



*P*alustrine Woodlands



*T*itus Bog, Erie County. Photograph by Staff of The Western Pennsylvania Conservancy.



*R*osencrans Bog Natural Area, Clinton County. Photograph by Staff of The Western Pennsylvania Conservancy.



CONIFEROUS PALUSTRINE WOODLANDS

Pitch pine - leatherleaf palustrine woodland

These wetlands occur on shallow peat over glacial till, often in burned-over areas, and/or in small basins. Scattered *Betula populifolia* (gray birch), *Pinus strobus* (eastern white pine), and *Acer rubrum* (red maple) may also occur, although *P. rigida* (pitch pine) is usually the dominant tree. *Chamaedaphne calyculata* (leatherleaf) generally forms a dense shrub layer. Other shrubs include *Aronia melanocarpa* (black chokeberry), *Vaccinium myrtilloides* (velvet-leaf blueberry), *Kalmia angustifolia* (sheep laurel), *Ledum groenlandicum*^s (Labrador tea), *Rhododendron canadense* (rhodora), *Gaylussacia baccata* (black huckleberry), and *V. corymbosum* (highbush blueberry). There is a sphagnum layer beneath, often with *Vaccinium macrocarpon* (cranberry).

Related types: Although *Rhododendron canadense* (rhodora) often occurs in these wetlands, this community type may be distinguished from the much rarer "Pitch pine - rhodora - scrub oak woodland" by its hydrology (this type is a wetland, the mesic till types are not) as well as by species composition. See the description of the "Mesic till barren complex" for more information on the ecology of mesic till barrens.

Range: Glaciated NE, Pocono Plateau.

Selected references: Reschke 1990.

[Crosswalk: TNC's *Pinus rigida* Saturated Woodland Alliance, *Pinus rigida* / *Chamaedaphne calyculata* / *Sphagnum* spp. Community, SAF's Pitch pine (45).]

Black spruce - tamarack palustrine woodland

This is a peatland community type that occurs in both glaciated and non-glaciated areas. Tree cover totals between 10% and 60%. *Picea mariana* (black spruce) and *Larix laricina* (tamarack) are usually both present in some amount, at least one dominating or co-dominating the tree stratum. Other trees commonly include *Abies balsamea* (balsam fir), *Pinus strobus* (eastern white pine), *Tsuga canadensis* (eastern hemlock), and *Acer rubrum* (red maple). Shrubs include *Chamaedaphne calyculata* (leatherleaf), *Kalmia angustifolia* (sheep laurel), *Alnus incana* (speckled alder), *Aronia melanocarpa* (black chokeberry), *Vaccinium myrtilloides* (velvet-leaf berry), *V. corymbosum* (highbush blueberry), *Ledum groenlandicum*^s (Labrador tea), *Rhododendron viscosum* (swamp azalea), *Kalmia polifolia* (bog laurel), *V. macrocarpon* (cranberry), and *Nemopanthus mucronatus* (mountain holly). Herbs include *Rhynchospora alba* (white beak-rush), *Thelypteris palustris* (marsh fern),

Drosera intermedia (spatulate-leaved sundew), *D. rotundifolia* (round-leaved sundew), *Sarracenia purpurea* (pitcher-plant), *Eriophorum uirginicum* (tawny cotton-grass), *E. uaginatum* spp. *spissum* (cotton-grass), *Carex canescens* (a sedge), *C. trisperma* (a sedge), and *C. folliculata* (a sedge). The bryophyte layer is well developed and dominated by sphagnum. This community type may occur as part of the "Acidic glacial peatland complex."

Related types: This type is closely related to the "Black spruce - tamarack peatland forest" type, which may accompany it. The distinction between the two is the percent canopy cover; the forested type typically has greater than 60% cover by trees, the woodland type less.

Range: Glaciated NE, Glaciated NW, Pocono Plateau, Unglaciated Allegheny Plateau.

Selected references: Crum 1992, PNDI field surveys.

[Crosswalk: Smith's "Non-Glacial Bog" (in part), "Oligotrophic Kettlehole Bog" (in part), TNC's *Picea mariana* Saturated Woodland Alliance, *Picea mariana* / *Ledum groenlandicum* / *Sphagnum* spp. Community, SAF's Black spruce - tamarack (13).]

Red spruce palustrine woodland

These wetlands tend to be small in size, or may occur as part of a structurally diverse wetland complex. The substrate is usually sphagnum peat. *Picea rubens* (red spruce) is always present in some amount and is often dominant or codominant; the most common associate trees are *Acer rubrum* (red maple) and *Betula populifolia* (gray birch). Common shrub species include *Vaccinium corymbosum* (highbush blueberry), *Nemopanthus mucronatus* (mountain holly), and *Lyonia ligustrina* (maleberry). Characteristic herbs include *Eriophorum vaginatum* ssp. *spissum* (a cotton-grass), and *E. virginicum* (tawny cotton-grass), *Carex folliculata*, *C. trisperma*, and other sedges, *Osmunda cinnamomea* (cinnamon fern), and *Smilacina trifolia* (false Solomon's seal). The bryophyte layer is usually well developed and dominated by sphagnum.

Related types: This type is closely related to the "Red spruce palustrine forest" type, which may accompany it. The distinction between the two is the percent canopy cover; the forested type typically has greater than 60% cover by trees, the woodland type less.

Range: Glaciated NE, Pocono Plateau.

Selected references: Sneddon, Anderson, and Metzler 1996.



[Crosswalk: Smith's "Boreal Conifer Swamp" (in part), TNC's (Southeast Region) *Picea rubens* Saturated Woodland Alliance, SAF's Red spruce (32).]

BROADLEAF PALUSTRINE WOODLANDS

Red maple - highbush blueberry palustrine woodland

This community type usually occurs on mineral soil often with a layer of muck (occasionally occurs on peat). These woodlands may occur as isolated pockets in small depressions or as part of larger wetland complexes, and are often associated with past impoundment (beaver or other). This type is most typical of northern portions of the state. *Acer rubrum* (red maple) *Nyssa sylvatica* (black-gum), and *Betula populifolia* (gray birch) are the most common trees, although other species may also be present, including *Pinus strobus* (eastern white pine), *P. rigida* (pitch pine), *Betula alleghaniensis* (yellow birch), *Tsuga canadensis* (eastern hemlock), *Larix laricina* (tamarack), and *Picea rubens* (red spruce). The most characteristic shrub species is *Vaccinium corymbosum* (highbush blueberry). Other shrubs that commonly occur are *Rhododendron viscosum* (swamp azalea), *Alnus incana* (speckled alder), *Gaylussacia baccata* (black huckleberry), *Lyonia ligustrina* (maleberry), *Nemopanthus mucronatus* (mountain holly), *Viburnum cassinoides* (withered), *V. recognitum* (arrow-wood), *Spiraea latifolia* (meadow-sweet), *S. tomentosa* (hardhack), *Sambucus canadensis* (American elder), and *Ilex verticillata* (winterberry). Herbaceous species include *Carex stricta* (tussock-sedge), *C. folliculata* (a sedge), *Juncus effusus* (soft rush), *Glyceria* spp. (mannagrass), *Dulichium arundinaceum* (three-way sedge), *Eleocharis palustris* (creeping spike-rush), *Triadenum virginicum* (marsh St.-John's-wort), and *Osmunda cinnamomea* (cinnamon fern).

Related types: This type lacks the thick sedge layer that typifies the "Red maple - sedge palustrine woodland" community type, and the associate species are generally more northern. The "Red maple - mixed shrub palustrine woodland" type is also similar, but occurs in less acidic situations, is more typical of non-glaciated regions, and has a generally more southern suite of shrub and herbaceous species.

Range: Glaciated NE, Glaciated NW, Pocono Plateau, Ridge and Valley.

Selected references: Golet et al. 1993, Metzler and Tiner 1991, PNDI field surveys.

[Crosswalk: Smith's "Acidic shrub swamp" (in part), "Broadleaf-conifer swamp" (in part), TNC's *Vaccinium corymbosum* Shrubland Alliance, SAF's Red maple (108).]

Red maple - sedge palustrine woodland

This type typically occurs in areas of past impoundment (often by beaver). *Acer rubrum* (red maple) is often the only tree species, although scattered *Nyssa sylvatica* (black-gum), *Pinus strobus* (eastern white pine), *Tsuga canadensis* (eastern hemlock), *Betula* spp. (birch), *Quercus bicolor* (swamp white oak), *Q. palustris* (pin oak), and others may also occur. There are frequently numerous snags and stumps of trees drowned out by fluctuating water levels. Depending on the condition of the dam and time since impoundment, the area may be very wet, with areas of open water, to nearly dry. Typically there is a thick sedge layer, with a pronounced tussock/hummock microtopography with live or dead trees on many of the larger hummocks. The shrub layer is variable; it may be dense, especially at the upland border, to nearly absent. Some of the possible shrub species are *Alnus incana* (speckled alder), *Vaccinium corymbosum* (highbush blueberry), *Ilex verticillata* (winterberry), *Chamaedaphne calyculata* (leatherleaf), *Spiraea latifolia* (meadow-sweet), *S. tomentosa* (hardhack), *Salix sericea* (silky willow), *Viburnum recognitum* (arrow-wood), *Cornus amomum* (red-willow), and *Sambucus canadensis* (American elder). The herbaceous layer is strongly dominated by sedges; the most common species is *Carex stricta* (tussock sedge), although other species (e.g. *C. lurida*, *C. intumescens*, *C. canescens*, *C. stipata*, and *C. tribuloides*) may also occur. Other herbaceous species include *Calamagrostis canadensis* (Canada bluejoint), *Agrostis scabra* (hairgrass), *Juncus* spp. (rushes), *Dulichium arundinaceum* (three-way sedge), and *Triadenum virginicum* (marsh St.-John's-wort), and in wetter areas, *Peltandra virginica* (arrow-arum), *Sagittaria latifolia* (arrowhead), and *Caltha palustris* (marsh marigold).

Related types: This type differs from the "Red maple - mixed shrub palustrine woodland" type in that it has a thick, sedge-dominated herbaceous layer and a less well-developed shrub layer.

Range: Entire state.

Selected references: Golet et al. 1993, Metzler and Tiner 1991, PNDI field surveys.

[Crosswalk: Smith's "Acidic Broadleaf Swamp" (in part), TNC's *Acer rubrum* - *Carex stricta* Saturated Woodland Alliance, SAF's Red maple (108).]

Red maple - mixed shrub palustrine woodland

This community type usually occurs on mineral soil with a thin layer of muck. The pH is somewhat acidic to circumneutral. *Acer rubrum* (red maple) dominates



the tree stratum, sometimes with a mixture of other trees such as *Nyssa sylvatica* (black-gum), *Tsuga canadensis* (eastern hemlock), *Pinus strobus* (eastern white pine), *Salix nigra* (black willow), *Quercus bicolor* (swamp white oak), *Q. palustris* (pin oak), and *Fraxinus nigra* (black ash). Shrubs include *Corpus amomum* (red-willow), *Ilex verticillata* (winterberry), *Lindera benzoin* (spicebush), *Alnus serrulata* (smooth alder), *Salix sericea* (silky willow), *Rosa palustris* (swamp rose), and *Cephalanthus occidentalis* (buttonbush). Ferns usually dominate the herbaceous layer. Characteristic species include *Thelypteris palustris* (marsh fern), *Osmunda cinnamomea* (cinnamon fern), *Onoclea sensibilis* (sensitive fern), *Dryopteris cristata* (crested shield fern), and *O. regalis* (royal fern). Other herbs include *Symplocarpus foetidus* (skunk-cabbage), *Bidens* spp. (beggar-ticks), *Impatiens* spp. (jewelweeds), and in wetter areas, *Peltandra virginica* (arrow-arum), *Sagittaria latifolia* (arrowhead), and *Caltha palustris* (marsh marigold).

Related types: This type differs from the "Red maple - sedge palustrine woodland" in that the latter type has a heavily sedge-dominated herbaceous layer. The "Red maple - highbush blueberry palustrine wetland" is also similar, but occurs in more acidic situations, is more typical of glaciated regions, and has a more northern suite of shrub and herbaceous species.

Range: Entire state, but more typical of southern Pennsylvania.

Selected references: Golet et al. 1993, Metzler and Tiner 1991.

[Crosswalk: Smith's "Circumneutral Shrub Swamp" (in part), "Circumneutral Broadleaf Swamp" (in part), TNC's *Acer rubrum* - *Fraxinus nigra* Saturated Forest Alliance, SAF's Red maple (108).]