



Central Alaska Network

Denali NP & Pres. • Wrangell-St. Elias NP & Pres. • Yukon-Charley Rivers N Pres.

Passerines Resource Brief

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photo credit: Dave Menke/USFWS

Status & Trends

Monitoring passerines in the Central Alaska Network

Using a repeat count design allows staff to account for different sources of variation including time of day, season, and observer when estimating the probability of detection for different passerine species. Recent analysis of passerine data presented in the [April 2013 issue of Biological Conservation](#) demonstrated substantial variation in the probability of detection through the nesting season, with detection probability being strongly affected by survey date and time of day. After accounting for these sources of variation, CAKN staff estimated that Fox Sparrow abundance increased at a rate of 6.4% (95% CI = 3.3-9.7%) annually while Wilson's Warbler decreased at a rate of -4.3% (95% CI = -8.5 - -0.2%) annually from 1995 to 2009 in Denali. Similar abundance and trend analyses are ongoing to incorporate data collected from 2009 to 2013 across the entire Network.

Many species of passerines are tightly linked to the vegetation that creates their breeding and foraging habitats. An integrated sampling design that links vegetation and passerine data helps CAKN understand how the ecosystem functions as a whole and to delineate the specific relationships among these elements of the biota. It also allows for detection of changes in the ecosystem at a landscape scale for long periods of time. Preliminary analysis of data collected in Denali suggests that changes in the active layer depth resulting from thawing permafrost could lead to major changes in vegetation patterns, which in turn could profoundly alter bird habits over large regions.

Recent research in other areas has demonstrated that migratory arrival

time has changed for many species of migratory birds. The repeat count design provides a formal approach to modeling changes in migratory time by including appropriate temporal and environmental variables in the detection model.

Objectives

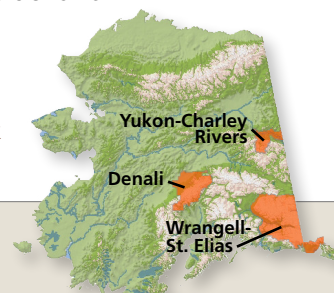
What do we want to know about passerines in CAKN?

- Estimate abundance and trends of common passerine species
- Identify the factors driving the trends in abundance of passerine birds
- Monitor dates of first detection and peaks in seasonal detection rates, detect changes in dates over time as well as drivers of change
- Provide demographic information for species of concern, including bank swallow, olive-sided flycatcher, gray-cheeked thrush, arctic warbler, blackpoll warbler, and rusty blackbird



left to right: a view of one of the vast landscapes where NPS observers conduct passerine monitoring ; a White-crowned sparrow

Passerines are being monitored in all 3 network parks



Importance

Why are passerines important in the Central Alaska Network?

Passerines are important components of park ecosystems and provide important ecosystem function including seed dispersal. Many species of passerines often respond quickly to changes in their environment making them good indicators of local, regional, and sometimes global, ecosystem change. Passerines include a wide variety of species that occupy many habitats over many environmental gradients and may represent unique response variables relative to changes in

vegetation and climate. Climate change is projected to be particularly strong in the northern latitudes and birds nesting in CAKN could be especially susceptible to the effects of climate warming including increased shrub cover and changes in availability of food. Changes in passerine community structure, and timing of passerine migration and nesting seasons could provide new and important insights into how a changing climate is affecting the ecosystems and biodiversity in CAKN.



Management Applications

How can monitoring protect passerines in CAKN?

- Provide data that indicates potential local and regional changes in ecosystems
- Inform decisions about protecting undeveloped areas from future impacts



photo credit: Kristine Sowl/USEWS

Long-term Monitoring

How do we monitor passerines in the Central Alaska Network?

The sampling protocol for passerines in CAKN was designed to continue for decades. The repeat count design allows for highly precise estimates of abundance, relatively quick detection of trends, and identification of factors that influence detectability. Passerine species are monitored in all three Network parks using repeat count surveys conducted along roads, mini-grids, and the upper Yukon River during the breeding season

(April – June). During each standard three-minute point count, all birds heard and all birds seen within 400m of the point are recorded. Detection of song birds on surveys is strongly correlated to habitat and the timing of surveys. Therefore, in addition to recording birds, other data are collected during surveys as well, including covariates for detection, such as weather conditions and background noise.

Data collected by the CAKN passerine monitoring program helped the US Geological Survey and the US Fish and Wildlife Service identify important breeding habitat for sampling Arctic Warblers (right) and other target species for the highly pathogenic avian influenza virus H5N1 in Denali in 2006. Arctic Warblers breed in Denali and over winter in the epicenter of Asian H5N1 outbreaks in southeast Asia and Indonesia.



CENTRAL ALASKA NETWORK

USING SCIENCE TO PROTECT OUR PARKS

THE CENTRAL ALASKA NETWORK (CAKN) IS ONE OF 32 NATIONAL PARK SERVICE INVENTORY AND MONITORING NETWORKS. EACH NETWORK EXISTS AS PART OF A NATIONAL EFFORT TO BETTER UNDERSTAND AND MANAGE PARK LANDS USING SCIENCE-BASED INFORMATION.

In order to focus this effort, 270 national park units with significant natural resources were grouped into 32 regional networks.

The Central Alaska Network is made up of 3 parks: Denali National Park and Preserve, Wrangell-St. Elias National Park and Preserve, and Yukon-Charley Rivers National

Preserve. Together, these 3 parks contain over 21.7 million acres and makeup 25% of all the land in the National Park Service. They represent a great diversity of climate and landform, from temperate coastal rainforests to glaciated mountain ranges. What they share in common are their largely wild and unaltered landscapes.

In order to track the condition of our parks, Central Alaska Network scientists have chosen 34 key indicators, or “vital signs,” to represent the overall health of the network. Each vital sign falls into one of 4 categories: animal life, physical environment, human use, or plant life. Underlying these 4 vital sign categories is a focus on habitat change.

CAKN VITAL SIGNS:

Animal Life

Arctic Ground Squirrel
Bald Eagles
Brown Bear
Caribou
Dall's Sheep
Freshwater Fish
Golden Eagles
Moose
Passerines
Peregrine Falcons
Ptarmigan
Small Mammals
Snowshoe Hare
Wolves

Physical Environment

Air Quality
Climate
Fire
Glaciers
Land Cover
Permafrost
Shallow Lakes
Snow Pack
Soundscape
Streams & Rivers
Volcanoes & Tectonics

Human Use

Human Populations
Human Presence/Use
Natural Resource Consumption
Trails

Plant Life

Exotic Species
Insect Damage
Plant Phenology
Subarctic Steppe
Vegetation Structure/Composition

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