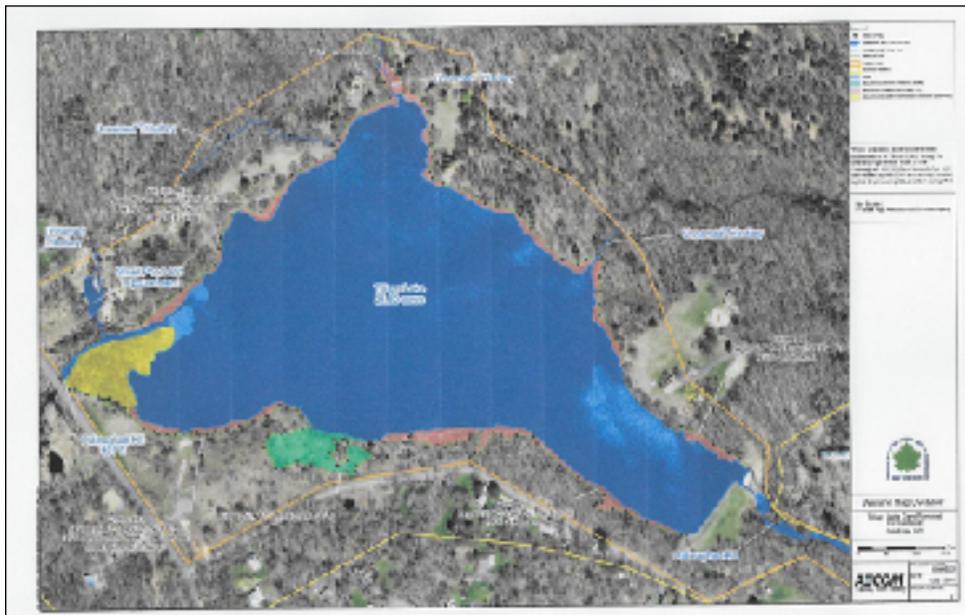


**Tillson Lake Wetlands
June 26, 2018**

The following information was gathered to provide information about wetlands at Tillson Lake; to assess whether or not the western portion of the lake is wetland; and to examine whether it may meet federal or state wetland regulatory criteria.

Background

An existing wetland delineation (2016) at the Tillson Lake site shows a narrow band of wetland along most of the Lake's perimeter. These are identified on Map 1, below, as Palustrine wetlands (see NWI below), a designation which include marshes, bogs, fens, wet meadows, swamps, ponds, seasonally wet woods, and shoreward areas of lakes and rivers. These wetlands are further described according to their vegetation, e.g. palustrine forested, palustrine emergent, and palustrine shrub wetlands. According to the draft Environmental Assessment Form (attached to an April 13, 2018 letter of SEQR Lead Agency Designation from the NYS Dept. of Parks, Recreation, and Historic Preservation) these delineated wetlands total 3.7 acres.



Map 1: Wetland
Map Overview,
Delineated
wetlands, 2016,
Tillson Lake

This total matches the total area of wetlands shown on Map1 (NYS OPRHP Wetland Map Overview). However the map is ambiguous because (1) no acreage is listed for area F, though it may be included in the totals listed under section E, and (2) delineated wetlands shown on this map appear to extend beyond the map in two places— along the Palmaghatt and along an unnamed tributary stream. Based on this map, it appears that the wetlands adjacent to Tillson Lake total at least 3.7 acres and likely exceed that amount when adjacent wetlands that extend beyond the map area are included.

The National Wetland Inventory

Additional wetlands on the property are mapped by the National Wetland Inventory (Map 2). The US Fish and Wildlife Service’s National Wetlands Inventory Project produced maps (available online) that show the location, size, and type of wetlands for the entire country. These maps are prepared using aerial photographs and a mapping procedure that includes field checks, stereoscopic photointerpretation, and quality control measures.



Map 2: National Wetlands Inventory Map, Tillson Lake (<https://www.fws.gov/wetlands/data/Mapper.html>)

The wetland mapper site contains the following disclaimer: “The map displays at this site show wetland type and extent using a biological definition of wetlands. There is no attempt to define the limits of proprietary jurisdiction of any Federal, state, or local government, or to establish the geographical scope of the regulatory programs of government agencies.”

NWI maps include all types of wetlands regardless of whether or not they are regulated, showing location and shape of both wetlands and deepwater habitats, type of wetland based on vegetation (or substrate, where vegetation is absent), water regime, and other characteristics; and the type of deepwater habitat based on ecological system, hydrology, and other features. According to Tiner (Wetland Indicators: A Guide to Wetland Identification, Delineation, Classification, and Mapping, 1999), “While the NWI maps depict the location of a large number of wetlands and probably the ones most important to wetland-dependent fish and wildlife resources and flood storage, not all wetlands are shown.” If the NWI map indicates the presence of a wetland in a given area, it is highly likely a wetland is there. Sometimes drier wetlands may be under-mapped due to aerial photo limitations and timing of photography. While regulatory requirement details

may vary between the ACOE and various state wetland regulations, the scientifically derived methods of identifying wetlands (based on vegetation, soils and hydrology) are similar.

Wetlands and deepwater habitats are classified according to the FWS official wetland classification system (Cowardin et al., 1979), using an alphanumeric code to designate the wetland type. NWI describes the western portion of Tillson Lake as a 12.7 acre palustrine wetland with the code PEM1E (Palustrine Emergent, persistent, seasonally flooded). Emergent wetlands are characterized by erect, rooted, herbaceous plants and water depth of less than 6.6 feet. The eastern portion of the lake, 10.43 acres, is described as deepwater habitat with the code L1UBHh (Lacustrine, Limnetic, Unconsolidated bottom, permanently flooded, impounded). Generally deepwater habitats have water depth of more than 2 meters (6.6 feet).

Site visit to verify NWI wetland description for Tillson Lake

On June 12, I conducted a site visit to assess wetlands mapped within and around Tillson Lake. This included an inspection by boat to explore the features of the western portion of the Lake designated as wetland by NWI. The NWI map shows a straight line dividing the wetland from the lake ecosystem (Map 2); in the field, a wetland boundary is never a straight line. In the field, this edge would be determined by water depth (which must remain less than 6.6 feet in a wetland) along with the presence of dominant wetland vegetation.



Map 3: Sketch map showing approximate sites for depth recording and approximate depth (due to soft mucky substrate) in feet (June 12, 2018).

Water Depth

Depth gradient isn't a straight line, either; the lake bottom is irregular. Depths sampled on June 12 are shown with their approximate locations on Map 3. These samples are an approximation; depths were taken to ascertain whether they were greater or less than 6.6 feet. Most readings within the NWI designated wetland area in the western portion of the lake were between .5 and 4 feet meeting the NWI science criteria regarding wetland depth. A few deeper pockets may correspond to known narrow channels in the lake bottom. Water depth is not a regulatory criterion, but is most useful as a way to define the area of the lake to be assessed for the presence of wetland vegetation. Areas deeper than 2 meters are clearly deepwater and not wetland.

Vegetation

Vegetation was sampled at points within the lake as well; but these point samples do not provide sufficient data to establish a wetland boundary between the north and south shores of the lake. Visual assessment of wetland boundary according to vegetation was not possible due to water depth. A fringe of wetland vegetation begins at the land/shore edge and extends into deeper water. This fringe also extends along much of the lake shore, even to the east of the NWI wetland line. Along this gradient the type of plants changes. Generally, *Sparganium* species are dominant at the shoreline and extending into water up to about two feet in depth; in deeper water *Potamogeton* species appear to dominate in many places. According to local information, lake vegetation in shallow areas becomes taller and more dense as the summer season advances. Sampling vegetation later in the summer season may reveal more information about wetland boundaries. Throughout this portion of the lake, at a variety of depths, a variety of species were found, the most abundant and dominant including:

Waterweeds: *Elodea canadensis*

Coontail: *Ceratophyllum demersum*

Cattail: *Typha latifolia*

Water milfoils: *Myriophyllum spicatum*

Naiads: *Najas flexilis*

Pondweeds: *Potamogeton* species which likely include *amplifolius*, *gramineus*, and *pusillus*

Bur-reed: *Sparganium spp.*

Based on this field inspection, the western portion of Tillson Lake matches the science criteria for a palustrine wetland as described by the National Wetland Inventory.

The next question is:

Does this wetland area meet the regulatory jurisdictional wetland definitions put forth by the US ACOE and NY State?

US ACOE 1987 Wetland Delineation Manual

This manual is the nationwide standard that is the basis for wetland identification and the delineation of wetland boundaries for wetlands that fall under the US ACOE jurisdictional criteria. The Manual describes the difference between wetland and deepwater habitat in Paragraph 27 as:

Deepwater aquatic habitat is a permanently inundated area that

- a. supports no rooted emergent or woody plants
- b. is greater than 6.6 feet deep (permanently inundated)
- c. substrate is not defined as a soil if the mean water depth is more than 6.6 feet or if it will not support rooted emergent or woody plants.

A deepwater habitat may be less than or equal to 6.6 feet deep if it doesn't support rooted emergent plants. Areas that are less than 6.6 ft. deep that support only submergent aquatic plants are vegetated shallows, not wetlands.

Wetland delineation criteria include hydrophytic vegetation, soils, and hydrology.

Paragraph 35 in the same manual states that the hydrophytic vegetation criteria for wetland designation is met when “more than 50 percent of the dominant species are OBL (or FACW or FAC**) on lists of plant species that occur in wetlands.”

All of the plant species noted above that were found on the site visit are identified and listed as wetland obligate (OBL) plants on the lists of plant species that occur in wetlands, in the COE Regional Supplement to the Wetland Delineation Manual for the Northcentral and Northeast Region (2012). All of the dominant species observed on the site visit were obligate species.

DEC Freshwater Wetlands Delineation Manual and Article 24 of NYS Environmental Conservation Law: Freshwater Wetlands Act

Though the Tillson Lake palustrine wetland is not mapped on DEC’s wetland maps, it appears to fit the DEC Freshwater Wetlands Delineation Manual’s (Manual) technical criteria and definition of “Freshwater wetlands.”

Technical Criteria for New York State Wetland Delineation from the Manual

“Wetland ecosystems generally possess three essential characteristics: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology, the driving force creating all wetlands. For some freshwater wetlands that are consistently "wet" (submergent, emergent, floating-leaved, open water and bog wetlands), wetland hydrology and hydric soils are implicit.” (Manual, page 3)

This leaves vegetation as the sole determining wetland criteria: is hydrophytic vegetation present?

The Manual (page 3) states:

“For purposes of this Manual, hydrophytic vegetation means macrophytic plant life that meets the definition of wetland vegetation in the Freshwater wetlands Act (see below).

Page 3 also states that delineators should refer to the “National List of Plant Species that occur in wetlands” to determine whether species are obligate, facultative, etc. and then determine whether these plant species are dominant. Dominance is based on the abundance of a species that can be visually estimated or measured in the field; dominant species are those with 20% or more areal coverage in the plant community.

“...hydrophytic vegetation is considered present if any of the following are present (technical criteria):

...(2) OBL perennial species collectively represent at least 10% areal cover in the plant community and are evenly distributed throughout the community...” (Manual, page 5)

Excerpts from Article 24

Environmental Conservation Law further define wetlands. Species found on June 12 at Tillson Lake are listed in both # 3 and #8 below:

24-0107. Definitions.

1. "Freshwater wetlands" means lands and waters of the state as shown on the freshwater wetlands map which contain any or all of the following:

- (a) lands and submerged lands commonly called marshes, swamps, sloughs, bogs, and flats supporting aquatic or semi-aquatic vegetation of the following types:
 - (1) wetland trees...
 - (2) wetland shrubs...
 - (3) emergent vegetation, including, among others, **cattails (*Typha* spp.)**, pickerelweed (*Pontederia cordata*), bulrushes (*Scirpus* spp.), arrow arum (*Peltandra virginica*), arrowheads (*Sagittaria* spp.), reed (*Phragmites communis*), wildrice (*Zizania aquatica*), **bur-reeds (*Sparganium* spp.)**, purple loosestrife (*Lythrum salicaria*), swamp loosestrife (*Decodon verticillatus*), and water plantain (*Alisma plantago-aquatica*);
 - (4) rooted, floating-leaved vegetation...
 - (5) free-floating vegetation; including, among others, *duckweed* (*Lemna* spp.), big duckweed (*Spirodela polyrhiza*), and watermeal (*Wolffia* spp.);
 - (6) wet meadow vegetation...
 - (7) bog mat vegetation...
 - (8) submergent vegetation; including, among others, **pondweeds (*Potamogeton* spp.)**, **naiads (*Najas* spp.)**, bladderworts (*Utricularia* spp.), wild celery (*Vallisneria americana*), **coontail (*Ceratophyllum demersum*)**, **water milfoils (*Myriophyllum* spp.)**, muskgrass (*Chara* spp.), stonewort (*Nitella* spp.), **water weeds (*Elodea* spp.)**, and water smartweed (*Polygonum amphibium*)..."

Based on the sites examined during the June 12 site visit, all dominant species within the western portion of the lake are listed as OBL wetland species, thus meeting wetland plant criteria (at least 10% area covered by OBL species).

Wetland size

NYS adds one more criterion in addition to vegetation, soil, and hydrology: to meet NY state regulatory criteria, wetlands must also be at least 12.4 acres in size or be specially designated as having "unusual local importance." To address this, we consider two questions: How large is the Tillson Lake wetland, mapped by NWI? Do additional fringe wetlands upland from the water's edge contribute to the overall size of the wetland?

Data from the June 12 site visit confirm that much, if not all, of the lake area west of NWI's line through Tillson Lake is less than 6.6 feet deep, and supports wetland vegetation. NWI measures this wetland as 12.7 acres. Even if pockets within this area are deeper than 6.6 feet, the actual wetland extends beyond the area measured and mapped by NWI, along the edges of the north and south shores of the lake. They are not as broad in the eastern portion of the lake (east of the NWI line) where the drop-off from shore is steeper. However they do add to the wetland acreage total.

In addition, the shoreline forested, shrub, and emergent wetlands delineated and otherwise noted on Map 1 are directly connected to the large NWI wetland. Adding the wetland acreages that we

know according to Map 1 and the NWI map: $12.7 + 3.7 = 16.4$ acres plus unassessed acreages from wetland areas noted on Map 1 that extend beyond the map.

Based on this information, it is my conclusion that even if there are small areas within the NWI wetland that are deeper than 6.6 feet, it is likely that the total acreage of the entire connected wetland area exceeds 12.4 acres.

Findings

Wetlands

Based on the information examined for this report, the wetlands found in and adjacent to Tillson Lake meet the National Wetland Inventory scientific criteria which includes water depth. They also appear to meet the vegetation, soils, and hydrology criteria for regulated wetlands under the US ACOE, and the NYSDEC jurisdictional criteria (including the size requirement). Verifying the NWI size estimate of 12.7 acres and establishing an eastern boundary for the NWI mapped wetland (which is currently shown as a straight line on the NWI map) will require additional information establishing both shallow water depth (less than 6.6 feet) to meet general NWI wetland definitions, and the location and extent of dominant wetland vegetation.

Visiting the lake at low water, perhaps in late summer, might provide more information about the plants within this wetland. The wetland/deepwater boundary may be more visible when the water level is lower and when plants have grown to their full height later in the season. Intensive vegetation sampling during low water (late summer) is one option which may further identify the likely wetland/deepwater boundary. Sampling could follow transects that begin at the water's edge and work toward the center of the lake, using GPS to map the extent of vegetation. This task is complicated by both the size of the lake area that would require sampling (at least 12.7 acres), and water depth which limits the extent of visual assessment of vegetation (an important component of wetland boundary delineation).

The findings made in this report are pending official interpretation of depth and vegetation criteria by federal and state jurisdictions.

Habitat

The wetland plants within the lake provide breeding and nursery habitat for fish; cover (e.g. coontail, water milfoil) for aquatic insects and other invertebrates that in turn are food for other species including fish; and food for wildlife (e.g., pondweed, bur-reed, water milfoil provide food for waterfowl). Habitats in and around the lake include the Palmaghatt and other unnamed tributary streams and their riparian zones; open water habitat; and several types of wetlands as noted in this report. These habitats support a variety of wildlife, for example: beaver, fish (rock bass, largemouth bass, sunfish species), reptiles (painted turtle, snapping turtle), amphibians, and birds (wood duck, ring-necked duck, merganser spp., ruddy duck, great blue heron, green heron, solitary sandpiper, osprey, bald eagle, belted kingfisher).