

USGS-NPS Vegetation Mapping Program

Isle Royale National Park

Thuja occidentalis - (Picea mariana, Abies balsamea) / Alnus incana Forest

COMMON NAME	Northern White-cedar - (Black Spruce, Balsam Fir) / Speckled Alder Forest
SYNONYM	White Cedar - (Mixed Conifer) / Alder Swamp
PHYSIOGNOMIC CLASS	Forest (I)
PHYSIOGNOMIC SUBCLASS	Evergreen forest (I.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar needle-leaved evergreen forest (I.A.8)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural (I.A.8.N)
FORMATION	Saturated temperate or subpolar needle-leaved evergreen forest (I.A.8.N.g)
ALLIANCE	THUJA OCCIDENTALIS SATURATED FOREST ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 2

USFWS WETLAND SYSTEM TERRESTRIAL

RANGE

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This community is common and widespread throughout the park.

Globally

This community is found in northern Minnesota, northern Wisconsin, Upper and Lower Michigan, southeastern Manitoba, and northwestern Ontario.

ENVIRONMENTAL DESCRIPTION

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This community occupies wet depressions that are either flat or have a gentle slope, at elevations ranging from about 605 to 1000 feet. Soils are peat or muck, poorly to very poorly drained, and saturated to seasonally flooded.

Globally

This community is found on level to gently sloping ground with wet, organic (Sims *et al.* 1989) or mineral soil (MN NHP 1993). Stands typically occur along the margins of peatlands, in drainage courses, or shallow depressions. The substrate has moderately minerotrophic conditions over deep peat. Hummock and hollow microtopography is usually well developed. In wetter stands, there is often standing water present in the hollows. Coarse woody debris can be significant. The water regime is saturated.

Schwintzer and Tomberlin (1982) reported detailed results on the chemical characteristics of the ground water of several wetland types in Lower Michigan. They found that it was difficult to differentiate swamps dominated by conifers from those dominated by other vegetation on the basis of ground water. The swamps were moderately to strongly minerotrophic and had circumneutral pH.

MOST ABUNDANT SPECIES

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<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Thuja occidentalis</i>
Tall shrub	<i>Alnus incana</i>
Short shrub	<i>Rhamnus alnifolius</i>
Forb	<i>Symplocarpus foetidus</i>
Graminoid	<i>Calamagrostis canadensis</i>

Globally

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Thuja occidentalis</i>
Tall shrub	<i>Alnus incana</i>
Forb	<i>Coptis trifolia</i> , <i>Maianthemum canadense</i>
Graminoid	<i>Calamagrostis canadensis</i> , <i>Carex disperma</i> , <i>Carex leptalea</i>
Nonvascular	<i>Hylocomium splendens</i> , <i>Rhytidiadelphus triquetrus</i> , <i>Sphagnum</i> spp.

CHARACTERISTIC SPECIES

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Thuja occidentalis, *Alnus incana*, *Symplocarpus foetidus*

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Globally

Thuja occidentalis, *Alnus incana*, *Coptis trifolia*, *Carex disperma*, *Hylocomium splendens*, *Sphagnum* spp.

VEGETATION DESCRIPTION

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At Isle Royale NP, this white cedar -(mixed conifer) swamp is a wooded wetland that has variable canopy cover, ranging from 25 to 90%. *Thuja occidentalis* is the most abundant canopy tree (average 30% cover); *Larix laricina* and *Picea mariana* may also be common. The tall shrub layer varies from 5 to 70% cover; *Alnus incana* is the most abundant tall shrub (average 26% cover). Saplings of *Thuja occidentalis* and *Picea mariana* are also common in tall or short shrub layers. The short shrub layer usually varies from 5 to 30% cover; *Ledum groenlandicum*, and *Rhamnus alnifolia* are characteristic shrubs. Cover of herbs is usually from 50 to 80%; the most abundant herbs are *Symplocarpus foetidus*, *Calamagrostis canadensis*, and *Carex stricta*. Other characteristic herbs include *Cornus canadensis*, *Carex trisperma*, *Iris versicolor*, *Coptis trifolia*, *Mitella nuda*, *Maianthemum trifolium*, *Menyanthes trifoliata*, *Linnaea borealis*, *Clintonia borealis*, *Trientalis borealis*, *Viola renifolia*, *Caltha palustris*, and *Glyceria striata*. Nonvascular cover varies from 5 to 80%. The most abundant mosses are *Sphagnum* spp.

Globally

The canopy is often moderately dense to dense (MN NHP 1993). Basal areas of 42.2-62.2 m²/ha and densities of 2457-7565 stems/ha have been reported in four stands in Lower Michigan, using a tree definition of woody stems greater than 2.5 cm dbh (Schwintzer 1981). The understory structure consists of high hummocks and deep, water-filled hollows, with fallen, moss-covered logs common. *Thuja occidentalis* is usually moderately to strongly dominant in the canopy, but occasionally *Picea mariana* may overtop the subdominant *Thuja occidentalis*. Other species include *Abies balsamea*, *Acer rubrum*, *Betula papyrifera*, *Fraxinus nigra*, *Larix laricina* and, more rarely, *Picea glauca* (in northern Minnesota and northwestern Ontario), or *Tsuga canadensis* (eastward). The shrub layer in this community is sparse to dense, in inverse proportion to the tree canopy. Species present in this stratum include *Alnus incana*, *Chamaedaphne calyculata*, *Cornus sericea*, *Gaultheria hispidula*, *Ledum groenlandicum*, *Linnaea borealis*, *Rosa acicularis*, *Rubus pubescens*, and *Vaccinium myrtilloides*. *Nemopanthus mucronatum* and *Viburnum cassinoides* are more common eastward. Species diversity in the herbaceous layer can be very high. The most common species are *Carex* spp. (including *Carex disperma*, *Carex leptalea*), *Coptis trifolia*, *Cornus canadensis*, *Clintonia borealis*, *Dryopteris carthusiana*, *Galium triflorum*, *Maianthemum canadense*, *Mitella nuda*, *Trientalis borealis*, and *Viola renifolia*. Mosses include *Hylocomium splendens*, *Pleurozium schreberi*, *Ptilium crista-castrensis*, *Rhytidiadelphus triquetrus*, *Sphagnum capillifolium*, *Sphagnum girgensohnii*, and *Sphagnum magellanicum*. Moss cover may be thin where the canopy is very dense. Diagnostic species include *Thuja occidentalis* as a dominant/co-dominant species, with a combination of acidic and minerotrophic understory species, such as *Alnus incana* and *Cornus sericea*. (Sims *et al.* 1989, Harris *et al.* 1996, Chambers *et al.* 1997).

OTHER NOTEWORTHY SPECIES

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Information not available

CONSERVATION RANK G4.

DATABASE CODE CEG002456

MAP UNITS 07

COMMENTS

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At Isle Royale NP this community has a variable physiognomy, occurring as either a woodland (25 to 60% canopy cover) or a forest (60 to 100% canopy cover).

Globally

Tipup mounds caused by blowdowns are common, in part because the very wet soils permit only shallow rooting by *Thuja occidentalis*.

REFERENCES

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