Aquatic Vegetation of Washburn Lake (11-0059-00) Cass County, Minnesota July 26 – August 3, 2006; July 20, 21, 27, 30 and August 3, 2009

Report by:
Donna Perleberg, Aquatic Plant Ecologist
Stephanie (Loso) Simon, Aquatic Biologist

Minnesota Department of Natural Resources
Division of Ecological and Water Resources
Lakes and Rivers Program
1601 Minnesota Drive, Brainerd, MN 56401

Surveyors:

2009: Stephanie Loso, Donna Perleberg, Dan Swanson (DNR Invasive Species Specialist)
Student interns: Ben Burggraff, Kevin Mortensen, Adam Rollins, Brandee Stomberg

2006: Donna Perleberg, Josh Knopik (DNR Specialist, Brainerd)
Student interns: Stephanie Loso, Lucas Wandrie

Emergent Plant Bed Mapping (2003): Tim Rosinger, DNR Fisheries, Brainerd

A note to readers:
Text that appears in blue underline is a hypertext link to a web page where additional information is provided. If you are connected to the Internet, you can click on the blue underlined text to link to those web pages.

*Throughout the report there will be a tag called Map 1 that shows an interactive PDF map of the common species from 2006 and 2009.

This report should be cited as:

Perleberg, D. and S. Simon. 2012. Aquatic vegetation of Washburn Lake (DOW 11-0059-00), Cass County, Minnesota, 2006 and 2009. Minnesota Department of Natural Resources, Ecological Resources Division, 1601 Minnesota Dr., Brainerd, MN 56401. 19 pp. plus 1 map.

Summary

Washburn Lake is a 1,554 acre, mesotrophic lake in northeast Minnesota. It includes three distinct basins that differ in water depth and shoreline development. The non-native submerged plant, Eurasian watermilfoil (*Myriophyllum spicatum*) was discovered in the lake in 2009. Plant surveys were conducted in 2006 and 2009 to assess the relative abundance of native and non-native aquatic plants.

Plants were found within the shore to 20 feet depth zone in each year but were most frequent in the 0-15 feet depth zone where at least 80% of the sample sites contained plants. Plant distribution at each depth zone was similar in both survey years.

Forty-seven native plant species were recorded in the lake, which is expected for a north central Minnesota lake with relatively high water clarity. The plant community included 13 emergent, five floating-leaved, 26 submerged, and three free-floating, plant species. Sample sites in shallow areas of the north and west basins had the highest numbers of different species, with as many as 9 different species found within a one-meter squared sample area. Sites with muck sediments of the east basin often had only two submerged species and sites with boulders on the lake bottom were typically lacking vegetation.

Emergent and floating-leaf plants occurred in water depths of six feet and less and common species included bulrush (*Schoenoplectus* sp.), wild rice (*Zizania palustris*) and waterlilies (*Nymphaea odorata* and *Nuphar variegata*). Emergent and floating-leaved plant beds covered at least 140 acres of the lake, or about one-fourth of the shallowest water.

Submerged native plants occurred within the emergent and floating-leaf beds and also extended into deeper water. The most frequently occurring submerged species were bushy pondweed (*Najas flexilis/guadalupensis*), flat-stem pondweed (*Potamogeton zosteriformis*), muskgrass (*Chara* sp.), wild celery (*Vallisneria americana*), coontail (*Ceratophyllum demersum*), northern watermilfoil (*Myriophyllum sibiricum*), Canada waterweed (*Elodea canadensis*), and broad-leaved pondweeds *(Potamogeton* spp.). The distribution and frequencies of these species were relatively stable between survey years.

The non-native species, Eurasian watermilfoil was only found in one survey site in 2009. It was found in one foot of water and did not reach the water surface.

Introduction

Washburn Lake is in northeast Minnesota in the Laurentian Mixed Forest Province, or the true forested region of the state (Fig. 1). The lake is about three miles northwest of the town of Outing in northern Cass County.

Washburn Lake is located near the top of the Pine River Major Watershed (Fig. 2). The land use in the watershed is mostly forest and wetlands with many lakes. Daggett Brook flows south from Island and George Lakes into the west bay of Washburn Lake and then outlets Washburn Lake at the south end. Flow continues south through Daggett Brook, a series of lakes, and the Pine River that enters the Mississippi River at the south end of the watershed. Washburn is the fifth largest lake in the watershed and other major lakes include Pelican, Whitefish, Cross and Pine Mountain.

Figure 1. Location of Washburn Lake (11-0059-00) in Cass County, Minnesota

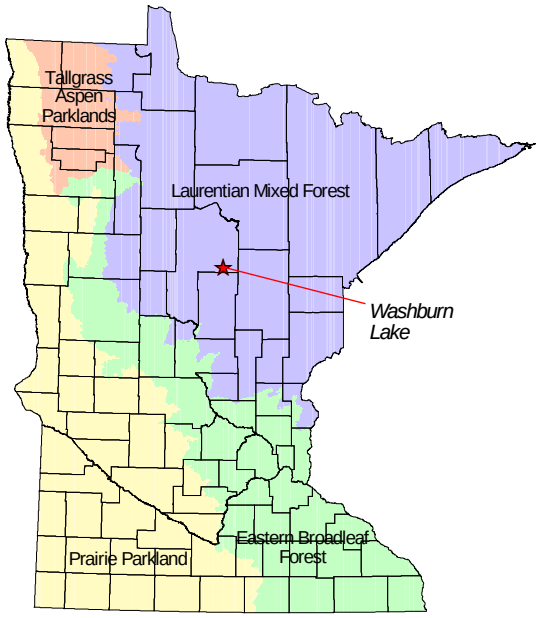


Figure 2. Location of Washburn Lake in Pine River Major Watershed.

Washburn Lake has a surface area of 1,554 acres and is composed of three distinct but connected basins (Fig. 3). The west basin is the largest in area (807 acres) with a maximum depth of 111 feet; the north basin is 456 acres in area with a maximum depth of 81 feet; and the eastern basin is the smallest (389 acres) and is shallow with a maximum depth of only 23 feet (Lindon and Heiskary 2005). Small islands occur in the west and east basins.

The shoreline of Washburn Lake is mostly developed with about 17 homes per shoreline mile (DNR Fisheries Lake Files 1993). From 2003 aerial photographs, a total of 277 docks were identified on the lake (Fig. 4). Shorelines that remain undeveloped are mostly wetlands and/or lands within public ownership (Fig. 4). A public access is located at the south end of the east basin within the Land O'Lakes State Forest.

Washburn Lake is described as mesotrophic (moderate nutrients) with moderate water clarity as indicated by an average Secchi depth of 11 feet between 1986 and 2006 (MPCA 2006). Shallow water substrates are primarily sand and gravel; although areas of rubble, boulders, and muck are also present (DNR Fisheries Lake Files).

Previous vegetation surveys of Washburn Lake were conducted in 1951, 1968, 1983 and 1999

Figure 3. Water depth contours of Washburn Lake (11-0059-00) Cass Co., MN.

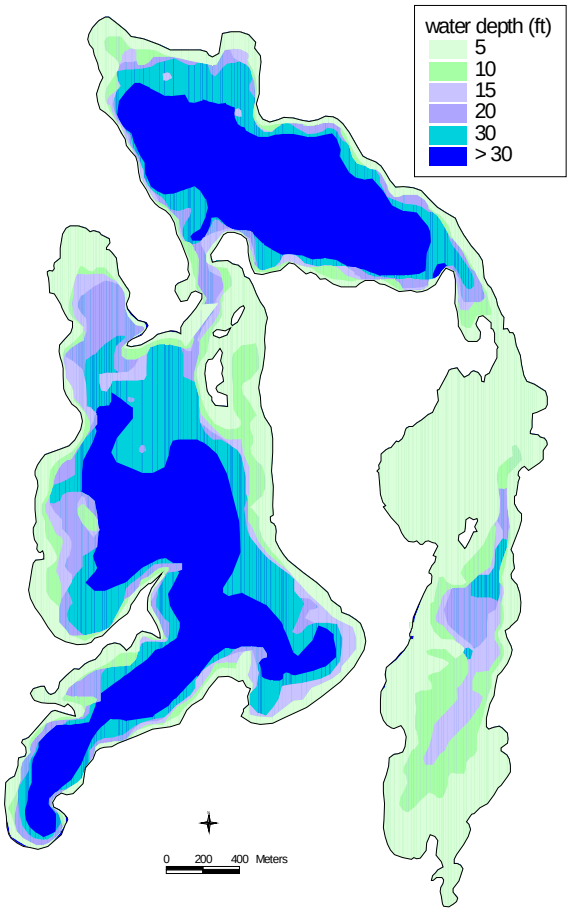
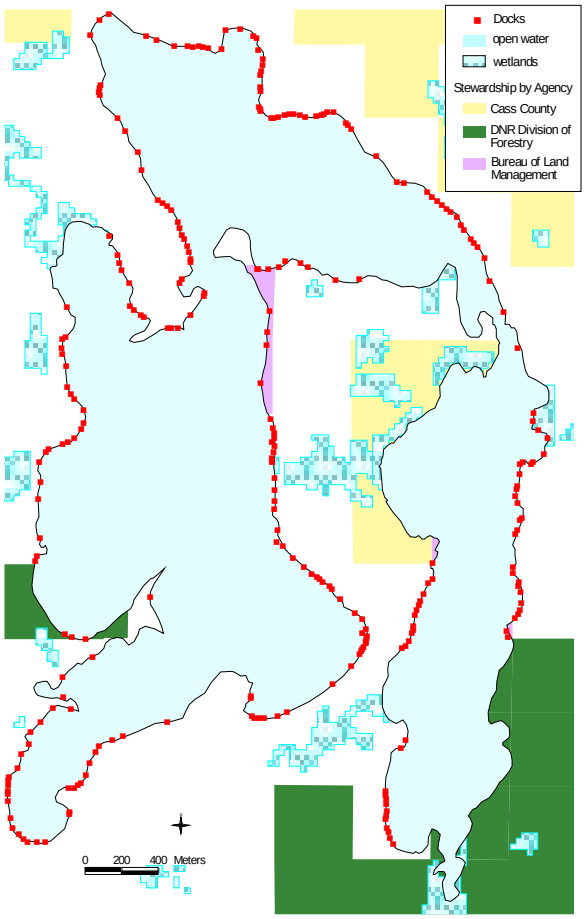


Figure 4. Shoreline landownership and dock locations. Washburn Lake, Cass Co.



(DNR Fisheries Lake Files). These previous surveys differ in methodology but they provide a general description of the aquatic plant community. More than 30 different plant species have been recorded in the lake and submerged plants were reported to a depth of at least 15 feet. Beds of emergent plants such as bulrush were recorded along much of the shore with numerous gaps in these beds along developed lots. Extensive mapping of emergent plant beds in the west and north basins were conducted by DNR Fisheries staff in 2003.

During a rare plant search in Washburn Lake in July 2009 Eurasian watermilfoil (*Myriophyllum spicatum*) was found on the east basin by the public water access.

Vegetation Survey Objectives

The purpose of this vegetation survey was to describe the 2006 and 2009 aquatic plant population of Washburn Lake. Specific objectives include:

1) Estimate the maximum depth of rooted vegetation
2) Estimate the percent of the lake occupied by rooted vegetation
3) Record the aquatic plant species that occur in the lake
4) Estimate frequencies of occurrence of individual species
5) Develop distribution maps for the common species

Methods

A Point-Intercept (or grid) vegetation survey of Washburn Lake was conducted on July 26, 27, 31 and August 1, 2, 3, 2006 and was repeated on July 20, 21, 27, 30 and August 3, 2009. The survey followed the methods described by Madsen (1999).

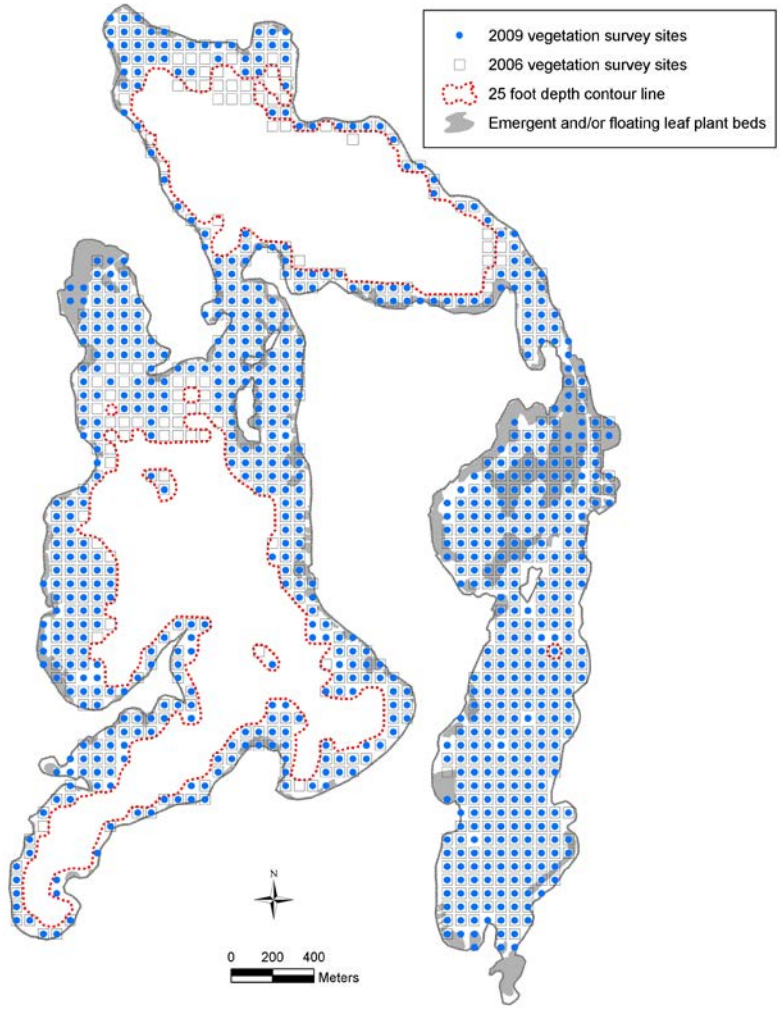
Survey waypoints were created and downloaded into a Global Positioning System (GPS) receiver. Sample points were established using ArcView GIS program using a 65 meter by 65 meter grid across the lake surface (Fig. 5). This spacing resulted in about one survey point for every surface acre of the lake. Surveyors initially sampled to a depth of 30 feet in 2006 but were consistently not finding vegetation beyond the 15 feet depth and therefore decided not to sample in depths greater than 20 feet. A total of 703 sites were sampled as shown in Table 1.

Table 1. Plant survey effort on Washburn Lake, July- August 2006.

Water depth interval (feet)	Number of survey sites	
	2006	2009
0 to 5	389 (*387*)	458 (*384*)
6 to 10	157 (*154*)	152 (*150*)
11 to 15	79 (*73*)	86 (*82*)
16 to 20	108 (*89*)	106 (*87*)
Total 0 to 20	733 (*703*)	839 (*703*)
21 to 25	70	37
26 to 30	20	---
total	823	839

The GPS receiver unit was used to navigate the boat to each sample point. One side of the boat was designated as the sampling area. At each site, water depth was recorded in one foot increments using a measured stick in water depths less than eight feet and an electronic depth finder in water depths greater than eight feet. The surveyors recorded all plant species found within a one meter squared sample site at the pre-designated side of the boat. A double-headed, weighted garden rake, attached to a rope was used to survey vegetation not visible from

Figure 5. Vegetation sample points on Washburn Lake (11-0059-00), July-August 2006 and 2009



the surface (Fig. 6).

Plant identification and nomenclature follows MnTaxa (2009). Voucher specimens were collected for most plants. Voucher specimens were collected for most plant species and are stored at the MnDNR in Brainerd. Data were entered into a Microsoft Access database and frequency of occurrence was calculated for each species as the number of sites in which a species occurred divided by the total number of sample sites. Frequency was calculated for the entire area from shore to 20 feet and sampling points were also grouped by water depth and separated into four depth zones shown in Table 1.

Example:
In Washburn Lake there were 703 samples sites in the depth zone from shore to the 20 feet.
Bushy pondweed occurred in 204 of those sites in 2006. Frequency of bushy pondweed in the shore to 20 feet depth zone of Washburn Lake
= (204/703)*100 = 29%

Figure 6. Sampling vegetation with rake.

Results

Shoal sediments

Between shore and the seven feet water depth, where sediment type was sampled, the majority (35%) of lake bottom was described as muck (Fig. 7) and muck was the main sediment type in the east basin (Fig. 8). Thirty-four percent of the shoal sites contained sand and 22 percent of the shoal sites contained gravel, rubble or boulder. The remainder (9 percent) of the sites was described as silt.

Figure 7. Types of Shoal sediments in Washburn Lake, 2006.

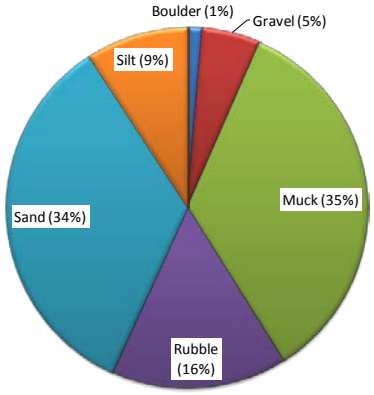
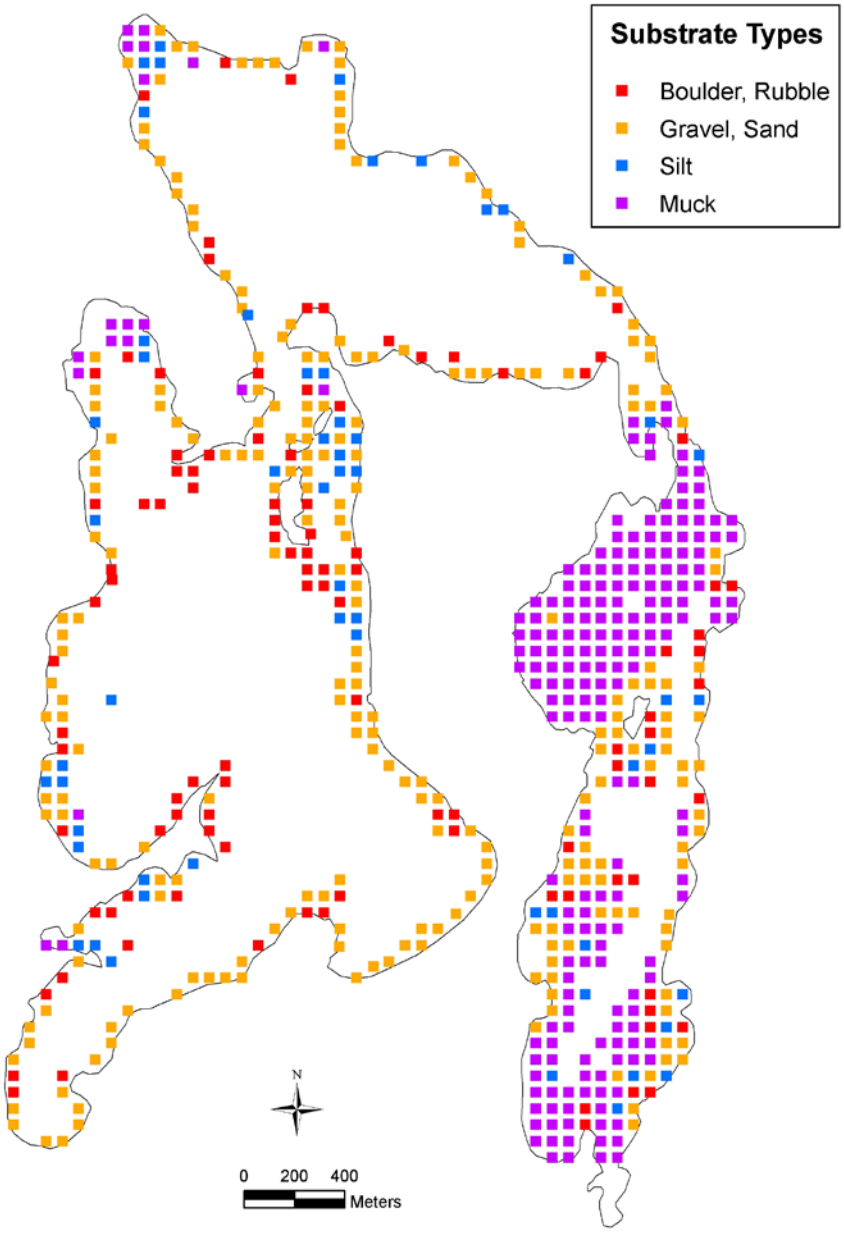


Figure 8. Shoal sediments of Washburn Lake, July-August, 2009.



Distribution of plants with water depth

Aquatic plants occurred around the entire shoreline of Washburn Lake (Fig. 9). Beds of emergent and/or floating-leaved plants ringed most of the shoreline and often extended 30 meters lakeward in the north and west basins and as much as 300 meters lakeward in the east basin.

Plants were found within the shore to 20 feet depth zone in each year but were most frequent in the 0-15 feet depth zone where at least 80% of the sample sites contained plants. Plant distribution at each depth zone was similar in both survey years (Figure 10).

Number and types of plant species recorded

A total of 47 native aquatic plant species were recorded in Washburn Lake including 26 submerged, three free-floating, five floating-leaved and 13 emergent plant species (Table 2). In the 2009 survey one non-native species, Eurasian watermilfoil (*Myriophyllum spicatum*) was found.

Figure 9. Distribution of aquatic plants in Washburn Lake, Cass Co. July-August 2006 and 2009

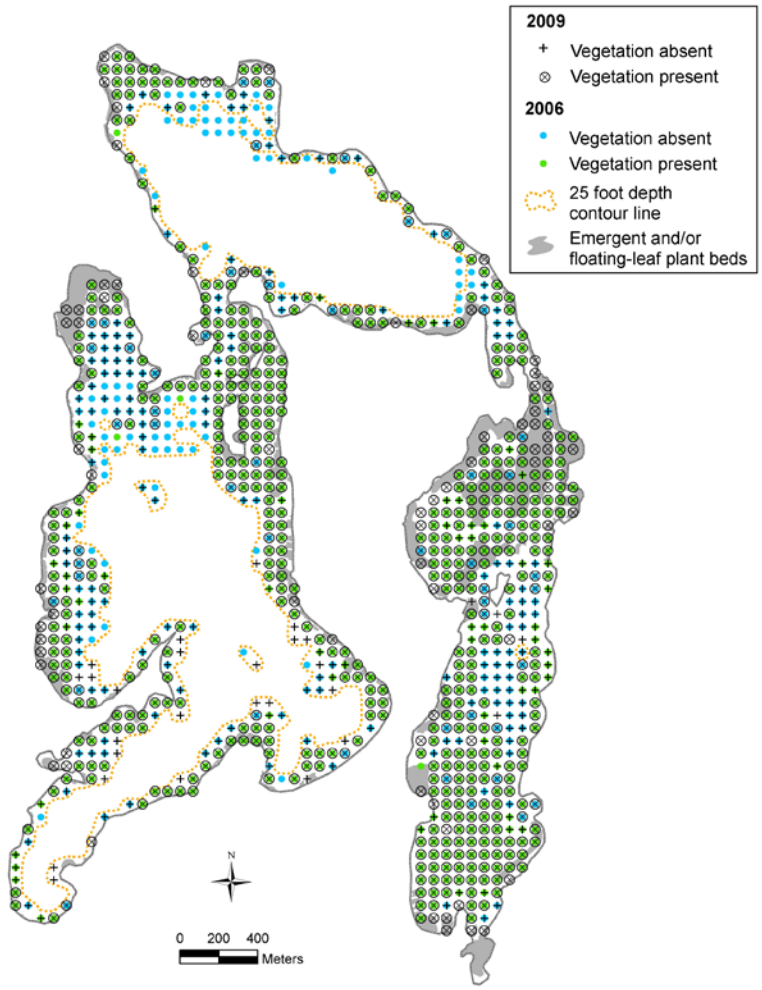


Figure 10. Frequency of aquatic plants at each depth zone in Washburn Lake, Cass Co, July-August, 2006 and 2009

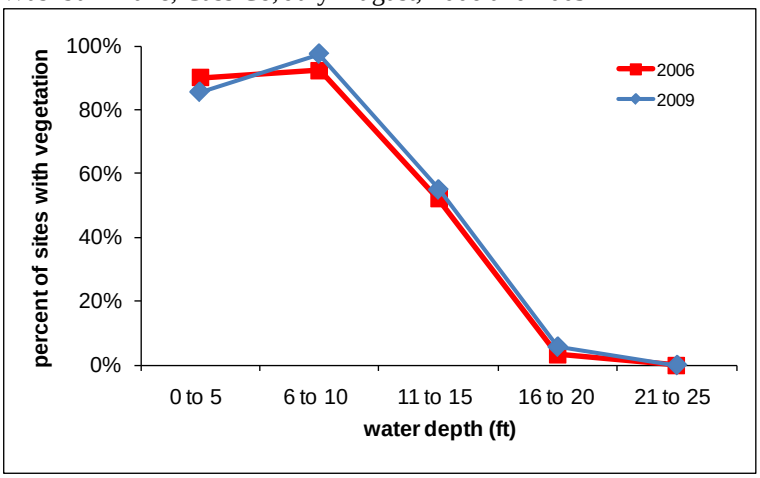


Table 2. Aquatic Plants of Washburn Lake, Cass County July - August 2006 and 2009

Frequency calculated for vegetated zone (shore to 20 feet depth) "---" = Not found in that year

Frequency = percent of sites in which species occurred (703 sample sites)

	Common name	Scientific name	frequency of occurrence	
			2006	2009
Submerged	Naiad species	*Najas guadalupensis / flexilis**	29	14
	Flatstem pondweed	*Potamogeton zosteriformis*	25	20
	Muskgrass	*Chara* sp.	20	18
	Wild celery	*Vallisneria americana*	18	13
	Coontail	*Ceratophyllum demersum*	14	15
	Northern watermilfoil	*Myriophyllum sibiricum*	12	21
	Canada waterweed	*Elodea canadensis*	11	14
	Robbins pondweed	*Potamogeton robbinsii*	11	12
	Narrowleaf pondweed	*Potamogeton* sp.**	10	9
	Illinois pondweed	*Potamogeton illinoensis*	9	7
	Variable pondweed	*Potamogeton gramineus*	8	5
	Water marigold	*Megaladonta beckii*	7	8
	Clasping-leaf pondweed	*Potamogeton richardsonii*	6	3
	Whitestem pondweed	*Potamogeton praelongus*	6	9
	Large-leaf pondweed	*Potamogeton amplifolius*	5	3
	Stonewort	*Nitella* sp.	2	2
	Water stargrass	*Heteranthera dubia*	2	1
	Quillwort	*Isoetes* sp.	1	<1
	Sago pondweed	*Stuckenia pectinata*	1	<1
	Leafless watermilfoil	*Myriophyllum tenellum*	<1	1
	White water buttercup	*Ranunculus aquatilis*	<1	1
	Creeping spearwort	*Ranunculus flammula*	<1	1
	Bladderwort	*Utricularia vulgaris*	<1	1
	Watermoss	Not identifies to genus	<1	---
	Flat-leaved bladderwort	*Utricularia intermedia*	---	<1
	Eurasian watermilfoil	*Myriophyllum spicatum*	---	<1
Free-Floating	Star duckweed	*Lemna trisulca*	<1	<1
	Greater duckweed	*Spirodela polyhriza*	---	<1
	Lesser duckweed	*Lemna minor*	<1	<1

* Two species of bushy pondweed (*Najas flexilis* and *Najas guadalupensis*) were recorded in this lake but plants were identified to only the genus level at each individual sample site.

** Some specimens of "narrow-leaved pondweeds" were positively identified as *Potamogeton friesii* (Fries' pondweed). However, it is not known whether other "look-a-like" narrow-leaf pondweed species occurred in the lake. Therefore, a separate group of unidentified narrow-leaf pondweeds (*Potamogeton* sp.) are reported here but not counted in species tally.

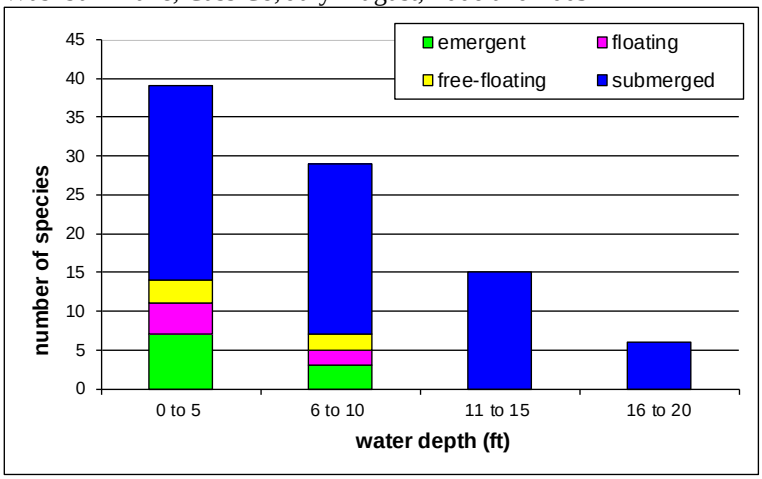
Table 2 (continued). Floating-leaf and Emergent plants of Washburn Lake, July – August 2006 and 2009.

	Common name	Scientific name	frequency of occurrence	
			2006	2009
Floating-leaf	Watershield	*Brasenia schreberi*	2	3
	White waterlily	*Nymphaea odorata*	3	3
	Yellow waterlily	*Nuphar variegata*	1	2
	Floating-leaf pondweed	*Potamogeton natans*	1	1
	Floating-leaf burreed	*Sparganium* sp.	---	X
Emergent	Bulrush	*Schoenoplectus* sp.	8	9
	Arrowhead	*Sagittaria* spp.	6	6
	Wild Rice	*Zizania palustris*	5	5
	Needlerush	*Eleocharis acicularis*	2	1
	Spikerush	*Eleocharis* sp.	1	3
	Swamp horsetail	*Equisetum fluviatile*	<1	X
	Three square bulrush	*Schoenoplectus pungens*	<1	1
	Cattail	*Typha* sp.	X	<1
	Three-way sedge	*Dulichium arundinaceum*	X	X
	Cane	*Phragmites australis*	X	X
	Narrow-leaf sedge	*Carex* spp.	---	X
	Burreed group	*Sparganium* spp.	---	X
	Giant burreed	*Sparganium eurycarpum*	---	X

--- = Not found in that year
X = present in lake but not found in survey sites

Emergent and floating-leaved plants were restricted to depths of six feet and less and submerged plants occurred at all depths to 20 feet (Fig. 11). The highest number of species occurred in the shore to five feet zone. Only one species, flat-stem pondweed *(Potamogeton zosteriformis*) was found in 2006 in the 21 to 25 feet zone; a single plant was found at one sample site and it likely was not rooted but simply had drifted temporarily to that location.

Figure 11. Types of aquatic plants at each water depth interval. Washburn Lake, Cass Co, July-August, 2006 and 2009



Emergent and floating-leaved plant beds

About 500 acres of Washburn Lake are less than six feet in depth, which is shallow enough to support emergent (Fig. 12) and floating-leaved plants. Based on the emergent mapping survey conducted in 2003 and review of aerial photography, emergent and floating-leaved plant beds cover at least 140 acres of the lake, or about one-fourth of the shallowest water (Fig. 13).

Common emergent species included bulrush (*Schoenoplectus* spp.), arrowhead (*Sagittaria* spp.) and wild rice (*Zizania palustris*). White waterlily (*Nymphaea odorata*), yellow waterlily (*Nuphar variegata*) and watershield (*Brasenia schreberi*) were the most common floating-leaved species. Bulrush stands were primarily found along sandy bottom shorelines while wild rice and other emergent plants occurred in softer substrates.

Figure 12. Whitetail deer at edge of bulrush stand in Washburn Lake, 2009.

Submerged species beds

Submerged plants occurred within the emergent and floating-leaf beds and also extended into deeper water. Sample sites in portions of the north and west basins had the highest numbers of different submerged species, with as many as nine different species found within a one-meter squared sample area (Fig. 14). Sites in the muck sediments of the east basin often had only two submerged species and sites with boulders on the lake bottom were typically lacking vegetation.

Figure 13. Emergent and floating-leaf plant beds on Washburn Lake.

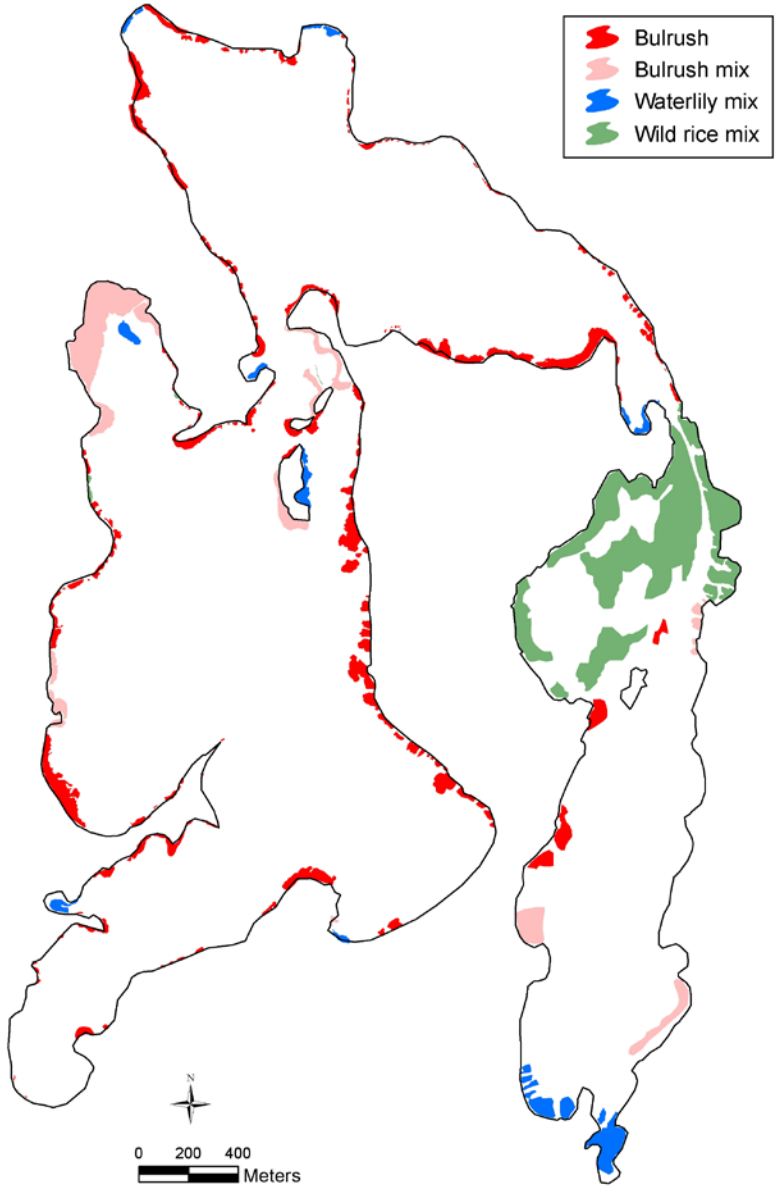
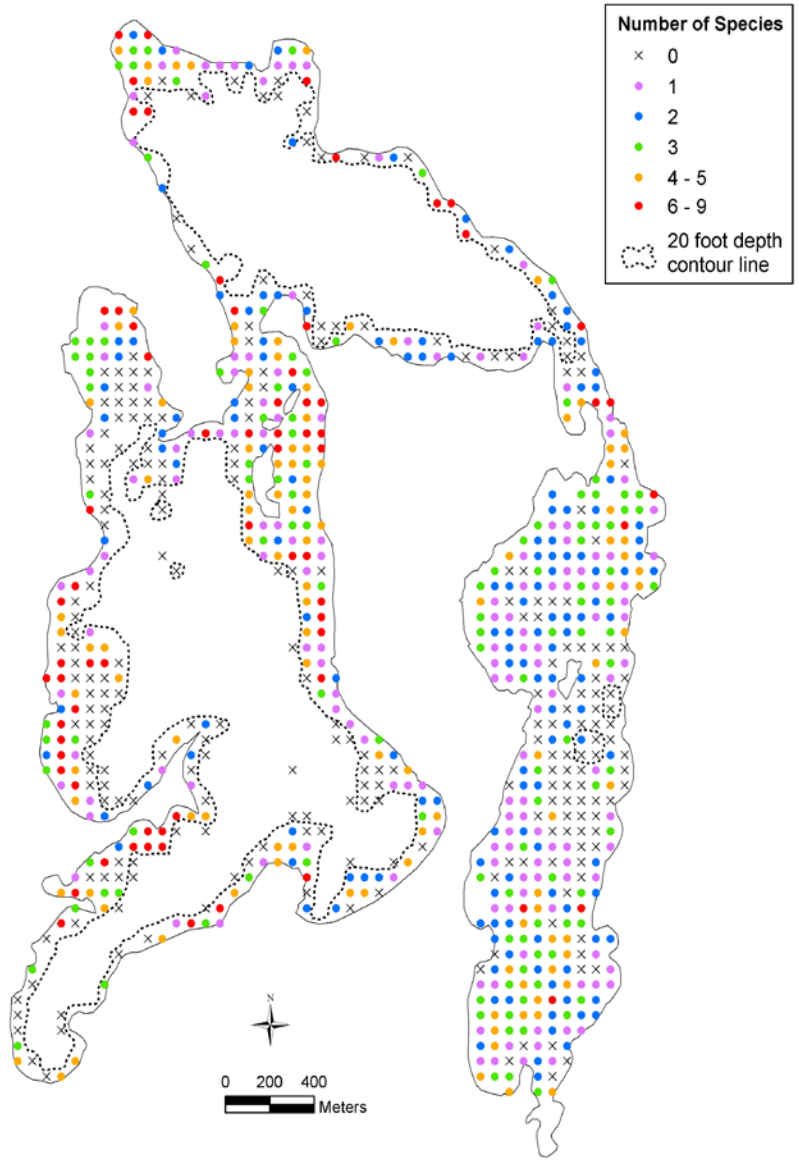


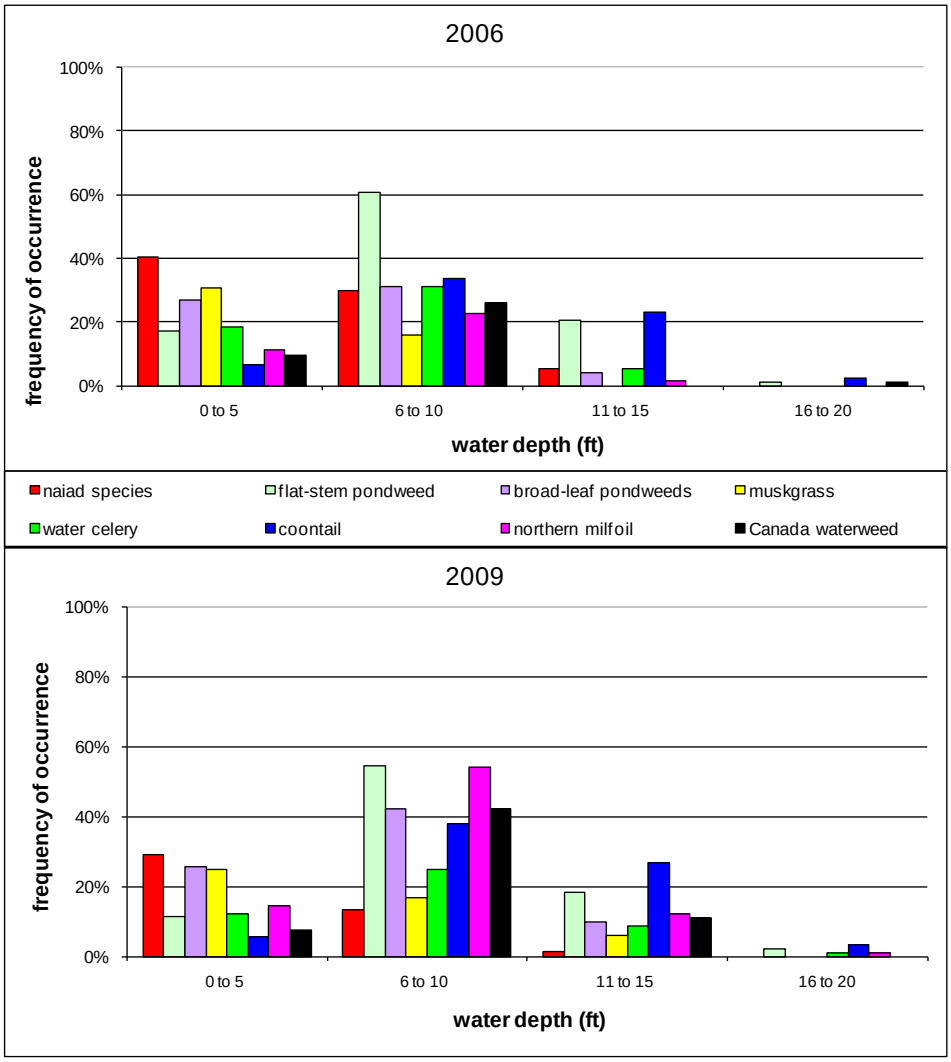
Figure 14. Number of submerged species per sample site, 2009.



Common submerged species

Although 26 different submerged plant species were found in Washburn Lake, only nine were present in at least 10 percent of the sample sites (Table 2). The most frequently occurring submerged species were bushy pondweed (*Najas flexilis/guadalupensis*), flat-stem pondweed (*Potamogeton zosteriformis*), muskgrass (*Chara* sp.), wild celery (*Vallisneria americana*), coontail (*Ceratophyllum demersum*), northern watermilfoil (*Myriophyllum sibiricum*) and Canada waterweed (*Elodea canadensis*). A group of similar species, the broad-leaved pondweeds *(Potamogeton* spp.) were also common and were grouped together for analysis. The relative frequencies of these species were fairly stable between survey years (Table 2, Figure 15).

Figure 15. Frequency of common submerged plant species by water depth.
Washburn Lake (11-0059-00), Cass Co., July - August 2006 and 2009



Bushy pondweed (*Najas flexilis or Najas guadalupensis)* occurred in 29 percent of the sample sites in 2006 and 19 percent in 2009 in the zero to 20 feet depth zone (Table 2). This species is an annual aquatic plant and re-grows each year from seed set in the previous summer. For that reason, its annual distribution and abundance can be quite variable. *Najas guadalupensis* however is a perennial plant that grows low in the water column. *Najas flexilis* (Fig. 16) and *Najas guadalupensis* (Fig. 17) can be hard to distinguish in the field and therefore both species were lumped together in the calculations. In both survey years, bushy pondweed was most frequent in water depths less than 11 feet (Fig. 15). It was most common in the muck sediments of the east basin, where it co-occurred with wild rice (Map 1).

Figure 16. Bushy pondweed

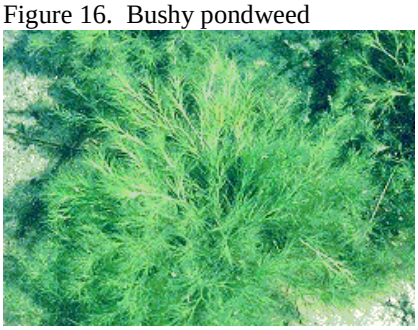
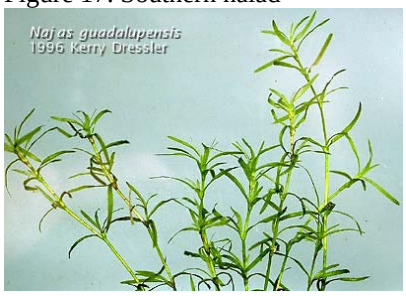


Figure 17. Southern naiad



Flat-stem pondweed (*Potamogeton zosteriformis*; Fig. 18) was found in 25 percent of the samples sites in 2006 and 20 percent of the sites in 2009 (Table 2). This plant can grow at a variety of water depths and can over-winter by rhizome and winter buds. In Washburn Lake, flat-stem pondweed was common at all water depths between shore and the 20 feet depth and reached its peak at depths of six to ten feet (Fig. 15). Flat-stem pondweed was often found growing in mixed stands with a variety of other submerged species (Map 1).

Figure 18. Flat-stem pondweed

Muskgrass (*Chara* sp.; Fig. 19) was present in 20 percent in 2006 and 18 percent in 2009 of the Washburn Lake sites (Table 2). It was mostly restricted to depths of ten feet and less (Fig. 15). Muskgrass is a submerged, macroscopic algae that is common in many hardwater Minnesota lakes. It is named for its characteristic musky odor. Because this species does not form true stems, it is a low-growing plant, often found entirely beneath the water surface where it may form low "carpets" on the lake bottom. Muskgrass is adapted to variety of substrates and in Washburn it was well distributed around the lake (Map 1) and found on all substrate types. It is often the first species to invade open areas of lake bottom where it can act as a sediment stabilizer.

Figure 19. Muskgrass

Wild celery (*Vallisneria americana*; Fig. 20) occurred in 18 percent of the sites in 2006 and 13 percent of the sites in 2009 between shore and 20 feet. This submerged, grass-like species prefers hard substrates but in Washburn Lake it was found on both hard and soft substrates. It

occurred around the entire lake (Map 1) and was most common in depths less than 11 feet (Fig. 15).

Figure 20. Water celery

Coontail (*Ceratophyllum demersum*; Fig. 21) was present in 14 percent of the sample sites in 2006 and 15 percent in 2009 between the shore to 20 feet depth zone (Table 2). This perennial grows entirely submerged and is adapted to a broad range of lake conditions, including turbid water. It is often found growing in deeper water than other native species because it is more tolerant of low light conditions. Coontail occurred at all depths to 20 feet (Fig. 15) but was primarily restricted to the west and north basins of Washburn Lake (Map 1).

Figure 21. Coontail

Northern watermilfoil (*Myriophyllum sibiricum*; Fig. 22) is a rooted, perennial submerged plant with finely dissected leaves. It may reach the water surface, particularly in depths less than ten feet and its flower stalk extends above the water surface. It spreads primarily by stem fragments and overwinters by hardy rootstalks and winter buds. Northern watermilfoil is not tolerant of turbidity and grows best in clear water lakes. In Washburn Lake, northern milfoil occurred in 12 percent of the sites in 2006 and 21 percent of the sites in 2009 from shore to 20 feet. Northern watermilfoil was common in depths of ten feet and less in both years (Fig. 15) and was found throughout the lake except the north end of the east basin (Map 1).

Figure 22. Northern watermilfoil.

Broad-leaf pondweeds, often called "cabbage" plants were another important group of submerged plants in the lake. In Washburn Lake, this group includes Illinois (*Potamogeton illinoensis*), variable (*P. gramineus*), large-leaf (*P. amplifolius*; Fig. 23), white-stem pondweed (*P. praelongus*) and clasping-leaf pondweed (*P. richardsonii*). Broad-leaf pondweeds were found in 22 percent in 2006 and 24 percent in 2009. Broad-leaf pondweeds were most often found in the shore to ten feet zone of Washburn Lake (Fig. 15) within mixed beds of other submerged species (Map 1).

Figure 23. A broad-leaf pondweed

Canada waterweed (*Elodea canadensis*; Fig. 24) had a frequency of 11 percent in 2006 and 14 percent in 2009 of the Washburn Lake survey sites (Table 2). This submerged perennial prefers soft substrates and is tolerant of turbidity. It was most common in depths of six to ten feet but a few plants were found in the 16 to 20 feet depth zone in 2006 (Fig. 15). Like

coontail and northern watermilfoil, this species was mostly found in the west and east basins (Map 1).

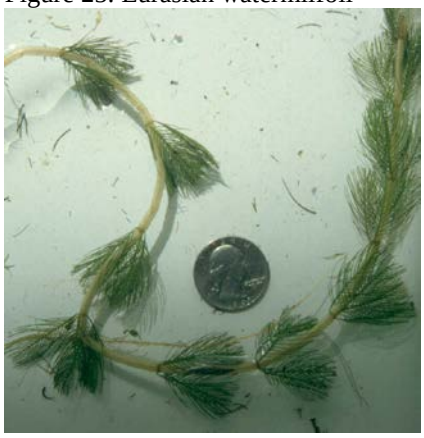
Figure 24. Canada waterweed
(photo by Vic Ramey, Univ of Florida)

All other native species were present in less than ten percent of the sample sites (Table 2).

Non-native Eurasian watermilfoil

The non-native species, Eurasian watermilfoil (*Myriophyllum spicatum*) (Figure 25) was only found in one survey site in 2009. It was found in one foot of water and did not reach the water surface. In some areas of some lakes, Eurasian watermilfoil can form thick beds and crowd out native plants. For information on how to distinguish the non-native, Eurasian watermilfoil from the native northern watermilfoil, click here: identification.

Figure 25. Eurasian watermilfoil



Discussion

The types and amounts of aquatic vegetation that occur within a lake are influenced by a variety of factors including water clarity and water chemistry. Washburn Lake supports an abundant and diverse native aquatic plant community that in turn, provides critical fish and wildlife habitat and other lake benefits. (Click here for more information on: value of aquatic plants). The high number of plant species is a reflection of the relatively good water clarity in the lake. Many of the plants that grow in Washburn Lake require clear water and are not found in lakes with higher turbidity. Another reason for the high diversity of plant types is that Washburn Lake has a variety of sediment types and a mix of protected bays and open water sites. Plant species with different habitat requirements can exist within this system.

Monitoring change in the aquatic plant community can be helpful in determining whether changes in the lake water quality are occurring and for estimating the quality of vegetation habitat available for fish and wildlife communities.

In general, factors that may lead to change in the aquatic plant communities include:

- Change in water clarity
  If water clarity in Washburn Lake increases, submerged vegetation is expected to expand in distribution and grow at greater water depths.
- Change in water level
  Many aquatic plants are adaptable to water level fluctuations and in low water years, aquatic plants may expand in distribution. The extent and duration of these distribution changes can be difficult to predict.
- Snow and ice cover

Many submerged plants have the ability to grow under the ice, especially if there is little snow cover and sunlight reaches the lake bottom. In years following low snow cover, and/or a reduced ice-over period, some submerged plants may increase in abundance.

- Water temperatures / length of growing season
  In years with cool spring temperatures, submerged plants may be less abundant than in years with early springs and prolonged warm summer days.
- Invasive species
  Non-native species Eurasian watermilfoil (*Myriophyllum spicatum*) has been documented in Washburn Lake but has not invaded the lake. Non-native species may directly or indirectly impact the native plant community. Non-native plant species, such as Eurasian watermilfoil (*Myriophyllum spicatum*) or curly-leaf pondweed (*Potamogeton crispus*) may form dense surface mats that may shade out native plants. The impact of these invasive species varies among lakes but the presence of a healthy native plant community may help mitigate the harmful effects of these exotics.
- Natural fluctuation in plant species
  Many submerged plants are perennial and regrow in similar locations each year. However, a few species such as bushy pondweed (*Najas flexilis*) and wild rice (*Zizania palustris*) are annuals and are dependant on the previous years seed set for regeneration.
  Aquatic plant management activities
- Humans can impact aquatic plant communities directly by destroying vegetation with herbicide or by mechanical means. For information on the laws pertaining to aquatic plant management: MnDNR APM Program. Motorboat activity in vegetated areas can be particularly harmful for species such as bulrush and wild rice. Shoreline and watershed development can also indirectly influence aquatic plant growth if it results in changes to the overall water quality and clarity. Herbicide and mechanical control of aquatic plants can directly impact the aquatic plant community. Monitoring these control activities can help insure that non-target species are not negatively impacted.

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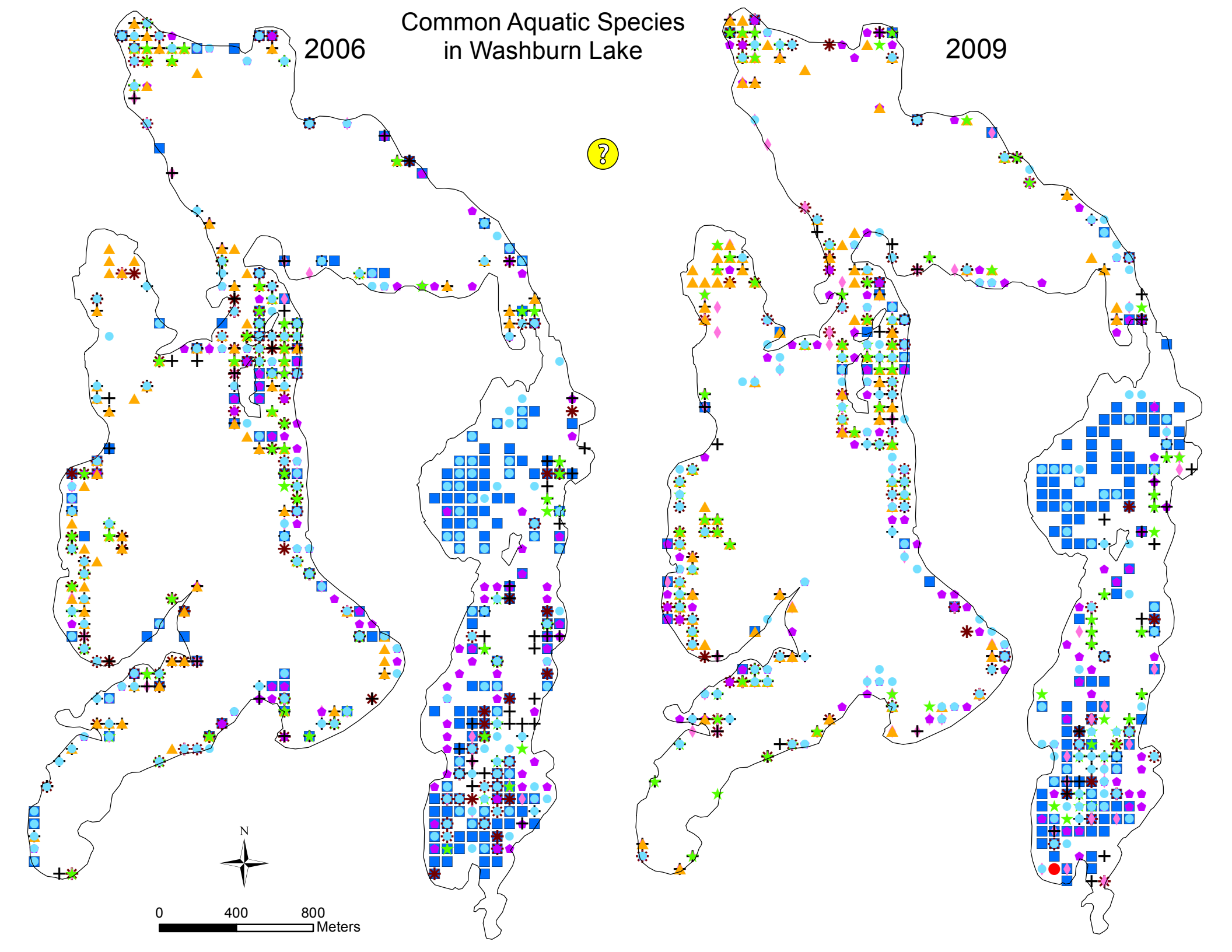
Common Aquatic Species
in Washburn Lake
2006
2009
?
N
0
400
800
Meters