U.S. ENVIRONMENTAL PROTECTION AGENCY

National Pollutant Discharge Elimination System (NPDES)

Aquatic Pesticides

Pesticides Home

IEPA Permit

- 59 pages
- Not yet final

Pesticides

OVERVIEW

EPA Pesticide General Permit for Discharges from the Application of Pesticides

Proposed Pesticide General Permit

On June 2, 2010, EPA announced the public availability of a draft National Pollutant Discharge Elimination System (NPDES) permit for point source discharges from the application of pesticides to waters of the United States. This permit is also known as the Pesticides General Permit (PGP). The PGP was developed in response to a decision by the Sixth Circuit Court of Appeals (*National Cotton Council, et al. v. EPA*). The court vacated EPA's 2006 rule that said NPDES permits were not required for applications of pesticides to U.S. waters. As a result of the Court's decision, discharges to waters of the U.S. from

Pesticides Information

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Alternative Methods to Control Nuisance Aquatic Species

Presented by: Keith Gray, President
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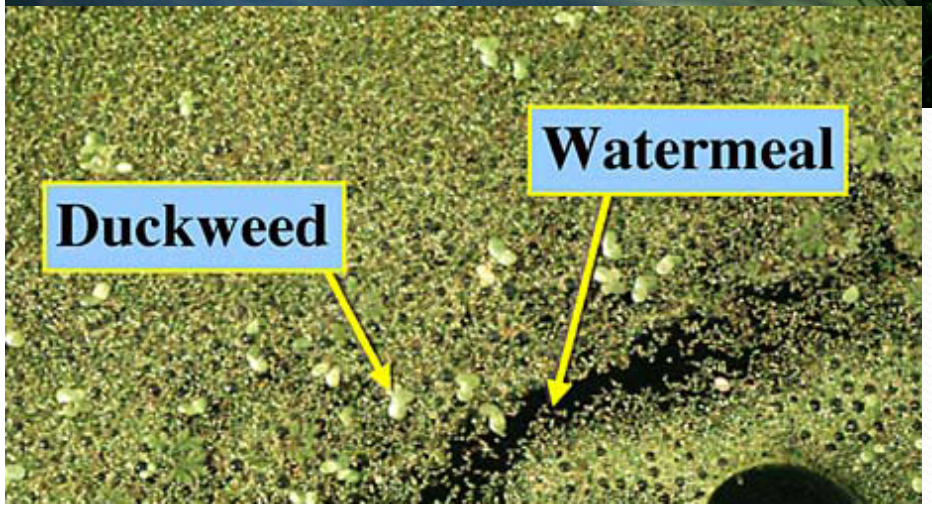
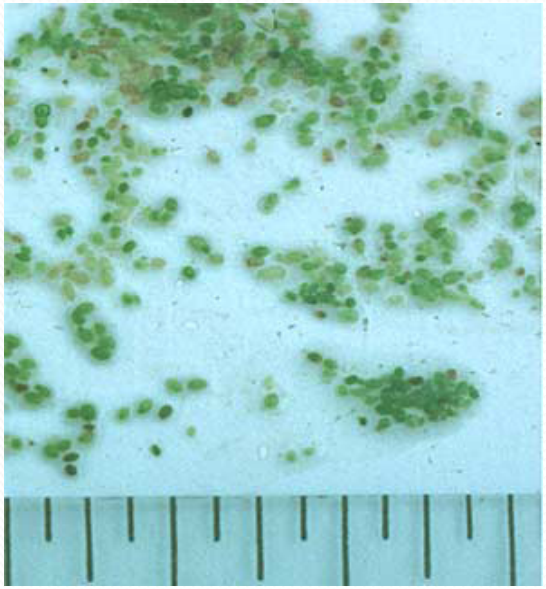
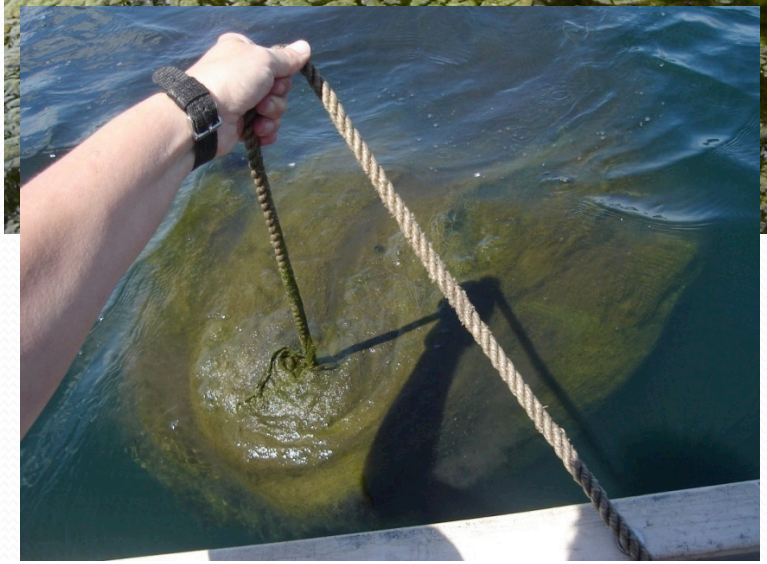
Integrated Lakes Management, Inc.
Lake and Pond Management
Restoration ▪ Consulting

Target Species: Wolffia (Watermeal)





Target Species: Algae



Alternative Methods for Controlling Nuisance Aquatic Species

Methods Evaluation:

- Sonic disruption of cell walls
- Harvesting (surface skimming)
- Enzymes and bacteria
- Nutrient Sequestration
- Herbicide Isolation

"Real world testing in this region"

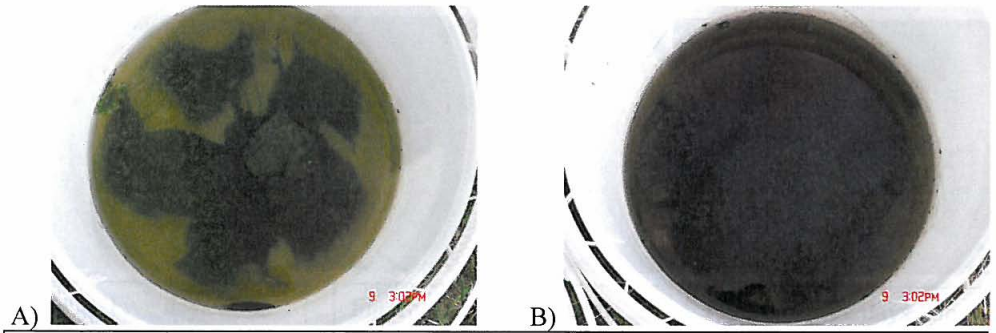


Figure 4: Seven days after misting over the top with 1000ppm of Tap water (A) or PondZilla 100 (B) on leaves. Somewhat faster degradation compared to control.

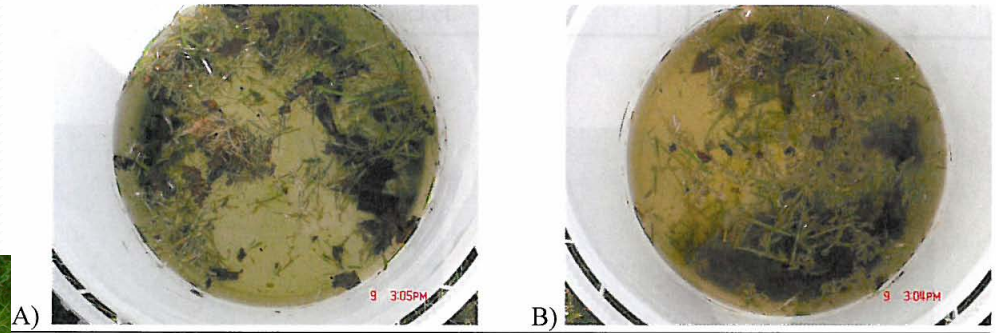


Figure 5: Seven days after misting over the top with 1000ppm of Tap water (A) or PondZilla 100 (B) on Grass. Not very effective degradation compared to control.

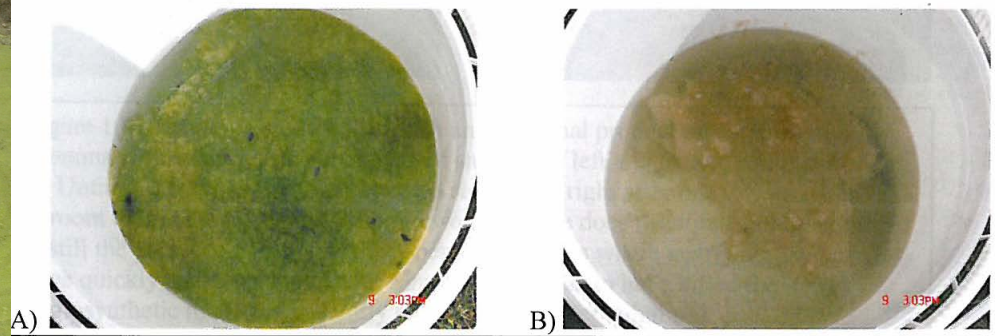
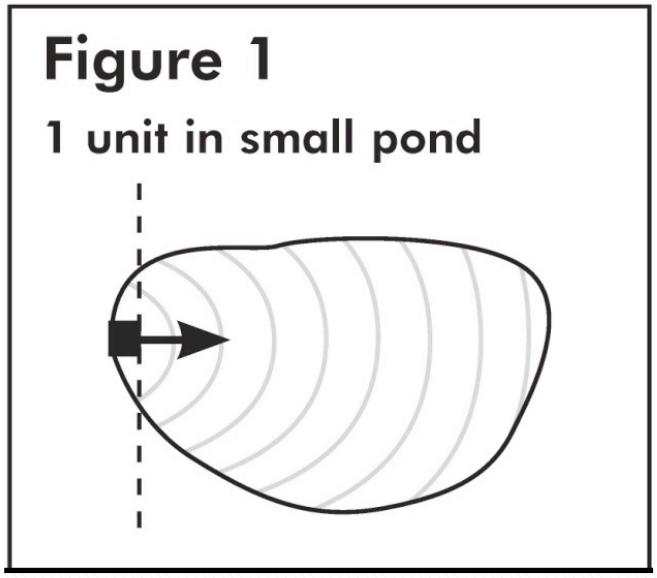


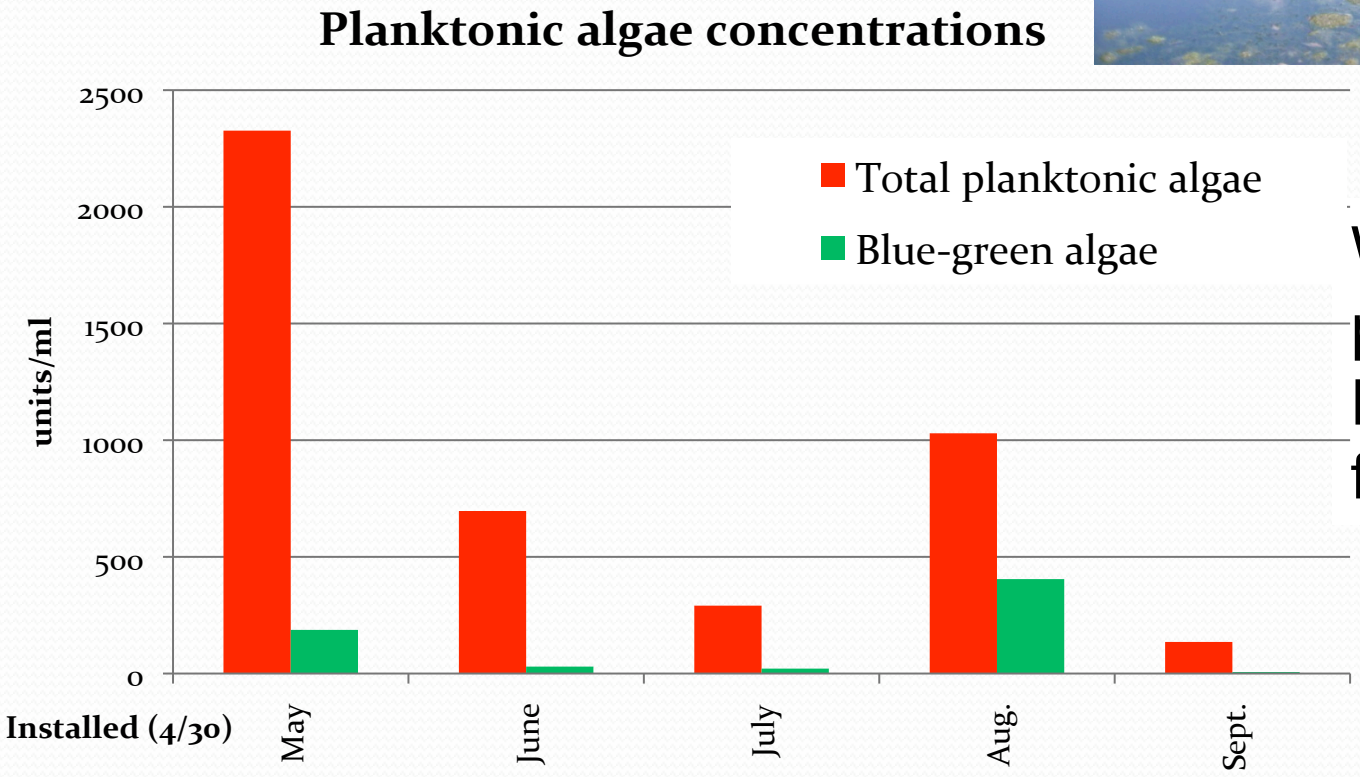
Figure 6: Seven days after misting over the top with 1000ppm of Tap water (A) or PondZilla 100 (B) on floating algae. Good control degradation of algae compared to control.

Sonic Disruption of Cell Walls

Target species: algae



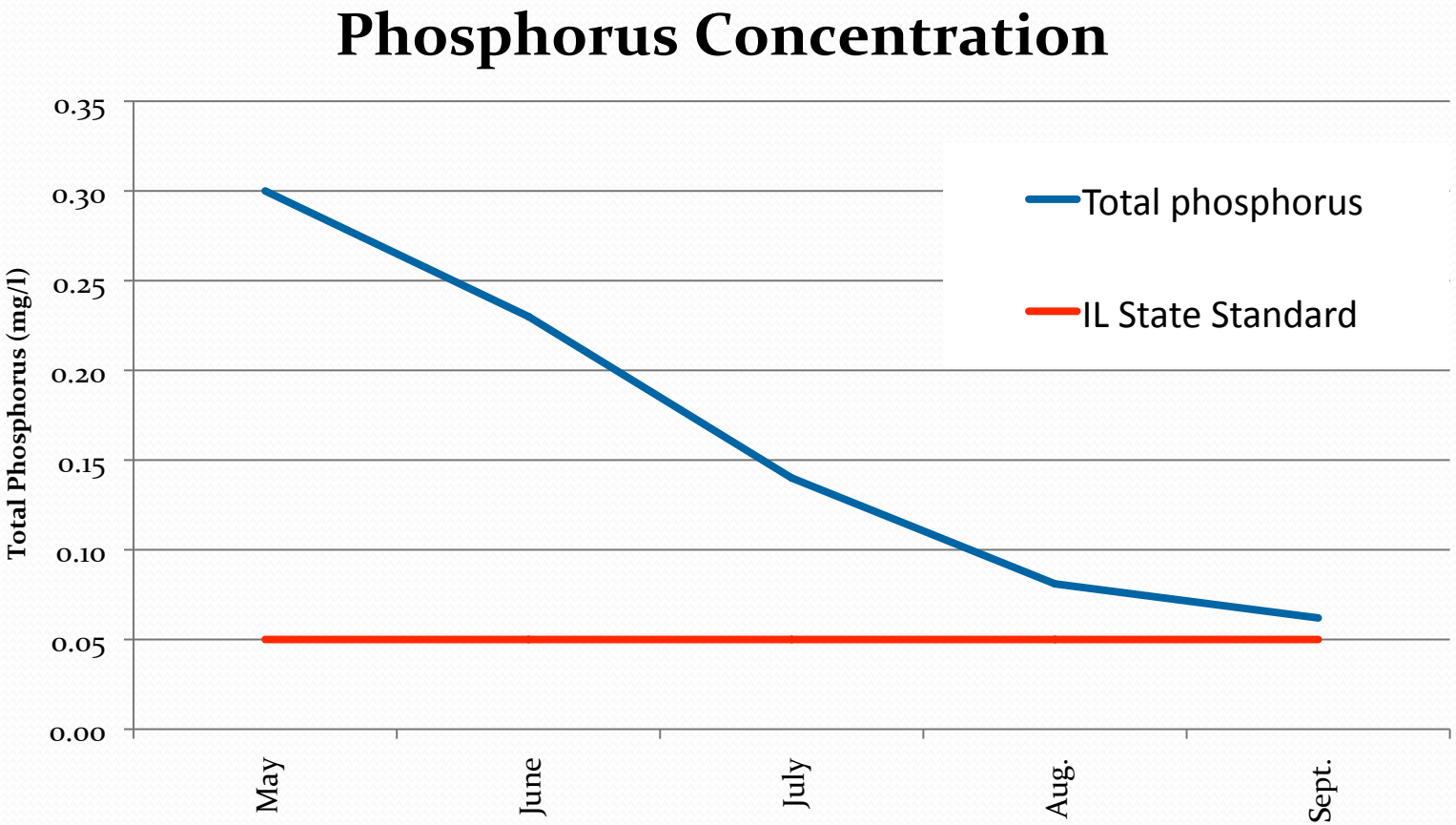
Sonic Disruption of Cell Walls



Works for planktonic algae
Does not work for filamentous algae

Sonic Disruption of Cell Walls

Unexpected results



Harvesting: Surface Skimming

Target species: Duckweed and Wolffia

Harvesting: Surface Skimming

1 single parent cell and it's "daughters"

→ 17,500 plants within 2 weeks

- Reproduce by budding
- allows duckweeds to quickly cover a pond in just a few weeks.

- Contact herbicides only affect plants present at that time.

Harvesting: Surface Skimming

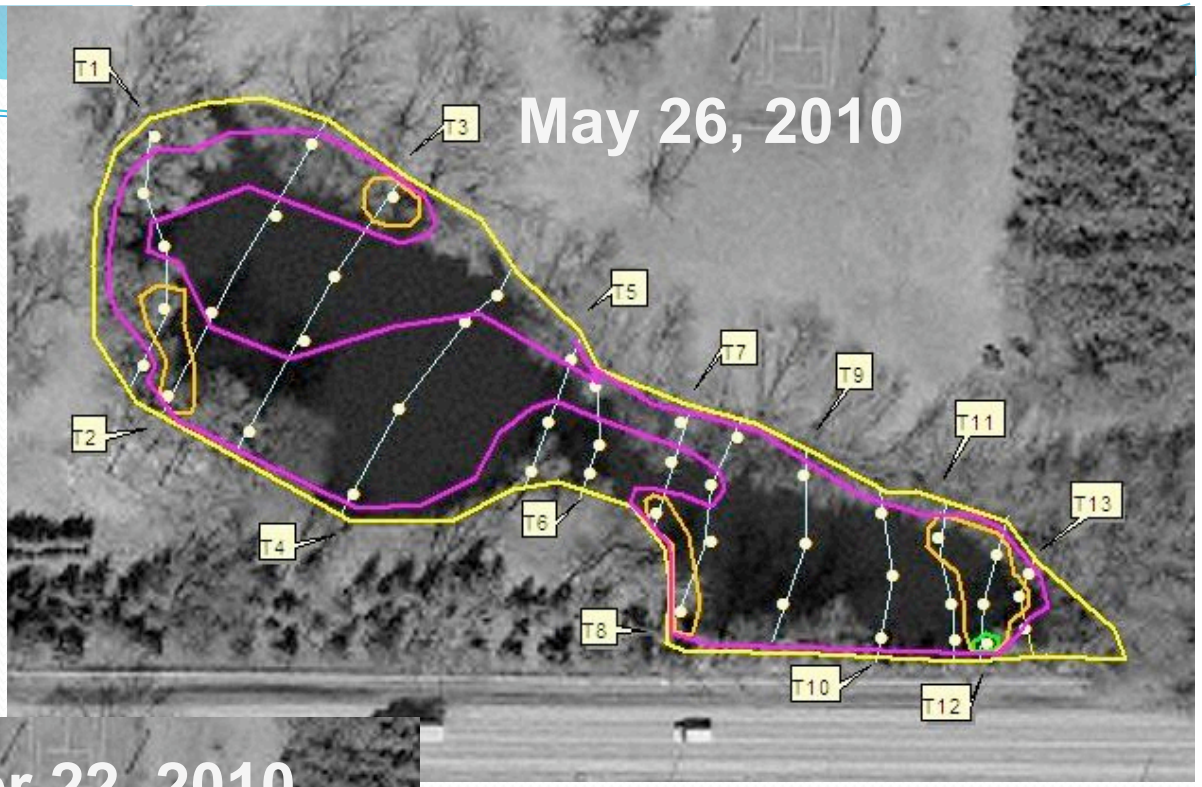
3 weeks later

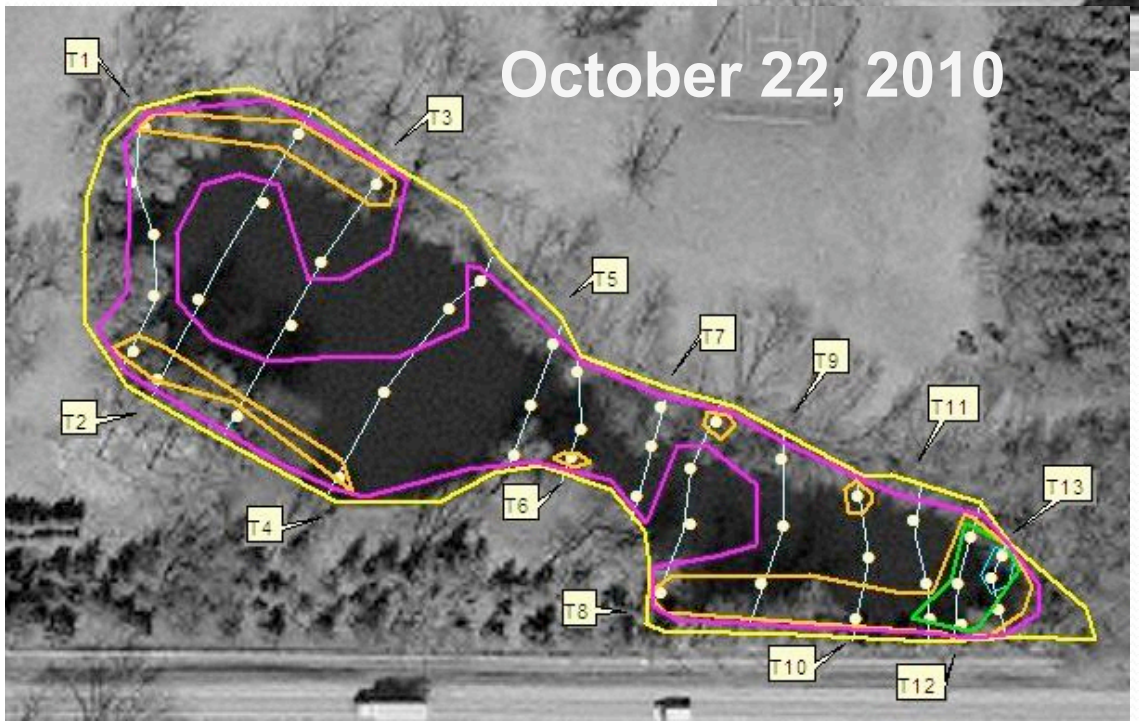
Challenges:

- need electricity;
- surface flow interference;
- maintenance of filters

Sediment Reduction: Enzymes & Bacteria

Sediment Reduction: Enzymes & Bacteria





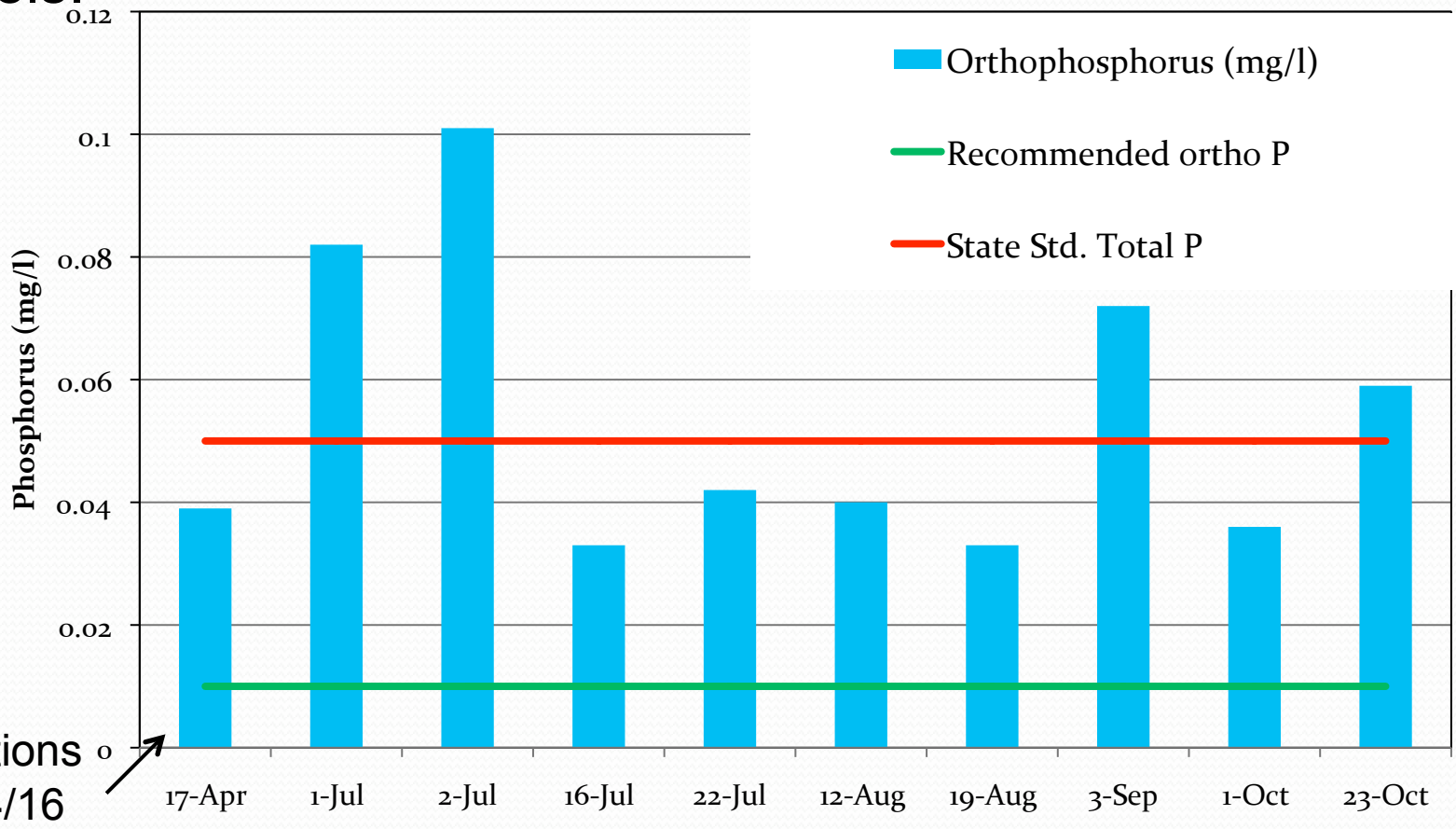
Found thicker sediment after second round of probing – which is within 20% range of error

May visit = 1.2 ft thick
Oct. visit = 1.4 ft thick

Aquarium Study

Sediment Reduction: Enzymes & Bacteria

Minor phosphorus changes – still above recommended levels.

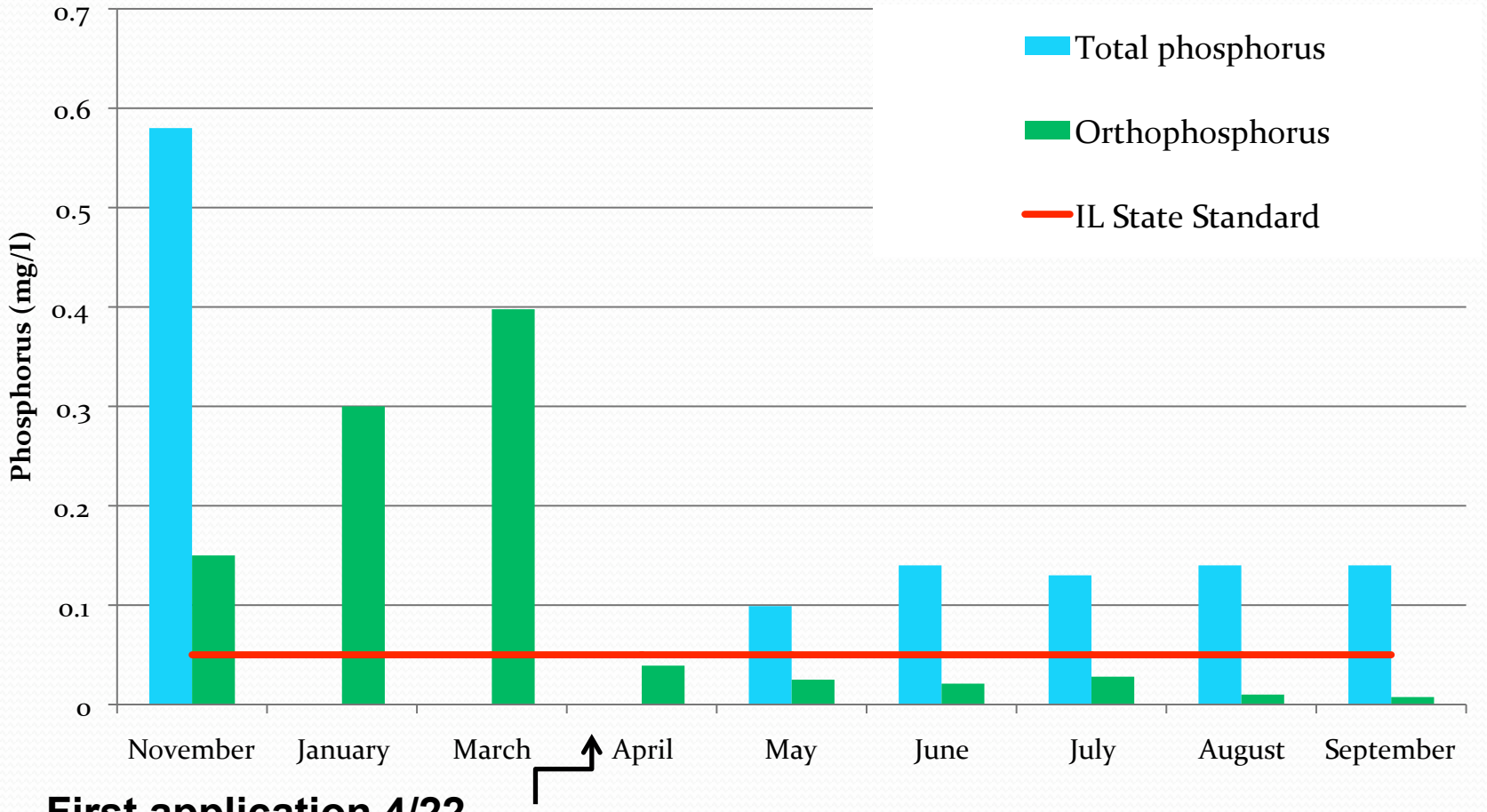


Applications began 4/16

Nutrient Sequestration using Phosphorus Reduction Agent (PRA)

- Two methods used:
  - Chemical binding agent
    - Secondary Target: Wolffia
  - Floc logs
    - Secondary Target: filamentous algae

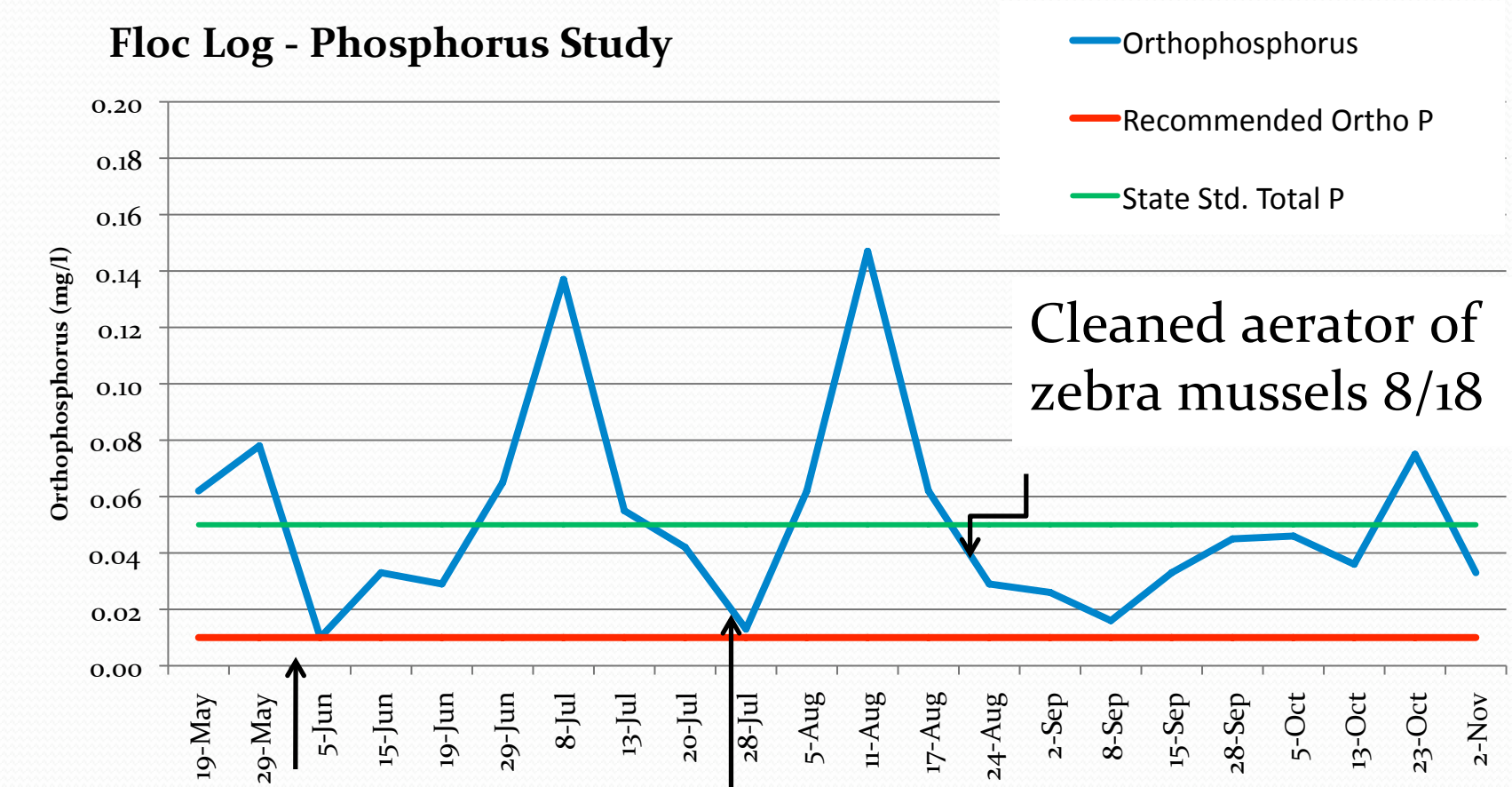
Phosphorus Reduction Agent (PRA)



Phosphorus Reduction Agent (PRA)

Wolffia density improved somewhat during the season, but continued to cover much of the pond

Phosphorus Reduction – Floc Logs



Phosphorus Reduction – Floc Logs

Pond had ring of algae all summer.

Marginally better than previous years.

Variables:

- Goose population
- Zebra mussels

Herbicide Isolation

- Air Curtain with aquatic herbicide –
  - Target: Eurasian Water Milfoil

Was successful for target species, but was more diluted than planned.

Herbicide Isolation

- Unfortunately other species replaced the Eurasian Water Milfoil – mostly algae and coontail

Conclusions

- Alternative methods are not as easy to use and do not produce predictable results.
- Sonic method works on planktonic algae only
  - Had no effect on filamentous algae or aquatic plants
- Surface skimming – showed little improvement at removing Wolffia in a large pond without constant attention – may work for small decorative ponds.

Conclusions continued

- Enzymes and bacteria had no measurable effect at reducing sediment thickness or Wolffia concentrations after 1 season.

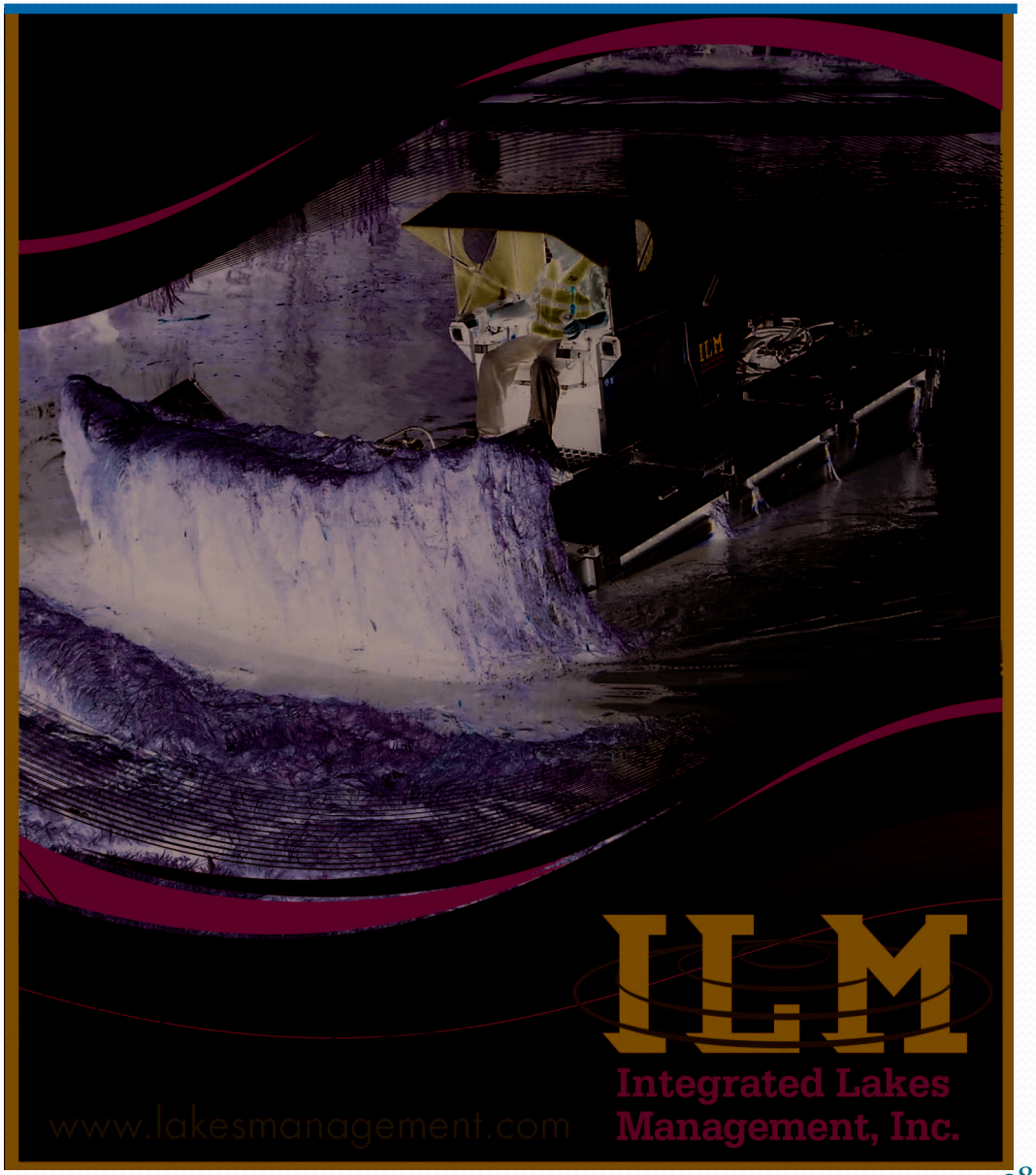
  (May work better in ponds with more aeration)

- Phosphorus reduction agents worked at reducing phosphorus, but ponds were still covered with algae or Wolffia because P thresholds were not obtained during the 1st season.

Conclusions continued

- Air curtain worked for limited herbicide treatment,
  - may not be as effective as a physical barrier like a turbidity curtain due to inflows and wind action
- Five of the six methods tested required electricity
- Most sites did not look “appealing” during studies
- May take several years of application for phosphorus reducing agents and bacteria and enzymes to show measurable results

Questions?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