



Forest: Mesic hardwood

Description

Mesic hardwood forests have moist soils and are generally dominated by American beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*), red oak (*Quercus rubra*), and basswood (*Tilia americana*). 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 dry upland areas and wet lowland areas. Mature mesic forests are often characterized by shade-tolerant species, especially sugar maple and American beech. The natural disturbance regime is characterized by gap phase dynamics: frequent, small windthrow gaps allow for the regeneration of shade-tolerant canopy dominants. These areas are characterized by a rich diversity of spring wildflowers and relatively high numbers of berry-producing herb and shrub species.

General Condition of Feature

Most of the mesic hardwood in the Eastern Upper Peninsula is considered to be in fair to good condition (~55%). Most of the remaining areas are considered degraded or very degraded (~40%). The mesic northern forest natural community is classified as rare or uncommon in the State.

Associated Natural Communities

Mesic Northern Forest

Associated Species of Greatest Conservation Need

SNAILS

- widespread column (*Pupilla muscorum*)
- delicate vertigo (*Vertigo bollesiana*)
- a land snail (*Vertigo paradoxa*)
- a land snail (*Guppya sterkii*)

INSECTS

- ringed boghaunter (*Williamsonia lintneri*)
- early hairstreak (*Erora laeta*)

AMPHIBIANS

- blue-spotted salamander (*Ambystoma laterale*)
- spotted salamander (*Ambystoma maculatum*)
- eastern tiger salamander (*Ambystoma tigrinum tigrinum*)
- four-toed salamander (*Hemidactylum scutatum*)

REPTILES

- northern ringneck snake (*Diadophis punctatus edwardsii*)
- western fox snake (*Elaphe vulpina*)
- smooth green snake (*Liochlorophis vernalis*)
- eastern massasauga (*Sistrurus catenatus catenatus*)
- wood turtle (*Glyptemys insculpta*)

BIRDS

- Northern Bobwhite (*Colinus virginianus*)
- Bald Eagle (*Haliaeetus leucocephalus*)
- Cooper's Hawk (*Accipiter cooperii*)
- Northern Goshawk (*Accipiter gentilis*)
- Red-shouldered Hawk (*Buteo lineatus*)
- Merlin (*Falco columbarius*)
- American Woodcock (*Scolopax minor*)
- Yellow-billed Cuckoo (*Coccyzus americanus*)

BIRDS cont.

- Red-headed Woodpecker (*Melanerpes erythrocephalus*)
- Northern Flicker (*Colaptes auratus*)
- Acadian Flycatcher (*Empidonax vireescens*)
- Least Flycatcher (*Empidonax minimus*)
- Boreal Chickadee (*Poecile hudsonica*)
- Wood Thrush (*Hylocichla mustelina*)
- Golden-winged Warbler (*Vermivora chrysoptera*)
- Northern Parula (*Parula americana*)
- Black-throated Blue Warbler (*Dendroica caerulescens*)
- Cerulean Warbler (*Dendroica cerulea*)
- Connecticut Warbler (*Oporornis agilis*)
- Canada Warbler (*Wilsonia canadensis*)
- Evening Grosbeak (*Coccothraustes vespertinus*)

MAMMALS

- smoky shrew (*Sorex fumeus*)
- pygmy shrew (*Sorex hoyi*)
- red bat (*Lasiurus borealis*)
- hoary bat (*Lasiurus cinereus*)
- northern bat or northern myotis (*Myotis septentrionalis*)
- gray wolf (*Canis lupus*)
- 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*)
- snowshoe hare (*Lepus americanus*)

Associated Threats

MODIFICATION OF NATURAL PROCESSES

- Fragmentation

HABITAT CONVERSION

- Industrial, residential, and recreational development

CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Forestry practices: Inappropriate forestry practices may lead to vertical simplification or a lack of species diversity. Some logging may be necessary to restore mesic hardwood systems.

BIOLOGICAL INTERACTIONS

- Invasive plants and animals: Invasive species such as garlic mustard (*Alliaria petiolata*), honeysuckles (*Lonicera tatarica*), glossy buckthorn (*Rhamnus frangula*), and emerald ash borer (*Agrilus planipennis*) may alter species composition. Invasive earthworms may contribute to increased erosion.
- Disease, pathogens, and parasites: Beech bark disease and other diseases may alter species composition.
- Other biological interactions: White-tailed deer (*Odocoileus virginianus*) browse may hinder regeneration, especially of oaks.

EDUCATION

- Social attitudes: There is a lack of understanding and appreciation by the public of the value to wildlife of forest structure and a multi-layer canopy.

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

- Institute invasive species monitoring, prevention and control programs. [Invasive plants and animals]
- Implement disease monitoring and control programs. [Disease, pathogens, and parasites]
- Manage white-tailed deer densities to allow for regeneration. [Other biological interactions; Social attitudes]
- Develop and implement forestry best management practices which address the value of mesic hardwood to wildlife. [Forestry practices; Incompatible natural resource management]
- 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]
- 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 adequate protection for mesic hardwood systems. [Industrial, residential and recreational development; Fragmentation]

EDUCATION & AWARENESS

- Educate local planning and zoning boards about the value of mesic hardwoods and methods to conserve mesic hardwood systems. [Industrial, residential and recreational development; Social attitudes]
- Create awareness in the general public of the value of mesic hardwoods and a complex forest structure to wildlife. [Social attitudes]

Research and Survey Needs

- An inventory needs to be conducted to determine the location, condition, and classification of mesic hardwoods and of the opportunities for restoration.
- Test the assumption that mesic hardwood 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 hardwood features.
- A better understanding is needed of the temporal and spatial distribution of disturbance and its influence. What factors provide disturbance within mesic hardwood communities?
- Identify the characteristics of mesic hardwood 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 hardwood sites for wildlife. Develop techniques to control invasive species. Develop treatments for diseases that threaten mesic hardwoods. Common invasive species and diseases include emerald ash borer (*Agrilus planipennis*), oak wilt, ash decline, and beech bark disease.
- Evaluate whether mesic hardwood communities act as corridors. These systems are common along river floodplains and may provide a linear forested feature on the landscape. Are these riparian systems sinks to some species?
- Document the historic and current range of variation between mesic hardwood sites. This includes variables such as species composition, age or size class, and stand size.

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 lowland hardwoods.
- Track hydrology patterns and water quality.