



Alagnak

Aniakchak

Katmai

Kenai Fjords

Lake Clark

SWAN Field Season Highlights 2011

Fish Contaminants Survey

Resident lake fish serve important ecological, recreational, and subsistence roles in SWAN parks. They represent a variety of trophic levels (omnivores, insectivores, planktivores, and piscivores) and as such reflect changes that occur in the food chain. There is growing concern that fish species in some of SWAN's lakes have acquired elevated levels of mercury and other contaminants.

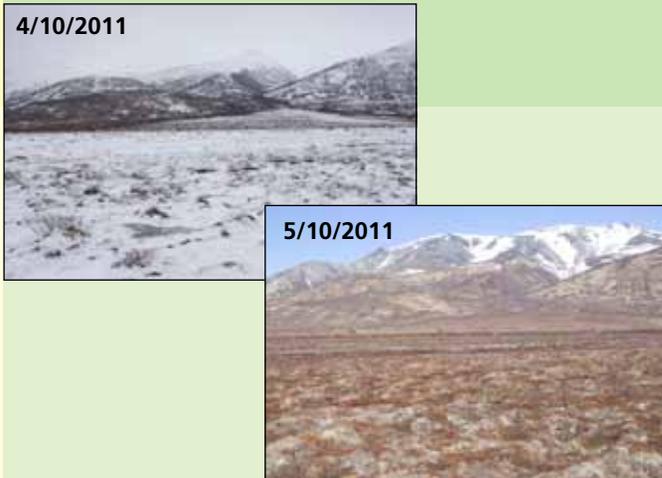
- Fish samples from LACL and KATM were collected from a number of lakes to assess baseline levels of contaminants within the aquatic foodweb.
- Lake trout (*Salvelinus namaycush*), Arctic char (*Salvelinus alpinus*), northern pike (*Esox lucius*), humpback whitefish (*Coregonus pidschian*), and slimy sculpin (*Cottus cognatus*) were targeted to represent multiple trophic levels and species of subsistence and recreational importance.
- Anadromous and non-anadromous lakes were sampled to assess the contribution of marine-derived contaminants from spawning salmon that may be entering SWAN parks.



Lake trout is an ideal species for contaminants monitoring. Their long life expectancy make them sentinels of freshwater conditions.

Time-lapse Cameras Update

Time-lapse camera systems are an excellent tool to document the timing of seasonal events, including the start and end of the growing season (leaf emergence and senescence), at fine spatial scales. Digital camera images captured through time can be analyzed to quantify stages of phenology.



Images from time-lapse camera at Contact Creek captured on April 10 and May 10 show changes in snowcover. Daily images will be analyzed to estimate snowmelt and green-up dates.

- Images were downloaded from three camera locations co-located with RAWs in KATM and LACL.
- The photo series showed thin and often ephemeral snowpacks at the three sites, with green-up lagging snowmelt by as much as two and a half months.
- The images will be used to monitor phenology and snowpack dynamics at the RAWs sites, as well as to validate, and potentially scale up to, satellite-derived (i.e. MODIS) seasonal metrics.

Terrestrial Animal Monitoring

SWAN has selected three terrestrial species that are important ecologically. As top predators, brown bears influence population dynamics of other species and the transfer of nutrients from spawning salmon to the terrestrial system. Moose have the potential to influence structure and function of terrestrial systems through their browsing effects on vegetation communities. Bald eagles are keystone predators of seabirds and fish in marine and freshwater ecosystems.

- LACL staff conducted two aerial trend counts of brown and black bears along the coastline.
- Moose surveys were conducted during the late fall before moose shed their antlers.
- Aerial surveys for bald eagle nest occupancy (May) and productivity (July) were completed in KEFJ, LACL and KATM.



Bald eagle nests are well camouflaged and difficult to observe. This nest with chick was spotted during July productivity survey in KEFJ.

Moose spotted during fall survey in LACL. Surveys are conducted before males lose their antlers for the season, which enables biologists to estimate sex ratios.



SWAN Field Season Highlights 2011 Continued

Alagnak River Bird Inventory

The Alagnak Wild River (ALAG) is the last park unit within the SWAN network to be inventoried for avian fauna. This park unit preserves the upper 90 km of riverine habitat in pristine, free-flowing condition and the surrounding riparian and upland environment, which are extremely valuable habitats for avian species.



Golden crown sparrow. Photo: Kelly Walton, ANHP.



Alagnak Wild River. Photo: David Tessler, ANHP.

- Surveys were conducted at 72 points, within 9 different sampling grids along the ALAG river corridor.
- 78 individual species were detected, including 11 species of waterfowl, 1 loon, 7 raptors, 1 crane, 8 shorebirds, 5 gulls and terns, 2 grouse and ptarmigan, 3 owls, 3 woodpeckers, 1 kingfisher, and 36 passerines.
- The American Kestrel and Bar-tailed Godwit had not previously been recorded in Alagnak Wild River.
- 24 of the 78 species detected during surveys had been designated as species of concern by various conservation organizations.

Ground-based Vegetation Monitoring

Vegetation is integral to ecosystem function and element cycling, and is a sensitive indicator of environmental change. SWAN ground-based monitoring is primarily focused on three vegetation types: alpine tundra, dwarf shrub and spruce forest across three elevation bands. This monitoring is intended to detect changes in vegetation structure and species composition that are too subtle spectrally to monitor through remote senses techniques.

- 23 new vegetation monitoring plots were established in alpine tundra and at treeline in LACL and KATM, for a total of 100 monitoring plots across the two parks.
- Soil temperature dataloggers were downloaded from 15 sites in LACL and KATM and 2 additional soil temperature loggers were installed for a total network of 27 sites.
- Color-infrared air photos (1:24,000) were acquired for 75% of the KATM coastline. The imagery (photos and orthorectified derivatives) will be used to detect change in salt marshes and nearshore marine environments, and to refine shoreline delineations and associated GIS products.



SWAN staff use a specially designed pointer to estimate percent cover along plot transect.

Rare North American lichen and mosses found in LACL

Cetrelia alaskana (C. Culb. & Culb.), a rare macrolichen (G2G4) known across Alaska and the Northwest Territories, was found at two alpine locations in the park. *Iwatsukiella leucotricha* (Mitt.) W.R. Buck & H.A. Crum, a rare moss (G4G5) across most of western North America, was found at one forested site along the coastline of the park. *Buxbaumia aphylla* Hedw., an uncommon to rare circumboreal moss (G4G5), was detected at two mid-elevation sites in the interior of the park.



The unique spore capsule of the moss *Buxbaumia aphylla* has earned it the nickname "bug-on-a-stick." The moss was found in a mid-elevation spruce woodland site in LACL.

To learn more about SWAN's monitoring projects, or to download reports, please visit our website at: <http://science.nature.nps.gov/im/units/swan/>

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