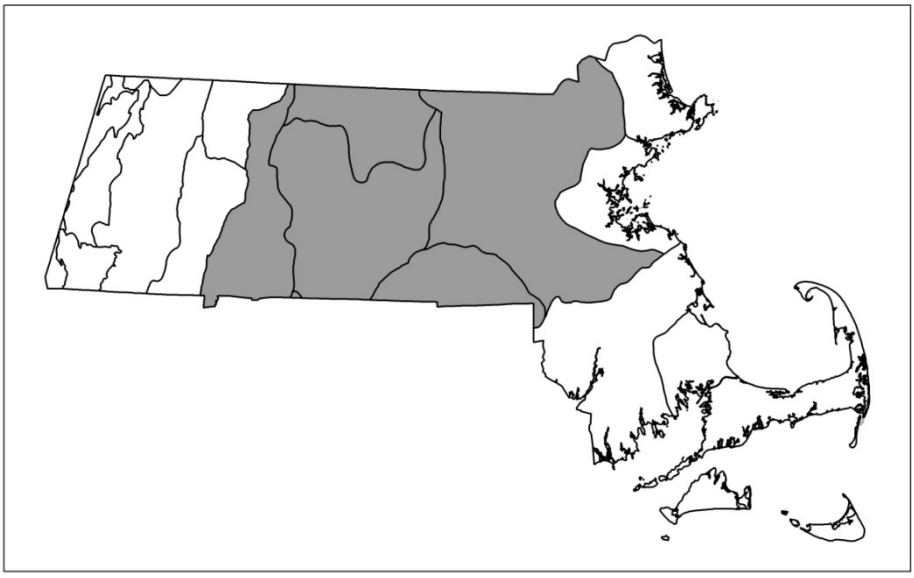
Inland Atlantic White Cedar Swamp

Community Code: CP1B1A2000

State Rank: S2



Concept: Inland basin or seepage swamps dominated by Atlantic white cedar in the overstory. Hemlock, spruce, red maple, and yellow birch co-occur, and coastal indicator species are lacking.

Environmental Setting: Inland Atlantic White Cedar Swamps generally occur in the central part of the state in basins or seepage wetlands at a wide range of elevations. As in all Atlantic white cedar swamps, water-saturated peat overlies the mineral sediments (sand and gravel, glacial lake sediments, or till deposits), and standing water generally occurs for half of the growing season or longer. There is typically some surface water movement, and some sites receive groundwater seepage from nearby steep till deposits. The water and soil are nutrient-poor, and particularly low in nitrogen and phosphorus. Soil pH is acidic (3.1-5.5) and leaf litter decomposition is slow. When conifers dominate the canopy, occurrences may be dark and have limited understory growth. Fallen and tipped trees are common and the resultant openings become tangles with dense shrub and sapling growth around downed trunks.

Vegetation Description: Atlantic white cedar swamps are defined as having >25% cover of Atlantic white cedar in the canopy. Associated canopy trees in Inland Atlantic White Cedar Swamps differ depending on elevation. In sites lower than 700 ft. elevation, Atlantic white cedar (*Chamaecyparis thyoides*) is mixed with hemlock (*Tsuga canadensis*), red maple (*Acer rubrum*), and yellow birch (*Betula alleghaniensis*). At elevations above 700 ft., Atlantic white cedar is mixed with hemlock and spruce (*Picea* spp.). The low-elevation sites typically have sweet pepper-bush (*Clethra alnifolia*) and winterberry (*Ilex verticillata*) in the shrub layer, and high-elevation sites have abundant mountain holly (*Ilex mucronata*). The herb layer of both low- and

high-elevation sites is similar, with cinnamon fern (*Osmundastrum cinnamomeum*), starflower (*Lysimachia borealis*), and Canada mayflower (*Maianthemum canadense*) common. High-elevation sites also have northern species such as creeping snowberry (*Gaultheria hispidula*) and bunchberry (*Chamaepericlymenum canadense*).

Differentiating Occurrences: Although each of the Atlantic white cedar swamp community types has a characteristic vegetation structure and composition, as with all natural communities, transitions and mixes do occur. Coastal Atlantic White Cedar Swamps generally occur below 60 ft. elevation and in southeastern Massachusetts (the Cape and Islands, Plymouth and Bristol Counties). In Coastal Atlantic White Cedar Swamps, pitch pine (*Pinus rigida*) is an occasional canopy associate seldom found in other Atlantic white cedar swamp types. Other species that are found in greater abundance in coastal sites than elsewhere include greenbrier (*Smilax rotundifolia*), the shrubs inkberry (*Ilex glabra*), dangleberrry (*Gaylussacia frondosa*), sheep laurel (*Kalmia angustifolia*), and fetterbush (*Eubotrys racemosa*), and the ferns Virginia chain-fern and netted chain-fern (*Woodwardia virginica* and *W. areolata*). Inland Atlantic White Cedar Swamps typically occur at elevations > 60 ft. above sea level and not in southeast Massachusetts. Yellow birch (*Betula alleghaniensis*) is more common than in Coastal Atlantic White Cedar Swamps. Inland Atlantic White Cedar Swamps have lower abundance of coastal indicators than Coastal Atlantic White Cedar Swamps. High-elevation Inland Atlantic White Cedar Swamps also have northern species such as creeping snowberry (*Gaultheria hispidula*) and bunchberry (*Chamaepericlymenum canadense*). Northern Atlantic White Cedar Swamps are codominated by northern conifers such as black and red spruce (*Picea mariana* and *P. rubens*) and balsam fir (*Abies balsamea*). Shrubs and herbs are similar to those found in high-elevation Inland Atlantic White Cedar Swamps, along with Labrador tea (*Rhododendron groenlandicum*) and rhodora (*Rhododendron canadense*). Northern Atlantic White Cedar Swamps are restricted to basins at high elevations, with the single documented example at >1100 ft. Atlantic white cedar also occurs in Atlantic White Cedar Bogs, relatively open peatland communities with canopy cover <25%. Alluvial Atlantic White Cedar Swamps are along streams. The vegetation is highly variable. Atlantic white cedar and red maple dominate the tree layer, and highbush blueberry and sweet pepperbush occur in the shrub layer along with silky dogwood (*Swida amomum*). The herb layer includes sensitive fern (*Onoclea sensibilis*), royal fern (*Osmunda regalis*), bugleweed (*Lycopus* spp.), and marsh St. John's-wort (*Hypericum virginicum*). In Alluvial Red Maple Swamps, silver maple is often a codominant with red maple. If Atlantic white cedar is present, it is well under 25% cover. Red Maple Swamps in basins in southeastern Massachusetts are often former Atlantic white cedar swamps that were cut in the past. Many have small patches of Atlantic white cedar; however, Atlantic white cedar needs to be dominant in the overstory for the community to be classified as an Atlantic white cedar swamp. Mapping of relatively large dense patches of Atlantic white cedar as Atlantic white cedar swamp communities may be useful within a Red Maple Swamp to indicate a mosaic of wetland communities.

Associated Fauna: Inland Atlantic White Cedar Swamps can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these areas provide important amphibian breeding habitat.

Public Access: Boxford State Forest, Boxford; Westborough Cedar Swamp (DCR and Sudbury Valley Trustees), Westborough; Douglas State Forest, Douglas; Hodges Village Dam Flood Risk Management Project (US Army Corps of Engineers), Oxford; Cedar Swamp Conservation Area, Monson.

Threats: The two greatest threats to Atlantic white cedar swamps are land clearing for agricultural, commercial and residential development, and interference of normal hydrological functioning as a result of development. Atlantic white cedar has been cut extensively for posts and shingles for over three centuries. In an extensive statewide vegetation inventory funded by NHESP in 1990, no uncut stands were found, but several sites contained cedars that were 100-200 years old. Selective cutting is detrimental to the persistence of Atlantic white cedar swamps, because hardwoods, such as red maple, outcompete and replace Atlantic white cedar. Any alteration to the natural hydroperiod of Atlantic white cedar swamps threatens their persistence.

Management Needs: Due to the limited distribution of Atlantic white cedar swamps, it is recommended that no clearing or filling of these wetlands be allowed. Atlantic white cedar will regenerate best following catastrophic disturbance events such as hurricanes and fires. Data suggest that in the absence of disturbance, red maple and shrubs increase in abundance at the expense of Atlantic white cedar. Fire suppression negatively threatens the long-term persistence of Atlantic white cedar swamps, and controlled burning practices may be an appropriate restoration tool in many areas. Controlled burning should be accompanied by small-patch clearcuts to be most effective. By clear-cutting small patches (generally 20 m x 20 m) and removing the slash and competing vegetation, pure, even-aged stands of Atlantic white cedar are able to regenerate. Atlantic white cedar swamps require a natural cycle of wet and dry periods for their survival and reproduction. Standing water for much of the year is unfavorable for both seed germination and seedling survival, and young seedlings are killed by both drowning and drought. It is recommended that any alterations in water levels be avoided. This includes development and road construction in uplands surrounding Atlantic white cedar swamps which can alter water levels. Where cedar wetlands are associated with river systems, it is important to maintain normal hydrologic regime of the river.

USNVC/NatureServe: *Chamaecyparis thyoides* Saturated Forest Alliance - *Chamaecyparis thyoides* - (*Tsuga canadensis*, *Betula alleghaniensis*)/*Clethra alnifolia* Forest (CEGL006189); includes much of *Chamaecyparis thyoides*/*Rhododendron maximum* Forest (CEGL006355) except for lacking dominant *Rhododendron maximum*.