



Keeping Broom Crowberry From Being Swept Away

Rare Woodland and Forest Community Monitoring

Background

Acadia National Park lies within a transition zone of the Maine coastline, containing ecological communities typical of both southwestern and “downeast” coastal Maine. Eleven of these communities, or “associations” as defined within the United States National Vegetation Classification, are rare within the state of Maine, and one is globally rare. Rare communities are of particular management and conservation interest for the park, precisely because they are rare and because they may be particularly sensitive to anthropogenic (human caused - i.e. climate change, trampling, etc.) impacts. This monitoring program is designed to provide data for the assessment of the status and trends in rare woodland and forest communities within Acadia, and was largely adapted from the NETN Long-term Forest Monitoring Protocol.

Purpose & Scope

Of the rare communities in the park, four terrestrial forest or woodland communities are recommended for long-term monitoring at this time. Three of the communities are considered rare in the state of Maine (Jack Pine Woodland, (Pitch Pine Woodland, and the White Pine / Red Pine Forest) with the Pitch Pine / Broom Crowberry Woodland ranking as globally rare. Key stressors potentially impacting these rare woodland and forest communities include lack of fire or other disturbance, forest succession, coastal erosion, climate change, trampling, deer browsing and invasive species.

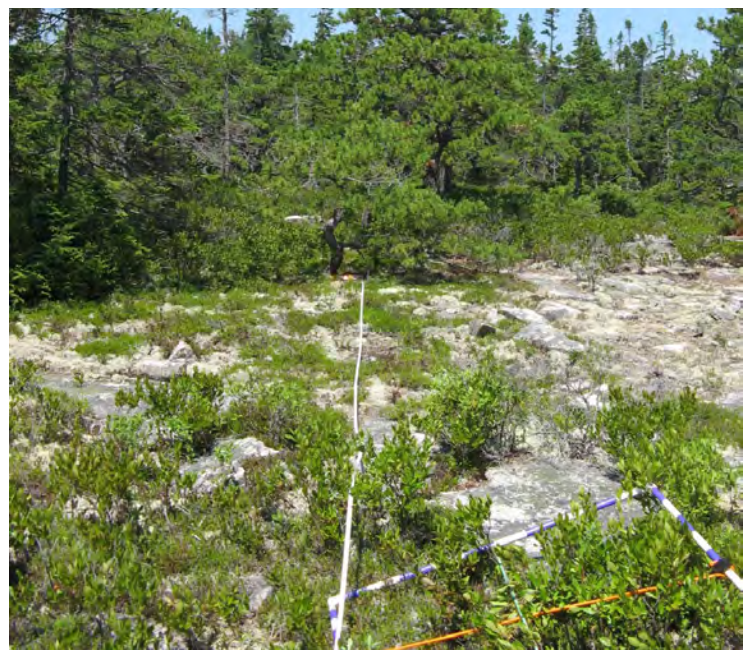
All four of these rare communities are typically fire-dependent, and may be negatively impacted by fire suppression policies. Jack pine, pitch pine, red pine and broom crowberry are all species that regenerate following fire disturbance. Analysis of a lake sediment core taken from The Bowl (near The Beehive on Mount Desert Island) showed some evidence of fire prior to European settlement. Many current forest and woodland stands in the park established after fires during the 19th and early-to-mid 20th century. However, fires caused by natural ignition sources (lightning strikes) are uncommon along coastal Maine and the cool, moist climate is not friendly to fire. It is more likely that for Acadia, harsh soil conditions and disturbance from salt spray helps to prevent trees from taking over areas where rare communities persist in the absence of fire. However, research has indicated that jack pine regeneration on Schoodic Peninsula

has decreased in recent decades, while red spruce regeneration has increased. Despite the lack of a clear understanding of fire’s natural role in the park, these rare communities may benefit from the disturbance caused by prescribed fire. If monitoring shows that maintenance of these communities is threatened by tree incursion, or by regeneration failure of fire-dependent species, prescribed fire may be a useful management option to have in the tool-kit.

The three rare woodland communities occur in close proximity to the coast, and thus may be threatened by coastal erosion and sea-level rise over the mid-to-long-term. In addition, because pitch pine is near its northern range limit and jack pine is near its southern range limit in Acadia, altered temperature, precipitation and disturbance regimes associated with climate change could substantially impact community composition and structure.

Acadia National Park is also a very popular tourist destination, receiving over two-million visitors annually, and trampling of sensitive communities could be an issue. Trampling is likely to be a bigger issue for the pine woodlands on Mount Desert Island, which attract more visitors than the relatively remote Schoodic Peninsula and Isle au Haut.

A view of one of Acadia’s Pitch Pine / Broom Crowberry Woodlands being studied as part of NETN’s Rare Woodland & Forest Community monitoring program, which typically occur on acidic rocky outcrops along the Maine coast (ten extra points if you saw the NETN scientist behind the tree in the middle-top of the photo). Kate Miller photo.



Monitoring Methods

Sampling will occur annually, in late July or August. A spatially balanced random sample within patches of each community identified on the Acadia Vegetation Map will be selected. This design will allow for sample size to be adjusted as needed even after sampling has begun without sacrificing spatial balance.

This protocol was designed primarily with the globally rare Pitch Pine/ Broom Crowberry Woodland (PPC) community in mind. It was hoped that since the three other state rare communities in the park also happen to have similar species, disturbance dynamics, structure and potential stressors, that those habitats could also be included in this monitoring program. Unfortunately, since the protocol was originally developed, NETN has had to scale it back to only monitoring plots in the PPC community because of limited staff availability.

So far, the Pitch Pine / Broom Crowberry Woodland has been positively identified and mapped at a single 13.5 acre patch on Mount Desert Island, but it is thought that it may also be present on Isle Au Haut. Six plots are recommended within the mapped patch on Mount Desert Island. Depending upon the location and size of additional patches, four more plots may be installed.

Condition of individual broom crowberry plants will be monitored within each vegetation quadrat. Up to nine individual broom crowberry plants per quad will be selected for monitoring. Height, live/dead branches, and evidence of reproduction will all be recorded.

More Information

To get a complete picture of this monitoring program, standard operating procedures, and monitoring methods, download the **Rare Woodland & Forest Communities** monitoring protocol from our website, or contact the project managers listed below.

NETN Plant Ecologist

Kate Miller

Phone/Email

207-288-8736
kathryn_miller@nps.gov

NETN Program Manager

Brian Mitchell

Phone/Email

802-457-3368 ext. 37
brian_mitchell@nps.gov



Broom Crowberry (*Corema conradii*) is a rare plant in Acadia National Park, Maine, and the Northeast in general. It is a low, densely branched evergreen shrub with narrow yellow-green needles (brown in winter). It has small terminal clusters of inconspicuous

purple or reddish flowers that appear early in the season (March-May), and small, dry, brown berries with three (occasionally 4-5) seeds in July-August. It belongs to a small genus distributed on both sides of the Atlantic represented by only two species: one in Spain and Portugal, the other on the Atlantic Coast of eastern North America. A plant of coastal plains, it grows on sandy soil, open sand, or (like in Acadia) on rocky plateaus, ledges, and summits. On open hilltops, it can be found in pitch pine stands, forming a springy carpet. All of these habitats have relatively open light conditions, a requirement for the plant. This may be due to disturbance, often in the form of infrequent fire. Plants can live up to 50 years and may act as a pioneer species, taking hold on recently cleared soil. The fruits are collected by a particular ant species that likely aids in seed dispersal. Fire can directly kill adult plants but will often result in an abundant establishment of seedlings if the fire was not too intense. As a recent example, in June 2001, an F-16 fighter jet practicing bombing at the Warren Grove, N.J. missile-range missed its target and started a fire that burned crowberry patches where no seedlings had been seen since observations began in 1996. After the fire, which killed the adult plants, many seedlings emerged over the next two years.

Broom Crowberry plants that have reseeded a burned-over patch of ground 2 years after the fire event. *Jack Pine*, Nova Scotia Wild Flora Society (nswildflora.ca) photo.



Northeast Temperate Network

54 Elm Street, Woodstock, Vermont 05091
802-457-3368
<http://www.science.nature.nps.gov/im/units/netn/>

Program Manager

Brian R. Mitchell
802-457-3368 ext. 37
Brian_Mitchell@nps.gov

Appalachian Trail Coordinator

Fred Dieffenbach
802-457-3368 ext. 36
Fred_Dieffenbach@nps.gov

Data Manager

Adam Kozlowski
802-457-3368 ext. 40
Adam_Kozlowski@nps.gov

Plant Ecologist

Kate Miller
207-288-8736
Kathryn_Miller@nps.gov

Science Communication

Ed Sharron
802-457-3368 ext. 23
Ed_Sharron@nps.gov

