



**Yellow Floating Heart
Eradication From Two Storm
Water Ponds Near
Delavan Lake**

**Heidi Bunk, DNR Lakes
Biologist**

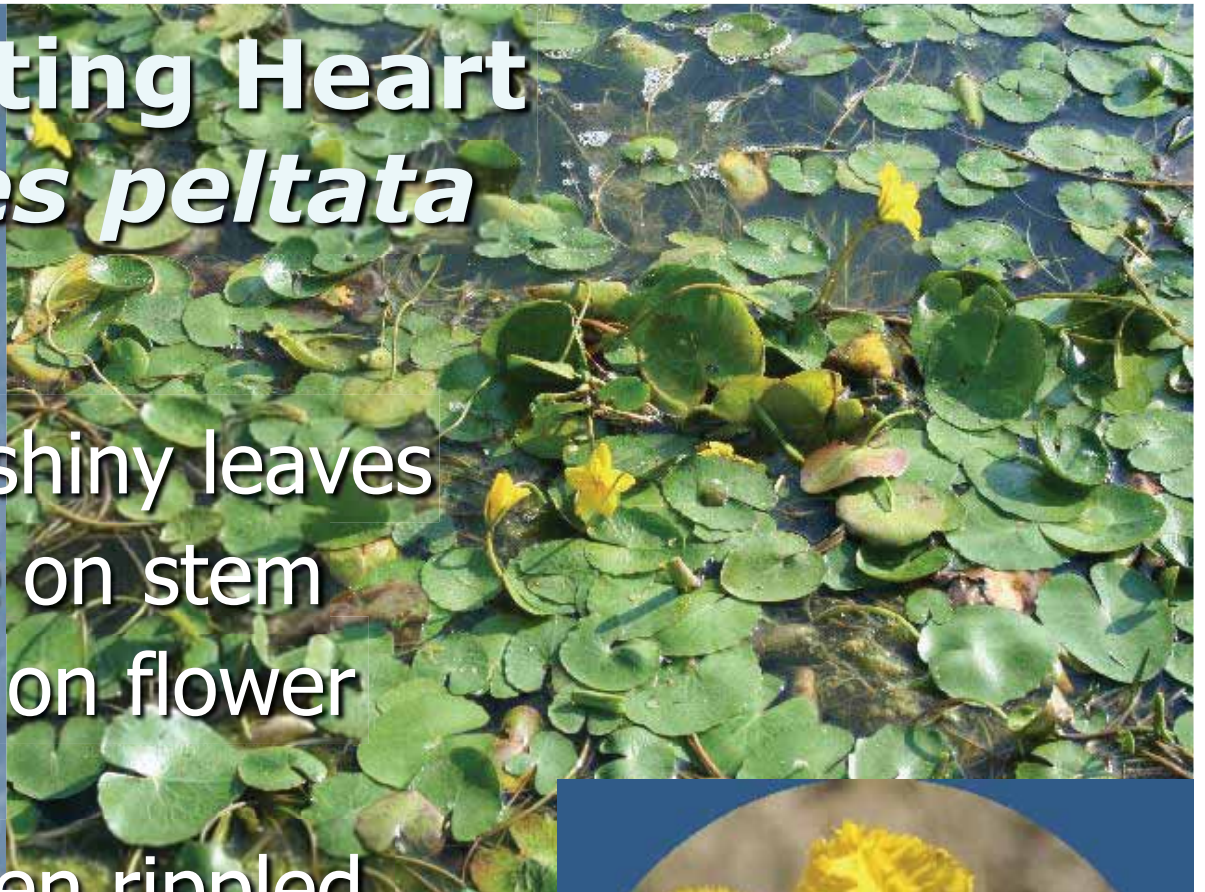
**Audrey Greene, Walworth
County Lakes Specialist**

Yellow Floating Heart

Nymphoides peltata

IDENTIFICATION

- Heart – shaped shiny leaves
- Leaves alternate on stem
- Leaves opposite on flower stalks
- Leaf margins often rippled, may be purplish underneath
- 2-5 yellow flowers per stalk
- Flowers have 5 petals, fringed margin, 3-5 cm in diameter



Yellow Floating Heart



- Aggressive non-native aquatic plant
- Prohibited in Wisconsin as of Sept. 1, 2009
- Prefers shallow, slow moving systems
- Produces monotypic patches across water surface
 - shades out native aquatic plants
 - creates stagnate water areas
 - Often found in low O₂ conditions
 - Reduces recreational opportunities (boating, swimming, fishing)

Methods of Reproduction Add to Concerns

- Under Ground Rhizomes
 - Must be removed completely or will produce growth
- Adventitious Roots
 - Allows leaf/stem fragments to grow
- Seeds
 - Viable 3-5 years
 - Winged margins allow them to float and attach to birds & mammals





Yellow Floating Heart Location



History of Infestation

■ 2007

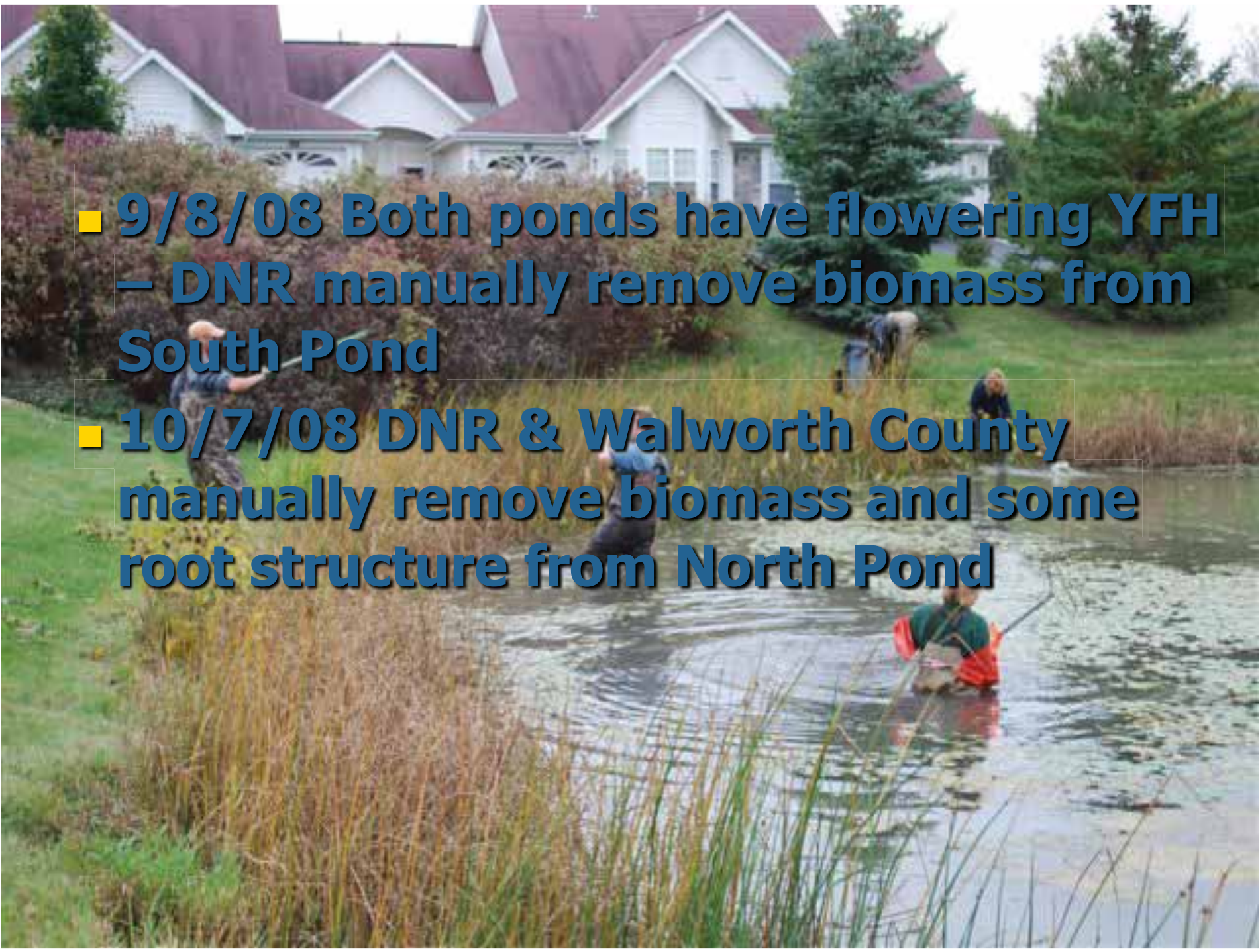
- **7/3/07 Positively ID'ed by chemical applicator in North Pond**
- **Found in two ponds, called North and South ponds, respectively**
- **7/12/07 Treated with ShoreKlear (0.42ppm) & surfactant**
- **8/02/07 Treated with Touchdown Pro 0.32ppm**
- **8/30/07 No YFH noted in either pond**

■ 2008

- **5/2/08 Yellow Floating Heart growing in North Pond**
- **5/21/08 treated with ShoreKlear, surfactant, Avast and Earthtec**
- **5/21/08 treated South pond with Avast**
- **6/10/08 Treated with Reward and Cutrine Ultra**

2008 Continued..

- **7/2/08 Treated with Reward, ShoreKlear & Surfactant**
- **7/23/08 Treated with ShoreKlear & Surfactant**
- **8/15/08 Chemical Treatment Discontinued**

- 
- **9/8/08 Both ponds have flowering YFH – DNR manually remove biomass from South Pond**
 - **10/7/08 DNR & Walworth County manually remove biomass and some root structure from North Pond**

Costs for Short Term Management

- Chemical treatment from 2007-2009 – Estimated cost of \$2000
- Handpulling: Estimated man hours: 32
- Estimated cost for handpulling: \$750

■ 2009

- **May 5, 2009 - Yellow Floating Heart found in both ponds**
- **June 11, 2009 - Meeting held to plan Rapid Response Grant to eradicate Yellow Floating Heart**
 - **DNR**
 - **Geneva Landings Personnel & Directors**
 - **Town of Delavan**
 - **Delavan Lake Sanitary District**
 - **Walworth County**
 - **Chemical Firm**

Rapid Response Project Goal

- Completely Eradicate Yellow Floating Heart from Storm Water Ponds
- Make Sure that No Seeds or Plant Parts Are Left Exposed to Possible Spread
- Prevent spread to nearby Delavan Lake

Project Cost-Shared with DNR Rapid Response Grant

75% Cost-Share
Maximum \$20,000

Required Partnership with Grant
Eligible Entity (Town of Delavan)

Rapid Response Plan Step 1



Dewater Ponds through sediment bags in order to retain all seeds

- Dewatering through Sewer System rejected - no data that sewage treatment would render seeds unviable
- Sediment bag pore holes required to be 2mm or less

Rapid Response Plan Step 2



Dredge to Existing Clay Liner

- Place dredge spoils in newly excavated pits near ponds

Trucking spoils to alternate disposal site to bury or land spread was discussed & discarded – more expensive – greater chance that seeds could be dispersed

Rapid Response Plan Step 3



Place liner in ponds to prevent any remaining seeds from germinating

- Liner min. of 3 mm thick
- Min 5 year warranty

Rapid Response Plan Step 4 - 6



- 4. Cap Dredge Pits**
- 5. Allow Ponds to refill**
- 6. Monitor for 3 years**



Sept 14, 2009
Spoil Pits Excavated Near
Ponds

Dewatering Precautions

- Submersible Pump used - no oils/lubricant leakage issues
- Extra Sediment bags on site
- Sediment bags rated for 1200 gpm – pump will run at 600 – 700 gpm
- Sediment bags placed adjacent to dry stormwater detention basins

**Dewatering
9/17 & 9/18
Time to
Dewater:
approx. 4 hours/
pond**





Dredging

- Remove all sediment down to existing clay liner
- shape & prep for liner

















Before v.s. After





Pond Liner – Step 1

Under liner to protect the liner from sharp objects on bottom of ponds



Pond Liner: Step 2

Liner is unfolded & laid across entire pond area




Liner: Step 3 Trenching & Burying Liners



Double Silt Fence Between Work Pad & Pond Prevents Stray Seeds from Washing Back into Ponds





**Equipment
power washed
over spoil pit to
reduce chance of
recontamination**





Liner: Step 4
Soil on liner
provides protection
from UV rays &
ballast to hold liner
in place



Placing soil on
rain filled North
pond liner more
challenging





Final Steps:

Disposing of filter bags into pits

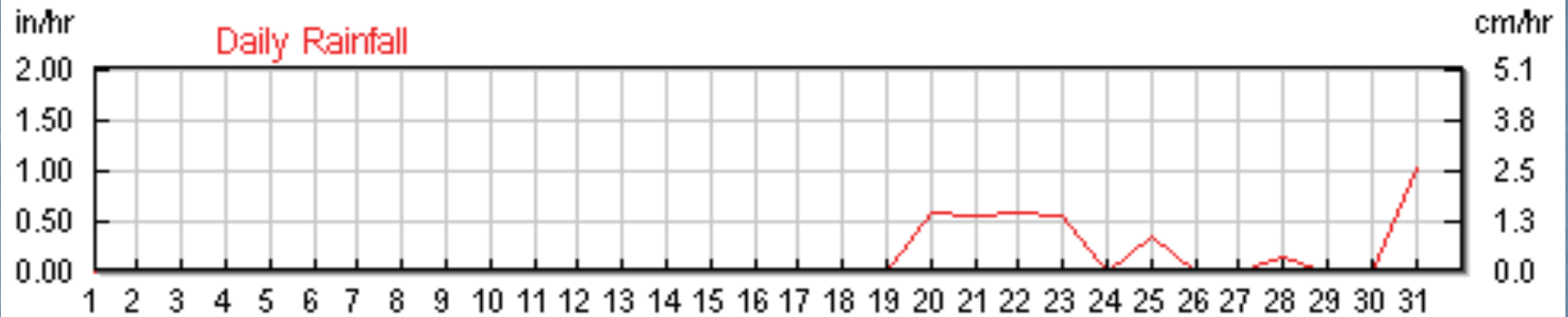
Filling in (capping) spoil pits

Disposal of rocks from stormwater discharge pipes into pits

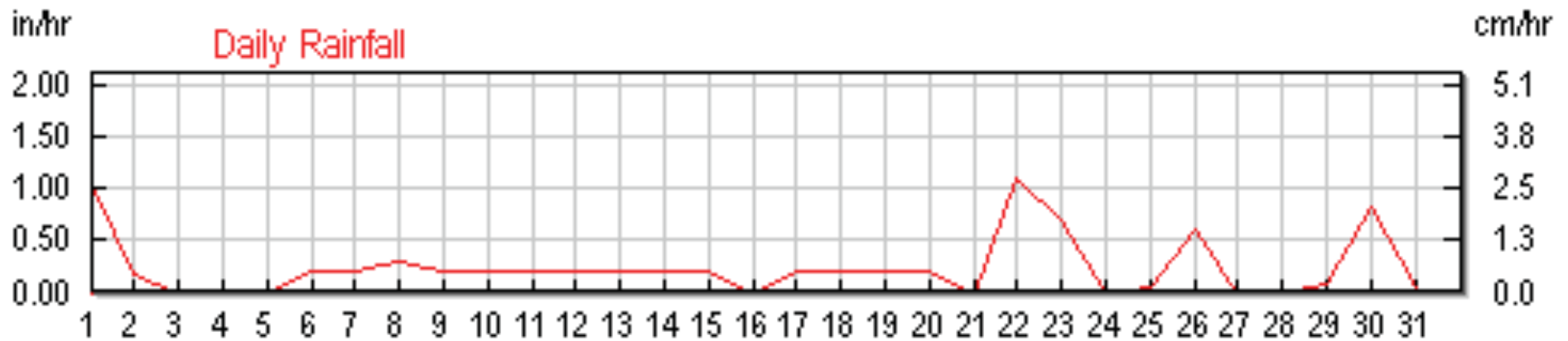
Final Steps: Erosion control matting
Final Landscaping Spring 2010
Pictures from June 10th, 2010



Issues & Delays



September



October

Issues & Delays

- Contracts & Legalities
- Pump Type Change (went with submersible) – Ship Time
- Liner Ship Time Longer Than Expected
- Trenching for Liner Mostly by Hand – Slope Too Extreme for Dingo & Backhoe
- Ponds Dewatered Twice (Rain)
- North Pond Rain Filled Before Ballast In Place

Permits

- Ponds over 500 ft from Lake – DNR did not require Chapter 30 permit
- County waived permits

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
September						
		1	2	3	4	5
6	7	8	9	10	11	12
13	14 Spoil pits dug	15 Waited for Submersible pump	16	17 Dewatering	18 & Dredging	19
20	21 Liners did not arrive	22 Rain	23 Rain	24 Rain	25 Rain	26
27 Rain	28 Rain Wind	29 Wind Dewater again	30 Liner South Pond –Start Liner North Pond	Note: 2.75" rain Between 19th & 31st		

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
October						
				1 Work con't on Liners – Rain 11am	2 Rain	3
4	5 Work on N. pond liner	6 Rain	7 Complete Ponds Fill Pit as much as possible	8 Add more fill to pit	9	10
11	12	13	14	15	16	

Suggestions for Future Projects

- Involve contractors in planning process
- Liners that do not require soil ballast will result in greater water clarity – small stone ballast should be considered if manufacturer of liner states it is ok
- Staging, staging, staging – have everything ready to go – materials and labor so that the project can proceed quickly, smoothly and with minimal delays
- Waiting for liner delayed project
- If no permit needed, get it in writing from the DNR, County, etc.
- Plan for rain delays – It will happen!
- Have the right size and kind of equipment for the slope of your ponds

Ponds were monitored every other week in 2010 – A few plants found September 1st, 2010 and removed



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Questions??