabins

For many years the shelter cabins at Ear Mountain, Grayling Creek, Nuluk and Cottonwood Creek and the Serpentine Hot Springs bunkhouse had fuel tanks consisting of 55 gallon drums that were deemed unsuitable because they were not vented and were hazardous

to refill. In 2012, a contract was awarded to Ahtna Engineering to construct and install new tanks and piping at each location (except for Cottonwood Creek because of its status as a historic cabin). The custom fabricated fuel tanks were designed to be easier to refill, well vented, well-secured, light, and durable. They were installed in July 2012.

In addition to the replacement of the drums with the new tank systems, Ahtna was also tasked with investigating the fuel contamination from the releases over the years. Nuluk and Grayling Creek: Soil test results showed no significant contamination, and no further action will be taken.

- Ear Mountain and Goodhope Cabin: Diesel contamination was above acceptable levels; soil was turned over and fertilizer added to encourage bacterial degradation of the contamination.
- Cottonwood: The fuel tank appeared to have been overturned and damaged by a bear, and the surrounding soil was contaminated with diesel. Because the groundwater is likely shallow in this area and the site is near the creek, further sampling of soil to determine the effectiveness of the remedial action and sampling of water in the creek was recommended.
- Serpentine Hot Springs: Limited contamination was found around the airstrip and in the groundwater near the bunkhouse, likely from old fuel lines. Ahtna recommends excavating more test pits to determine the extent of groundwater contamination. Depending on funding in 2013, a NPS crew will remove the plywood on the floor under the former routing of the fuel lines in the bunkhouse and Ahtna will remove as much contaminated soil as possible.

project leader: Bill Heubner, NPS

Interpretation & Education

This year brought many changes for the interpretive program at Bering Land Bridge National Preserve (BELA). The permanent interpretive position was vacated in November and not filled until February. New programs were presented by increasing community partnerships and we were able to add content on park websites and social media through grant funding. This year we continued working with Nome Community Day Care to provide summer programming to pre-kindergarten children and expanded our partnership by including elementary aged children. This allowed us to reach diverse populations and increase the exposure of children in many age groups to the National Park Service.

We partnered with Nome Summerize program to promote their goal of providing nutrition education and physical fitness. BELA gave youth the opportunity to have fun exercising outdoors by attending an interpretive hike. Additionally, we worked with the Nome Youth Correctional Facility to bring high school students to our visitor center for a program.

This year we were able to again visit two villages that surround BELA and provide Junior Ranger program that addressed oceans. These villages are an underserved population because the location of their community is difficult to reach. We expanded our program in the Village of Teller by providing separate program for older youth. We were also able to employ two youth and support the volunteering effort to two youth this year through grant funding. This was the first experience for these youth in the National Park Service. One volunteer was a local high school student who was able to give coworkers and visitors firsthand knowledge of the subsistence lifestyle including things like hunting wales and gathering beach greens. Another volunteer had such a positive and successful experience that he went on to be employed with the NPS at another

park site.

These youth increased the content of the park website including creating blogs and nature and science pages with a total of 86,218 views of our website this year. They also drastically increased BELA's content and visitation to Facebook, twitter, and Flickr. We increased our number of Facebook followers from following from 43 people to 253 people. Two park videos were produced that are posted on the park website and the regional YouTube channel. One highlights the most visited destination and most culturally significant area for local residence, Serpentine Hot Springs. The second video records the observations of a local Inupiat man on the effects of a changing climate is having on maintaining a subsistence lifestyle. We also began work on an interactive online visitor guide and a printed Serpentine Hot Springs brochure.

Finally, we had a Teacher Ranger Teacher who built on the climate change in the Arctic kit developed in 2011 and introduced curriculum based lessons for middle school students. We continued our partnership with Nome Public Schools and went into a fifth grade classroom every other Friday to provide curriculum based programs and received various grade levels at the Visitor Center for curriculum based programs.

Volunteers in Parks

Our volunteers were very productive this year and completed 1,171 volunteer hours. Philip Westcott, an SCA volunteer, helped BELA move into the digital age by creating two short park videos that are posted on the park website and you tube channel. One highlights the most visited destination, and most culturally significant area for local residence, Serpentine Hot Springs. The second video records the observations of a local Inupiat man on the effects of a changing climate is having on maintaining a subsistence lifestyle. This was Phil's first experience volunteering for the NPS. He was also able to transfer the skills he gained volunteering to a paid position with another unit of the NPS.

Other volunteers were also able to increase BELA's image on the internet by adding 5 pages to the park website and creating postings multiple times a week on Facebook and twitter. As a result of the combined efforts of volunteers and paid staff, we were able to increase our Facebook following from 43 people to 253.

Another volunteer also traveled by plane to important park locations to take photographs and video for use in the development of park publications, which will be available in both digital and physical formats.

Four volunteers from the community of Shismaref, which borders the preserve, completed maintenance on emergency shelters in BELA and completed a search and rescue for a lost party during the winter.

Cultural Resources

Iyat Traditional Cultural Property Designation Project

The Serpentine Hot Springs Traditional Cultural Property (TCP) Project acquired precise boundaries and photographic documentation within the Iyat area to serve as an example for other recognized TCPs in Alaska. This last summer a small crew of cultural resources staffed camped at Serpentine and collected the information that was needed for a TCP application. After a public meeting in Shismaref, comments and information from village residents were gathered during the spring and summer of 2012. In fall 2012, a TCP application was drafted and is under review by park staff. The Project Investigator is Heather Miller, NPS Alaska Regional Office.

Nuluk and Kuzitrin Lake Cultural Resource Projects

In Bering Land Bridge National Preserve, WEAR Culture Resource (CR) staff will continue archaeological reconnaissance and limited evaluative testing at Kuzitrin Lake/Twin Calderas Archaeological District. In addition, CR staff will monitor the replacement of the the Serpentine Hot Springs bathhouse, to mitigate impacts derived from construction activities. The replacement is expected to take 4-5 weeks to complete. Fuel tank replacement and soil evaluation/treatment will also require CR monitoring during the treatment process. The Nuluk Cultural Resources Assessment Project, also based in BELA, will take place mid-July through early-August and will focus on assessing the conditions of relocated archaeological sites previously recorded in NPS lands surrounding Ikpek Lagoon.

Qamani Publication

Bering Land Bridge National Preserve is working the Eileen Devinney of the NPS Regional Office to complete a publication on Inupiat place names for Shismaref called Qamani Place Names,

Cultural Resources Natural Resources

Localities and Site Descriptions. This project was originally begun by the late Edgar Ningeulook who worked for the park until 1997 and Dr. Susan Fair who passed in 2003. Qamani means “up the coast...” but it also means “inside” (in a place one cannot see), so it is indeed true that the word also may carry connotations of “in the heart or mind.” Others who worked on this project were the late: Gideon Kahlook Kunautaq Barr, Sr., Bessie Barr Cross, Ray, Hattie and Jack Herman Ningeulook, Fannie Kigrook Barr, Alex and Elsie Weyiouanna, Kara Aghupuk, Walter Nayokpuk and Reila Okpowruk. Also, Morris Kiyutelluk, Harvey Pootoogooluk, and Levi A. Mills, Sr. have also worked on this project. The park hopes to have this publication reviewed in February 2013.

Shallow Lake Monitoring Project

Shallow Lake Monitoring Project is part of the Arctic Network (ARCN) vital signs monitoring program. Park vital signs are considered to be physical, chemical, and biological elements and processes of park ecosystems that represent the overall health or condition of the park. Signs that will be monitored include water quantity and quality, vegetation, and macroinvertebrates, which were chosen because they are essential to the maintenance of these poorly understood ecosystems. In addition, evidence has shown that lakes are disappearing throughout Alaska likely due to permafrost degradation and subsequent water loss to groundwater.

In summer 2012, ARCN sampled 99 lakes in Bering Land Bridge National Preserve. The crew collected water samples, mapped permafrost degradation, mapped the lake morphometry, and vegetation composition. This information will be used in combination with remote sensed imagery to determine the condition of shallow lake ecosystems.

In general several recently drained lakes and many lakes with extensive permafrost degradation were observed. Much of the permafrost degradation observed was in Yedoma, a type of ice-rich permafrost that developed during the Pleistocene. This sediment was deposited as the ice developed and is very rich in nutrients and carbon. So when this ice melts and the sediment is dumped into the lake, there are a lot of nutrients dumped into the lakes as well. The crew observed large algal blooms, insect hatches and large groups of waterbirds on lakes that have recently had major slumps. It was within this frozen ground that the remains of an over 12,000 year old mammoth were also discovered over the summer. project lead: Amy

Larsen, ARCN, NPS.

Natural Resources cont.

2012 Mammoth Discovery

A one-day reconnaissance was conducted in Bering Land Bridge National Preserve at the site of a mammoth bone discovery in summer 2012. The initial find was made by aquatic ecologists working in the preserve on the Shallow Lake Monitoring Project. The original discovery consisted of large mammoth leg bones and a tooth partially submerged at the edge of a lake. Most unusual about this find is that it contained multiple bones from what appeared to be a single mammoth. Some of the leg bones, for example, were found very close to their anatomical position. This is rare in Alaska and indicated that there was good research potential at this site perhaps the remains of an entire mammoth.

A radiocarbon date was also run on a small sample from the initial find and showed the mammoth to have died about 12,400 years ago at the very end of the Pleistocene. It is also one of the younger mammoths known from Alaska from a time just before the species became extinct on the mainland (some mammoths survived for several thousand more years on islands in the Bering and Chukchi seas). The young date for the mammoth also meant there was a possibility that the mammoth was a victim of human hunters.

Work in 2012 sought to follow up on some of these questions, to assess the research prospects for the site, and to determine if any emergency protection of the find was needed. It was confirmed that there were indeed multiple bones from one mammoth, but could not be determined how much of the skeleton was present due to high water. No evidence was found for human hunting, but the possibility remains. A geological reconnaissance in the area was also conducted in order to plan further research into the paleoenvironmental setting, and to learn how this skeleton was deposited in this location. PI: Jeff Rasic, NPS.d

Western Arctic Caribou Herd (WAH) Collaring Project: 2012

Each year, Alaska Department of Fish & Game (ADF&G) deploys radio collars on 20-40 caribou and collects blood samples from live caribou that are then released. The caribou are captured using boats and physical restraint. The calves of captured cows are weighed and released together. At least once every 3-5 years, 10 caribou are euthanized to collect tissue samples to assess health and body condition. In addition, each year 6-8 middle and high school students from 2 schools within range of this herd participate in the project for educational purposes. ADF&G bases work out of Gidding's cabin at Onion Portage in the Noatak National Park and Preserve. Project Lead: Jim Dau, ADF&G Biologist

Post-fire Successional Trajectories

Starting on July 28th, this study assessed effects of wildfire disturbance with respect to the structural and functional changes to the vegetation in tundra ecosystems. These changes in vegetation are predicted to not only alter wildlife habitats, but also fuel loads, temperature, snow cover, and water availability. Particularly on the Seward Peninsula, major changes in vegetation over the last century include shrub cover expansion and major shifts in tree line. As a result of this increase in trees and shrubs on the tundra, further wildfire disturbance is facilitated, exposing new seedbeds and increasing nutrient availability. This creates opportunities for the establishment of new or altered ecosystems.

Tundra wildfires and their consequences are poorly understood, and modeling efforts to predict post-fire vegetation do not account for variation in types of tundra vegetation. Although large tundra fires are currently restricted to the Seward Peninsula, changes in fire regime are predicted to increase the extent and frequency of fires throughout the tundra region in Alaska.

Natural Resources cont.

As large fires become more frequent, accurate prediction of post-fire vegetation changes is critical due to the impacts on wildlife habitat, permafrost degradation, carbon release, and range expansion of species from the neighboring boreal forest. The study aims to develop a conceptual model that integrates wildfire disturbance, vegetation succession, and climate dynamics in western Alaskan tundra ecosystems to inform land managers of the implications of a changing fire regime.

The study addresses questions such as:

1. Are particular tundra vegetation communities more prone to fires?
2. In the past decade, what is the trend in lightning strikes, fire frequency, and fire extent in the tundra biome as compared to the previous 50 years?
3. How resilient are tundra vegetation communities to fire? Does post-fire fuel load and recruitment differ among tundra vegetation communities?

The results of the work will be utilized to develop a model that simulates the response of arctic vegetation to wildfire disturbance and climatic change. This will greatly improve the utility of a larger Alaskan ecosystem model project, and provide a decision-support tool for fire and land managers in Western Alaska.

Comparisons of Population Dynamics and Ecology of Muskox in and adjacent to Bering Land Bridge National Preserve and Cape Krusenstern National Monument

• Field research for this project began in 2009 and will end in 2012. This project compares and contrasts muskox populations, calf births, adult female survival, sex/age structure, health and growth information between muskoxen of the northern Seward Peninsula and Cape Thompson populations. Layne Adams of the USGS, Joel Berger of the Wildlife Conservation Society, and

NPS staff biologists Marci Johnson, Brad Shults, and Jim Lawler are conducting this project.

- The studies on the northern Seward Peninsula will focus on areas east of Shishmaref including the Serpentine, Goodhope, and Cripple River drainages.
- Muskox were radio collared, fecal samples are being analyzed, and populations are being mapped.
- There are up to 30 radio-collared adult females within the preserve, ranging from Cape Espenberg to Ear Mountain.
- The project will be capturing additional animals in late March (after the harvest season closes). In early April, Joel Berger will be returning to the area by snow mobile to collect fecal samples and photographs for estimating body mass. Layne Adams would appreciate receiving jaws from harvested muskoxen, particularly with the front incisors intact.
- A final report, consisting of up to three manuscripts for publication in scientific journals, will be provided by March, 2013.

Grazing Enclosures

The NPS installed 18 grazing enclosure after the Environmental Assessment was complete. The enclosures are designed to answer the questions:

1. What type and condition of tundra vegetation would occur in the absence of grazing in a variety of ecotypes?
2. How long does it take for a heavily grazed area to recover the abundance and diversity of lichens comparable to an ungrazed area?

Arctic Network (ARCN) Lagoon Vital Sign

The Arctic Network (ARCN) Inventory and Monitoring Program monitors specific vital signs in the 5 northern Alaska park units, including the coastal lagoons of Cape Krusenstern (CAKR) and Bering Land Bridge (BELA). Coastal lagoons are critically important ecosystems for wildlife and subsistence practices in the region and are

Natural Resources cont.

vulnerable to both climatic change and industrial development. The logistics of visiting multiple coastal lagoons, the distances that must be traveled, and the challenges of collecting quality information in a diverse set of lagoons that change throughout the seasons make monitoring these water bodies very difficult.

in these lagoons and be compared to results from previous efforts.

In order to understand the status of Park resources in a rapidly changing environment, and to mitigate threats of climate change and development, the Arctic Network collaborates with the Wildlife Conservation Society (WCS) to gather baseline information and monitor lagoons in Cape Krusenstern National Monument and Bering Land Bridge. Currently, biologists from the NPS and the WCS are in the process of assessing results of analyses on water samples (e.g., chlorophyll) and biological samples (e.g., fish) collected in late July 2012 from 2 lagoons in Bering Land Bridge and 3 in Cape Krusenstern.

This data will continue to develop a strong baseline of conditions in these lagoons and be compared to results from previous efforts. A report on this project will be available in spring 2013. The information gathered from this field effort will be beneficial for NPS land managers as well as land management agencies elsewhere in Alaska. The project also aims to work more closely with local residents to ensure that the information collected is presented in a manner that is useful for them. Project Lead: Stacia Backensto, NPS.

ShoreZone

ShoreZone is a coastal habitat mapping project that characterizes the physical and biological resources of the shoreline during low-tidal ranges. The project uses aerial data, GIS data, and a searchable database that provides a baseline

for damage assessments, oil spill planning and response operations, habitat mapping, coastal development planning, species vulnerability with climate change, and coastal erosion monitoring. The gathered shoreline data will be served via the web and ArcMap Geodatabases.

The ShoreZone project is particularly important because of the recent increase in gas and oil exploration in the Chukchi Sea. This increase is due to the lifting of a 30-year moratorium on outer-continental shelf oil and gas development, and allows the placement of drill rigs as close as 170 miles from the coasts of Bering Land Bridge National Preserve (BELA) and Cape Krusenstern National Monument (CAKR). Therefore, the project will aid in providing a baseline data layer of sensitive habitats and species that would be affected by this activity.

In 2012, multi-agency funding was given to Coastal and Ocean Resources (CORI) of B.C., Canada, to acquire high resolution images and videos of the entire coastline from Point Hope to Wales. These are now available online at <http://mapping.fakr.noaa.gov/szflex/>. GIS mapping of biota and such physical properties as sediment type, wave energy and oil residency index will be completed in 2013. The park contact for this is Peter Neitlich, WEAR Ecologist.

Monitoring for Yellow-billed Loon Contaminant Burdens in Cape Krusenstern National Monument and Bering Land Bridge National Preserve

The yellow-billed loon (YBLO, *Gavia adamsii*) is an international species of concern with a global population estimated at 16,650-21,000. Approximately 20-25% of this population occurs in Alaska, including areas of Cape Krusenstern National Monument (CAKR) and Bering Land Bridge National Preserve (BELA). The entire US population of YBLO seasonally occurs in Alaska,

Natural Resources cont.

where the total summer breeding population is estimated at 3,700-4,900 birds. The species' life history characteristics, low reproductive rate and success, slow rate of sexual maturity and reproduction, small population size, and restricted distribution, combined with unsustainable levels add to the vulnerability of this species.

Because these loons are long-lived and return to the same breeding sites each year, they are ideal for monitoring long-term trends in density and distribution, as well as for their consumption of contaminants through their diets.

The objectives for ARCN's monitoring of the western Alaska YBLO population include:

- Aerial surveys of population occupancy and density.
- Assessment of contaminants including metals, persistent organic pollutants, pesticides, and other harmful chemicals.

In June 2012, ARCN collaborated with Dr. Angela Matz at the U.S. Fish and Wildlife Service (USFWS) Ecological Contaminants Program to opportunistically collect eggs from 13 different YBLO nests across BELA. Minnow traps were set at 12 of the 13 YBLO nest lakes where egg collection occurred and at additional YBLO nesting and fishing sites across BELA and CAKR. Opportunistic DNA sampling across BELA and CAKR, including the egg-collection sites and other YBLO fishing and nesting sites was also conducted during nest visits. Contaminants samples will be analyzed by USFWS Environmental Contaminants Program. The YBLO egg and minnow samples from BELA and CAKR will be compared to similar data collected from the Arctic Coastal Plain in Alaska. This will establish baseline levels of contaminant burdens occurring in the species across its range in Alaska. The contact for this project is Melanie Flamme, NPS.

Serpentine Water Quality and Stream Ecology

This project began in 2010 as a collaborative effort between NPS, USGS and Montana State University to understand the geochemistry, microbiology and water quality of Serpentine Hot Springs and Hot Springs Creek. The NPS has taken over ongoing monitoring associated with this project. Three data loggers are installed in Hot Springs Creek to monitor water temperature, conductivity and stream velocity. A data logger is also installed in the main outdoor hot pool at the cabin to continuously monitor water temperature. Water quality samples are collected and analyzed annually. Based on these results, and due to the presence of beaver upstream of the cabin, the NPS continues to advise that drinking water be treated or boiled prior to consumption. The contact for this project is Linda Hasselbach, NPS WEAR.

Serpentine Beaver Colonization

A visual estimate based on aerial photos indicates the area of beaver-induced flooding above the bunkhouse has increased 400 - 500% over a 3 year period ending in 2012. During that time, we estimate that 31-67% of the total stream flow was diverted from the main creek channel immediately above the bunkhouse. Stream diversion is primarily the result of numerous beaver dams pushing water into pools, and new and existing side channels. 100% of diverted stream flow re-enters the main creek channel at the bunkhouse site via: 1) the channel behind the bunkhouse, 2) the small channel(s) in the gravels just above the bunkhouse, and 3) as overland flow. A small amount (1-3 cfs) of additional discharge is added below the bunkhouse by Serpentine Hot Spring itself. The NPS is concerned that increased overland flow associated with continued beaver colony expansion will threaten the bunkhouse and bathhouse facilities. Management options will be discussed in January 2013. Project lead: Linda Hasselbach, NPS WEAR.

Natural Resources Cont.

2012 Hazard Fuels Treatment

The NPS removed hazardous vegetative fuel (brush) that surrounds two Fairhaven Ditch Historical Cabins, numbers 2 and 3. Hazard fuels around these cabins consisted mostly of willow shrub, dwarf birch-tussock shrub, and sedge landscape cover types. Removal of this brush will enable firefighters to become more effective if the cabins need protection from wildfire since tall shrubs inhibit firefighters' ability to work around the cabin. All brush cut were ragged (tore up) and scattered out beyond 100' from each cabin, eliminating the need to burn piles at this site in the future. project lead: Larry Weddle, NPS.

Thermal Response of Lakes to Climate Change

The primary goal of this project is to provide land and resource managers with information related to the past, present, and future temperature trends in lake and lagoon surface waters in western Alaska. Specifically, the project:

- Reconstructed summertime lake and lagoon surface temperature trends for waterbodies larger than 50 km² back to 1985, and larger than 10 km² back to 2001.
- Measures hourly lake temperatures in 50 waterbodies from summer 2012-2015.
- Develops a predictive model using relationships between in-situ data, remotely sensed data, and meteorological data to forecast lake and lagoon surface temperature trends out to 2025, 2050, and 2100.

Preliminary results from 2012:

- Insitu observations for August 2012 from 17 lakes show that mean lake surface temperature was lower in the more northerly shallow lakes and more so in the deep lake when compared to lakes south of 66° N. All lakes responded to what appears to be a region-wide warming event during the middle of August which resulted in maximum lake surface temperatures in all cases except the three shallow northerly lakes.

- UAF masters student Terezka Bendlova finished a thesis developing a hindcasting model for lakes located in the NW portion of the study region, with the aim to determine the number of years over a 25 year period for which lake temperatures exceeded 20°C. It was found that this occurred in almost half of the years.

- A related project is focused on observing iceout patterns on large lakes, including the Yukon-Kuskokwim Delta and Bering Land Bridge National Preserve. Results from this project have allowed development of models to predict the timing of ice-out based on air temperature and lake morphometry. Compiled data will be made available to the public.

project lead: Ben Jones, USGS

Geothermal Investigations at Serpentine Hot Springs

Additional hydrological testing was conducted at Serpentine and Arctic Hot Springs in 2012 as part of the "Geothermal Investigations" project. The overarching project goals are to characterize the hydrology, geochemistry, water quality, and microbiology of Serpentine area water resources. This year's goals were to obtain more information on discharge levels and patterns, water quality and helium isotopes (to investigate whether a hidden magma source is present). The NPS continues to collaborate with researchers from USGS and Montana State University. A final draft of overall findings is prepared and will be ready for peer review shortly. Once reviewed, results will be shared with public. Project Lead: Linda Hasselbach, NPS

Subsistence

Work was completed to meet the challenge of balancing the ANILCA (PL 96-487) mandated requirement to provide subsistence use opportunities of wild, renewable resources by rural residents with the NPS mission to ensure park natural resources remain unimpaired for future generations.

A substantial review and revision to the draft Environmental Assessment (EA) for “Providing Big Game Commercial Guide Services Within Bering Land Bridge National Preserve” in preparation for the document’s release for public comment was completed.

The Subsistence manager coordinated the federal response (including working with the State of Alaska) in adjusting muskoxen harvest regulations in the face of significant biological concerns including declines in population abundance, mature bull to cow ratios, and recruitment.

The 2 federal subsistence muskox hunts in GMU 23, 4 in GMU 22, and a federal sheep hunt in GMU 23 were managed.

The subsistence manger participated in a major Resources Programs review (natural, cultural, and subsistence) for the four Western Arctic Parklands (WEAR) units.

The Subsistence manager developed, and coordinated WEAR’s input into and management alternative preference for the Horns and Antlers Environmental Assessment. This analyzed the potential impacts to legalizing the collection and use for subsistence purposes of shed or discarded horns and antlers as well as plant products.

Work was completed on the development of a special management area in the northwestern portion of the Noatak National Preserve designed to reduce user conflict during the fall caribou hunt between local subsistence users and big

game commercial transporter services that provide air transport of nonlocal hunters into the Preserve prior to the beginning of the 2012 hunting season.

Materials were developed for local groups aimed at promoting a better understanding of hunting regulations.

A presentation was given focused on the NPS Mission and NPS wildlife management with special reference to muskoxen at a breakout section of the annual Kawerak Regional Conference in Nome, AK..

The Subsistence Manager participated along with the Alaska Department of Fish and Game at a very well attended public meeting in the rural village of Shishmaref, AK focused on villagers’ rising concerns over brown bears, bear management, and issues of human safety and property damage.

Visitor & Resource Protection

In fiscal year 2012, the park hired Walker Gusse as the District Law Enforcement Ranger. Mr. Gusse previously worked for Klondike Gold Rush National Park in Skagway, Alaska. He also did a detail in Bering Land Bridge in 2010 where he patrolled the park and visited Shishmaref.

Mr. Gusse traveled with other park staff and patrolled 650 miles of winter trails going to Serpentine Hot Springs and park shelter cabins. He also provided assistance to Western Arctic National Parklands District Ranger Dan Stevenson on a float patrol of the Noatak River.

The primary purpose of these patrols was to assess the parks 5 shelter cabins and to work with local emergency services organizations like Shishmaref Emergency Services to ensure the safety of residents and visitors. Also to assess any visitor use conflicts that was reported at Serpentine Hot Springs.

He provided seasonal and new staff snow mobile and arctic weather safety training. He was also utilized as a helicopter manager and aviation manager on park flights and helped the Region's Fire program based out of Denali with prescribed fuel reduction projects in the park.

Walker also was able to take ATV instructor training.

