



## 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

Most of the lowland conifer in the Western Upper Peninsula is considered to be in fair or good condition (~80%). Much of the remaining area is considered degraded. 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*)  
 delicate vertigo (*Vertigo bollesiana*)  
 a land snail (*Vertigo paradoxa*)  
 a land snail (*Euconulus alderi*)

#### INSECTS

muskeg damer (*Aeshna subarctica*)  
 ocellated damer (*Boyeria grafiana*)  
 lake emerald (*Somatochlora cingulata*)  
 ringed boghaunter (*Williamsonia lintneri*)  
 large marble (*Euchloe ausonides*)  
 frigga fritillary (*Boloria frigga*)  
 freija fritillary (*Boloria freija*)  
 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*)  
 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*)

#### 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*)

#### BIRDS cont.

Black-backed Woodpecker (*Picoides arcticus*)  
 Northern Flicker (*Colaptes auratus*)  
 Olive-sided Flycatcher (*Contopus cooperi*)  
 Northern Shrike (*Lanius excubitor*)  
 Gray Jay (*Perisoreus canadensis*)  
 Boreal Chickadee (*Poecile hudsonica*)  
 Ruby-crowned Kinglet (*Regulus calendula*)  
 Northern Parula (*Parula americana*)  
 Blackburnian Warbler (*Dendroica fusca*)  
 Palm Warbler (*Dendroica palmarum*)  
 Connecticut Warbler (*Oporornis agilis*)  
 Canada Warbler (*Wilsonia canadensis*)  
 Red Crossbill (*Loxia curvirostra*)  
 White-winged Crossbill (*Loxia leucoptera*)  
 Evening Grosbeak (*Coccothraustes vespertinus*)

#### MAMMALS

arctic shrew (*Sorex arcticus*)  
 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*)  
 gray wolf (*Canis lupus*)  
 cougar (*Puma concolor*)  
 lynx (*Lynx canadensis*)  
 American marten (*Martes americana*)  
 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*)  
 deer mouse (*Peromyscus maniculatus gracilis*)  
 snowshoe hare (*Lepus americanus*)

**MICHIGAN'S WILDLIFE ACTION PLAN**  
**TERRESTRIAL SYSTEMS: WESTERN UPPER PENINSULA**

Associated Threats

*MODIFICATION OF NATURAL PROCESSES*

- Altered fire regime
- Altered hydrologic regimes: Changes in the hydrologic regime may influence species composition.

*CONSUMPTIVE BIOLOGICAL RESOURCE USE*

- Forestry practices: Some forestry practices may alter species composition.

*BIOLOGICAL INTERACTIONS*

- Invasive plants and animals
- Disease, pathogens, and parasites: Pests, such as spruce bud worm (*Choristoneura fumiferana*), affect species health.
- Other biological interactions: White-tailed deer (*Odocoileus virginianus*) browse may hinder regeneration, especially of oaks.

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 and restoration of water flow patterns. [Altered fire regime; Altered hydrologic regimes]
- 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 lowland 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]
- Where large diameter tree snags and coarse woody debris are occasional or rare, seek to increase their volume. [Forestry practices]
- To the extent possible cedar harvest should be limited to sites where a high probability exists for successful regeneration. [Forestry practices]
- Where appropriate, encourage silvicultural practices that favor conifer regeneration over hardwoods. [Forestry practices]
- Support Landowner Incentive Programs to foster conservation on private land [variety of threats]

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 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. What factors provide disturbance within lowland conifer communities?
- 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.