Proposal for a new forest type in New York State

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I would like to propose a new forest type for New York State (as in Reschke's 1990 publication on ecological communities) as the Reschke forest designations do not seem to cover a wet Oak-Hickory forest type that exists adjacent to the river in New York and probably across the river in Ontario. This is a wet Oak-Hickory assemblage, not dry, as in "oak opening" types of woods that are well known and seem to be perched on sand or elevated up onto mountain (hill) tops in New York State. The Ash-Silver/Red Maple wet woodland designations for some of the woods on Grand Island and other areas along the Niagara River do not seem to describe very well the actual woods or woods elements in these wet areas.

These wet Oak-Hickory woods have a soil type peculiar to themselves, and clay seems to be a significant factor in the sense that this soil type seems to control a spring-wet, autumn dry regime. The Ash-Maple swamps do not vary very much or as much in this respect, and the water there seems to be deeper or more long-standing - at least without the autumn dry regime. The wet Oak-Hickory woods exist right beside the wet Ash-Maple woods, and both exist right beside the Red Oak-Sugar Maple-Beech upland type. In an area just upstream from Niagara Falls, in an arc from the Tonawandas on the New York State mainland, across the northern part of Grand Island and into Navy Island (Ontario), occur wet Oak-Hickory woods that are distinctive enough to warrant their own community-type designation, in my opinion, at least for describing these woods.

Recent correspondence with individuals studying the clayplain forests in the St. Lawrence River valley indicates that that forest type, itself perhaps undescribed, has a very species rich assemblage including a well developed herbaceous layer of forbs, especially spring wildflowers such as Trillium, which are not present in the wet Oak-Hickory assemblage at Niagara. The forest type on the clayplain is an upland woods.

The species along the Niagara River include some that do not appear to occur downstream in the St. Lawrence: for example, Pin Oak (Quercus palustris) is not supposed to occur in northern New York according to the Flora North America treatment for that species (Jensen 1997), yet in western New York State, it occurs in a corridor along the eastern shore of Lake Erie right through the Niagara River section, but not east and north of it except in the area of New York City. This tree is typical of the wet-Oak-Hickory woods I am describing.

Also, the two stations recorded so far for the Shumard Oak (Quercus shumardii) both occur in these Niagara River woodlands, and across the river in Ontario. This is an Oak of wet soil, as is Swamp White Oak (Quercus bicolor), which is rare in Ontario.

The other conspicuous tree species in this assemblage, and perhaps the most typical are the Hickories. We have the rare, I think, Carya laciniosa association with the two trees just mentioned. Other Hickories that hover about are Carya ovata, Carya ovalis-glabra, Carya cordiformis (everything but C. tomentosa). In one place (Tuscarora Indian Reservation) the entire canopy was Carya ovata - quite an experience!

A typical geomorphological feature of this forest type is "vernal pools", typically craters of black soil with a ring of graminoids around the elevated rim, typically with Carex lupulina there. Otherwise, these black areas occur in linear or curving swathes absolutely sterile of any vegetation, as though what was killed by drowning in spring was finished off later by soils, sometimes so dry in drought years the surface is cracked into polygons. Exposed, black (reduced) vegetationless soil in troughs and depressions amid the roots of the Pin Oak is very typical.

The clay surface prevents spring precipitation from percolating. I think another essential characteristic is how close the limestone pavement is to the bottom of the clay horizon. This closeness may account for the special hydrology in these woods. A variant of this forest,
where the Hickory element is pronounced is where this clay is very thin. The clay seems to grade into karst, which I am aware is developed very nicely further downstream in the Great Lakes in both Ontario and New York but I am unfamiliar with the forest composition on these substrates - I might guess they are dry in character, not wet as in the woods I am describing. A vivid example of this wet-woods type at Niagara where the limestone is actually exposed at the surface, but which still bears the wet Oak-Hickory type is on the Tuscarora Indian Reservation on the edge of the north-facing Niagara limestone escarpment in Niagara County.

Another element that distinguishes the wet Oak-Hickory woodlands down here from the Ash-Maple wet woods is the predominance of graminoids on the ground layer: grasses and sedges in the Oak-Hickory assemblage. In the Ash-Maple wet woods later in summer occur lush swathes of urticaceous species: *Boehmeria cylindrica* and *Pilea pumila* being very conspicuous. These forbs are not typical of the wet oak hickory woods and occur in their adjacent association with the Maple-Ash element.

Spicebush, *Lindera benzoin*, where it is a monoculture, appears to be an indicator of the wet oak-hickory woods assemblage as well - this as distinct from drier woods where Witch Hazel occurs (*Hamamelis virginiana*).

The only moss species that seems typical of this element is *Atrichum altecristatum*.

It may be that this undescribed (in New York State) forest type occurs further west and upstream in the Great Lakes. It would seem to be closely associated with post-glacial drainage patterns as the geomorphology of some of these little woods I've been looking at seem directly derived from the history of the adjacent river. I would imagine this woods might occur for example, around the Detroit-Windsor area.

Currently, the standard reference to ecological community types and associated vegetational characteristics in the state of New York is that authored by Reschke (1990). An updated version is currently in press (2002). After examination of several small forests in the vicinity of the Niagara River over several years, I thought it timely to advance an apparently distinctive community type whose definition may be useful in local forest studies in western New York and perhaps adjacent peninsular Niagara in Ontario, Canada.

Ecological community types in New York State are presented by Reschke as a series of seven systems with subsets (subsystems). The community type presented here would fall under Reschke's Palustrine System, subsystem C: Forested Mineral Soil Wetlands. In this subsystem are included various forest and swamp types and a type associated with vernal pools. The communities are developed on seasonally flooded, permanently flooded or saturated soils.

Work over several years conducted by myself in the area from Buffalo, New York, north to the Niagara Escarpment involved the study of a kind of forest that was either unique to the community list or a pastiche of various intergrading subsystem types. However, the various forests examined seemed to present a consistent set of characteristics to describe them, explain their presence and persistence, and define their substrate type. The extent of the distribution of this wet new forest type in the region and details as to its floral and faunal character remain to be explored.

The type or subsystem proposed here for western New York would be an Oak-Hickory forest and, although such forests occur as the Oak opening community type in the Terrestrial Community System as well as the Appalachian oak-hickory forest, Allegheny oak forest, Chestnut oak forest or Appalachian oak-pine forest of the Forested Uplands subset, none of these is a wetland forest. All are associated with porous soil and good drainage. One palustrine forest type that may be comparable is the Perched swamp white oak swamp situated above the water table on forested hillsides with poor drainage.

**THE OAK-HICKORY SWAMP FOREST TYPE**

The word swamp is problematical because although moisture exists all year round, for an important part of the year, this moisture is enough below the soil surface as to be available to the deep roots of trees, but not available to germinating seeds and herbaceous vegetation, which is suppressed, producing a characteristic bare earth with such vegetation as exists occurring on low hummocks, fallen logs and the roots of trees where they are elevated above the spring-wet substrate.

These forests appear to be closely associated with ancient drainage patterns centered around the Niagara River. Several of these forest types occur up to a mile inland from that river and in some instances far enough inland to appear developmentally independent of it. The Niagara River, a strait between Lakes Erie and Ontario, might be said to be a post-glacial relict of the poor drainage characterized by lowlands with gentle undulations, heavy clay near or at the soil surface, this thinly overlaying calcareous bedrock, which is known to expedite drainage, contributing to an arid regime wherever this jointed bedrock is exposed at or near the surface. That this forest type is
probably the result of factors associated with post-glacial drainage history (fine soil deposition associated with quiet water and scour of sediments away from bedrock) in the Great Lakes, this forest type is probably well known in the Great Lakes bioregion. It would be most likely closely associated with the lowlands associated with the Erie and Ontario Lake Plains and matching forest communities should occur in the peninsular Niagara region of the Province of Ontario, Canada.

Physical characteristics of this forest type include poor drainage in the spring, such that water stands in shallow depressions long enough to kill off any germinating seeds or seedlings, leaving throughout the summer and into winter patches, often extensive, of black soil with no vegetation of any kind, including bryophytes except on low mounds that perhaps represent fallen tree boles rotted beyond recognition as such and mounds occurring from the gentle uplift of roots at the tree bases. Rainfall during the growing season would serve to exacerbate this drowning.

Sporadic mosses, ferns and various herbs may be seen on fallen logs, fresh as well as punky, in stark contrast with the black soil on which the logs lay.

Another physical characteristic of this forest is the occurrence of vernal pools, areas of limited extent, somewhat deeper than the surrounding black soil, with a rather prominent lip on which Carex lupulina is characteristic. No vegetation grows in the center of the pit, which is often dry at the end of summer.

Paired with vernal moisture is autumn aridity, which also may suppress the establishment of vegetation, especially of maples, such as Acer rubrum and Acer saccharinum, ash, such as Fraxinus pensylvanica and elm, Ulmus americana, U. rubra. The maples are noted for their extraordinary seedling success during years when these trees are stressed when the forest floor is blanketed with sprouts, all of which are exterminated by the ensuing summer. In autumn the soil may be riven with cracks and claylike plates of dried earth.

Perhaps the type bryophyte for such a forest is Atrichum undulatum var. alticristatum, for this moss was found in nearly all sites in small mounds amid the blackened patches. Other woodland species become present when conditions are ameliorated.

Four natural areas have been identified during several recent field seasons in which this forest type may be described growing adjacent to well described and acknowledged forest types: Buckhorn Island State Park, a designated wilderness area in New York State, Navy Island, part of the semi-public areas administered by the Niagara Parks Commission in Ontario, Canada, and Klydel woods, an Audubon Preserve in North Tonawanda, New York and a piece of undisturbed woods on the Tuscarora Indian Reservation in Niagara County adjacent to the lip of the Niagara escarpment. All three woods are separated from one another by the channels of the Niagara River, Klydel being several miles inland and surrounded by urban development and the fourth far from the Niagara River.

In all of the forest communities described by Reschke (1990), hickories (Carya spp.) have always formed a subordinate element to communities dominated by Maples, Oaks or evergreen trees. In the proposed community, although there is a significant representation of Oak species, it is the Hickory presence that seems the more significant - specifically Carya laciniosa, although by far the most conspicuous hickory is Carya ovata (Mill.) K. Koch (Shag-bark Hickory). Carya cordiformis (Wang.) K. Koch is always present, but sparse; Carya glabra-ovalis (Pignut or Small-fruited Hickory) may or may not be present. No species of Carya tomentosa (Poir.) Nutt. (Mockernut Hickory) has yet been detected in the areas examined.

By far, the most extensive areas with this forest type occur on Grand Island, New York, and most are in imminent danger of development as a real-estate boom is occurring on the island.

Intimately associated with this forest type is Pin Oak (Quercus palustris Muenchh.). Evidence suggesting this is not a typical element comes from its occurrence in other local forest associations in which no hickories occur. That it can thrive in both wet and drier conditions may account for its use in horticulture for, in addition to its beauty, it is tolerant of a variety of situations.

Pin Oak is not very common in New York State, occurring in a narrow strip along the western shore of Lake Erie, parallel to the New York State Throughway (Interstate 90), disjunct to the lower Hudson River Valley area (Jensen 1997). It is rare in Ontario, rare in Canada (P. W. Ball, in Pryer, K. M. & G. W. Argus, eds. 1987). Pin Oak occurs everywhere in this Oak-Hickory swamp woods, often forming the center of a large round patch of black earth.

I thank representatives of the Tuscarora Indian Nation for their kind permission to visit the Niagara escarpment site in company with Lee Harper, Chuck Rosenberg and Kathy Schneider. I thank the New York State Department of Parks for permission to study the vegetation of Buckhorn Island State Park and the Niagara Parks Commission for providing transportation to and from Navy Island.


Changes to the constitution

We are required to publish this notice in two issues of Clintonia.

The Board of Directors has moved to make two changes in the constitution of the Society pertaining to the length of term of officers and vacancy of the position of president. Changes to the constitution require an approval by the general membership of the Society. Accordingly, a vote by all members in good standing on these changes will be brought up at the May 8th meeting. Shown below are the two sections to be considered for changes.

The text in normal type indicates the current constitution. The text in bold type and underlined indicates the proposed additions to the constitution. No removal of the current text is proposed.

**ARTICLE IV: OFFICERS**

**SECTION 1:** The elected officers of the Society shall be a President, a President-Elect, a Vice President, a Secretary, and a Treasurer. The President shall hold office for a two-year term and shall not succeed himself. At the close of the first year of any presidency, a President-Elect shall be elected by the members and will serve on the Board of Directors. The same individual may simultaneously hold the office of Vice-President and President-Elect. The outgoing President shall serve on the Board of Directors in the year following his term of office. All other officers shall serve 2-year terms.

**SECTION 2:** A vacancy in any office shall be filled by the majority vote of the Board of Directors to hold office until the next Annual Meeting at which time the vacancy shall be filled in the regular way. In the case of a vacancy in the office of the President occurring during the term of the President-Elect, the latter shall immediately succeed to the office of President. If there is no President Elect, the Vice President shall serve as