



THREATS ADDRESSED

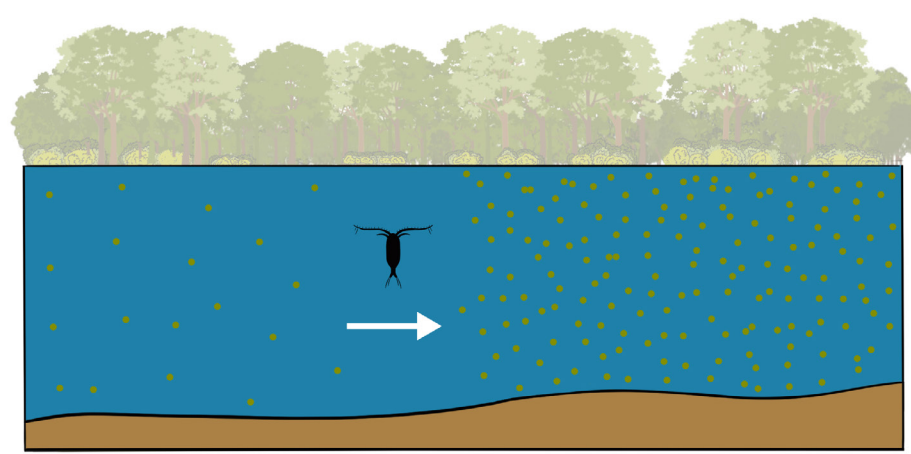
- Excess Nutrients
- Pollutant Inputs
- Algal Blooms
- Erosion
- Invasive/Nuisance Species

STRATEGY GOALS

- Protect
- Manage
- Rehabilitate

STRATEGY CO-BENEFITS

- Habitat Neutral
- Aesthetics Neutral
- Recreation Neutral



- Permittable in Massachusetts**
Depends on biological control agent used. 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**
Local review and permitting may be required.
- Nature-based Solution**
If native species used

DURATION OF BENEFITS

- Less than one month
- One season or year
- Multiple seasons or years

MAINTENANCE REQUIREMENTS

- Monthly
- Annually
- Infrequent

DESCRIPTION

Biological control of algae involves the introduction of organisms such as bacteria, phages, fungi, zooplankton, or fish to control algae. These biological control agents have adverse effects on algae through infection, predation or production of algicidal compounds. Biological control may reduce excess levels of algae.

ADVANTAGES

- Specific to the target organism
- No direct chemical pollution that might affect humans
- Can be inexpensive to implement at a small scale
- No infrastructure required

CONSTRAINTS

- Not a replacement for nutrient control but can improve conditions where nutrients are not excessive
- Reapplication depends on whether desirable populations can be established
- Limited destruction of target organism and may have impacts on non-target organisms
- Water quality can be indirectly impacted by biological control
- Problems of large-scale production, storage and application
- Successful in lab settings, less understood under field conditions



IMPLEMENTATION

POTENTIAL ACTORS



Towns: Towns may propose biological control in town-managed ponds



Pond Groups: May propose or support biological control in public or private ponds and provide supportive role through education



Private Landowners: May propose or support biological control



Land Trusts: May provide supportive role through education

SITING REQUIREMENTS

- All size ponds (scalable)
- Ponds with target organism present
- Ponds that could benefit by food web adjustments that will favor algae control (e.g., low zooplankton body size and biomass, overabundance of panfish)

INFORMATION NEEDS

- Understanding of food web
- A full biological survey and study should be conducted to determine what type of manipulation is best suited to achieve the desired goals while minimizing possible adverse impacts



IMPLEMENTATION EXAMPLES

Biological controls for algae management are not being used in Massachusetts; however, there is a [study being done at Lower Mill Pond in Brewster](#) on the effects of herring on zooplankton and water clarity.

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 size of treatment area



ADDITIONAL FINANCIAL CONSIDERATIONS

Assessment: Planning, design, and permitting

Implementation: Biological control agents, application

Maintenance: Monitoring and reapplications, as needed



POTENTIAL FUNDING SOURCES

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

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