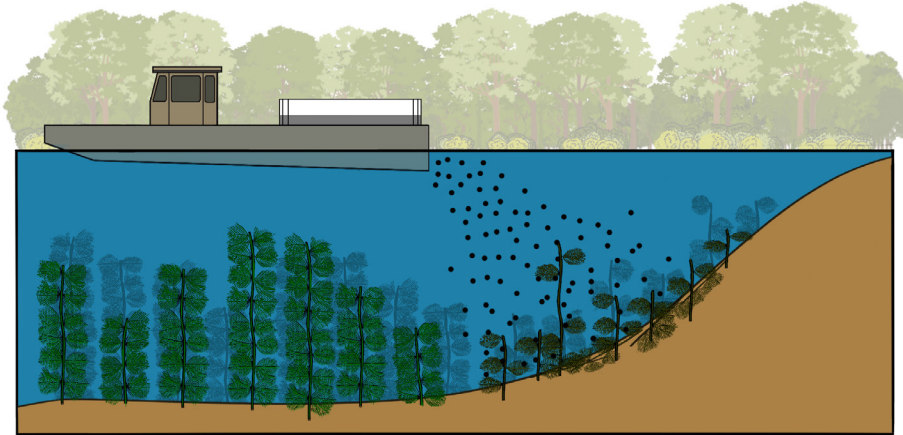


**THREATS  
ADDRESSED**Excess  
NutrientsPollutant  
InputsAlgal  
Blooms

Erosion

Invasive/Nuisance  
Species**STRATEGY  
GOALS**Protect  
Manage  
Rehabilitate  
**STRATEGY  
CO-BENEFITS**Habitat  
 DetrimentalAesthetics  
 NeutralRecreation  
 Neutral**Permittable in Massachusetts**Local planning process. List of potential permits available [here](#).**Implemented on Cape Cod**See examples of pond projects implemented on Cape Cod [here](#).**Listed in 208 Plan Technologies Matrix**Learn more about the nutrient management strategies in the Tech Matrix [here](#).**Can be Performed at Homeowner Scale**

In small, private ponds. Local review and permitting may be required.

**Nature-based Solution****DURATION  
OF BENEFITS**Less than  
one month  
One season  
or year  
Multiple seasons  
or years  
**MAINTENANCE  
REQUIREMENTS**Monthly  
Annually  
Infrequent  

## DESCRIPTION

Herbicides are used in ponds to kill or interfere with problem plants. Only herbicides registered for use in Massachusetts through the Department of Agricultural Resources (DAR) may be used, and then only by licensed applicators with proper permits. An updated list of registered herbicides can be obtained from DAR. Herbicides (e.g., copper-based herbicides, diquat, endothall, Aquathol K, glyphosate, 2,4-D, fluoridone, triclopyr, flumioxazin, ProcellaCOR, imazapyr, imazamox, carfentrazone, metsulfuron) kill macrophytes or inhibit their normal growth through direct toxic reactions or by hampering their photosynthetic ability. Some chemicals are species-specific and others affect a broad spectrum of plants. Some are contact herbicides, toxic to only those parts of the plant contacted by the herbicide, and others are systemic herbicides that affect the plant's metabolic growing processes.

## ADVANTAGES

- Very effective technique for controlling invasive species
- Ideal for large areas, but may also be used to spot treat specific plants
- Can restore balance to plant community
- Can open areas for human access and recreation

## CONSTRAINTS

- Herbicides, herbicide residues and degradants may be toxic and may affect pond water quality
- Some herbicides are non-specific, killing all (or most) plants in the treatment area
- Herbicide applications must be properly timed to correlate with lake conditions, plant life cycles and recreational uses of a lake
- Reapplication(s) may be necessary and plants may develop resistance to herbicides
- Decomposing plant matter may release nutrients and decrease oxygen levels in the water



## IMPLEMENTATION

### POTENTIAL ACTORS



**Towns:** Towns may propose the use of herbicides in town-managed ponds



**Pond Groups:** May propose or support the use of herbicides in public or private ponds and provide a supportive role through education



**Private Landowners:** May propose or support the use of herbicides



**Land Trusts:** May provide a supportive role through education

### SITING REQUIREMENTS

- All ponds with nuisance or invasive plant species present (littoral zone)
- Access/launch site for herbicide application vessel

### INFORMATION NEEDS

- Macrophyte survey (species composition and abundance)
- Choice of herbicide to maximize intended effect while minimizing non-target impacts
- Fish habitat survey



Hydrilla from Long Pond/Mystic Lake

### IMPLEMENTATION EXAMPLES

Herbicides have been applied in many ponds in Massachusetts, including several on Cape Cod. For example, the [Town of Barnstable has used herbicides](#) in Long Pond and Mystic Lake to control Hydrilla (*Hydrilla verticillata*).

### RESOURCES

- The Massachusetts' Department of Conservation and Recreation's [Lakes and Ponds Program](#) provides related resources.

### COST ESTIMATE

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Relative to other in-pond strategies

Varies depending on chemical used and area to be treated



### ADDITIONAL FINANCIAL CONSIDERATIONS

**Assessment:** Planning, design, and permitting, including macrophyte survey

**Implementation:** Chemical, application equipment, and labor

**Maintenance:** Monitoring and reapplication, as needed



### POTENTIAL FUNDING SOURCES

- Community Preservation Act
- Capital Budget
- Grants
- Private Funding

Additional information regarding potential funding sources is available [here](#).