



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

Much of the lowland hardwood in the Northern Lower Peninsula is considered degraded (~55%). Most of the remaining areas are considered to be in fair or good condition (~45%). Lowland hardwood natural communities are classified as rare or uncommon in the State.

Associated Natural Communities

Hardwood-Conifer Swamp
Northern Swamp
Southern Floodplain Forest

Associated Species of Greatest Conservation Need

SNAILS

widespread column (*Pupilla muscorum*)
Foster mantleslug (*Pallifera fosteri*)
Carolina mantleslug (*Philomycus carolinianus*)
spike-lip crater (*Appalachina sayana*)

INSECTS

spatterdock darner (*Aeshna mutata*)
arrowhead spiketail (*Cordulegaster obliqua*)
ringed boghaunter (*Williamsonia lintneri*)
a spur-throat grasshopper (*Melanoplus eurycerus*)
post-oak grasshopper (*Dendrotettix quercus*)
Davis's shield-bearer (*Atlantius davisii*)
barrens buckmoth (*Hemileuca maia*)
three-horned moth (*Pachypolia atricornis*)

AMPHIBIANS

blue-spotted salamander (*Ambystoma laterale*)
spotted salamander (*Ambystoma maculatum*)
eastern tiger salamander (*Ambystoma tigrinum tigrinum*)
four-toed salamander (*Hemidactylium scutatum*)
Fowler's toad (*Bufo fowleri*)
western chorus frog (*Pseudacris triseriata triseriata*)

REPTILES

northern ringneck snake (*Diadophis punctatus edwardsii*)
eastern fox snake (*Elaphe gloydi*)
black rat snake (*Elaphe obsoleta obsoleta*)
eastern hognose snake (*Heterodon platirhinos*)
smooth green snake (*Liochlorophis vernalis*)
queen snake (*Regina septemvittata*)
eastern massasauga (*Sistrurus catenatus catenatus*)
spotted turtle (*Clemmys guttata*)
wood turtle (*Glyptemys insculpta*)
eastern box turtle (*Terrapene carolina carolina*)

BIRDS

Great Blue Heron (*Ardea herodias*)
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*)
Northern Flicker (*Colaptes auratus*)
Acadian Flycatcher (*Empidonax virescens*)
Northern Shrike (*Lanius excubitor*)
Wood Thrush (*Hylocichla mustelina*)
Golden-winged Warbler (*Vermivora chrysoptera*)
Northern Parula (*Parula americana*)
Cerulean Warbler (*Dendroica cerulea*)
Prothonotary Warbler (*Protonotaria citrea*)
Louisiana Waterthrush (*Seiurus motacilla*)
Hooded Warbler (*Wilsonia citrina*)
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*)
Indiana bat or Indiana myotis (*Myotis sodalis*)
eastern pipistrelle (*Pipistrellus subflavus*)
least weasel (*Mustela nivalis*)
northern flying squirrel (*Glaucomys sabrinus*)
woodland jumping mouse (*Napaeozapus insignis*)
southern red-backed vole (*Clethrionomys gapperi*)
woodland vole (*Microtus pinetorum*)
southern bog lemming (*Synaptomys cooperi*)
snowshoe hare (*Lepus americanus*)

Associated Threats

MODIFICATION OF NATURAL PROCESSES

- Altered fire regime: A lack of fire may result in succession and a change in community composition.

- Altered hydrologic regimes: Changes to the hydrologic regime may result in altered species composition or increased vulnerability to invasive species or development. Removal of beavers (*Castor canadensis*) may alter hydrologic regimes.
- Fragmentation

HABITAT CONVERSION

- Industrial, residential, and recreational development
- Dredging and channelization
- Incompatible natural resource management

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*) may alter species composition.
- Disease, pathogens, and parasites: Diseases like Dutch elm disease may alter species composition.
- Other biological interactions: White-tailed deer (*Odocoileus virginianus*) browse may hinder regeneration.

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]
- Institute invasive species monitoring, prevention and control programs. [Invasive plants and animals]
- Manage local beaver densities to maintain lowland hardwood systems. [Altered hydrologic regimes; Incompatible natural resource management]
- Institute disease monitoring and control programs. [Disease, pathogens, and parasites]
- Manage white-tailed deer densities to allow for regeneration within lowland hardwoods. [Other biological interactions]
- Consider wildlife values, timber values, and natural landcover and conditions when selecting vegetative species composition as part of management of these areas [Incompatible natural resource management]
- Work with private and public land managers to develop priorities for lowland hardwood restoration and management. [Fragmentation; Incompatible natural resource management; Forestry practices]
- Develop forestry best management practices that addresses the wildlife value of lowland hardwoods. [Forestry practices]
- Manage for representation of all successional stages. [Incompatible natural resource management; 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. [Incompatible natural resource management; 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 lowland hardwood systems or their conversion to features that have greater wildlife value. [Fragmentation; Industrial, residential and recreational development]

Research and Survey Needs

- An inventory needs to be conducted to determine the location, condition, and classification of lowland hardwood remnants and of the opportunities for restoration.
- Test the assumption that lowland 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 lowland hardwood features.
- A better understanding is needed of the temporal and spatial distribution of disturbance and its influence on lowland hardwoods. 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*).

MICHIGAN'S WILDLIFE ACTION PLAN
TERRESTRIAL SYSTEMS: NORTHERN LOWER PENINSULA

- 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.

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.