



## Forest: Lowland hardwood

### Description

Lowland hardwood areas have seasonally or permanently saturated soils and are dominated by moisture-tolerant hardwood trees such as silver maple (*Acer saccharinum*), red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), black ash (*Fraxinus nigra*), American elm (*Ulmus americana*), yellow birch (*Betula alleghaniensis*), pin oak (*Quercus palustris*), swamp white oak (*Quercus bicolor*), and cottonwood (*Populus deltoides*). These areas are often adjacent to open wetlands, lakes, rivers, or streams. Natural disturbances in lowland hardwood forests include prolonged flooding, fluvial erosion or deposition, windthrow, and infrequent fire.

### General Condition of Feature

Most of the lowland hardwood in the Western Upper Peninsula is considered to be in fair or good condition (~80%). Most of the remaining areas are considered degraded. Lowland hardwoods include natural communities that are considered rare or uncommon in the State.

### Associated Natural Communities

Hardwood-Conifer Swamp  
Northern Swamp  
Southern Floodplain Forest

### Associated Species of Greatest Conservation Need

#### SNAILS

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

#### INSECTS

spatterdock damer (*Aeshna mutata*)  
arrowhead spiketail (*Cordulegaster obliqua*)  
ringed boghaunter (*Williamsonia lintneri*)

#### AMPHIBIANS

blue-spotted salamander (*Ambystoma laterale*)  
spotted salamander (*Ambystoma maculatum*)  
four-toed salamander (*Hemidactylium scutatum*)  
boreal chorus frog (*Pseudacris triseriata maculata*)  
western chorus frog (*Pseudacris triseriata triseriata*)

#### REPTILES

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

#### BIRDS

Spruce Grouse (*Falcipennis canadensis*)  
Green Heron (*Butorides virescens*)  
Bald Eagle (*Haliaeetus leucocephalus*)  
Northern Goshawk (*Accipiter gentilis*)  
Red-shouldered Hawk (*Buteo lineatus*)  
Merlin (*Falco columbarius*)  
American Woodcock (*Scolopax minor*)  
Yellow-billed Cuckoo (*Coccyzus americanus*)

#### BIRDS cont.

Northern Flicker (*Colaptes auratus*)  
Northern Shrike (*Lanius excubitor*)  
Wood Thrush (*Hylocichla mustelina*)  
Golden-winged Warbler (*Vermivora chrysoptera*)  
Northern Parula (*Parula americana*)  
Cerulean Warbler (*Dendroica cerulea*)  
Canada Warbler (*Wilsonia canadensis*)  
Evening Grosbeak (*Coccothraustes vespertinus*)

#### MAMMALS

pygmy shrew (*Sorex hoyi*)  
silver-haired bat (*Lasionycteris noctivagans*)  
red bat (*Lasiurus borealis*)  
hoary bat (*Lasiurus cinereus*)  
northern bat or northern myotis (*Myotis septentrionalis*)  
eastern pipistrelle (*Pipistrellus subflavus*)  
gray wolf (*Canis lupus*)  
cougar (*Puma concolor*)  
least weasel (*Mustela nivalis*)  
moose (*Alces alces*)  
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

- Altered hydrologic regimes: Changes to the hydrologic regime may result in altered species composition, increased vulnerability to invasive species, or development. Adjacent forestry practices may increase the likelihood of erosion, increased nutrient loads, and flooding.

#### CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Forestry practices: Poor forestry planning may result in harvests at suboptimal intervals, runoff, and other significant impacts.

#### BIOLOGICAL INTERACTIONS

- Invasive plants and animals: Invasive insects such as the Emerald Ash Borer (*Agrilus planipennis* Fairmaire) may alter species composition.

- Other biological interactions: White-tailed deer (*Odocoileus virginianus*) browse may hinder regeneration, especially of oak.

#### 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 by restoring water flow patterns. [Altered hydrologic regimes]
- Develop and implement plans for invasive species control and prevention. [Invasive plants and animals]
- Manage deer densities to allow for natural regeneration within lowland hardwoods. [Other biological interactions]
- Develop and enforce best management practices for forestry management that address wildlife needs and values. [Forestry practices; Altered hydrologic regimes]
- Manage for representation of all successional stages. [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*

- Develop stronger wetland protection and mitigation laws. [Forestry practices]

#### Research and Survey Needs

- An inventory needs to be conducted to determine the location, condition, and classification of remnants 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 lowland hardwood features.
- A better understanding is needed of the temporal and spatial distribution of disturbance and its influence. What factors provide disturbance within lowland hardwood communities? Historically, hydrology probably provided many disturbance events.
- Identify the characteristics of lowland hardwood systems that contribute to their value to wildlife and which species may be affected by changes in these characteristics.
- Identify invasive species that may degrade the value of lowland hardwood sites for wildlife. Develop techniques to control invasive species. Common invasive species include emerald ash borer (*Agrilus planipennis*), autumn olive (*Elaeagnus umbellata*) and glossy buckthorn (*Rhamnus frangula*).
- Evaluate whether lowland hardwood communities act as corridors. These systems are common along rivers and may provide a linear forested feature on the landscape. Are these riparian systems sinks to some species?
- Determine whether site characteristics exist which favor the establishment and retention of lowland hardwood communities over shrub or grassland communities.
- Document the historic and current range of variation between lowland hardwood sites. This includes variables such as species composition, age or size class, and stand size.
- Develop a classification system for lowland forest types (based on characteristics such as soil nutrients, moisture regimes, and successional pathways) similar to John Kotar's classification of upland forest types.
- Evaluate the use of silvicultural treatments, such as periodic selection and improvement harvests, in accelerating the process of restoring northern hardwood forests to a resilient, more complex, mature forest.

#### 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.