



Pining for Dry Forestland

The Importance of Fire-Dependent Ecosystems to Michigan and Wildlife

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Photo Courtesy of Rob Routledge, Sault College, Bugwood.org

For hikers, campers, or any Michiganders who love the outdoors, accidentally sparking a roaring wildfire by mishandling a campfire is a shared nightmare. Accidental wildfires cause immense damage to property, forestland and the lives of humans and animals who dwell within. However, the role that fire plays in Michigan's ecosystem is much more complicated than it would seem. Natural and controlled burns are necessary for some species and forests to thrive. The same fire that reduces acres of woodlands to ash can also help maintain a healthy and diverse ecosystem.

Dry northern forest is a pine, mainly red, jack and white, or pine-hardwood forest of pine and red oak that occurs frequently in the Upper Peninsula. Considered a fire-dependent ecosystem, these forests typically occur in sandy, poorly drained, highly acidic soil. Because they thrive in low-nutrient soil where few other plants can grow, these types of forests are pivotal in stabilizing sandy soils, fighting erosion and improving soil quality by slowly adding organic matter to enrich the land.

Dry northern forests are particularly prevalent throughout Luce County in the Upper Peninsula. Especially beautiful examples of this forest type can be found throughout the State forestland north of Newberry (County Road 414 among others).

**A jack pine's
cones only open to
spread its seeds in
extreme heat.**

Threats to Pine Forests and Rare or Endangered Species

Dry northern forests are fairly rare throughout the Great Lakes Region. In the 19th century, they had all but disappeared from the State of Michigan. Jack pine communities have since made a comeback, but they are still threatened by invasive species, global climate change and negative public perceptions on clear cutting and fire management strategies. The these fire-dependent habitats provide habitat for unique species, while not found in the Upper Peninsula, in the Lower Peninsula the Dusted Skipper (a butterfly), Eastern Massasauga Rattlesnake and the Secretive Locust all have unique state or federal designations.

One notable species that depends on jack pine communities is the Kirkland's warbler, a federally endangered species and one of the rarest warblers in North America. The Kirkland's warbler nests on the ground,

preferring young jack pine forests. As a jack pine ages, lower branches fall away, changing the ground cover and making it difficult for the warbler to nest. The stronghold of the Kirtland's warbler is in the pine plains around Grayling, but recently more birds have been found in pine forests of the Upper Peninsula.



Jack pine seeding pop up after the Duck Lake fire. *Photo Courtesy of The Nature Conservancy/Christine Hall*

Most Upper Peninsula residents believe forest fires should be prevented at all costs. However, fires are often necessary for some species to thrive. Jack pine is one specific species that requires fire to reproduce, as the pine cones of a jack pine only open during the extreme heat provided by a forest fire.

Frequent, low-intensity ground fires are also necessary to remove competing hardwoods and allow red pine to grow freely. The Michigan State Department of Natural Resources (DNR) frequently works to maintain these ecosystems through timber harvesting and prescribed burns.

While it is always necessary to exercise caution around a campfire, it is also important to understand the pivotal role that natural and controlled fires can play in Michigan's delicate ecosystem. By learning more about the effects of forest fires, we can help ensure Michigan's diverse array of forestland and wildlife are preserved for generations to come.

Through a partnership with Michigan Technological University (MTU) and property owned by the Department of Natural Resources you can visit first hand some recent research in under burning in dry pine forests. Between 2004 and 2008 MTU and the DNR did a series of rehabilitation and restoration burns in dry red pine sites while also reducing fuel loads. The objectives of the research included:

- Determine the effects that treatments of fire and/or mechanical treatments had on both red pine, other forest vegetation, and forest floor materials
- Evaluate the presence and impact of forest pest and pathogens on red pine forests
- Determine if there are any relationships between forest pest and pathogens and the fire and mechanical treatments.

This research took place at Muskrat Lakes in northeast Luce County. The study site originated from a stand-replacing fire about 80 years ago and is more than half red pine with some white and jack pine and less than 10% oak. Results from the work found that low intensity fire reduced some of the red pine pathogens. While fire did increase the presence of red turpentine beetles, it did not have an increased effect on the trees. The research concluded that there are complex interactions between management activities, insects and disease within the forest. Therefore, the successful continuation of these projects and future data collection will add to knowledge about how forest management practices relate to ecosystem function. The Muskrat Lake research plots remain in place and are available for re-measurement in the future. The plots are in several locations just east and west of County Road 500 in eastern Luce County.

More Information

Cohen, J. G., Kost, M. A., Slaughter, B. S., & Albert, D. A. (2015). *A Field Guide to the Natural Communities of Michigan*. East Lansing, MI: Michigan State University Press.

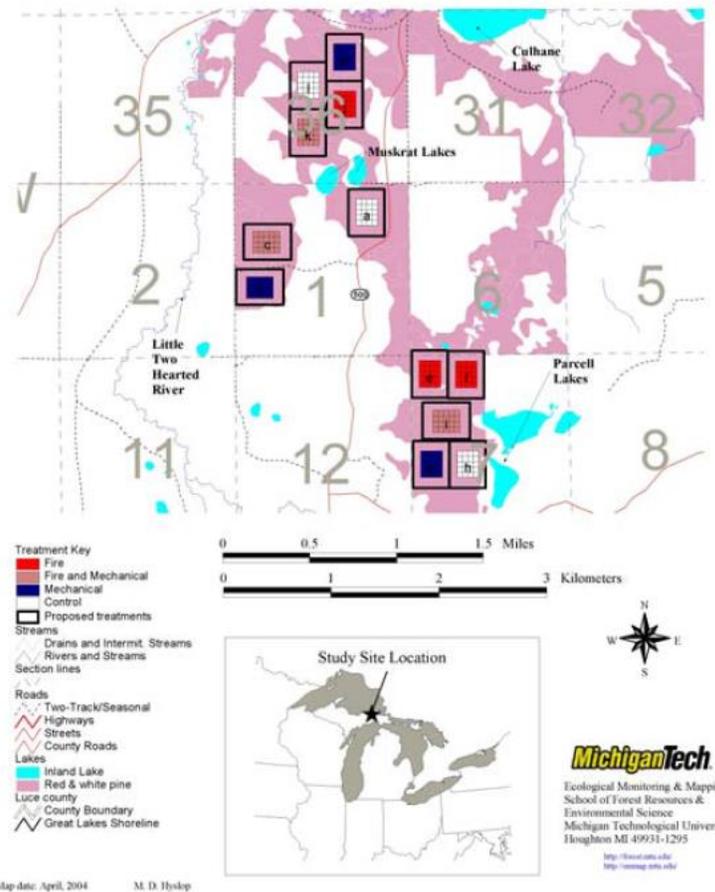
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Michigan Department of Natural Resources. *Muskrat Lakes (MIDNR); Underburning in Dry Pine Forests*. <http://conservationregistry.org/projects/100837>

Storer, A.J., Nagel, L.M., Haugen, L.M. 2008. *Interactions Among Prescribed Fire, Mechanical Treatments, Insect Pests and Pathogens in Red Pine*. Final Report, Michigan Technological University. Ppl 13.

Fire/Fire Surrogate Treatment Areas Muskrat Lakes Site

Luce County, MI



Jack pine dominated forests typically occur during the years following a large forest fire. *Photo attributed to mricon on Flickr (Flickr) [CC BY-SA 2.0 (<http://creativecommons.org/licenses/by-sa/2.0/>)], via Wikimedia Commons*