



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 parks. To address this information need, we have partnered with Oregon State University to conduct a lichen inventory of its three largest parks: Katmai and Lake Clark national parks and preserves, and Kenai Fjords National Park.



NPS/James Walton

Lucia Muggia and Tor Tønsberg collecting lichens at Hammersly Lake, Katmai National Park and Preserve.

Preliminary Findings

A collaborative team of lichenologists from North America and Europe visited Katmai National Park and Preserve in 2013, Lake Clark National Park and Preserve in 2014, and Kenai Fjords National Park in 2015-2016. They surveyed sites throughout each park that were selected by National Park Service botanists to span a range of rich lichen habitats, including coastal rock outcrops and forests, large interior lakes, river and forest systems, and interior and coastal alpine zones. Researchers observed a lichen flora with an interesting mix of arctic-alpine, boreal, and coastal elements. The Beringian element that is evident on the Seward Peninsula and Aleutian Islands did not appear to be prominent in Southwest Alaska parks.

A number of oceanic forest species were found at low-elevation, moist forest sites. Certain species groups or genera common to the alpine were surprisingly rare in Katmai. These included the alpine ground-dwelling *Rinodina* species, ground-dwelling *Hypogymnia*, and *Dactylina*. These genera were somewhat more abundant in Lake Clark than in Katmai, but still not as abundant as in more continental climates. Nitrophilous species (e.g., *Caloplaca*, *Xanthoria*) did not appear to be abundant in any park, suggesting low levels of nitrogenous pollutants. Few calciphiles were encountered, owing to the predominantly acidic rocks in all parks. Although the team was unable to sample on limestone or dolomite in Katmai or Kenai Fjords, they did visit one site with



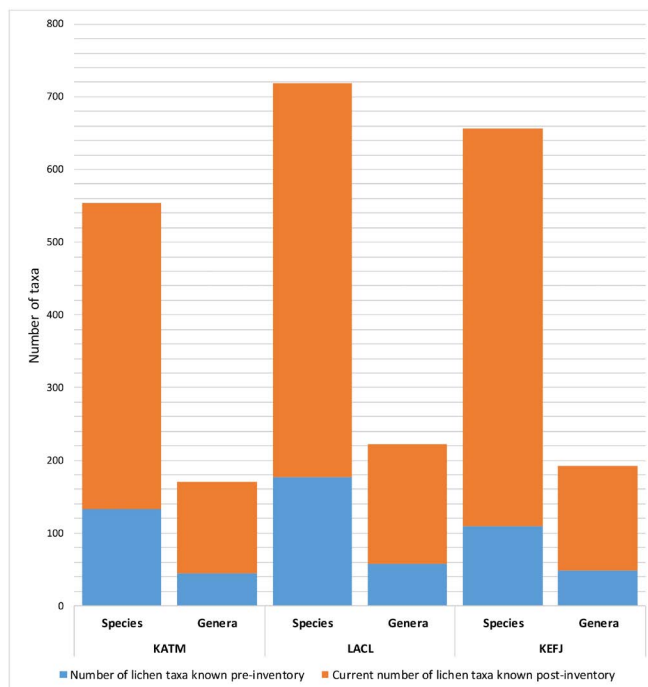
marble on the shore of Lake Clark. Species found at that site differed from those occupying more acidic rock in surrounding areas.

To date, at least 14 species have been discovered that are new to science, 7 species are new to North America, and 14 species are new to the state of Alaska. Additionally, new populations of the globally endangered lichen, *Erioderma pedicillatum* (Hue) P. M. Jørg., were discovered in both Katmai and Lake Clark. Twelve peer-reviewed journal articles and one master's thesis have been published

using inventory findings. Other products include two manuscripts (in progress) that discuss the biodiversity and ecology of Southwest Alaska lichen communities through an annotated voucher-based lichen species list and accompanying database for each of the three parks. Specimens collected during the course of the inventory will be provided on loan to the Museum of the North Herbarium, University of Alaska, and several other institutions, where they will be available for research and educational purposes.



Bruce McCune and Lucia Muggia observe lichens at Brooks Camp, Katmai National Park and Preserve.



Contribution of documented lichen taxa from the Southwest Alaska Network Lichen Inventory. Katmai National Park and Preserve (KATM) saw a 317% increase in known lichen species, Lake Clark National Park and Preserve (LACL) a 306% increase, and Kenai Fjords National Park (KEFJ) a 503% increase from pre-inventory levels.