



# DUKES EXPERIMENTAL FOREST

## Marquette, Michigan



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The 5,500 acre (2,227 ha) Dukes (formerly Upper Peninsula) Experimental Forest was established in 1926 in the Upper Peninsula of Michigan. The uplands are dominated by old growth northern hardwoods and hemlock-hardwoods. Primary studies on the Dukes EF consist of stocking level experiments in hardwoods and swamp conifers and cutting cycle and cutting methods experiments in northern hardwoods. In 1974, a Research Natural Area (233 acres) was established within the Dukes Experimental Forest boundaries. Information from studies on the Dukes has been used to develop management guides for northern hardwood forests in the Lake States. These guides are applied by virtually all management organizations in the region. Long-term data records on growth and yield and mortality in management of old-growth northern hardwoods make the Dukes an especially unique asset.

### Assets:

**Scientists:** 3 Northern Research Station scientists are currently conducting studies on the Dukes.

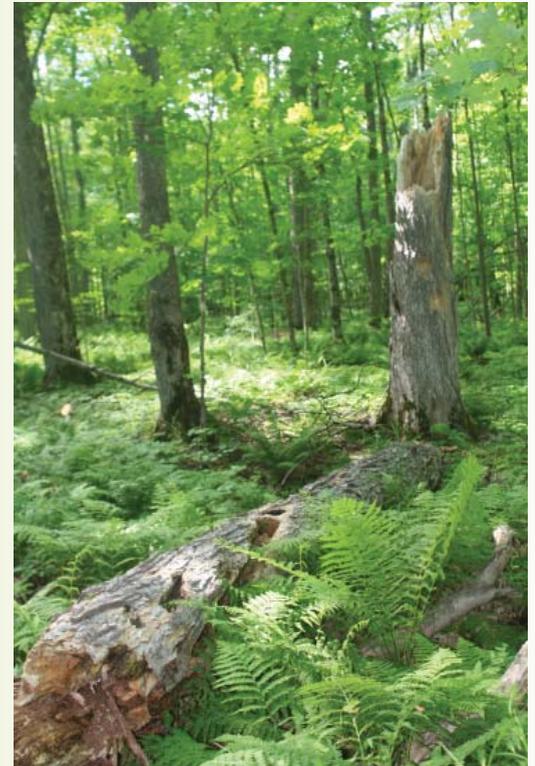
**Scientific support:** 2 technicians and/or professionals support the work of these scientists.

**Cooperators:** Hiawatha National Forest, University of Minnesota.

### Needs:

**Annual operating costs:** \$38,979

**Critical needs:** Updated ecosystem classification and stand inventory maps.



### The Dukes Experimental Forest is administered by:

U.S. Forest Service, Northern Research Station  
5985 Highway K, Rhinelander, WI 54501

Key Contact:

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## More About the Dukes Experimental Forest

**Location:** Lat. 46°21' N, long. 87°10' W

The Dukes EF is located about 16 miles southeast of Marquette, in the upper peninsula of Michigan. The Dukes can be accessed by Dukes Road off Highway 94.

**Vegetation:** The uplands of the Dukes are dominated by old-growth northern hardwoods and eastern hemlock-hardwoods. Hemlock dominates the somewhat poorly drained soils and northern white-cedar-spruce and hardwood-conifers dominate the poorly drained soils and muck. Although a small amount of white pine and elm were logged during the early 1900s, the remaining forest is essentially old growth today.

**Climate:** Average annual precipitation on the Dukes is about 35 inches (86 cm) and is distributed evenly through the year. Lake-effect snowfall is considerable and averages 142 inches (355 cm) per year, with up to 304 inches (760 cm) some years. Proximity to Lake Superior results in a cool lacustrine climate, with moderated minimum and maximum temperatures. Average annual temperature is around 41 °F (5 °C), and the growing season averages 110 days.

**Research—past and present:** Research began on the Dukes in the 1920s. Studies consisted of stocking levels of hardwoods and swamp conifers, cutting cycles, regeneration, and cutting methods of northern hardwoods. Pioneering work by Carl Arbogast on a sustainable age structure for uneven-aged northern hardwoods was conducted on the Dukes Experimental Forest. This structure (known as the Arbogast guide) is applied to millions of acres of northern hardwoods in the Lake States and more broadly to uneven-aged forests in general. Currently, only the stocking-level studies and a red maple growth and yield study remain active. The Duke is home to the oldest running northern hardwood management experiments in the Great Lakes region.



**Research opportunities:** There are research opportunities to study the silviculture and ecology of all the vegetation types on the Dukes. There also are opportunities for comparing treatments that have been applied since the 1920s. Much of this is managed old growth, of which little remains in the Lake States. The Dukes RNA is available for nondestructive research in old-growth northern hardwoods.

**Facilities:** There are no facilities on the Dukes Experimental Forest. Roads are well maintained but are not plowed during the winter.

More information can be found at: <http://www.nrs.fs.fed.us/ef/locations/mi/dukes/>