EFFECTS OF *NYMPHOIDES PELTATA* AND HERBICIDE TREATMENT ON MACROINVERTEBRATE COMMUNITIES IN LAKE CARL BLACKWELL

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Yellow Floating Heart (*Nymphoides peltata*)

- Aquatic bottom-rooted perennial
- Native to Eurasia and the Mediterranean
- Flowers from May through October
- Occurs in moderately cold temperate areas
- Prefers slow moving rivers, lakes, reservoirs and ponds
- Listed as Near Threatened on Japan Red List

Introduction

- Used as ornamental pond plant
- First reported as an introduced plant in 1870 in Sweden
- Introduced into North America in late 19th century
- First recorded in Oklahoma in 1935. Last occurrence in 1979
- Can be purchased online and shipped
- Seeds can attach easily to feathers and fur

2-YELLOW FLOATING HEART MINI LILY PLANT WINTER HARDY SHIPPED DORMANT

by yazs2000

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Nymphoides peltata
floating heart

(0 reviews)

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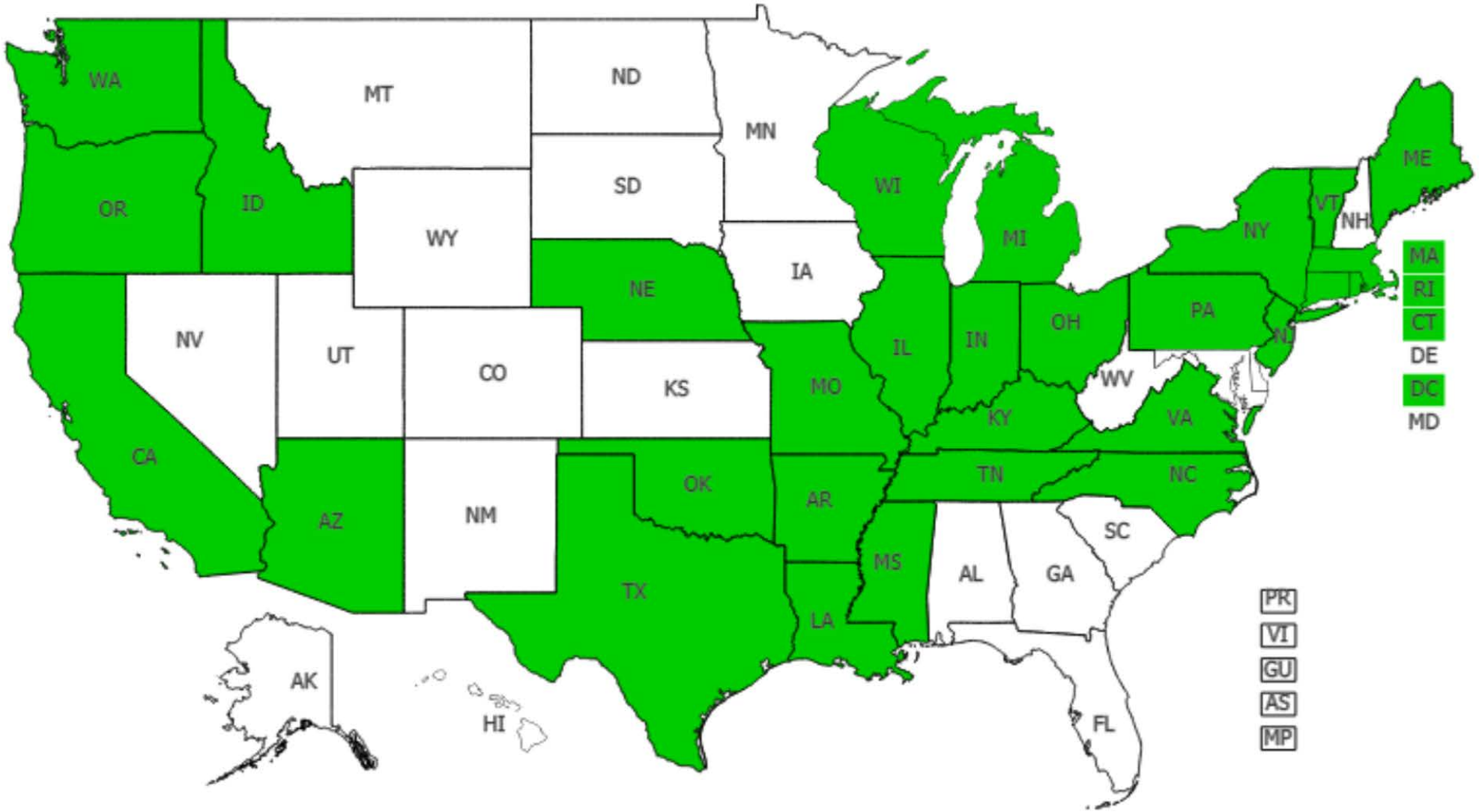
1 litre aquatic pot **£17.99**

available to order from spring

Crocus.co.uk



EDDMapS. 2019. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at http://www.eddmaps.org

Lake Carl Blackwell

- Water source for OSU
- Reported in Lake Carl Blackwell as early as 2014
- Shows on aerial views as early as 2010

Invasiveness

- Grows in dense mats
- Reproduces prolifically through both vegetative and sexual means
- Can form a new plant from rhizomes, stolons, fragmented leaves or seeds
- Each plant is able to produce over 100 new plants in only 12 weeks
- Hard to distinguish


September 2018

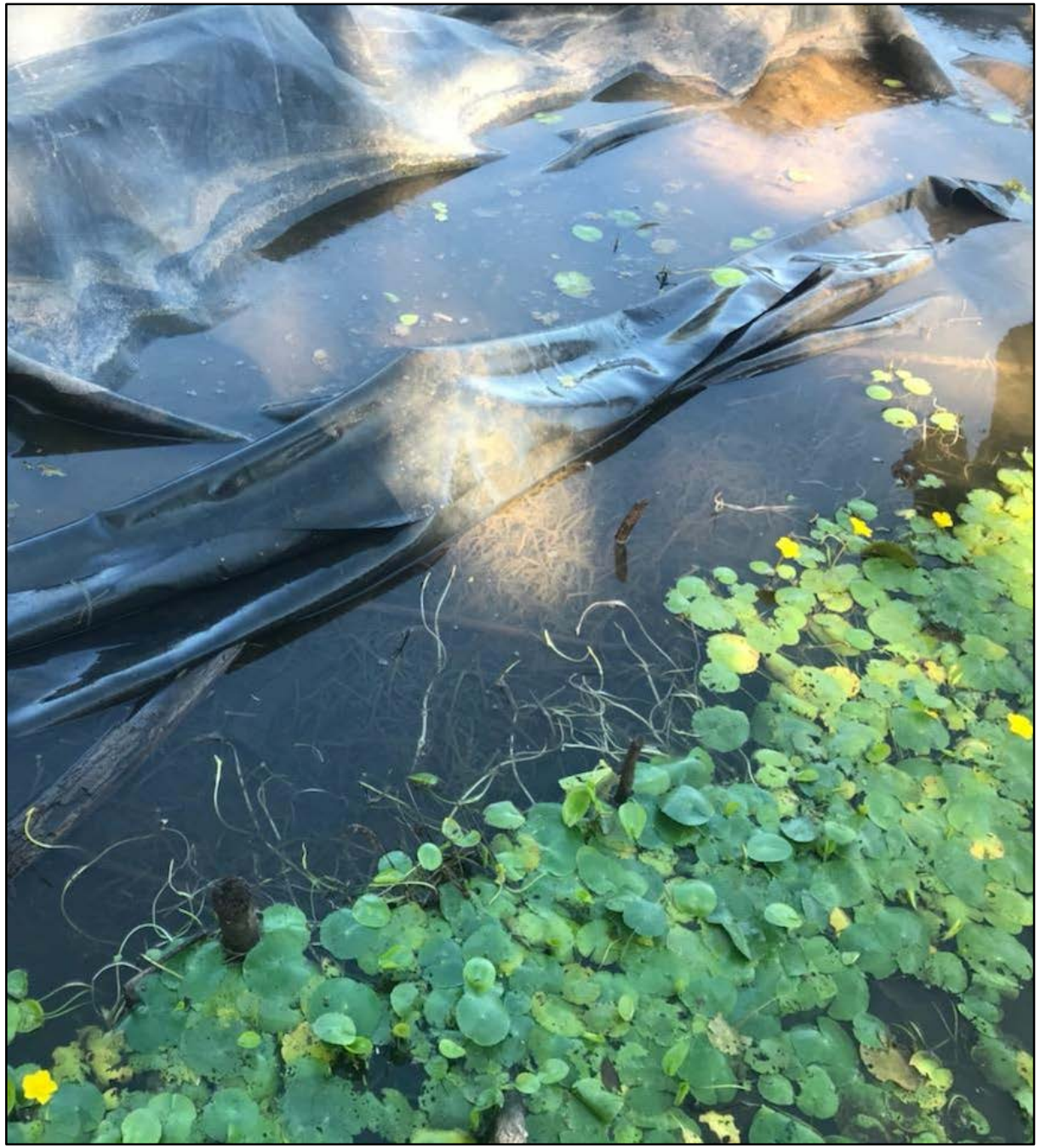
Treatment

- Glyphosate
- Prevents the plants from making certain growth proteins
- Commonly used on terrestrial environments
- Applied by boat

How do we treat areas we cannot spray?

Glyphosate has a water intake setback requirement of ½ mile


86
Lake Carl Blackwell
51



Effectiveness of treatment

- Effective glyphosate treatments were limited to the smaller infestations
- Ineffective on large infestations where the area could not be completely sprayed
- Requires an alternate herbicide use to ensure reduction of Yellow Floating Heart in Lake Carl Blackwell

September 2016

October 2017

September 2018

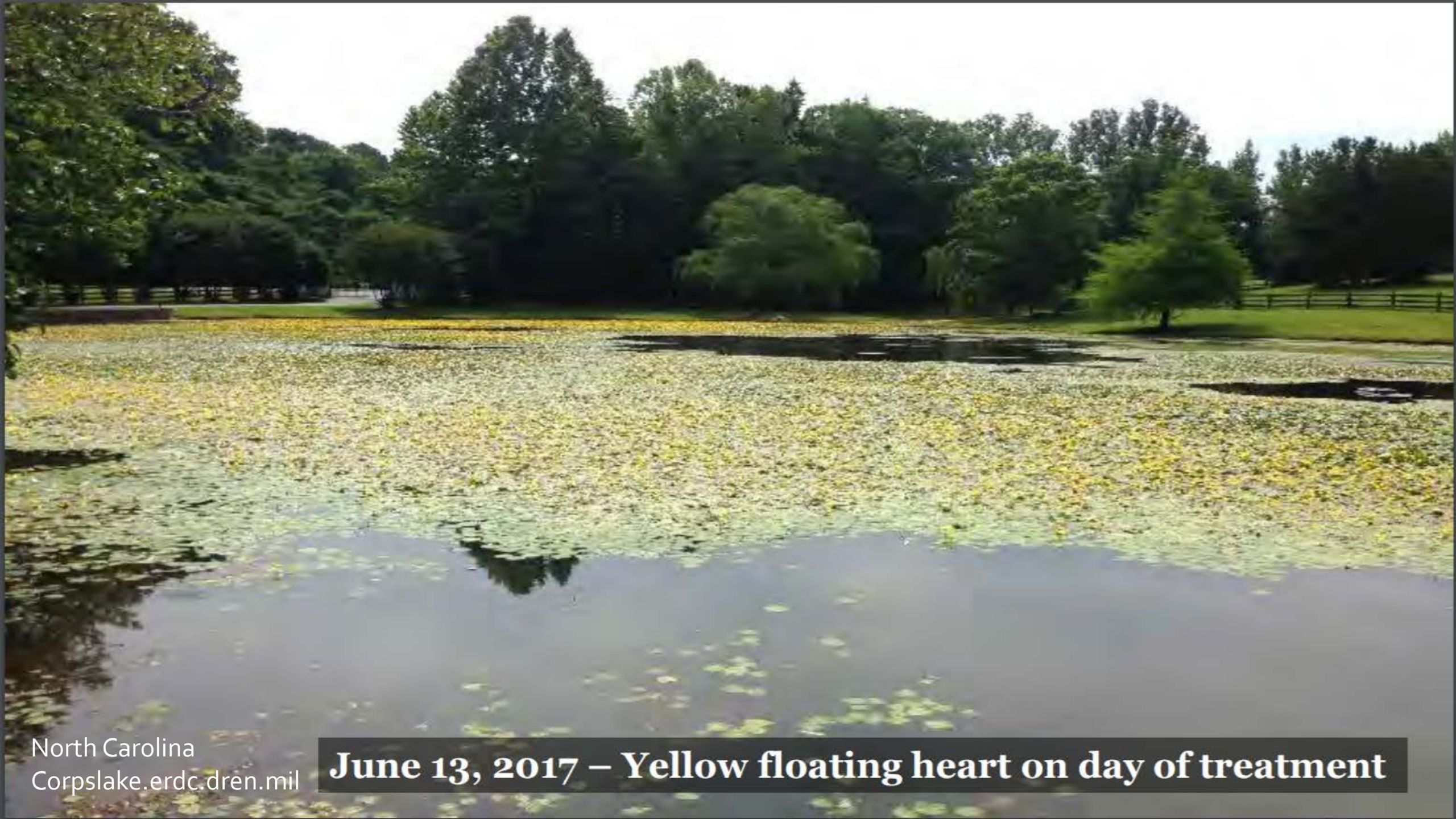
Created by Abby McCrea

Treatment for 2019

- In 2019 treatment use will shift away from glyphosate and towards ProcellaCOR
- More effective using a lesser amount of herbicide
- Expected to take 3-4 treatments over emergent period
- Benthic matting at spillway will remain in place
- Glyphosate will be used to spot treat terrestrially growing Yellow Floating Heart
- Plant health will be monitored weekly

ProcellaCOR

- Postemergence herbicide
- High selective, systemic activity on multiple major US weeds
- EPA Reduced Risk Classification – 100X or greater reduction in use rates versus older herbicides and excellent environmental profile
- No drinking water or recreational use restrictions
- No risk concerns for non-target wildlife; fish, birds, bees, reptiles, amphibians, or mammals
- Rapid dissipation


North Carolina
Corpslake.erdc.dren.mil
June 13, 2017 – Yellow floating heart on day of treatment

ProcellaCOR™

September 26, 2017 – 100% YFH Control @ 105 DAT

Research Objectives

- Effects of the presence of Yellow Floating Heart in Lake Carl Blackwell on macroinvertebrate communities
- Effects of herbicide treatments on macroinvertebrate communities
- Will help show effects of ProcellaCOR on Yellow Floating Heart

How will we look at communities?

- Field sampling on Lake Carl Blackwell
- Mesocosms

Field Sampling Locations

- Two sprayed sites
- Benthic matting treated site (no spray)
- Native site (American Lotus)
- Yellow floating heart and American Lotus mixed site


American Lotus

Field Sampling

- Sorting samples
- Identifying individuals
- Diversity indices

Mesocosm studies

- Replicated mesocosms (~150 L) with sediment, YFH, and resident macroinvertrbrates
- Treated with Glyphosate
- Two different ProcellaCOR treatments one surface and one subsurface
- Controls (unsprayed)

Mesocosm studies

- Establish treatments – conduct experiment for at least 28 days
- Collect macroinvertebrates
  - Diversity, abundance, community structure
- Basic water quality
  - Dissolved oxygen, pH, conductivity, chlorophyll a, nutrients
- Measure plant growth
  - Wet and dry biomass

What this will show us?

- Determine how the herbicide treatments affect macroinvertebrate community structures (diversity, density, etc.)
- Determine how herbicides affect plant growth
- If switching to ProcellaCOR is right decision

Conclusions

- Yellow Floating Heart invaded LCB and has increased acreage even after two years of herbicide treatment
- Different herbicide treatment options are needed
- Drinking water intakes must be considered during treatment

Acknowledgments

- OSU Lake Carl Blackwell
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- Dr. Stoodley
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Citations

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QUESTIONS?