ALGAE / VEGETATION MANAGEMENT

Shading

STRATEGY SCALE

THREATS ADDRESSED

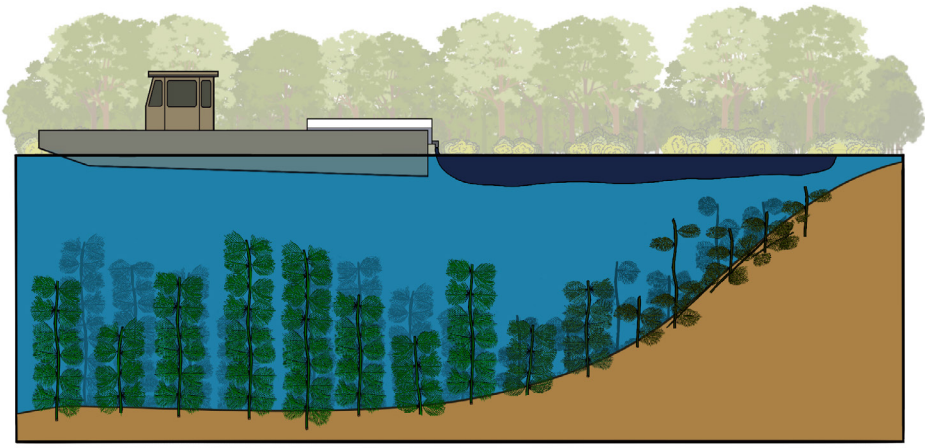
- ✗ Excess Nutrients
- ✗ Pollutant Inputs
- ✓ Algal Blooms
- ✗ Erosion
- ✓ Invasive/Nuisance Species

STRATEGY GOALS

Protect	Manage	Rehabilitate
○	✓	✓

STRATEGY CO-BENEFITS

Habitat	Aesthetics	Recreation
⊖ *Neutral*	⊖ *Neutral*	⊗ *Detrimental*



- ✓ **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

Shading uses surface covers or non-toxic vegetable dyes to prevent light penetration into the water column inhibiting algal/plant growth. Shading using surface covers, such as opaque sheet material applied to water surface, inhibits light penetration to prevent algal/vegetative growth. Shading using dyes treats an entire waterbody and is most often used in small (e.g., farm) ponds. Shading is rarely used on large lakes, due in large part to cost considerations. The dye treatment duration is a function of water retention time – when applied to lakes with significant inflow or outflow, dyes will quickly dilute or be flushed downstream. Dyes may persist throughout much of the recreational season, depending on the flushing rate of the lake.

ADVANTAGES

- Non-toxic, quick action, low cost
- Reliability may be high if target area permanently covered (surface covers)
- Produces appealing color and creates illusion of greater depth (dyes)
- Can provide localized (e.g., dockside, swimming areas) control on a temporary (e.g., April - June) basis

CONSTRAINTS

- Short-term solution, not long-term control
- Non-selective, all algae / plants within treatment area affected
- May not control all target species
- May alter thermal regime
- Covers are restricted to areas where there's limited access or ecological interference
- Covers interfere with atmospheric gas exchange and can be aesthetically unpleasing
- Wind and waves may compromise effectiveness of covers
- Dyes are not recommended in highly flushed systems and may require multiple applications
- Public may perceive dyes to be another "toxic chemical"

Shading

CAPE COD COMMISSION

IMPLEMENTATION

POTENTIAL ACTORS

- **Towns:** Towns may propose shading in town-managed pond docking or swimming areas
- **Pond Groups:** May propose or support shading in public or private ponds and provide a supportive role through education
- **Private Landowners:** May propose or support shading
- **Land Trusts:** May provide a supportive role through education

SITING REQUIREMENTS

- Small shallow ponds or small shallow area of larger pond (e.g., docking or swimming areas)
- No outlet (dyes)
- Long residence time of pond water

INFORMATION NEEDS

- Survey of target plants or algae
- Thermal and oxygen profiles
- Survey of potentially impacted populations

Example dye application

IMPLEMENTATION EXAMPLES

Dyes have been used very rarely in Massachusetts and these have been done at small, mostly private ponds. Covers are not widely used in recreational lakes (generally used in drinking water storage reservoirs) likely because of access restrictions.

RESOURCES

- The Massachusetts' Department of Conservation and Recreation's *Lakes and Ponds Program* provides related resources.

COST ESTIMATE

**$-$$**$$

Relative to other in-pond strategies

Cost: Varies with method, materials used, and treatment area

ADDITIONAL FINANCIAL CONSIDERATIONS

Assessment: Planning, design, and permitting

Implementation: Equipment (dye/cover), labor

Maintenance: Monitoring and cover maintenance or dye reapplication, as needed

POTENTIAL FUNDING SOURCES

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

Additional information regarding potential funding sources is available ***here***.