



THREATS ADDRESSED

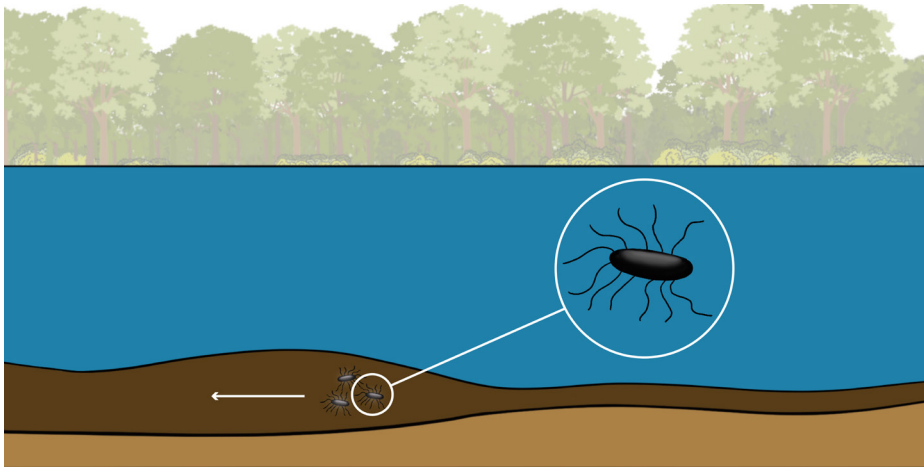
- Excess Nutrients
- Pollutant Inputs
- Algal Blooms
- Erosion
- Invasive/Nuisance Species

STRATEGY GOALS

- Protect
- Manage
- Rehabilitate

STRATEGY CO-BENEFITS

- Habitat Neutral
- Aesthetics Neutral
- Recreation Neutral



- Permittable in Massachusetts**
Not permitted in MA. 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**
- 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 sediment digestion (aka “biological dredging”) makes use of Bacillus spores, microorganisms, and enzymes to enhance natural sediment degradation processes. The approach has been marketed as a “natural” means to clean bottom muck, which can potentially clean the water. The objective of using biological sediment digestion is to decrease pond bottom sediment and organic matter.

ADVANTAGES

- Potential for minimal physical disruptions to pond
- May be considered a “natural” solution if native biological agents used

CONSTRAINTS

- Not much support for success in peer reviewed literature
- Largely experimental, and not currently permitted in MA
- Introducing novel organisms may disrupt pond ecosystem
- May further consume dissolved oxygen



IMPLEMENTATION

POTENTIAL ACTORS

- Towns:** Towns may explore potential for biological sediment digestion in town-managed ponds
- Pond Groups:** May support exploration of biological sediment digestion in public or private ponds and provide a supportive role through education
- Private Landowners:** May explore potential for or support exploration of biological sediment digestion
- Land Trusts:** May support exploration of biological sediment digestion and provide a supportive role through education

SITING REQUIREMENTS

- Ponds with sediment with high organic content

INFORMATION NEEDS

- Sediment sampling
- Organic content of sediment
- Bottom DO monitoring

IMPLEMENTATION EXAMPLES

Researchers in Michigan assessed the effectiveness of [muck-digesting bacterial pellets](#). Controlled laboratory experiments were conducted and changes in organic matter, dissolved organic carbon, bacterial community composition, and water quality were assessed at various times throughout the experiments. The researchers found no statistically significant differences in changes of organic matter between treatments with pellets and those without pellets. Based on these results, the researchers concluded that these pellets are not an effective treatment to reduce sediment organic matter.



RESOURCES

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

COST ESTIMATE

Variable

Varies depending on scope of project and biological agent



ADDITIONAL FINANCIAL CONSIDERATIONS

Assessment: Planning, design, and permitting, including sediment sampling costs

Implementation: Biological agents, equipment and logistics

Maintenance: Annual monitoring of biological agents, sediments, and other parameters, and reapplication, as needed



POTENTIAL FUNDING SOURCES

- Grants
- Private Funding

As it is not allowed in MA, public funding may not be available.

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