Management Options for Controlling Aquatic Plants

Management Option	Advantages	Disadvantages
Promotion of Beneficial Plants	▪ Promotes good fish and wildlife habitat ▪ Encourages native species ▪ Protects against the invasion of nuisance species ▪ Low or no cost	▪ May conflict with some recreational uses such as swimming and boating
No Intervention	▪ No cost or labor required ▪ No environmental disruption	▪ Certain recreational uses may be impeded
Selective Maintenance	▪ Controls the plants primarily responsible for recreational hindrance ▪ Maintains and promotes good populations of desirable plants in the treated environment ▪ Minimizes environmental impacts. ▪ Reduces costs	▪ Some recreational uses may still be impaired.
Small-Scale Site Maintenance	▪ Low cost ▪ Maximum use of small areas ▪ Minimal environmental disruption	▪ Usually labor intensive ▪ Recreational uses requiring a large area, such as boating, may still be hindered in some lakes
Large-Scale Continual Maintenance	▪ Beneficial to recreational uses requiring a large area	▪ High cost ▪ Commitment to continual development ▪ Usually disruptive to fish and wildlife populations ▪ Encourages “weed” species
Dredging	▪ Possible long-term control of aquatic plants ▪ Improved recreational use	▪ Very expensive ▪ Loss of lake use during dredging ▪ Increased turbidity and/or algal problems during dredging ▪ Possible contaminated sediments and placement of them. ▪ Environmental issues regarding placement of sediments ▪ If there has been no reduction of sediment and nutrient loading, dredging may only shift the lake’s

		vegetation from rooted plants to algae.
Biological Control	▪ Long-term control ▪ Potential low cost	▪ Potential for significant environmental damage ▪ Results may take years to manifest ▪ The level of plant control may not meet use expectations.
Drawdown (Water Level Manipulation)	▪ Low cost ▪ Eurasian milfoil generally decreases ▪ May allow for certain beach maintenance activities	▪ Not practical in lakes without a water level control structure ▪ Can seriously reduce fish populations, particularly northern pike ▪ May damage contiguous wetlands ▪ Can seriously injure hibernating wetland animals ▪ May result in increased algal blooms

Bottom Barriers	▪ A good treatment for small, defined areas ▪ Can be used in areas close to shore where other control tools may not work as well.	▪ Cost per area treated is very high ▪ Labor intensive ▪ May become slippery
Mechanical Harvesting	▪ Cost competitive with chemical controls ▪ Removes nutrients from the lake, but may be minimal compared to input ▪ Removes organic material from the lake ▪ May provide some selective control	▪ Undesirable plants may fragment, spread and colonize new areas ▪ Desirable plants such as pondweeds may be suppressed ▪ Limited operation in shallow water and around docks and rafts ▪ Machine breakdowns can disrupt operations ▪ Drifting plant fragments may accumulate at nuisance levels in quiet water areas
Hand Harvesting	▪ Low cost ▪ Excellent control in small areas ▪ Low environmental impact	▪ Labor intensive ▪ Not suitable for large areas
Herbicides	▪ Costs are reasonable in many situations ▪ Range of products and combinations available provide flexibility in management options ▪ Some products are highly selective for nuisance species ▪ Can provide complete control of plants for swimming beaches	▪ Involves the introduction of pesticides into shared water resources ▪ Potential for misuse ▪ May contribute to the buildup of organic materials ▪ Algal blooms are possible following large herbicide treatments ▪ Large treatments may encourage shifts in plant communities ▪ Potential fish kills with misuse of certain products ▪ Imposed water use restrictions ▪ Does not address the causes of cultural eutrophication

Types of Aquatic Herbicides Commonly Used to Treat Michigan Lakes

Selective Herbicides

2,4-D—available in liquid and granular forms. Liquid forms control emergent species such as cattails, bulrushes, and lilies. Granular forms may be used on both emergent and submergent plants. The most common granular form of 2,4-D used in products registered for aquatic uses is the butoxyethanolester (BEE). At low rates, BEE forms of 2,4-D are used to selectively control Eurasian and native milfoils. Higher rates will control coontail in addition to many emergent species.

Fluridone—available in liquid and granular forms. At normal label rates it is not a selective herbicide but very broad spectrum. Only at concentrations of about 5 to 8 ppb (Parts per billion) does it appear to have selective control qualities. At these low concentrations, it controls Eurasian milfoil and curly-leaf pondweed.

Broad-spectrum Herbicides

Diquat—available only in liquid form. Diquat is a restricted-use product available only to state licensed applicators. It binds rapidly with the aquatic plants and other organic material in the lake, so drift from the treatment area can be minimal. Diquat is often mixed with a copper product to increase its spectrum of plants controlled, including some species of algae, and increase its toxicity to the plants, allowing application at lower concentrations. It is also mixed with endothall products to produce a very broad-spectrum combination capable of controlling most submergent aquatic plant species. Aquatic plants usually controlled by Diquat include duckweed, coontail, milfoil, waterweed, bushy pondweed, buttercup, and curly-leavef, floating leaf, and sago pondweeds.

Endothall dipotassium salt—available in liquid and granular forms. Endothall is particularly effective on pondweed species, most of which as susceptible. This herbicide may also control coontail, milfoil, and bushy pondweed.

Endothall Mono (N,N-dimethylalkylamine salt)—available in liquid and granular forms. It is fairly broad-spectrum, controlling waterweed and wild celery in addition to the species controlled by the dipotassium salt. It is one of the few herbicide products that suppress wild celery. At higher dosages, fish kills are possible if the product is used improperly.

Glyphosate—available only in liquid forms. It is extremely broad-spectrum and is used extensively in agriculture. Few land plants are not injured or killed by glyphosate. The applied product is inactivated in water, however, so glyphosate is ineffective on plants growing below the water surface. In the aquatic environment, this herbicide is used emergent species and on plants with large, floating leaves such as water lilies. Because of the extreme broad-spectrum qualities of glyphosate, care must be exercised to avoid excessive damage to wetland and shore zone plant communities.

Copper—Copper is available as copper sulfate, a granule, and as copper complexes in liquid or granular form. Copper sulfate is used to suppress algae and the macroalgae, stonewort. Copper complexes are used on algae and certain rooted plants, particularly bushy pondweed, waterweed, and some pondweeds. Copper sulfate can be very toxic to some fish, such as trout.

Sonar???