



## Forest: Lowland conifer

### Description

Lowland conifer forests have seasonally or permanently saturated soils and are dominated by moisture-tolerant conifers such as black spruce (*Picea mariana*), tamarack (*Larix laricina*), white cedar (*Thuja occidentalis*), balsam fir (*Abies balsamea*), and jack pine (*Pinus banksiana*). These areas are often adjacent to open wetlands, lakes, rivers, or streams. They are characterized by diverse microtopography and ground cover (especially in systems dominated by cedar or tamarack). Natural disturbances in lowland conifer forests include seasonal and beaver-induced flooding, windthrow, and fire.

### General Condition of Feature

Much of the lowland conifer in the Northern Lower Peninsula is considered degraded or very degraded (~60%). Most of the remaining areas are considered to be in fair or good condition (~35%). Some lowland conifer natural communities are classified as rare or uncommon in the State, and sometimes globally.

### Associated Natural Communities

Boreal Forest	Rich Conifer Swamp
Hardwood-Conifer Swamp	Wooded Dune and Swale Complex
Poor Conifer Swamp	

### Associated Species of Greatest Conservation Need

#### SNAILS

- eastern flat-whorl (*Planogyra asteriscus*)
- widespread column (*Pupilla muscorum*)
- tapered vertigo (*Vertigo elatior*)
- deep-throat vertigo (*Vertigo nylanderii*)
- Foster mantleslug (*Pallifera fosteri*)
- Carolina mantleslug (*Philomycus carolinianus*)
- spike-lip crater (*Appalachina sayana*)

#### INSECTS

- Hine's emerald dragonfly (*Somatochlora hineana*)
- incurvate emerald dragonfly (*Somatochlora incurvata*)
- ringed boghaunter (*Williamsonia lintneri*)
- pine imperial moth (*Eacles imperialis pini*)
- 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*)
- 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*)
- eastern box turtle (*Terrapene carolina carolina*)

#### BIRDS

- Spruce Grouse (*Falcapennis canadensis*)
- Great Blue Heron (*Ardea herodias*)
- Osprey (*Pandion haliaetus*)
- Bald Eagle (*Haliaeetus leucocephalus*)
- Northern Goshawk (*Accipiter gentilis*)
- Red-shouldered Hawk (*Buteo lineatus*)
- Merlin (*Falco columbarius*)
- American Woodcock (*Scolopax minor*)
- Long-eared Owl (*Asio otus*)
- Black-backed Woodpecker (*Picoides arcticus*)
- Northern Flicker (*Colaptes auratus*)
- Olive-sided Flycatcher (*Contopus cooperi*)
- Northern Shrike (*Lanius excubitor*)
- Ruby-crowned Kinglet (*Regulus calendula*)
- Northern Parula (*Parula americana*)
- 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*)
- water shrew (*Sorex palustris*)
- silver-haired bat (*Lasionycteris noctivagans*)
- red bat (*Lasiurus borealis*)
- hoary bat (*Lasiurus cinereus*)
- northern bat or northern myotis (*Myotis septentrionalis*)
- American marten (*Martes americana*)
- 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*)
- deer mouse (*Peromyscus maniculatus gracilis*)
- snowshoe hare (*Lepus americanus*)

### Associated Threats

#### *MODIFICATION OF NATURAL PROCESSES*

- Altered fire regime
- Altered hydrologic regimes: Changes in the hydrologic regime may influence species composition. Beavers may alter natural hydrologic regimes.
- Fragmentation

#### *HABITAT CONVERSION*

- Industrial, residential, and recreational development: Residential development is a threat to lowland conifers.
- Wetland modifications
- Incompatible natural resource management: Retention of lowland shrubs prevents succession to forested feature types. A lack of management may result in a lack of regeneration. Water level manipulations may be detrimental to lowland conifers.

#### *CONSUMPTIVE BIOLOGICAL RESOURCE USE*

- Forestry practices

#### *NON-CONSUMPTIVE BIOLOGICAL RESOURCE USE*

- Non-consumptive recreation

#### *BIOLOGICAL INTERACTIONS*

- 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]
- Manage local beaver densities to create and maintain lowland conifer systems. [Altered hydrologic regimes]
- Manage white-tailed deer densities to allow for regeneration within lowland conifers. [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]
- Develop and implement forestry best management practices which address the value of lowland conifers to wildlife. [Incompatible natural resource management; 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]
- Avoid motorized trail construction in cedar swamps and hardwood-conifer swamps [Industrial, residential, and recreational development]
- To the extent possible cedar harvest should be limited to sites where a high probability exists for successful regeneration. [Forestry practices]
- 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 conifer systems. [Fragmentation; Industrial, residential and recreational development]
- Develop and enforce regulations to curtail recreational activities that cause significant damage. [Non-consumptive recreation]

#### *RECREATION*

- Promote responsible ATV and ORV use. [Non-consumptive recreation]

### Research and Survey Needs

- An inventory needs to be conducted to determine the location, condition, and classification of lowland conifers and of the opportunities for restoration.
- Test the assumption that lowland conifer 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 conifer features.
- A better understanding is needed of the temporal and spatial distribution of disturbance and its influence on lowland conifer communities. What factors provide disturbance within lowland conifer communities?

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

- Identify the characteristics of lowland 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 lowland conifer sites for wildlife. Develop techniques to control invasive species. Develop treatments for diseases that threaten lowland conifers.
- Evaluate whether lowland conifer 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?
- Document the historic and current range of variation between lowland conifer 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.
- Develop techniques to aid cedar regeneration in lowland conifer systems.

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 conifers.
- Track hydrology patterns and water quality.
- Track cedar regeneration.