



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

About half of the lowland conifer in the Eastern Upper Peninsula is considered to be in fair or good condition and about half is considered degraded or very degraded. Some lowland conifer natural communities are classified as rare or uncommon in the State.

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*)
- delicate vertigo (*Vertigo bollesiana*)
- tapered vertigo (*Vertigo elatior*)
- deep-throat vertigo (*Vertigo nylanderii*)
- a land snail (*Vertigo paradoxa*)
- a land snail (*Euconulus alderi*)

INSECTS

- lake emerald (*Somatochlora cingulata*)
- Hine's emerald dragonfly (*Somatochlora hineana*)
- incurvate emerald dragonfly (*Somatochlora incurvata*)
- ringed boghaunter (*Williamsonia lintneri*)
- northern blue (*Lycæides idas nabokovi*)
- frigga fritillary (*Boloria frigga*)
- freiija fritillary (*Boloria freiija*)

AMPHIBIANS

- blue-spotted salamander (*Ambystoma laterale*)
- spotted salamander (*Ambystoma maculatum*)
- eastern tiger salamander (*Ambystoma tigrinum tigrinum*)
- 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*)
- eastern massasauga (*Sistrurus catenatus catenatus*)

BIRDS

- Spruce Grouse (*Falci pennis canadensis*)
- Great Blue Heron (*Ardea herodias*)
- Osprey (*Pandion haliaetus*)

BIRDS cont.

- 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*)
- 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*)
- smoky shrew (*Sorex fumeus*)
- 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*)
- 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*)

MAMMALS cont.
snowshoe hare (*Lepus americanus*)

Associated Threats

MODIFICATION OF NATURAL PROCESSES

- Altered fire regime: Natural fire regimes in lowland conifers contain long cycles; there is a lack of the use of fire to manage these systems.
- Altered hydrologic regimes: Changes in the hydrologic regime may influence species composition.

HABITAT CONVERSION

- Incompatible natural resource management: After harvesting, species composition may change despite regeneration goals (e.g., the target community composition may be cedar, but balsam component grows instead).

CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Forestry practices

BIOLOGICAL INTERACTIONS

- Invasive plants and animals: While currently not a major problem, invasives such as gloss buckthorn have the potential to severely alter lowland conifer areas
- Other biological interactions: White-tailed deer (*Odocoileus virginianus*) and snowshoe hare (*Lepus americanus*) browse may hinder regeneration, especially of hemlock (*Tsuga canadensis*) and white cedar (*Thuja occidentalis*).

EDUCATION

- Lack of scientific knowledge: There is a lack of experience using fire for management in lowland conifer systems.

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 by restoring water flow patterns. [Altered hydrologic regimes; Altered fire regime]
- Manage white-tailed deer and snowshoe hare densities to allow for vegetation regeneration. [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 to wildlife of lowland conifer systems. [Forestry practices; Incompatible natural resource management]
- Manage for representation of all successional stages. [Incompatible natural resource management; Forestry practices]
- Avoid motorized trail construction in cedar swamps and hardwood-conifer swamps [Incompatible natural resource management]
- 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]

EDUCATION & AWARENESS

- Work with land managers to develop priorities for lowland conifer restoration and management. [Incompatible natural resource management; Forestry practices]
- Develop strategies for the use of fire as a management tool in lowland conifer systems and provide training to managers on its use. [Altered fire regime]

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. 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.

MICHIGAN'S WILDLIFE ACTION PLAN
TERRESTRIAL SYSTEMS: EASTERN UPPER PENINSULA

- 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.
- Track cedar regeneration.