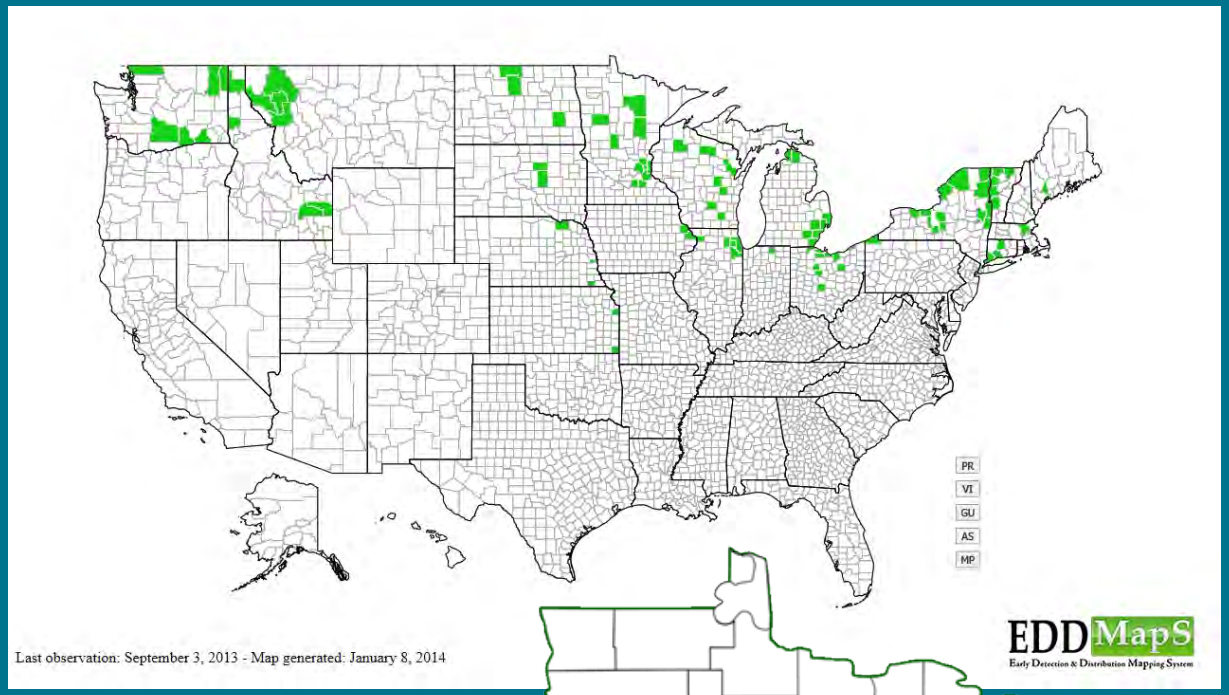
DETROIT LAKES AREA FLOWERING RUSH
History and Perspectives

Tera L Guetter

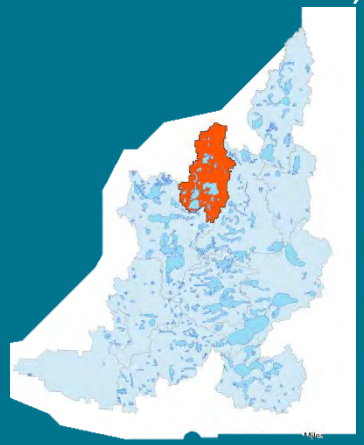
"Protecting Our Lakes"
PELICAN RIVER WATERSHED DISTRICT

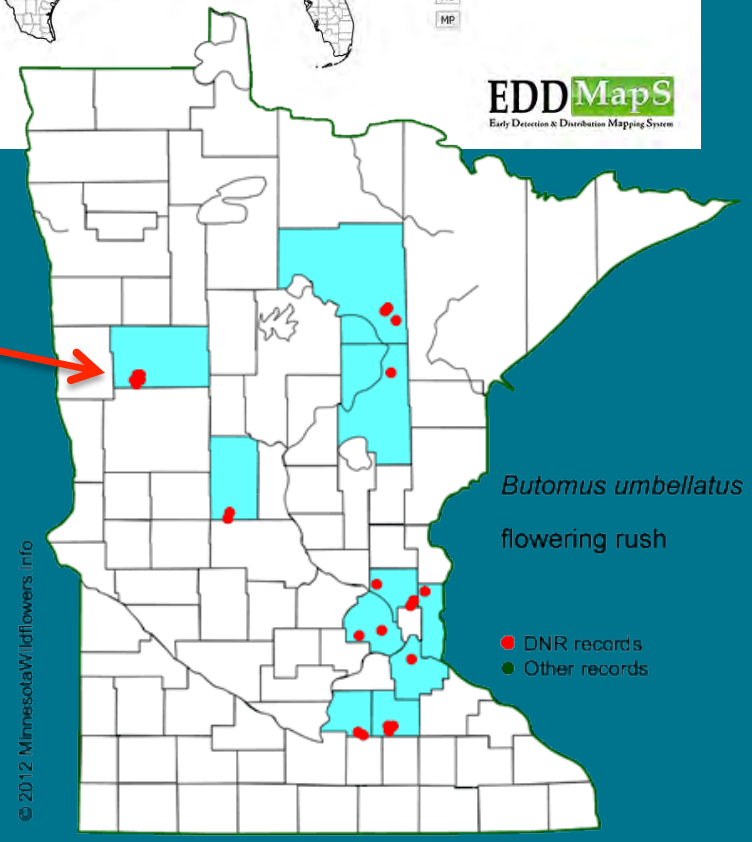
Flowering rush – Detroit Lakes Area
Triploid phenotype – clonally by rhizomes and lateral rhizome buds



Pelican River Watershed District

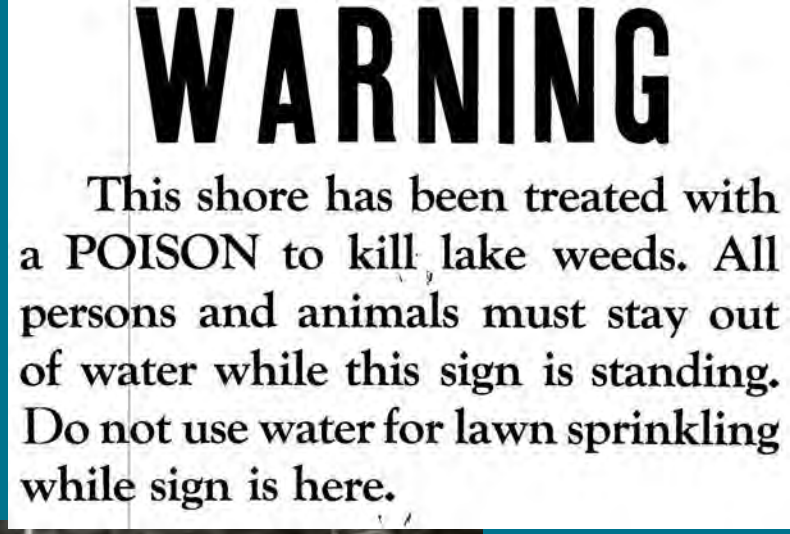
Detroit Lakes, MN





Becker County is home to 412 lakes, plus
ponds & hundreds of miles of stream habitat

1950's Treatments
"nuisance" native plants


WARNING

This shore has been treated with a POISON to kill lake weeds. All persons and animals must stay out of water while this sign is standing. Do not use water for lawn sprinkling while sign is here.

1960's Mechanical Harvesting

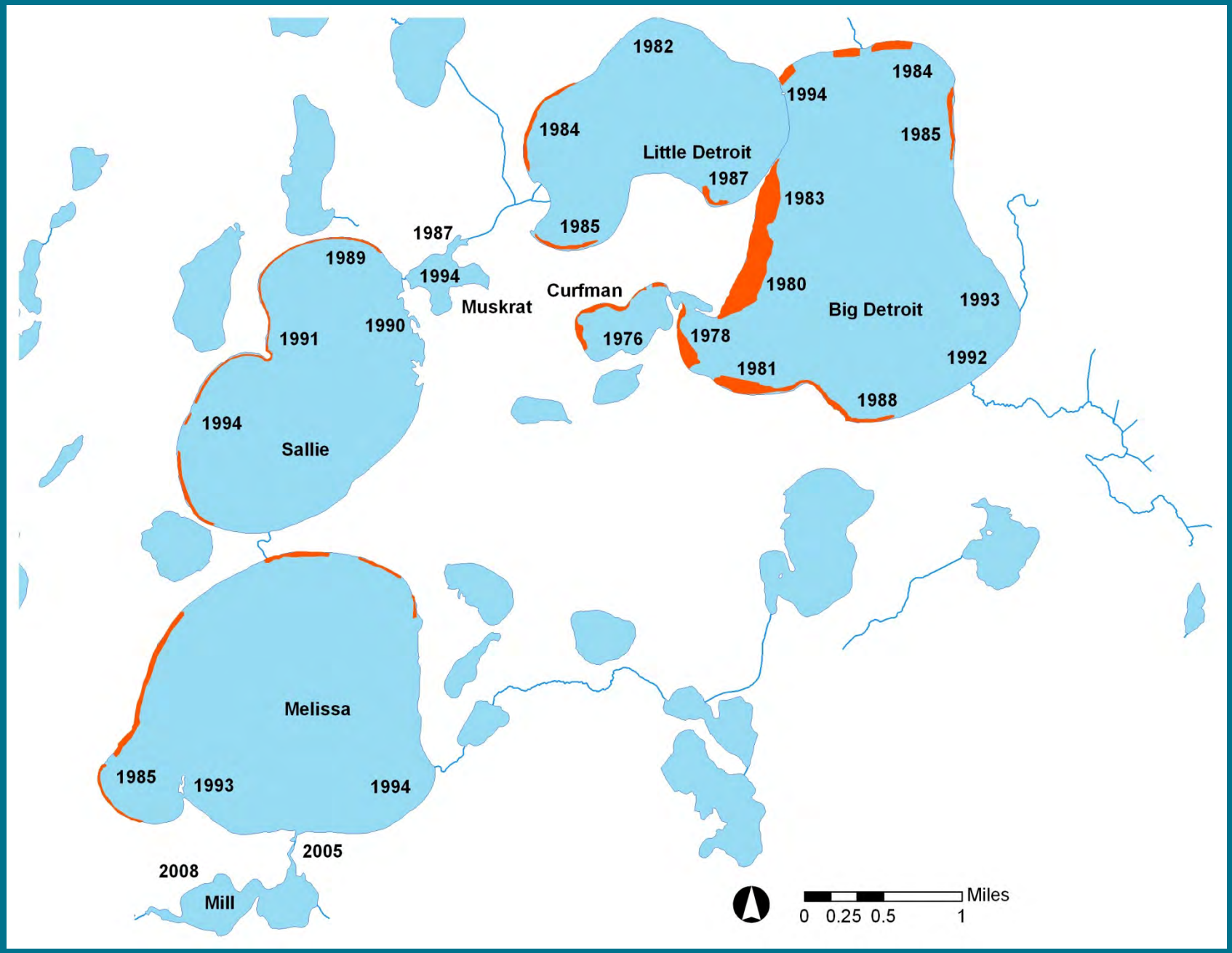
"Water quality Improvement Research"

Sallie & Melissa

1970's - Mechanical Harvesting

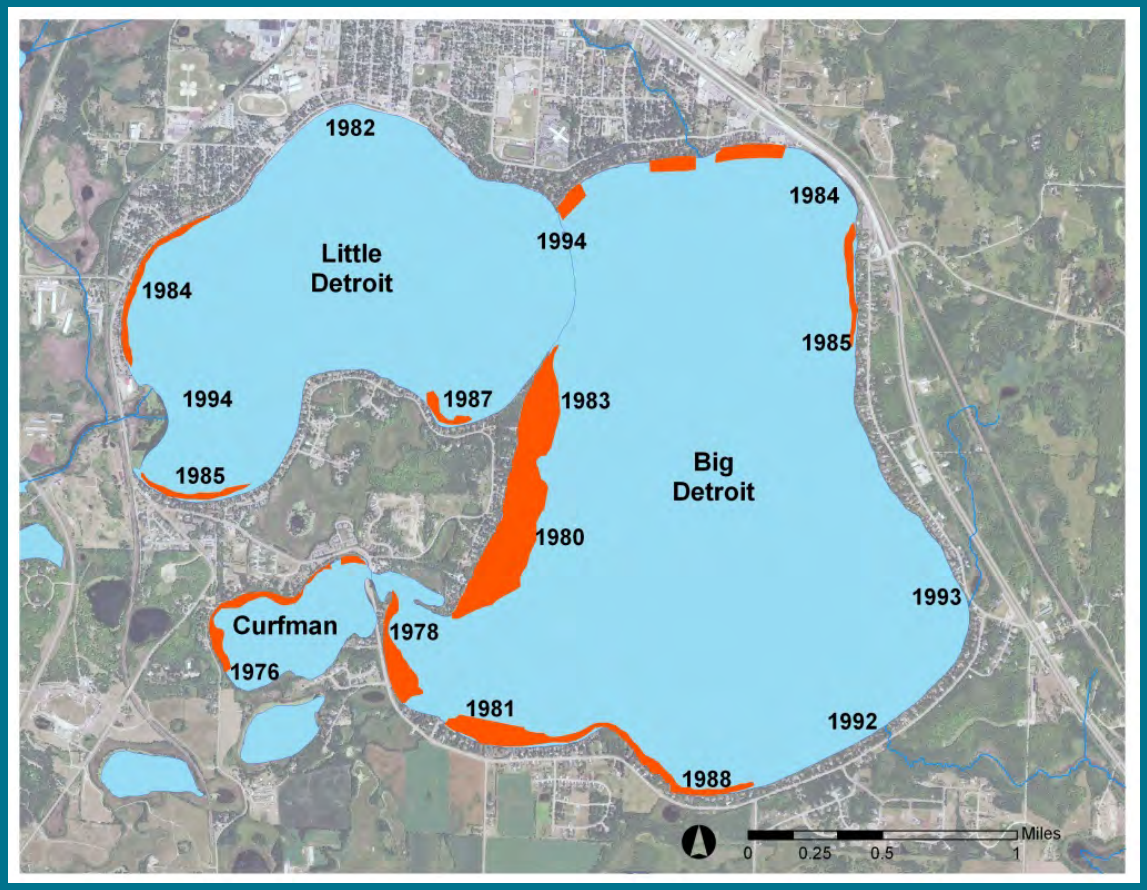
Shift from water quality improvement to nuisance control

Flowering Rush discovered in Curfman


1982
1984
1994
1984
1985
Little Detroit
1987
1983
1985
1987
1989
1994
Muskrat
Curfman
1980
Big Detroit
1993
1991
1990
1976
1978
1981
1992
1988
1994
Sallie
Melissa
1985
1993
1994
2005
2008
Mill
Miles
0 0.25 0.5 1

1980's - Mechanical Harvesting

nuisance management mode



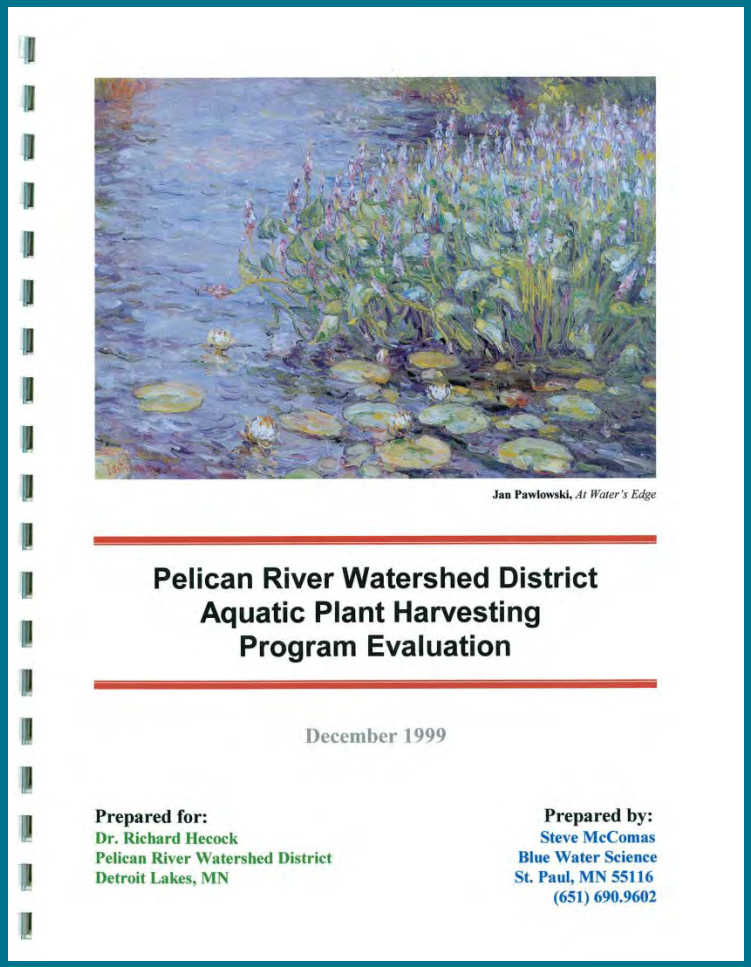
Flowering Rush is beginning to be recognized as a "problem"

Tried 2,4-D didn't work

1993-2003
Mechanical Harvesters
were used to manage FR

1999 Study

- Exotics can be targeted and controlled
- Harvesting preferred over herbicides
- Harvest 3-8 ft water depth range
- Target Flowering rush populations



Jan Pawlowski, *At Water's Edge*

Pelican River Watershed District
Aquatic Plant Harvesting
Program Evaluation

December 1999

Prepared for:
Dr. Richard Hecock
Pelican River Watershed District
Detroit Lakes, MN

Prepared by:
Steve McComas
Blue Water Science
St. Paul, MN 55116
(651) 690.9602

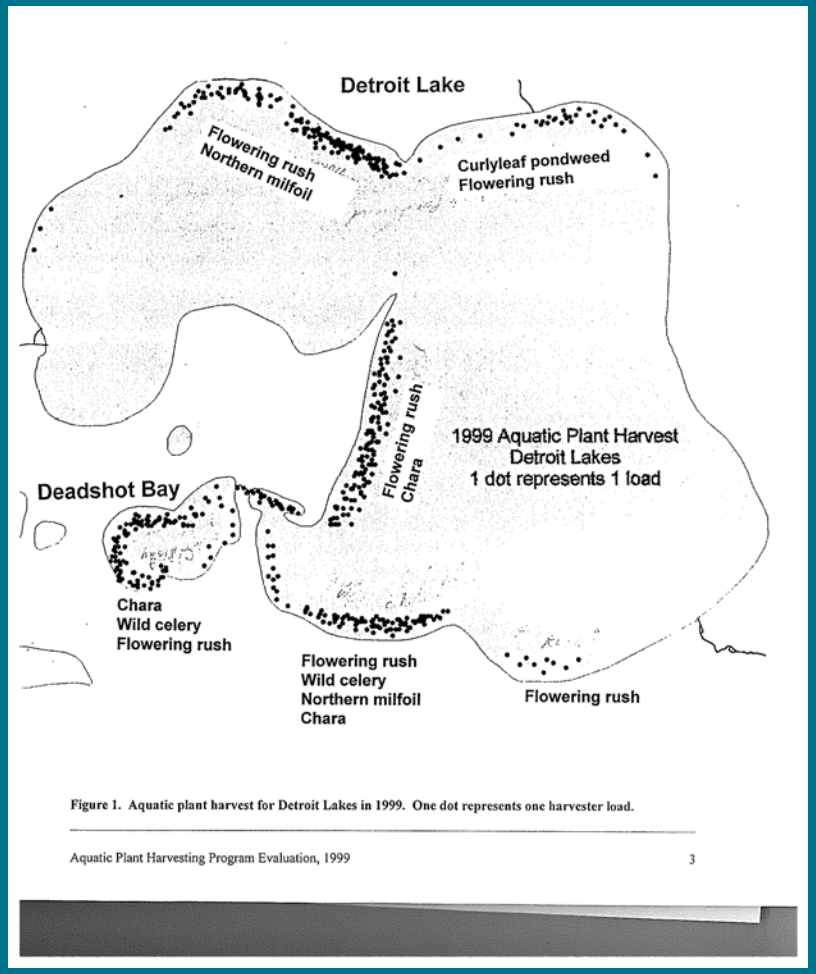


Figure 1. Aquatic plant harvest for Detroit Lakes in 1999. One dot represents one harvester load.

Aquatic Plant Harvesting Program Evaluation, 1999 3

2000's
"A losing battle"

FR Plants, uprooted by harvester?

Dense stands of FR, including flowers

2003, 2004, Herbicide Testing at 7 100 x 100 ft sites on Detroit and Curfman

1 Detroit	Glysophate Eagre w/ Cygnet Plus
2 Detroit	Glysophate Eagre w/ Windbreak
3 Detroit	2-4D Granular (Navigate)
4 Detroit	Diquat (Reward) Glysophate (Eagre) w.Cygnet)
5 Curfman	2-4D Granular (Navigate) 2-4D Liquid (DMV4)
6 Curfman	Glysophate Eagre w/Cygnet
7. Curfman HW	Glysophate (ShoreKlear)

•Chemical testing in 2004, 2005

2003-2004 SEVERAL HERBICIDE "COCKTAILS" USED

Hand-wicking

Imazypyr Test, August, 2004

Herbicide tests of Habitat seem successful

Let's try lake wide applications!

The Good……..

"Looks promising!"

"Only works on emergent plants"

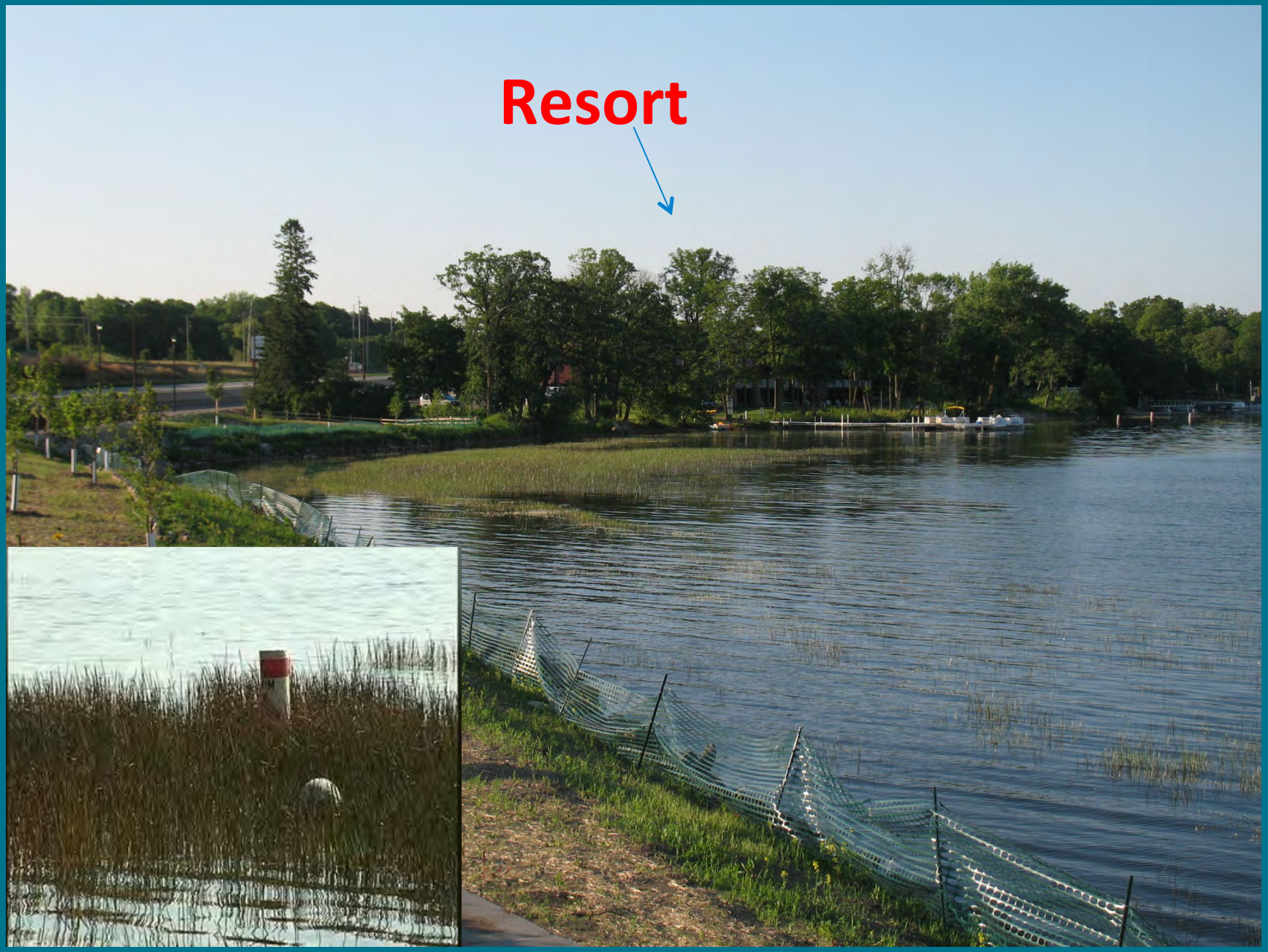
" MN DNR Supportive for permits"

The Bad……..

“ need to let the plant grow above water surface”

“ have to wait a season to see results”

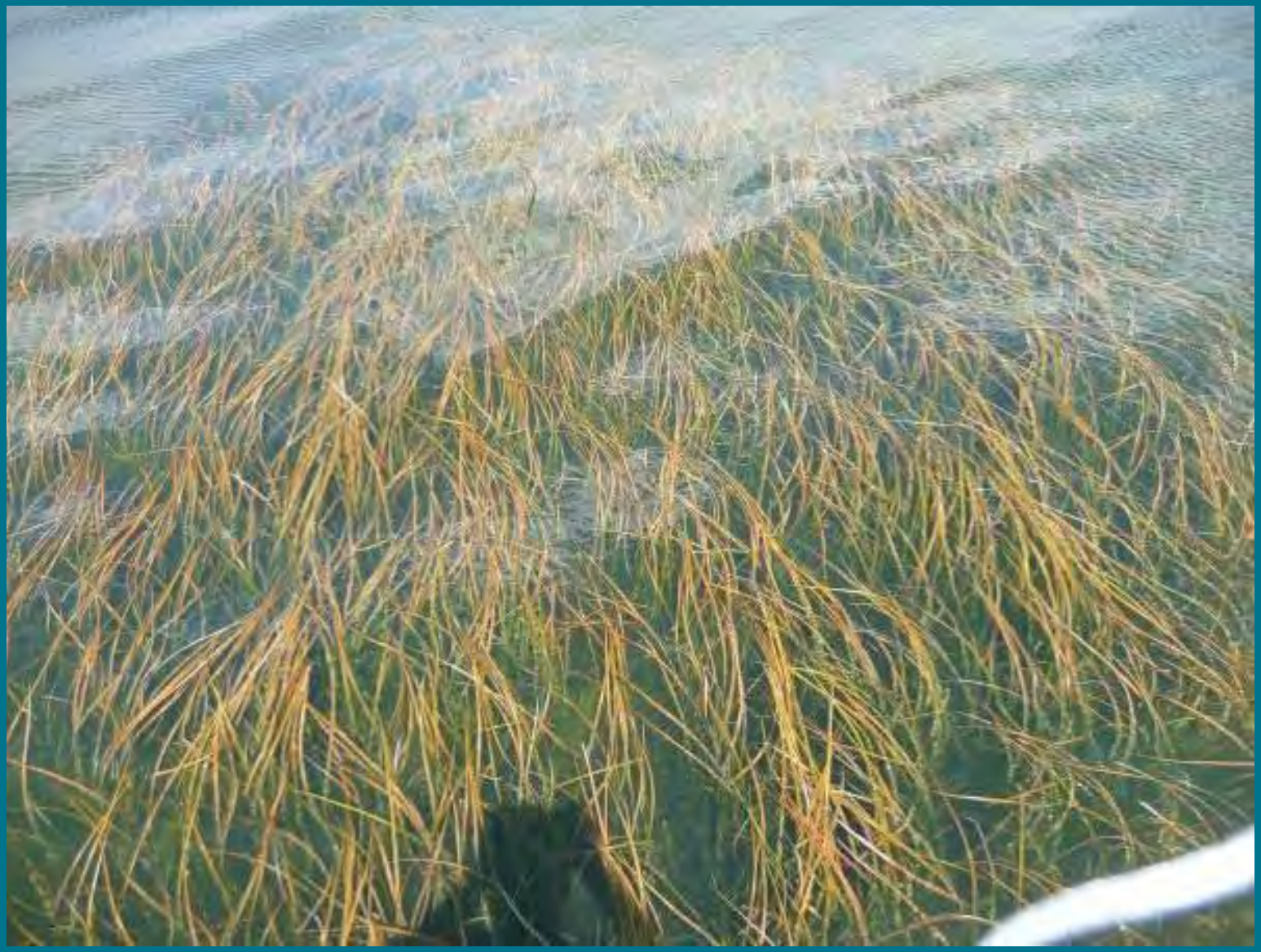
“beg for public patience”


Resort

2006-2009 TREATMENT WITH IMAZYPYR

HAS IMAZYPYR TREATMENT MADE ANY DIFFERENCE?

“some”



CRUSH THE RUSH

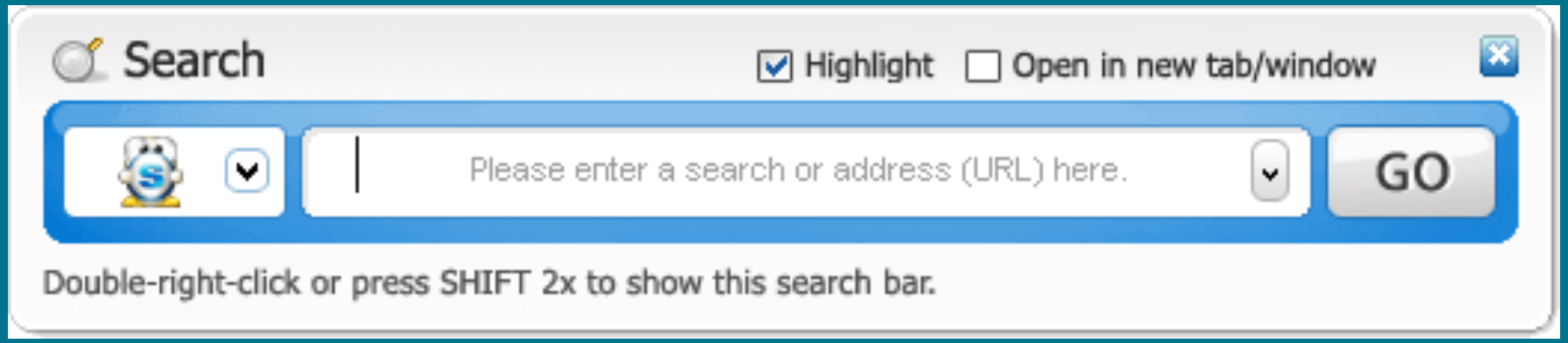
& SAVE THE BEACH

Flowering rush
Butomus umbellatus
Photo provided by
Nick Proulx, Minnesota DNR

Control Management – inconsistent and unpredictable

Emergent and submersed forms – different treatment plans?

Variables - water levels, flows, etc.



- Location of FR populations; genetic studies
- No existing information depository
- Not a “big” enough problem (EWM, CLP)
- Management/control information sparse
  ….mostly referenced PRWD!

Vicksburg
Idaho
Montana
Michigan
Florida
Mississippi
Washington
Wisconsin

Evaluation of Aquatic Herbicides to Control Submersed Flowering Rush (2010)

US Army Engineer Research & Development Center (ERDC)

Angela Poovey, John Skogerboe, Mike Netherland

Systemic Herbicides

Triclopyr
2,4-D
Imazamox
fluridone

Contact Herbicides

diquat
endothall
Flumioxazin – not as effective

RULED OUT

Submersed Applications
No significant reduction in shoot and root biomass

Further Investigations

- Foliar – Emergent application
- 8-12 " above water surface

Product	Exposure	Sig Red shoots
Diquat	6 hrs	
Diquat	12 hrs	

- Shoot biomass reduction ("stem burn down") **> 74% - 95%**
- Root biomass not significantly impacted
- Re-growth potential (single application)

Application Strategies

- Repeat treatments- Early spring/ July
- Increased susceptibility of young plants

Ecology and management of Flowering Rush in the Detroit Lakes Chain of Lakes

Michelle D. Marko
Concordia College,
Moorhead, MN

John D. Madsen
Mississippi State University

John G. Skogerboe
US Army Engineer Research
and Development Center

the Tribune
Informing Becker County for over 100 years
Forecast
TODAY Showers High:59 Low:50
THURSDAY Chance of showers High:62 Low:50
OLUME 104, NO. 25 • WEDNESDAY, JUNE 22, 2011 • DETROIT LAKES, MN

PAULA QUAM/TRIBUNE

TESTING THE WATERS of Big Detroit Lake is Mississippi State University researcher John Madsen, who was checking dissipation levels of red dye to determine the amount of herbicide still in the water. Madsen and two other researchers are studying which herbicide works best on certain aquatic invasive species.

TAKING A STAB AT FLOWERING RUSH

BY PAULA QUAM
pquam@dlnewspapers.com

John Madsen knows all too well the nasty effects invasive species can have on lakes — it's what the Mississippi State University researcher does for a living.

That's why the Pelican River Watershed District contracted his services, along with a researcher from Concordia College in Moorhead and a representative from the Army Corps of Engineers.

The crew was in town last week to find out more about aquatic invasive species in the lakes region.

A big part of their study, which began last summer, is happening on Detroit Lake, where flowering rush is growing like wildfire.

Madsen, who is with the Geosystems Research Institute, says their goal is to find out how certain herbicide work on aquatic invasive species like flowering rush.

There has been a growing sense of urgency among local lake associations to light a fire underneath the Minnesota DNR to help them better fight invasive species at every level, and Madsen says their concerns should be taken seriously if Detroit Lakes area residents want to save themselves from a very costly mistake.

"I believe you've just entered the (flowering rush) rapid growth stage here."
Researcher John Madsen

PAULA QUAM/TRIBUNE

FLOWERING RUSH is an aquatic invasive plant that can squeeze out native plants and alter fish species in a lake if left to flourish.

ic hitchhikers" all over the U.S., "there is the slow growth phase, which can take years, then the rapid growth, then once the species has consumed the habitat's resources, it starts to slow down again — right now I believe you've just entered the rapid growth stage here."

Madsen says flowering rush, a nuisance plant that can grow both above and below water, not only clogs boat motors, but also kills native plants and completely alters the type of fish that a lake can sustain.

"It's displacing habitat that's important for the spawning of trout and fisherman say is not desirable.

Madsen says it's understandable that many residents here have kept a false sense of security because it's still tough to notice the effects locally due to a variety of fish in these lakes, but he warns inaction will lead to a costly shift in habitat.

"It's not too late, but there needs to be a change in the attitude here," said Madsen.

The researcher says the main two things that will determine whether or not an area successfully combats invasive species is support at the state level (with the legislature and the DNR) and how well local organizations work with those agencies.

"Local entities can either be a great help to management or slow it down," said Madsen.

Ecology

Habitat Range
Depth distribution and allocation

Phenology

Full understanding of life history
aboveground/belowground biomass
growth/senesce cycle – time of year
rhizome growth and splitting
carbohydrate movement correlation

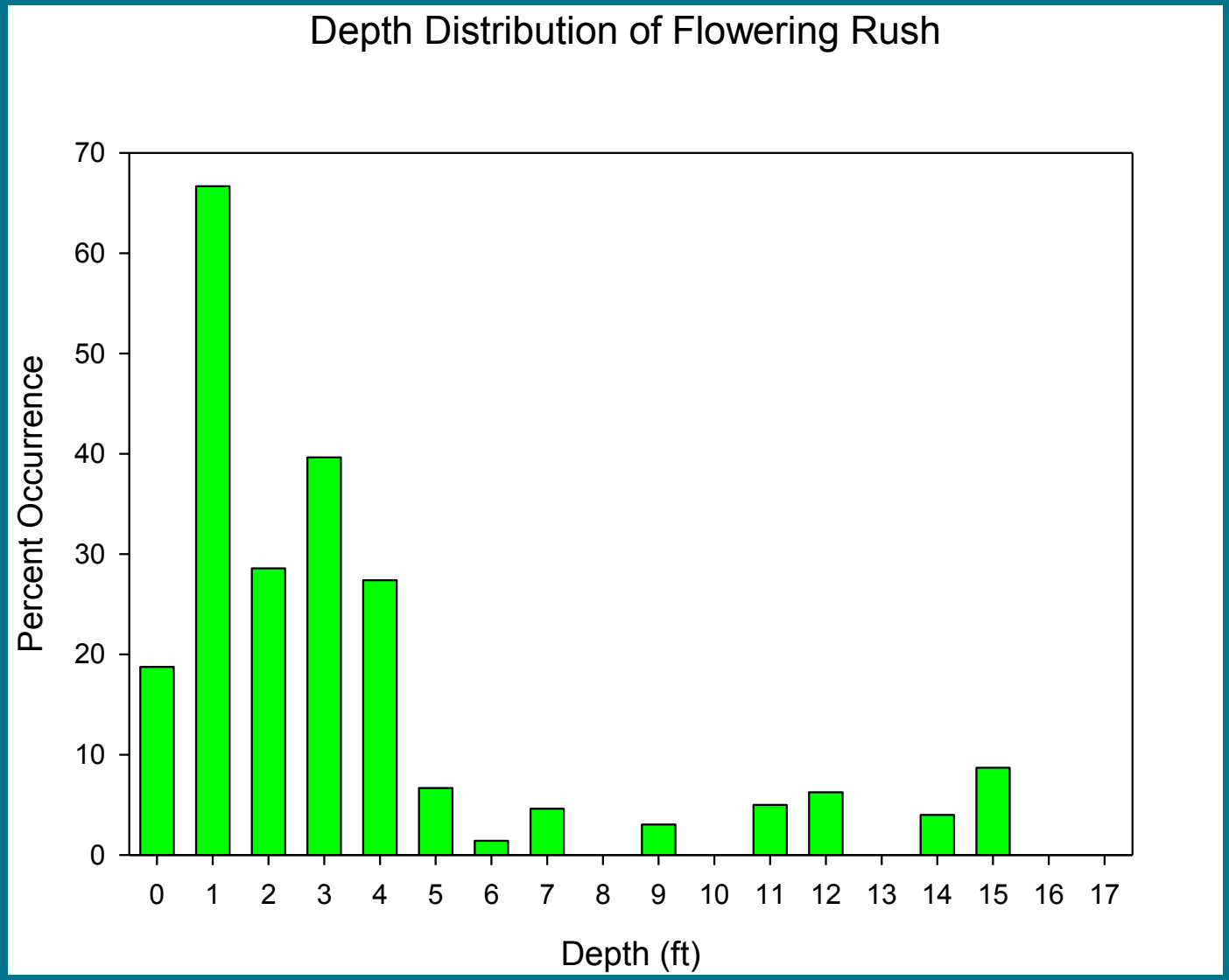
Management

Application to submersed plants

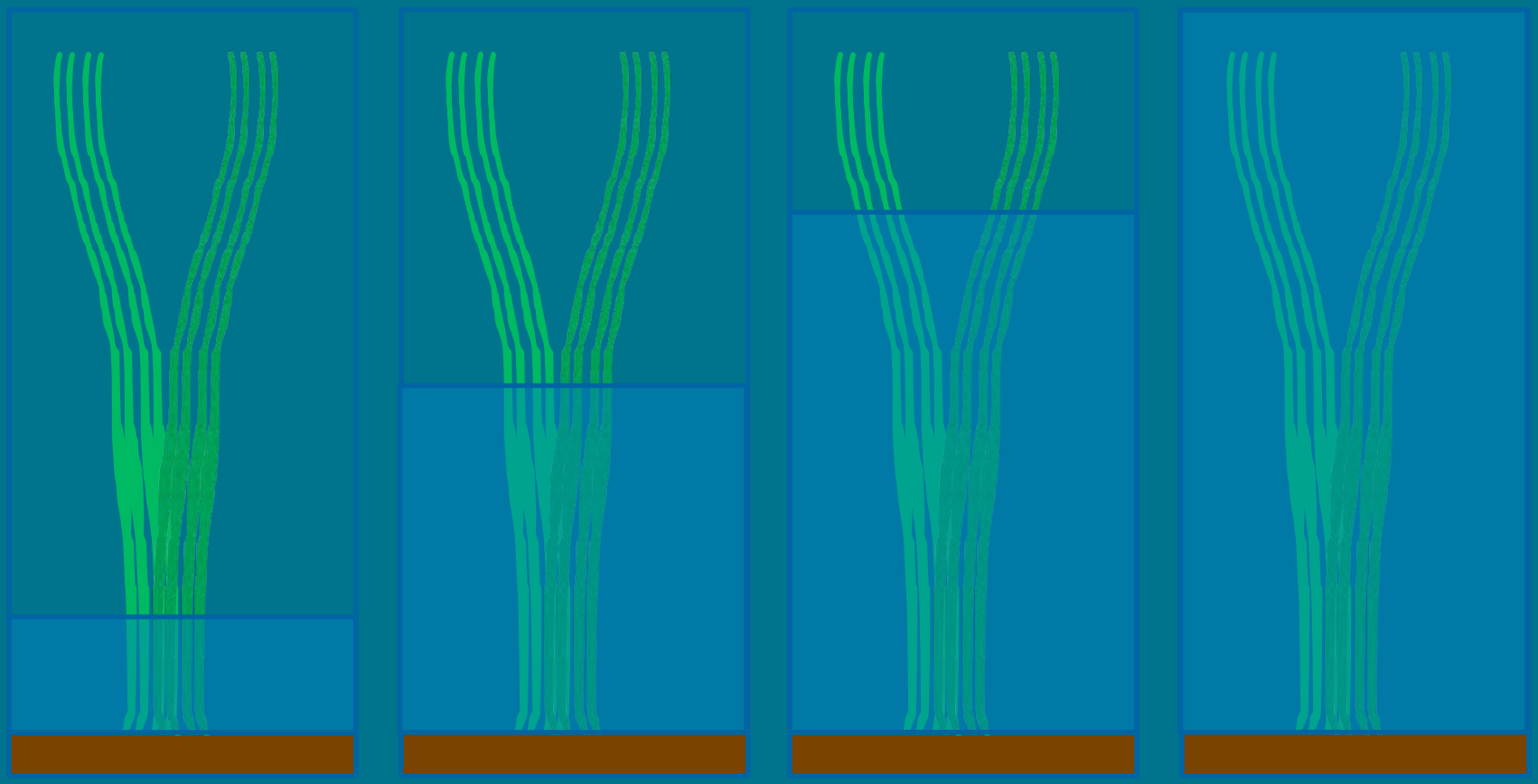
Use knowledge to identify potential "weaknesses"

Prevent bud production/spread
Kill rhizome/prevent overwintering

Q: Ecology - Where does Flowering rush grow?



Depth of Inundation

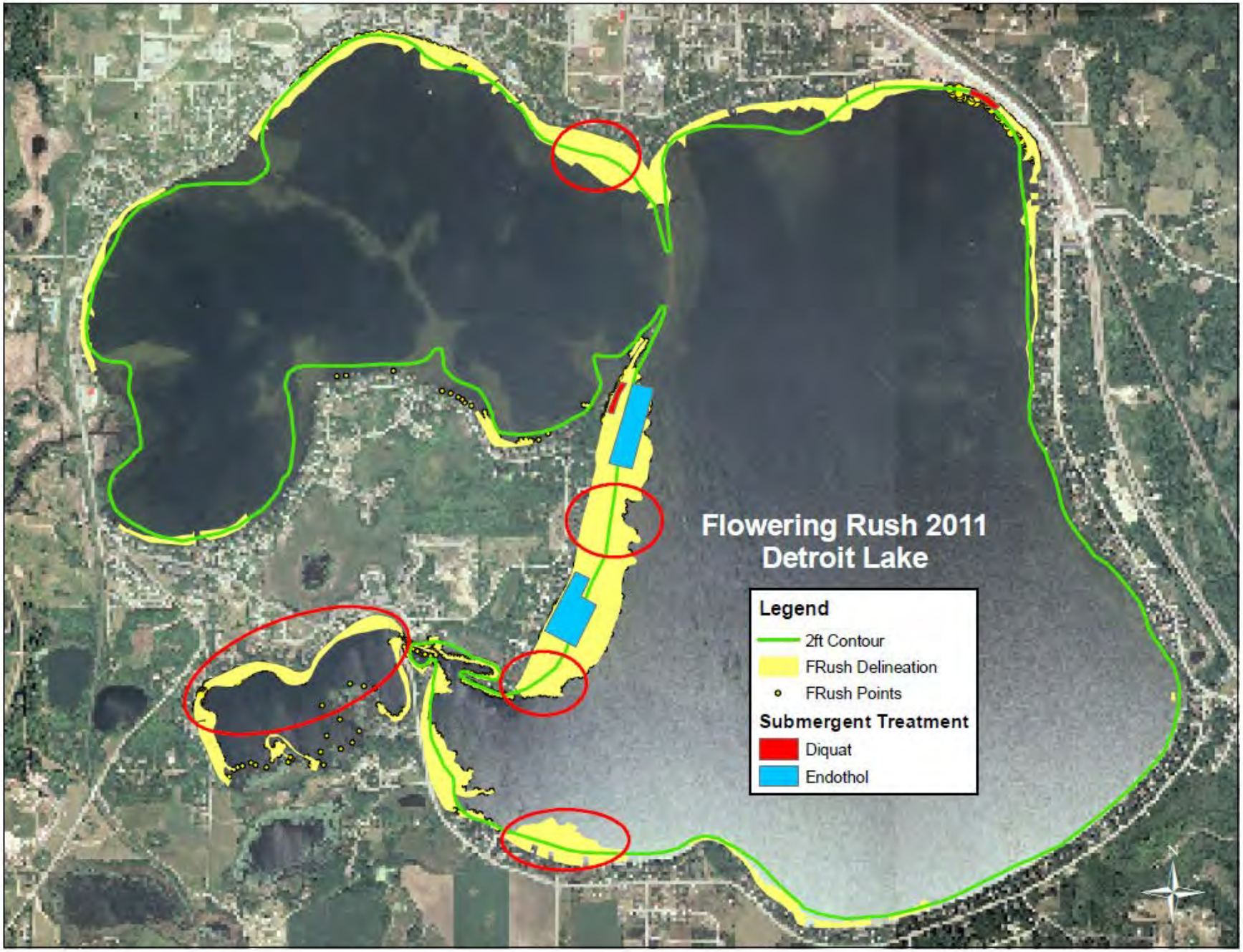


Emergent treatment should work

Emergent treatment likely to work

Emergent treatment may not work, submersed treatment instead or in addition

Submersed treatment required


Flowering Rush 2011
Detroit Lake
Legend
2ft Contour
FRush Delineation
FRush Points
Submergent Treatment
Diquat
Endothol

Contact Herbicides

diquat, endothall, Flumioxazin

Product	Exposure	Sig Reduction Shoots	Sig reduction Roots
Diquat	6 hrs	YES	NO
Diquat	12 hrs	YES	NO
Endothall	12 hrs	YES	NO
Endothall	24 hrs	YES	NO
Flumioxazin	12 hrs	NO	NO
Flumioxazin	24 hrs	NO	NO

- Shoot biomass reduction ("stem burn down") **> 74% - 95%**
- Root biomass <u>not</u> significantly impacted
- Re-growth potential (single application)

<u>Application Strategies</u>

- Repeat treatments- Early spring/ July
- Increased susceptibility of young plants

Concentration Exposure Time

"understanding concentration/exposure time relationship is critical to achieve desired control of submersed plants (Getsinger/Netherland 1997)"

MN 6655 JB

Permitting "Issues" AKA "obstacles"

2013 – 250 acres on 4 lakes

0.6
0.98
17.2
81.4
0.3
0.4
3.8
9.1
9.1
2.7

WHO PAYS?

"If control of [AIS] is undertaken, **it usually is initiated by a local lake association or perhaps an organization such as a lake improvement district or watershed district.** Plans for control are usually developed in cooperation with the DNR. Permits from the DNR are likely to be required."

Excerpt from DNR letter to Lake Association.

T

HOW TO PAY ?

MN DNR

- Flowering Rush Research
- $30,000-2012
- Management Grant
  - $16,000-2009
  - $22,500-2012
  - $25,000-2013

City of DL – Food/Beverage Tax

- Flowering Rush Research/Management
  - $25,000-2010
  - $25,000-2011
  - $40,000-2012
  - $25,000-2013
- City Beach/Public Boat Access

PRWD Project LMP-01

- AIS Research, Education, Prevention, Management

- District-wide, 15 consecutive yrs, approximately $140,000/year

- Special Assessment (riparian)
- $ 110,000/year

FR Research

$150,000 –Chemical ACOE
$150,000- Ecology/Phenology – Miss State/Concordia
$100,000++ –evaluating in-lake treatment

PRWD Experience with Flowering Rush

	1980's	1990-1995	1996-2000	2001-2005	2006-present
Recognize Problem					
Lobby for Exotic Species designation					
Digging, deflowering					
Harvest as principal management effort					
Shoreline cleaning and roadside pickup					
Herbicide tests					
Herbicide as principal management effort					