



Forest: Mesic conifer

Description

Mesic conifer forests have moist soils and are generally dominated by hemlock (*Tsuga canadensis*), balsam fir (*Abies balsamea*), or white pine (*Pinus strobus*). High soil moisture in mesic forests is often maintained by high canopy cover and a dense leaf litter. Mesic forests also commonly occur in transitional areas between dryer upland areas and wet lowland areas. Mature mesic conifer forests are characterized by shade-tolerant species, especially hemlock, but also sugar maple and American beech. Natural disturbances in mesic conifer forests include windthrow and fire. These forests generally have a relatively low density of herbaceous vegetation due to high canopy cover, low light infiltration, and nutrient poor needle litter. However, when mesic hardwoods are prevalent in the canopy, these systems can have very high spring wildflower densities. The soil moisture, thick layers of humus, and down woody debris within these forests can lead to very favorable habitat for fungal species, lichens, and other epiphytic flora.

General Condition of Feature

Much of the mesic conifer in the Western Upper Peninsula is considered to be in fair or good condition (~55%). The remaining areas are primarily degraded (~45%) due to fire suppression and deer browse. Mesic conifer forests include natural communities that are considered rare or uncommon in Michigan.

Associated Natural Communities

Boreal Forest

Dry-Mesic Northern Forest

Mesic Northern Forest

Wooded Dune and Swale Complex

Associated Species of Greatest Conservation Need

SNAILS

- delicate vertigo (*Vertigo bollesiana*)
- a land snail (*Vertigo paradoxa*)

INSECTS

- ringed boghaunter (*Williamsonia lintneri*)
- large marble (*Euchloe ausonides*)
- frigga fritillary (*Boloria frigga*)
- freiija fritillary (*Boloria freiija*)
- red-disked alpine (*Erebia discoidalis*)
- Macoun's arctic (*Oeneis macounii*)
- yellow-banded day-sphinx (*Proserpinus flavofasciata*)

AMPHIBIANS

- blue-spotted salamander (*Ambystoma laterale*)
- spotted salamander (*Ambystoma maculatum*)
- four-toed salamander (*Hemidactylium scutatum*)

REPTILES

- northern ringneck snake (*Diadophis punctatus edwardsii*)
- western fox snake (*Elaphe vulpina*)
- eastern hognose snake (*Heterodon platirhinos*)
- smooth green snake (*Liochlorophis vernalis*)

BIRDS

- Spruce Grouse (*Falcapennis canadensis*)
- Northern Bobwhite (*Colinus virginianus*)
- Bald Eagle (*Haliaeetus leucocephalus*)
- Cooper's Hawk (*Accipiter cooperii*)
- Northern Goshawk (*Accipiter gentilis*)
- Red-shouldered Hawk (*Buteo lineatus*)

BIRDS cont.

- Merlin (*Falco columbarius*)
- Black-billed Cuckoo (*Coccyzus erythrophthalmus*)
- Long-eared Owl (*Asio otus*)
- Common Nighthawk (*Chordeiles minor*)
- Northern Flicker (*Colaptes auratus*)
- Olive-sided Flycatcher (*Contopus cooperi*)
- Least Flycatcher (*Empidonax minimus*)
- Gray Jay (*Perisoreus canadensis*)
- Boreal Chickadee (*Poecile hudsonica*)
- Blackburnian Warbler (*Dendroica fusca*)
- Connecticut Warbler (*Oporornis agilis*)
- Canada Warbler (*Wilsonia canadensis*)
- Red Crossbill (*Loxia curvirostra*)
- White-winged Crossbill (*Loxia leucoptera*)
- Evening Grosbeak (*Coccothraustes vespertinus*)

MAMMALS

- pygmy shrew (*Sorex hoyi*)
- red bat (*Lasiurus borealis*)
- hoary bat (*Lasiurus cinereus*)
- lynx (*Lynx canadensis*)
- American marten (*Martes americana*)
- least chipmunk (*Tamias minimus*)
- northern flying squirrel (*Glaucomys sabrinus*)
- woodland jumping mouse (*Napaeozapus insignis*)
- southern red-backed vole (*Clethrionomys gapperi*)
- southern bog lemming (*Synaptomys cooperi*)
- deer mouse (*Peromyscus maniculatus gracilis*)
- snowshoe hare (*Lepus americanus*)

Associated Threats

MODIFICATION OF NATURAL PROCESSES

- Climate change
- Altered fire regime
- Fragmentation

CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Forestry practices: Poor forestry practices lead to structural oversimplification, a lack of diversity, and conversion to other forest types.

BIOLOGICAL INTERACTIONS

- Invasive plants and animals
- Disease, pathogens, and parasites: Pests like hemlock wooly adelgid (*Adelges tsugae*) and diseases like blister rust are threats.
- Other biological interactions: White-tailed deer (*Odocoileus virginianus*) browse may hinder regeneration.

OTHER

- Historic status/current abundance: Much of the mesic conifer forest was removed from the Western Upper Peninsula. Some recovery is under way, but this is hindered by a lack of seed trees.

Conservation Actions Needed [Threats addressed]

LAND & WATER PROTECTION

- Expand conservation easement programs [variety of threats]
- Support and expand conservation purchase of high quality occurrences [variety of threats]

LAND, WATER, & SPECIES MANAGEMENT

- Manage to approximate natural disturbance regimes using prescribed fire. [Altered fire regime]
- Develop and implement plans for invasive species control and prevention. [Invasive plants and animals]
- Identify and implement disease control measures. [Disease, pathogens and parasites]
- Manage deer densities to allow for natural regeneration within mesic conifers. [Other biological interactions]
- Develop and enforce best management practices which address the needs and values of wildlife. [Forestry practices]
- Manage for representation of all successional stages. [Forestry practices]
- Promote the closure of non-essential resource management roads and seek other road closure opportunities that do not conflict with other appropriate uses. [Fragmentation]
- Maintain and expend the eastern hemlock and white pine forest component where appropriate to better represent historic forest components and to provide for a greater diversity of plant and animal communities. [Forestry practices]
- Where large diameter tree snags and coarse woody debris are occasional or rare, seek to increase their volume. [Forestry practices]
- Support Landowner Incentive Programs to foster conservation on private land [variety of threats]

LAW & POLICY

- Work with municipalities to promote planning and zoning insuring the retention of larger parcel sizes in mesic conifers. [Fragmentation]

Research and Survey Needs

- An inventory needs to be conducted to determine the location, condition, and classification of mesic conifers and of the opportunities for restoration.
- Test the assumption that remnants are widely dispersed and becoming more fragmented resulting in a loss of species diversity.
- A better understanding is needed of the management needs and appropriate management techniques to maintain and improve mesic conifer features.
- A better understanding is needed of the temporal and spatial distribution of disturbance and its influence. What factors provide disturbance within mesic conifer communities?
- Identify the characteristics of mesic conifer systems that contribute to their value to wildlife and which species may be affected by changes in these characteristics.
- Identify invasive species and diseases that may degrade the value of mesic conifer sites for wildlife. Develop techniques to control invasive species. Develop treatments for diseases that threaten mesic conifers.
- Document the historic and current range of variation between mesic conifer sites. This includes variables such as species composition, age or size class, and stand size.
- Develop techniques to aid hemlock regeneration in mesic conifer systems.
- Determine whether differences exist in the value to wildlife of natural stands and forest plantations. Quantify the structural differences between these communities.

Monitoring

- Track woody species composition and diversity, with attention to structure and age class.
- Track the presence and abundance of invasive species.
- Track acreage and distribution of mesic conifers.
- Track hydrology patterns and water quality.
- Track hemlock regeneration.