CURLY-LEAF PONDWEED:
Challenges and Control Strategies

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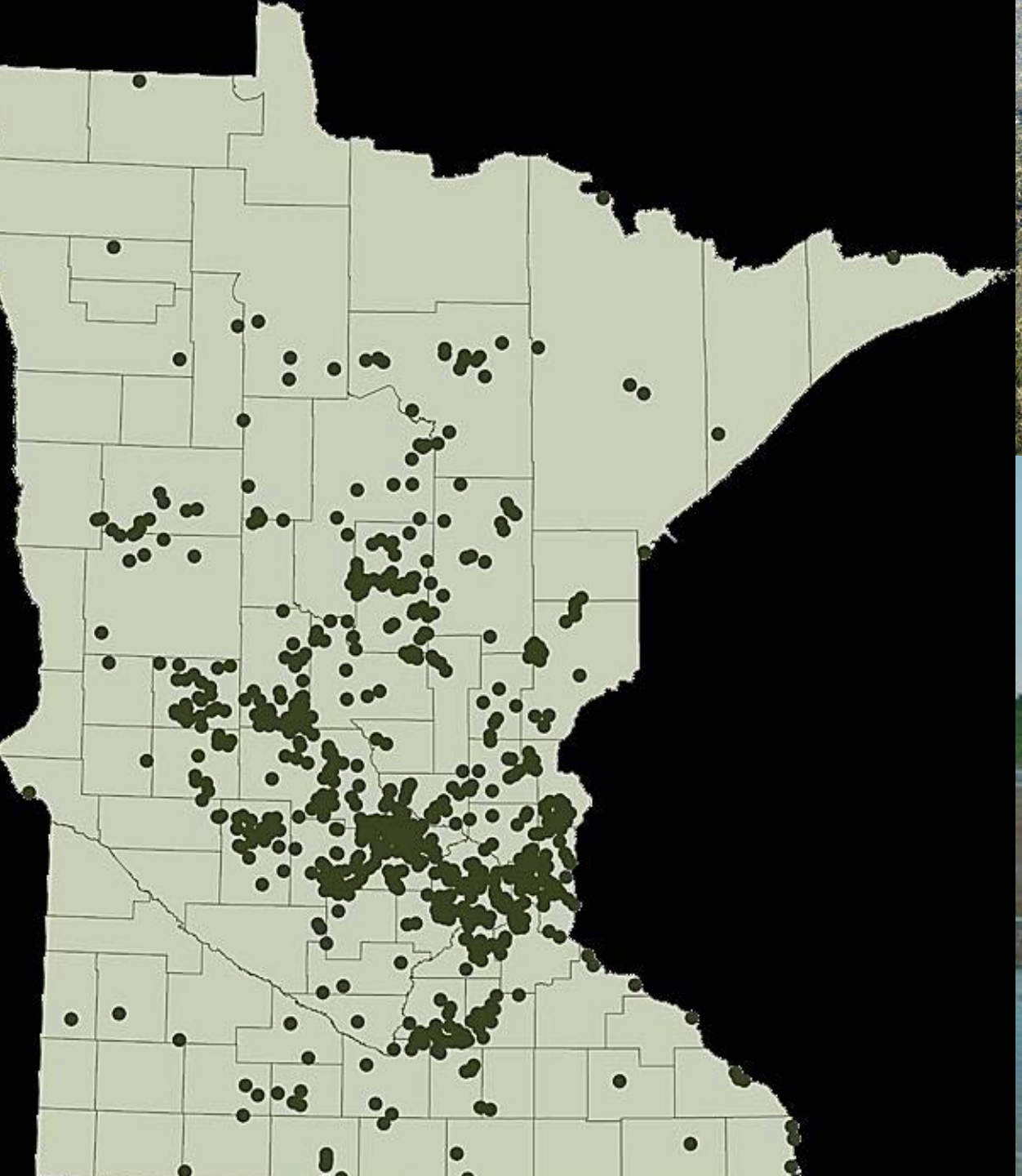
MnDNR - Invasive Species Program

BCWD

Nov 30, 2016

Curly-leaf Pondweed
first found in Minnesota in 1910



OUTLINE

- Management goals and timeframe
- Curly-leaf pondweed (CLP) control strategies
- Herbicide Control
- MN Pilot Projects & results
- Takeaways

MANAGEMENT GOALS & TIMEFRAME

- What are the nuisances caused by curly-leaf?
- What does your lake history tell you?
  - Has this issue persisted or is it increasing?
- What are possible negative effects of management?
- Doing nothing is generally cheapest.
- How long do you plan on treating?

CLP CONTROL STRATEGIES

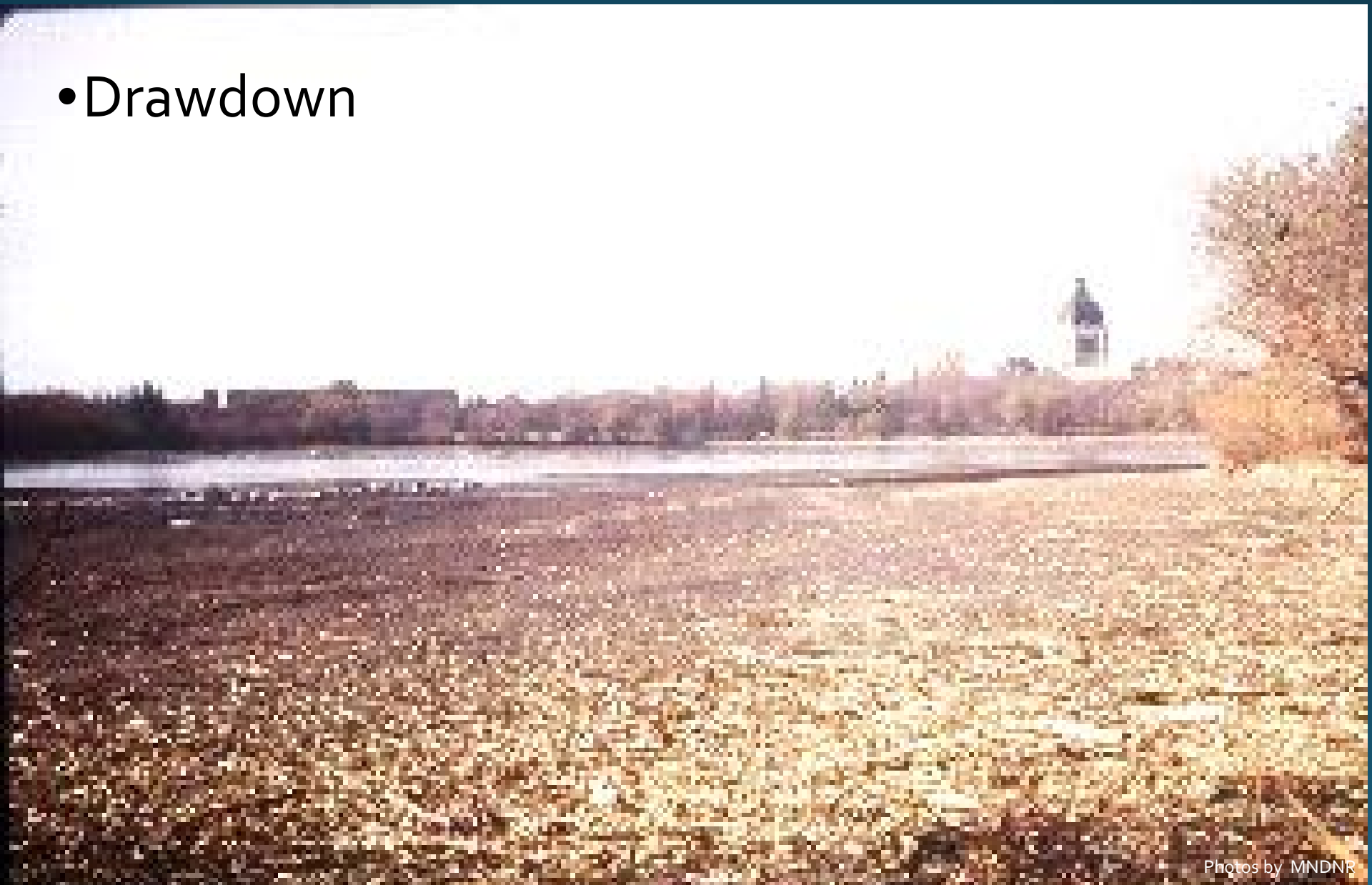
- Habitat manipulation (e.g. drawdown)
- Mechanical control (e.g. harvesting)
- Herbicide control

There is a limit on the amount of submersed vegetation which can be controlled with herbicides or mechanical harvesting. The littoral zone is the area of the lake 15 feet deep or less.

- *15% of the littoral zone can be treated with herbicide.*
- *50% of the littoral zone can be controlled mechanically.*
- *Both require permits.*

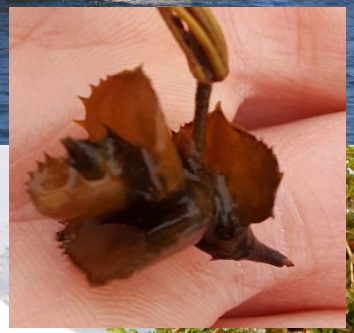
HABITAT MANIPULATION

- Drawdown



MECHANICAL CONTROL

- Mechanical harvesting or cutting
- Hand removal or DASH



HERBICIDE CONTROL

- Spot Treatment
  - Reduce nuisance CLP
  - Improve recreational use
  - May increase native aquatic plants
- Whole-Lake Treatment
  - Reduce turion production & CLP lakewide
  - Improve recreation
  - Increase native aquatic plants

Photos by MNDNR

Spot Treatments

- Endothall based herbicide such as Aquathol K
- Water temperatures between 50 - 60 F
- Target concentrations .75 - 1.5 ppm
- Early season application – May
- Seasonal effects, not long term

Whole-Lake Treatments

- Similar methods - lakewide exposure
- Require a variance and generally a Lake Vegetation Management Plan
- Significant monitoring costs involved
- Should be accompanied with other water quality improvement measures (i.e. alum, carp removal, etc.)
- Limited long-term results

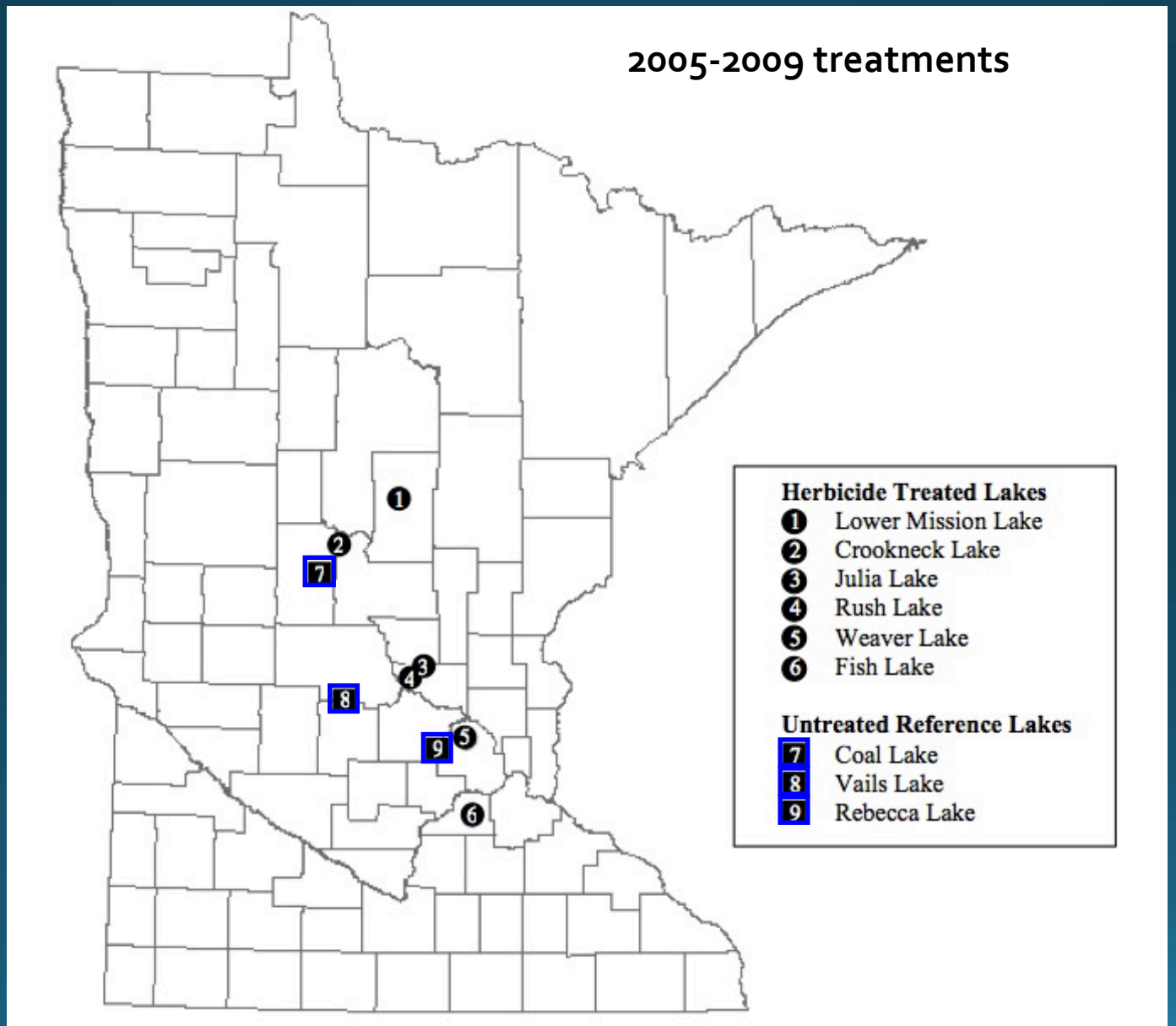
Photos by MNDNR

MN WHOLE-LAKE PILOT PROJECTS

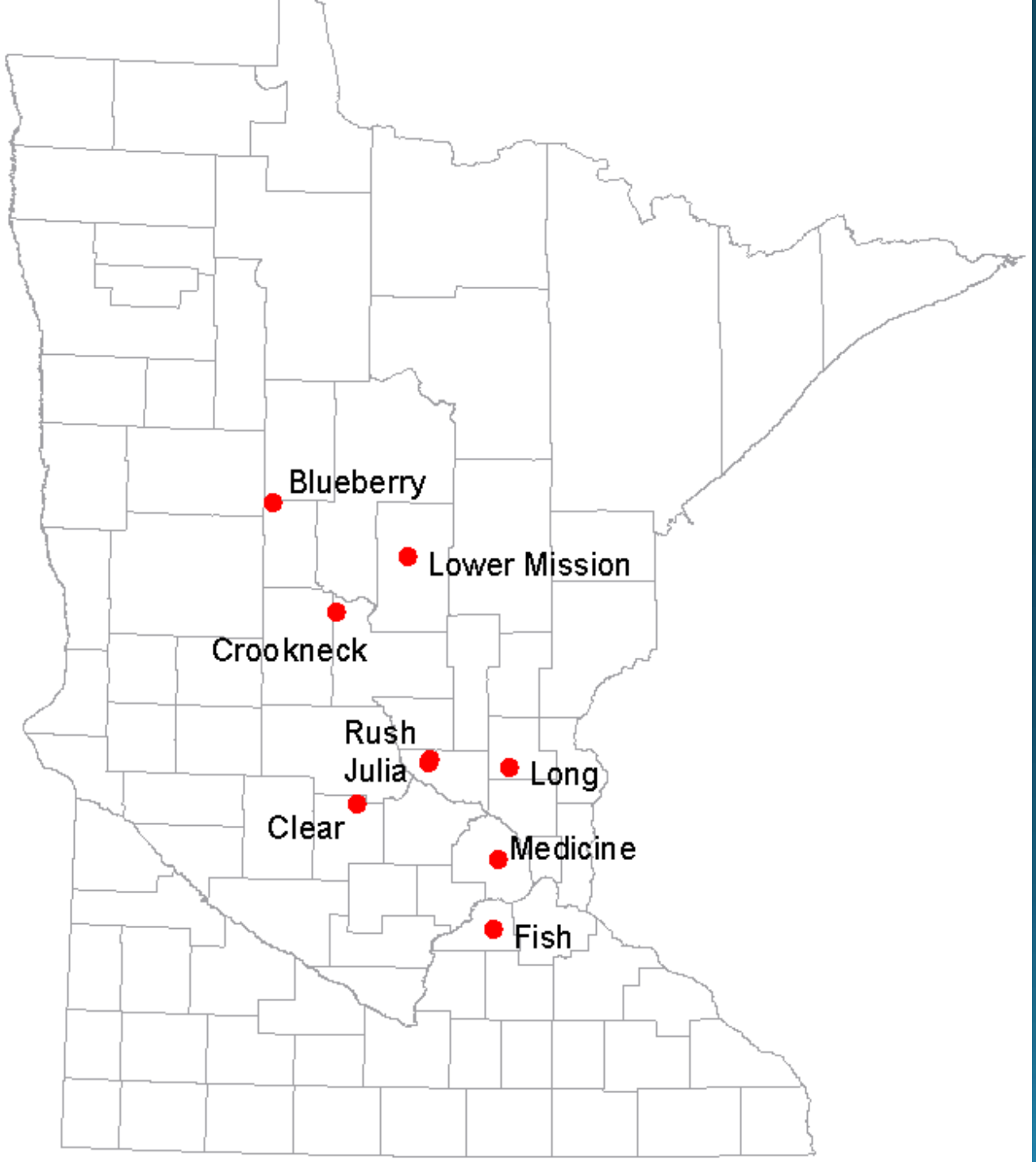
- DNR Pilot Program – 2006-2011, 10+ lakes
- **GOAL**: reduce CLP, increase water clarity and native plants
- Lakewide treatments performed 3-5 years in succession/lake
- Herbicides utilized:
  - Endothall
  - Fluridone
- See Newman et al. 2010, Johnson et al. 2012, Jones et al. 2012

Study Lakes

Johnson et al., Lake and Reservoir Management, 2012



Endothall Pilot Projects - 2007



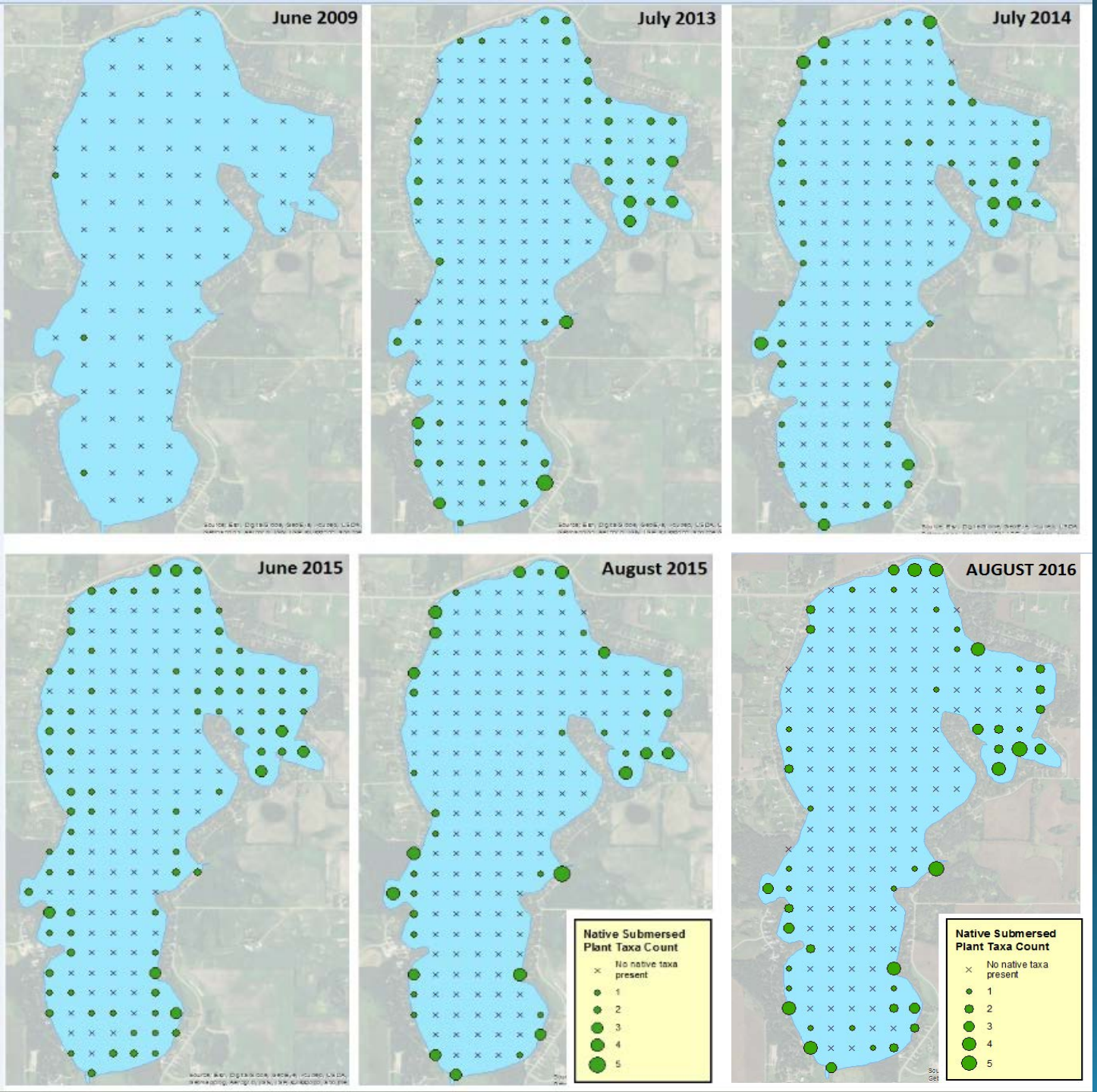
PILOT PROJECT RESULTS

- Treatments reduced frequency, biomass and surface matting of CLP
- No consistent trend of increasing water clarity
  - Suggesting CLP has limited effect on water clarity or is not the direct driver for reduced clarity
- Native plants increases observed in some lakes but not all
- Turion densities decreased but remain viable in sediment years after treatment
- See Newman et al 2010, Johnson et al 2012, Jones et al 2012

CLP & Water Quality

Why does CLP control show limited effects on water quality?

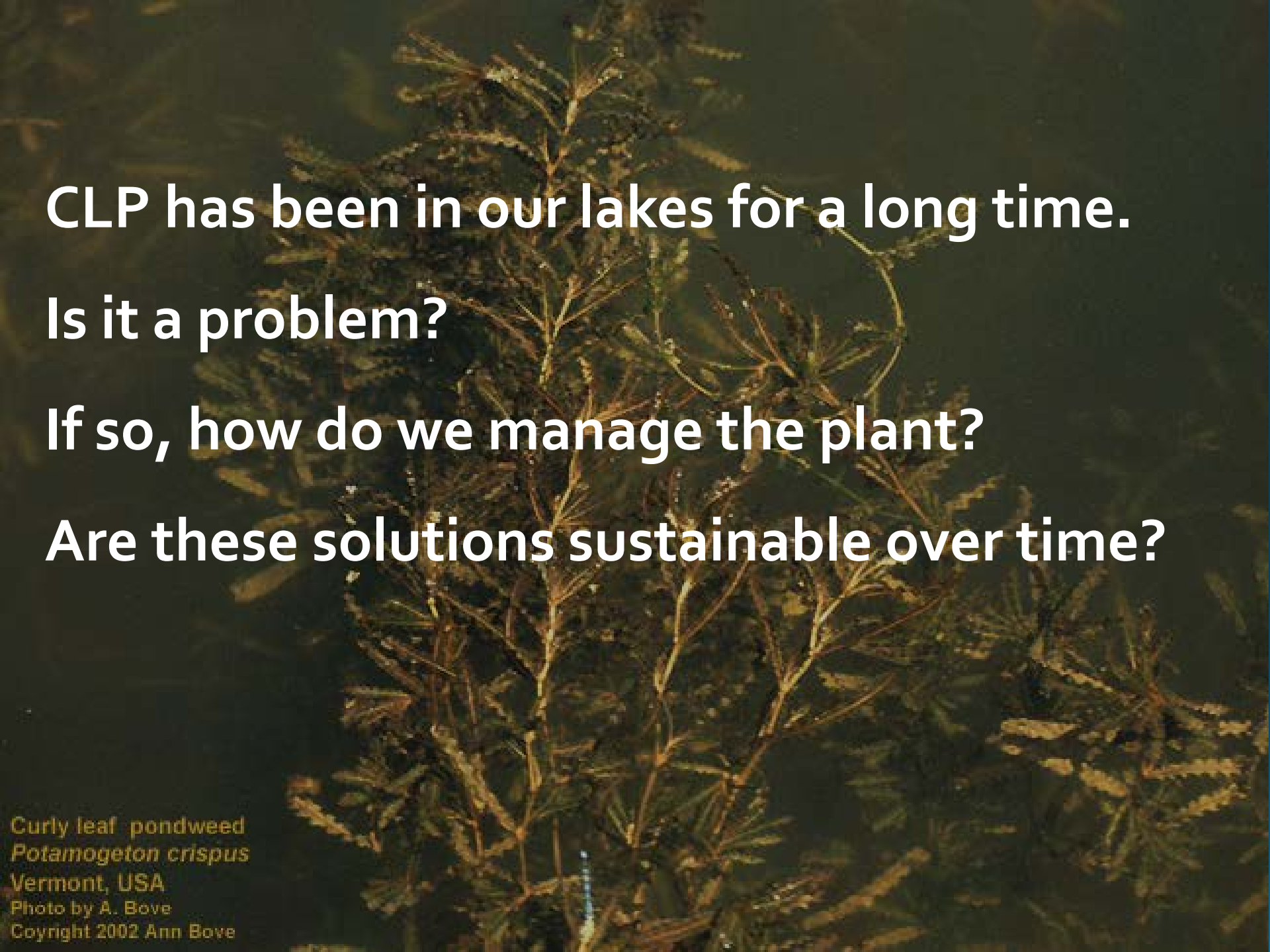
1. Other sources of phosphorous
   - External or internal loading
2. Internal cycling – physical factors
   - Benthivorous fish (e.g. carp)
   - Boating and mechanical mixing



Cedar Lake, Scott County

Native Plant Species Richness

- 4 years of lakewide endothall beginning in 2013
- Increased native plant abundance and richness but still limited


CLP has been in our lakes for a long time.
Is it a problem?
If so, how do we manage the plant?
Are these solutions sustainable over time?
Curly leaf pondweed
Potamogeton crispus
Vermont, USA
Photo by A. Bove
Coyright 2002 Ann Bove

TAKEAWAYS

- CLP has been established in MN for over 100 years
- CLP spot treatments seem the most effective in terms of long-term management of CLP for most lake groups
- CLP nuisances can (in most cases) be managed under the 15% littoral limit
- Lakewide treatments are costly and require professional monitoring and DNR consultation
- Lakewide treatments can increase native plants, reduce turion production, and significantly reduce CLP lakewide…but it comes back

Thank you!

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