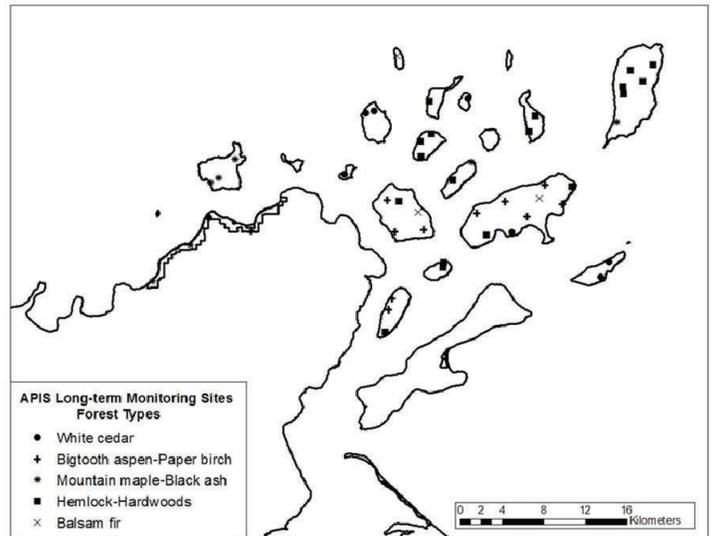




Monitoring Vegetation in the Apostle Islands

How We Monitor

- 48 permanent vegetation monitoring plots were established in the Apostle Islands in 2011 (see map).
- Plots were grouped into five forest types: white cedar, hemlock-hardwood, mountain maple-black ash, bigtooth aspen-paper birch, and balsam fir.
- At each plot, we collected extensive data on tree species composition and size, as well as the understory layer and browse impacts.
- These plots will be resampled in 2017 and every six years thereafter.



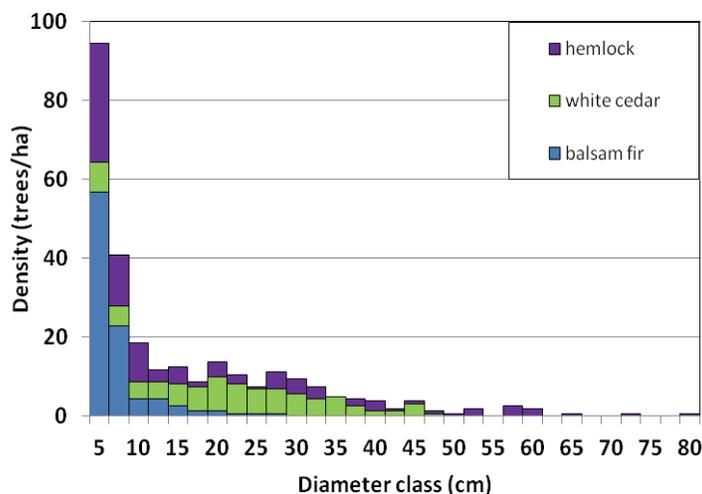
What We're Finding

In the hemlock-hardwood forests, smaller-size trees grew more densely than larger ones (see graph), indicating that the hemlocks are replacing themselves within these stands. **Canada yew was abundant in the hemlock-hardwood forests**, covering 16% of the forest floor, typically to a height of about one meter (approx. 3 feet).

Mountain maple-black ash and bigtooth aspen-paper birch forests both contained **large inclusions of ash trees**.

What It Could Mean

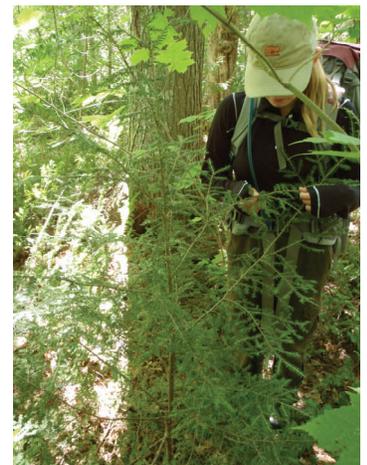
Hemlock-dominated forests with large components of sugar maple and yellow birch were the most common landcover type in northern Wisconsin prior to large-scale logging of the 1880s. Currently, it is estimated that these forests occupy about 0.5% of the landscape in the upper Great Lakes region. Our plots in hemlock-hardwood forests were primarily on islands with no



Density and diameter of hemlock, white cedar, and balsam fir in hemlock-hardwood forests at APIS. Note the high density of hemlock in the smaller size classes.

known historic deer occupation, or on islands where deer were absent for several decades. These islands are a significant resource and efforts should continue to maintain populations of hemlock as well as white cedar, which are both preferred browse species by deer.

The emerald ash borer (EAB) is now present in southern Wisconsin and the Upper Peninsula of Michigan, posing a significant threat to Apostle Islands forests over the next two decades. The decline of ash within the national lakeshore will leave gaps throughout park forests. Managers should continue striving to reduce the current abundance and distribution of non-native species, as these can opportunistically colonize the large gaps created by ash die-off.



Hemlock regeneration. A biological technician examines a hemlock on Otter Island.

