

THE MATOSKA MARSH: White Bear Lake's Nursery

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"Matoska Marsh serves as the nursery for White Bear Lake. As such, it provides habitat for birds, safe haven for small fish and critters, and captures seeds for keeping lake vegetation healthy. Maintaining a healthy marsh is a significant factor in maintaining the water quality of the entire lake."

-Mary Sue Simmons, Chairperson, White Bear Lake Conservation District

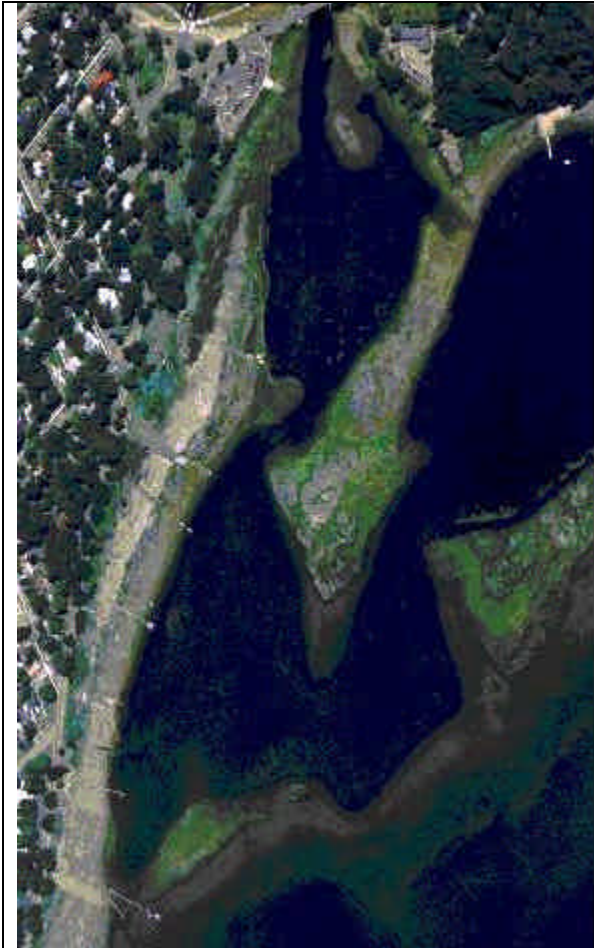
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INTRODUCTION

A marsh is an area that is covered by shallow water year round (as opposed to a swamp that is covered with water only part of the year, say in the spring). The Matoska Marsh is a permanently flooded wetland bordered by emergent vegetation.

The emergent, and thus visible, portion of the Matoska Marsh varies in size depending on, among other things, water levels, climate patterns, and human disturbance. As is evident in the photos below, emergent vegetation flourishes in drought years.



Matoska Marsh in July 1991, a drought year

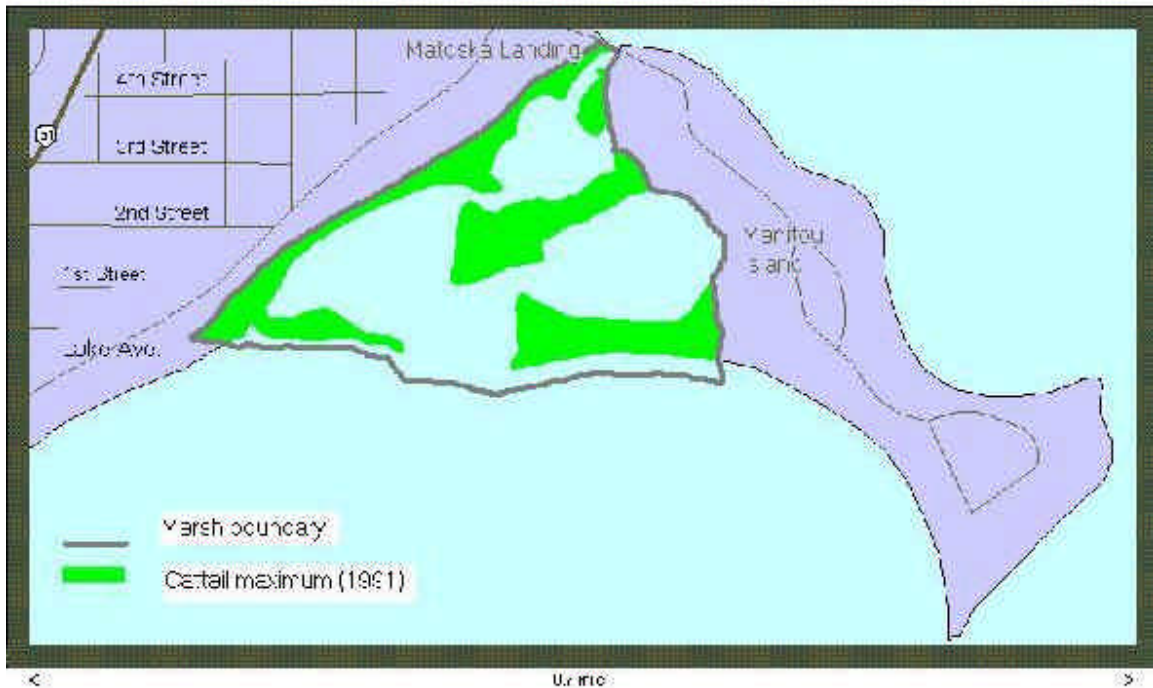


Matoska marsh in July 2002

Photos by Bordner Aerials

Since vegetation above and below the water's surface that makes up the marsh varies quite a bit, it is hard to precisely delineate a marsh within a lake. An approximation, however, can be drawn using the land surrounding the marsh as an obvious boundary and water depth (see graphic below).

The land boundaries of the Matoska Marsh extend southwest from the landing and park of the same name that border the west side of the lake, and on the west side of the northwestern half of Manitou Island. The southern edge of the marsh is less obvious. A sand bar runs from Manitou Island to the mainland that can be used to delineate the southern edge of Matoska Marsh. Since cattails and bulrushes don't grow in water over a yard or so deep, water depth can be used as this southern boundary.



IMPORTANCE OF A MARSH

The Matoska Marsh is White Bear Lake's nursery – a complex shelter and food system for plants and animals. Plant and animal life live and thrive here together. Water quality and clarity; climate, geology, and geography; pollution; plant and animal removal; exotic plants... all influence the habitat and its ability to be an effective nursery. No single factor is predominant in this coexistence. Therefore, the points that follow must not be considered in isolation but as an interconnected system.

A marsh is important:

- /// **As a critical habitat for animals:**
- /// Fish use marshes for spawning and protection.
- /// Waterbirds and shorebirds use marshes as a refuge.

~~///~~ **As a critical habitat for insects:**

~~///~~ Insects are an essential link of the food web for shorebirds, ducks, and fish.

~~///~~ Water fleas, caddis, mayflies, beetles, and black flies live on the stems and in the roots of marsh plants.

~~///~~ **For water quality and clarity:**

~~///~~ Marshes filter and trap sediments, chemicals, and acid rain.

~~///~~ They also absorb excess nutrients and keep water clear of algae while aerating shallow water with oxygen.

~~///~~ **For erosion control:**

~~///~~ Marshes anchor shoreland providing a barrier to protect property, roads, and bridges from waves or floods.

~~///~~ **For its aesthetic value:**

~~///~~ Marshes are beautiful with unique plant and animal species not found in open water. They are often used for art, relaxation, and contemplation.

~~///~~ **For recreation:**

~~///~~ Marshes are among the best places to fish, kayak, and canoe.

~~///~~ They are also very good places to watch wildlife.

~~///~~ **For education:**

~~///~~ Marshes are a site for research and education.

~~///~~ They are a healthy environment to which other areas of the lake can be compared.

~~///~~ **As a critical habitat for plants:**

~~///~~ Marshes consist of plants that can be seen – cattails, reeds, bulrushes, milfoil, algae.

~~///~~ Marshes also consist of plants that cannot be seen – tiny often single-celled animals called phytoplankton. Organisms such as bacteria, algae, fungi, and viruses do much to sustain life at the bottom of the food chain.

~~///~~ A marsh is also a seed bank for plants in the rest of the lake.

~~///~~ Many marshes, like the Matoska Marsh, have greater diversity of plant life than the rest of the lake that keep pest species at bay.

CATTAILS

Of particular attention and contention are the cattails in Matoska Marsh; they are the most visible and often misunderstood plant in the marsh. If proper lake functions such as water movement and depths are maintained, cattails will not take over the lake.

Minnesota has two types of cattails, and a hybrid of the two. One type has a broad leaf (0.5 – 1.0 inch width) and the other is narrow-leaved (< 0.5 inch width). They emerge in the spring from sprouts formed in the previous fall. Colonies can form quickly. In one summer the sprouts can spread out in a 10 foot diameter with 100 shoots.



Healthy and damaged plants on the edge of a cattail stand in Matoska Marsh.

Photo by Mary Sue Simmons.

Importance of cattails:

- ☞☞ Cattails are probably the most effective plant at excess nutrient removal, nutrient uptake, and sediment settling (some industries use cattails where they discharge waste).
- ☞☞ An overly thick cattail stand is not necessarily always good: ducks like open water, easy access to swim around; fish like to be able to swim in the stand and lay eggs.
- ☞☞ Muskrats are great cattail marsh managers. They eat cattail sprouts, which are full of starch, and keep marshes from becoming too thick.
- ☞☞ Cattails are very good at buffering the shore from wave action and guard against ice heave.
- ☞☞ Some shorebirds like marsh wrens, red-winged blackbirds, yellow-headed blackbirds, and bitter wrens are found only in cattails.
- ☞☞ Fish such as northerns and muskies use cattails as a nursery, or spawning area, attaching their eggs to the base of the cattails.
- ☞☞ If all cattails are removed Eurasian watermilfoil could take their place.

THE CONDITION OF THE MATOSKA MARSH

Cattails are but one of the important plant species in the Matoska Marsh; this diversity makes the marsh a high quality and sensitive area. There are a good number and mix of plants that are important to the overall quality of the lake environment. On average, there are roughly 50% more plants in the Matoska Marsh than in the rest of the lake. Many of these plants are very beneficial to the overall condition of the lake and the surrounding environment.

Along with the more visible emergent vegetation described above, the Matoska Marsh contains equally important and beneficial plants, including:

Cabbage pondweed

A high value submerged perennial with large leaf surface that supports many insects, an important sustainer of the local food web. This plant also provides cover for large fish and seeds for ducks.

Chara

A good plant for stabilizing sediment and trapping suspended debris, important for water clarity. This plant is also good at supporting insects.

Claspingleaf pondweed

Good for fish habitat (easy to swim through) and as a seed producer (from its emerging heads) for waterfowl.

Fern pondweed

This fern-like looking plant provides good habitat for insects and snails, and can thrive in deeper waters competing with Eurasian watermilfoil.

Flatstem pondweed

Is also a good source of seeds for waterfowl and provides good habitat for insects.

Illinois pondweed

A very good plant for insects and indicator of good water quality. If disturbed it could lead to more Eurasian watermilfoil.

Naiads

An annual plant that comes back from seed. A good source of seed for ducks.

Northern watermilfoil

This native milfoil with a large leaf area is an excellent habitat for insects and a good member of a mixed plant bed.

Slender arrowhead

This emergent plant is good for waterfowl as a prolific seed producer. It is not deeply rooted and therefore can be damaged by boats.

Variable pondweed

This plant can grow on sandy soils where other plants cannot thereby anchoring these sediments. It is also a good seed producer.

Water celery

This is a premiere aquatic plant. Diving ducks eat its root stocks which are full of carbohydrates (people have been known to eat them too).

Water marigold

This sensitive plant is a good indicator of water quality. Its lacy leaves and yellow daisy-looking flower can be cut off by boat motors. An excellent source of food for ducks.

Many of the plants found in Matoska Marsh are there because of the excellent water quality found in White Bear Lake. The water quality of the lake, in turn, is related to the high diversity of these plants found in the marsh. If the water quality decreases the diversity of plants will also decrease and plants such as coontail, elodea, sago pondweed, and Eurasian watermilfoil can take over in large numbers.

RECENT CONCERN

The visible loss of emergent vegetation in the marsh due to snowmobile trampling and manual removal are obvious signs of degradation and are reasons for concern. A much more serious problem, however, would be if the Matoska Marsh lost its generous mix of plants above-and-beyond emergent vegetation like cattails and bulrushes. The condition of plants not seen above water should also be kept in mind. The plants that live under the water are even more critical to health of the marsh, the lake, and the local environment. Loss of vegetation above and below the water's surface could compromise the ability of the marsh to function as a nursery that links plants with organisms that depend on it – insects, birds, fish – and the overall quality of the lake.

Damaging Emergent Vegetation

Department of Natural Resources (DNR) rules clearly state that it is illegal to remove emergent vegetation in Minnesota without a permit: "an APM [aquatic plant management] permit is required to... destroy emergent aquatic macrophytes¹ in public waters" (Minnesota Rule 6280.0250, Subpart 2, C). the penalty for such behavior is a misdemeanor (Minnesota Rule 6280.1200). By authority given by the State Legislature, DNR rules have the force and effect of law.



Snowmobiles going through the Matoska Marsh can damage emergent vegetation.

Photo by Mary Sue Simmons.

¹ Macrophyte plants are nonwoody plants, either submerged, floating leafed, floating, or emergent plants growing in water.

Snowmobiles and ATVs

Besides being illegal, it has been observed by field biologists that mechanical trampling of emergent vegetation can have the same effect as mechanical management; winter travel through cattails and bulrushes can inhibit the re-growth or kill the plants (McComas 2003; Borman 2003). Dormant stocks that remain standing after the winter act as a snorkel transferring oxygen to live plants at the bottom of the lake enabling rhizomes to sprout. If water levels rise above the sheared stocks in the spring, the plant's oxygen supply will be cut off. In fact, crushing and cutting emergent cattails and bulrushes are a way the plants are intentionally thinned and killed in situations where they are not wanted (Payne 1992).

Boats

Boat wakes have no impact on cattails and bulrushes, but boat motors do. Boat propellers can cut plant stems and create a downward force of water that disturbs the lakebed and vegetation in shallow waters. Boats should stay away from all emergent plants, especially in the spring, and go slow through shallow waters.

SPRINGTIME

Almost all the plants in the Matoska Marsh remain dormant throughout the winter and emerge again in the spring. It is then that the vegetation is the most vulnerable to disturbance from boats, trampling, and cutting. Emergent vegetation in particular is vulnerable in the spring when young shoots are reaching toward the surface of the water. Special care should be given to allow the plants to take root in the spring so that they can serve their function as the lake's nursery.

FIVE EASY THINGS YOU CAN DO

- 1. If you live on the lake, create a lakeshore buffer zone.**
 - Do not mow lawn up to the lake front.
- 2. Do not remove plants from the marsh.**
- 3. Do not drive snowmobiles or ATVs over cattails or other plants.**
- 4. Drive boats slowly through the marsh.**
 - When propeller is down stay in the channel.
- 5. Tell your neighbors and friends about the importance of a marsh.**

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