



**THREATS ADDRESSED**

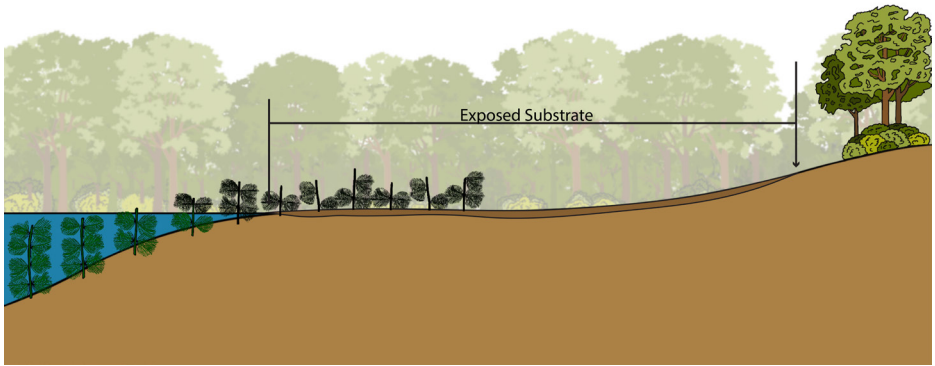
- Excess Nutrients
- Pollutant Inputs
- Algal Blooms
- Erosion
- Invasive/Nuisance Species

**STRATEGY GOALS**

- Protect
- Manage
- Rehabilitate

**STRATEGY CO-BENEFITS**

- Habitat  Detrimental
- Aesthetics  Neutral
- Recreation  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

Water drawdown is the winter manipulation of lake water level to expose rooted aquatic vegetation and sediments to the freezing and drying action of cold air to reduce excess levels of nuisance or invasive aquatic species. It requires draining large volumes of water for extended periods of time. Lower water levels create an inhospitable environment for nuisance or invasive aquatic plants, providing seasonal vegetation control, and creating opportunities for beneficial plants. Water drawdown disrupts plant life cycles by desiccation or freezing. Plants that reproduce by seeds are less susceptible to drawdown than plants that reproduce by rhizomes and other vegetative means. Over the longer-term (decades), water drawdown can change the substrate composition.

## ADVANTAGES

- Simple management strategy for smaller lakes for which water levels can be fully controlled
- Magnitude, duration, and frequency of drawdown are major variables; few impacts documented in MA where average drawdown is 2-3 ft.
- Provides widespread control in increments of water depth
- Public response is generally favorable due to the low cost and the winter timing that does not interfere with summer recreation
- Non-toxic, no chemicals or significant mechanical equipment used

## CONSTRAINTS

- Draining large volumes of water for extended periods of time may be impractical and may have non-target impacts
- Weather conditions may alter effectiveness - most effective if combined with freezing
- Groundwater seepage may mitigate or negate destructive effects on target submergent species
- Not species specific and variable species tolerance to drawdown
- Can negatively affect benthic and fish habitat and adjacent wetlands
- Should be used every other year or twice every three years to discourage the establishment of resistant plant species
- Removal of sediment-anchoring plants along the shoreline has the potential to increase turbidity, erosion or re-suspension of sediments and nutrients
- If too much water is removed, or there's drought, water levels may take a long time to return to normal levels



## IMPLEMENTATION

### POTENTIAL ACTORS



**Towns:** Towns may propose water drawdown in town-managed ponds



**Pond Groups:** May propose or support the use of water drawdown and provide a supportive role through education



**Private Landowners:** May propose or support the use of water drawdown



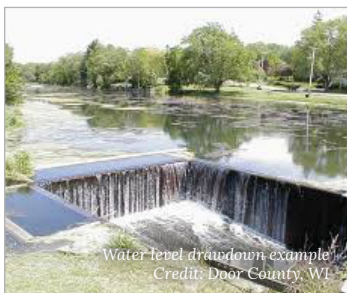
**Land Trusts:** May provide a supportive role through education

### SITING REQUIREMENTS

- Ponds with substantial littoral zone with excessive nuisance or invasive plants and soft substrate

### INFORMATION NEEDS

- Macrophyte survey (species composition and abundance)
- Fish habitat survey
- Timing, duration of exposure, and degree of dewatering



Water level drawdown example  
Credit: Door County, WI

### IMPLEMENTATION EXAMPLES

Water drawdown has not been implemented on Cape Cod, but is a common management strategy in other Massachusetts lakes. Information on the impacts of water drawdown can be found in the research article [here](#).

### 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 if water level controls need to be installed and magnitude of drawdown



### ADDITIONAL FINANCIAL CONSIDERATIONS

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

**Implementation:** Water level controls, pumps

**Maintenance:** Monitoring and maintenance of water level controls and pumps, reapplications, as needed



### POTENTIAL FUNDING SOURCES

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

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