



# Procellacor: Novel Herbicide Use in Michigan

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*Michigan DEQ Water Resources Division*

*Great Lakes Panel on Aquatic Nuisance Species*

*Ann Arbor, MI*

*November 8, 2018*





# Michigan aquatic invasive plant response program

## Goal:

- Prevent the establishment and spread of aquatic invasive plants on Michigan's watch list by responding rapidly, prudently, and efficiently to reports
- Pursue local eradication when possible and practical







# Michigan aquatic invasive plant watchlist

*Be on the lookout for these invasive species!*

Yellow Floating Heart  
*Nymphoides peltata*



Water-chestnut  
*Trapa natans*



Parrot Feather  
Water-milfoil  
*Myriophyllum aquaticum*



Water Soldier  
*Stratiotes aloides*



Hydrilla  
*Hydrilla verticillata*



Brazilian  
Water-weed  
*Egeria densa*



European Frog-bit  
*Hydrocharis morsus-ranae*



Water Lettuce  
*Pistia stratiotes*



Water Hyacinth  
*Eichhornia crassipes*



European  
Water-clover  
*Marsilea quadrifolia*



These species are currently allowable for sale and possession. Please contact the DNR if these plants are observed outside of cultivation.

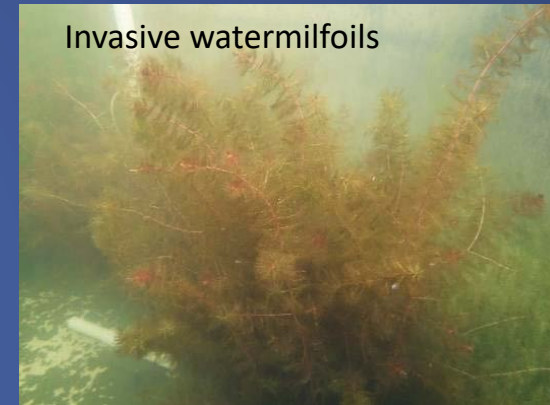
\* Seven species are prohibited in Michigan



# ProcellaCOR<sup>®</sup>

a.i., florpyrauxifen-benzyl

- USEPA label approved late February 2018
- Highly selective, systemic activity
- Short-exposure (hrs to days)
- EPA Reduced Risk Classification
  - 100X or greater reduction in use rates versus older herbicides (ppb vs ppm)
  - Excellent environmental profile
    - no water use restrictions except some forms of irrigation
- Approved for use in Michigan July 2018







# Case Study #1

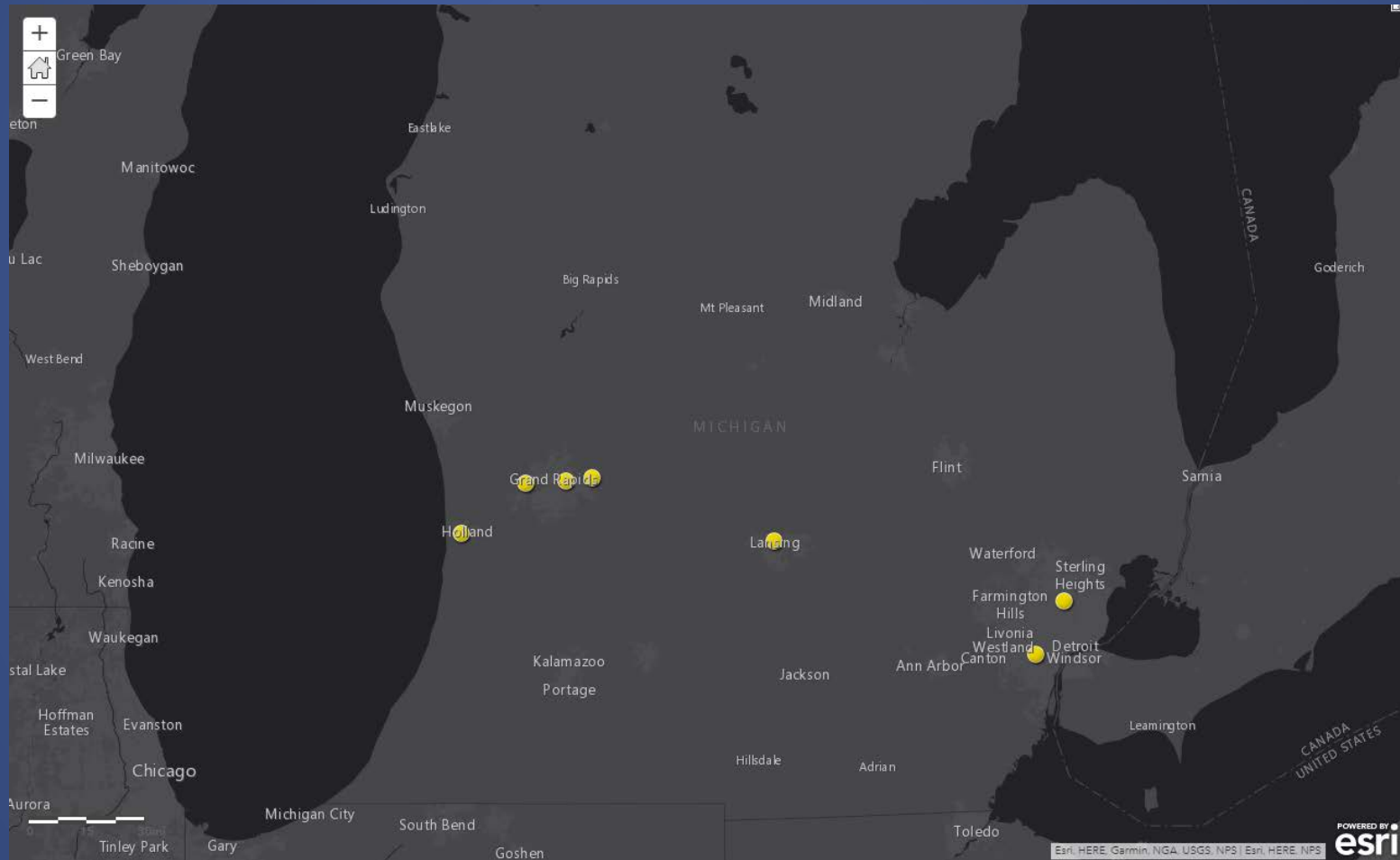
## Yellow floating heart (YFH)

- Prohibited in MI
- Rooted with floating leaves
- Scalloped leaf edges
- Dense mats





# Known YFH locations





# Known YFH locations







# Lubbers Farm

- Family farm
- Small business
- Farm to table
- Organic practices



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#### Lubbers Farm Store sells:

Pastured Pork  
Succulent Beef

Eggs  
Breads  
Rolls and Buns  
Crackers  
Crunchers

Honey  
Maple Syrup  
Fresh Goat Cheeses  
Heirloom Seedlings

And More

Everyone should have a Farm Store to visit, to experience authentic food at its source, to know their farmer, to taste the terroir of real food from a real place.

Farm Tours and Farm Activities are offered on a rotating basis most Saturdays at 11:00 a.m. You can check our Facebook page for a listing of the current month or subscribe to our newsletter for a direct mailing.



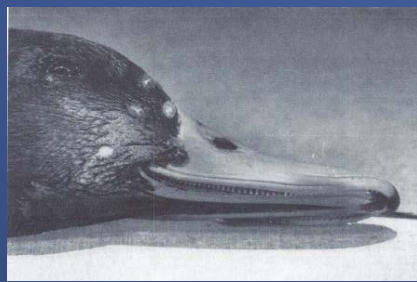
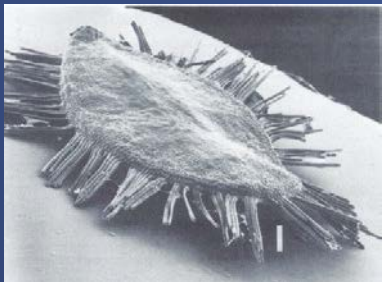




# Site characteristics

- YFH planted 20+ yrs ago for daughter's wedding
- Reported: July 2017
- 0.3 acre Farm pond
- No surface water hydrologic connections
- 1<sup>st</sup> occurrence in Michigan in unlined pond
- Plants deeply rooted
- Lack herbicide experience in Michigan for YFH

On the bright side: No off site spread



Images from Cook 1990



# Management option evaluation

## External consultation

- Wisconsin, North Carolina, Florida, Chemical companies and herbicide applicators

## Management options




- Hand pulling- not practical likely ineffective due to rooted plants
- Draining- logistics, possible increase in seed sprouting, aesthetics
- Excavation/lining- costly, destructive, aesthetics
- Herbicide- uncertainty for long-term control, desire for as few treatments as possible with as little herbicide as possible

## Internal Consultation

- DEQ Water Resources Division staff- AIS, Aquatic Nuisance Control Permits, NPDES Permits, Aquatic Toxicology Unit

**ProcellaCOR. The solution you've been waiting for.**

For superior treatment of:

-  Milfoil
-  Hydrilla
-  Crested Floating Heart





# Why ProcellaCOR

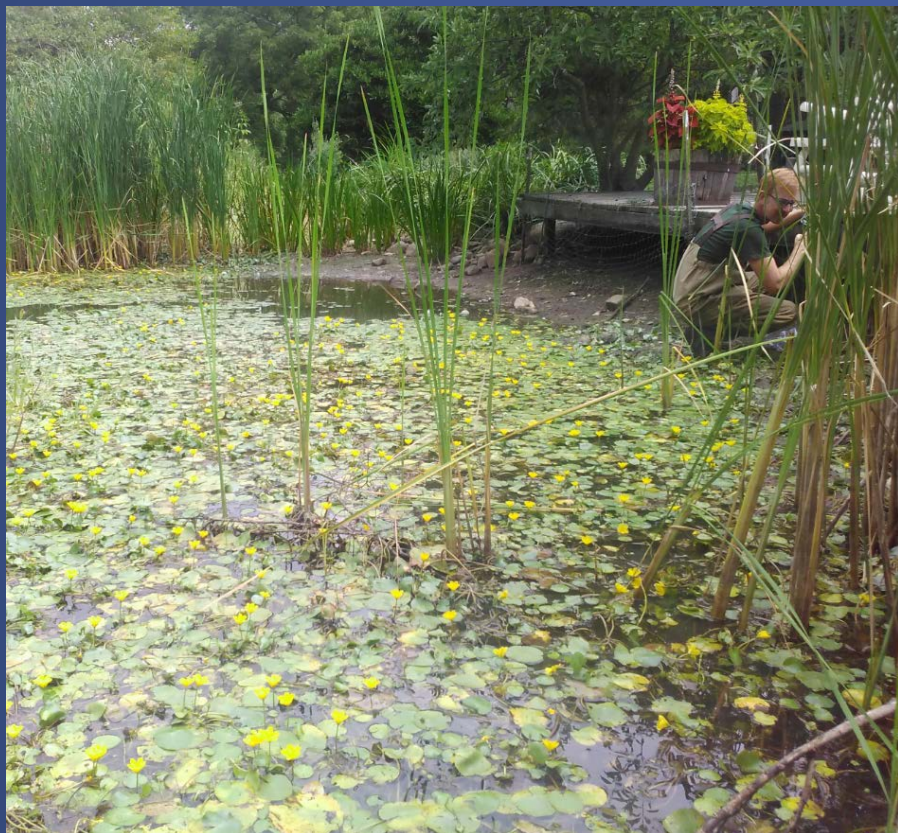
- Labeled for floating heart species
- Recommended by professionals with experience
- Discussions with SePro (registrant)
- Newly approved in Michigan
- Small closed system
- Opportunity to test efficacy





# ProcellaCOR treatment

Pre treatment 8/14/18



Post treatment 9/24/18



Treated 9/6/18 PLM Lake and Land Management



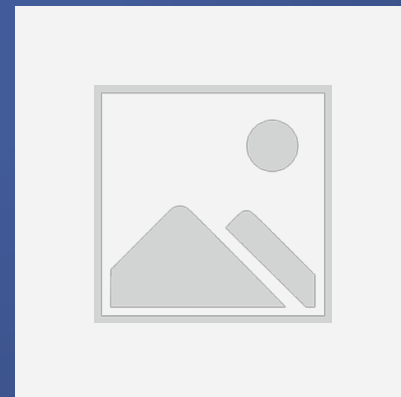
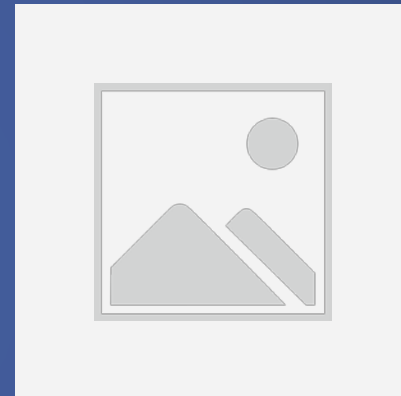


# YFH Next steps

- Follow-up monitoring and management
  - YFH seed bank- density, viability, persistence?
  - Root mass survival?



Post treatment. Note numerous seed pods present.



Seeds collected 8/14/18



# Cast Study #2

## Parrot Feather (PF)

- Prohibited in Michigan
- Popular water garden plant
- Rooted/emergent
- Cold tolerant
- Vigorous
- Spreads through fragmentation

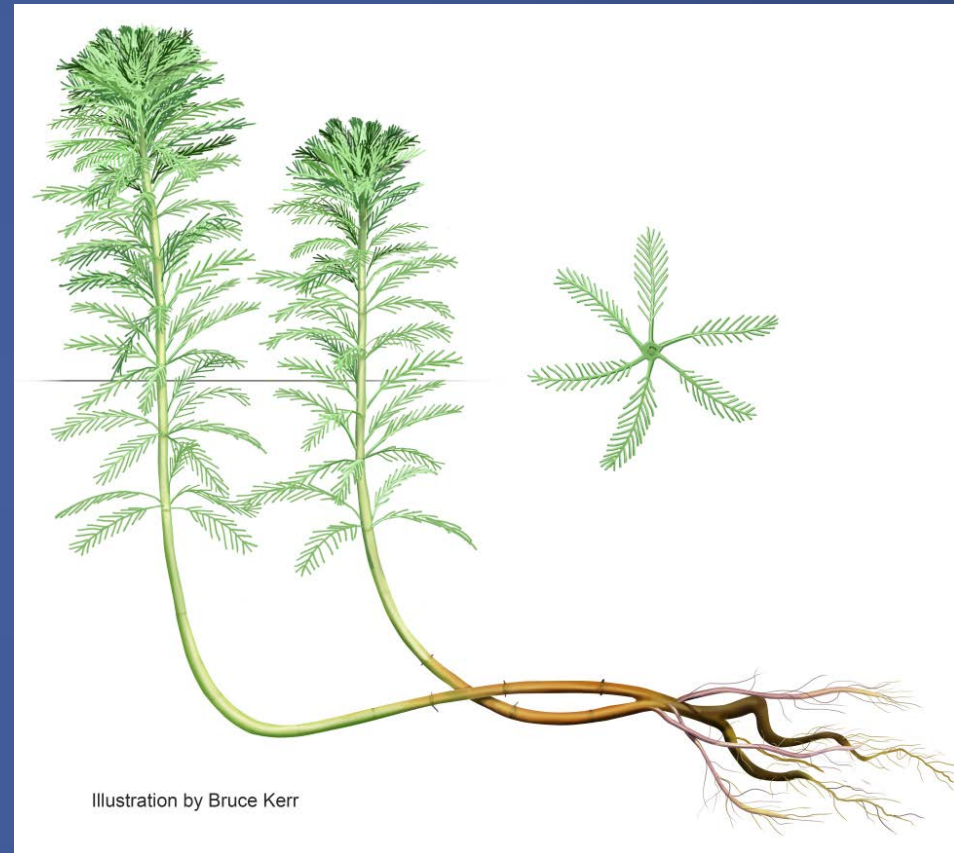


Illustration by Bruce Kerr





# Known PF locations





# Indian Brook Trout Farm

- Rainbow trout farm
- Serves restaurants and retail stores
- Artesian well fed facility
- Discharges to Sandstone Creek
- NPDES regulated facility

## Michigan fish farm inks deal with Meijer to sell rainbow trout at all 235 stores

Updated Apr 5, 2018; Posted Apr 5, 2018



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# Trout Farm Finishing Pond

- Previous owner sold pond plants (prior to PF prohibition)
- Observed during DEQ NPDES inspection: September 2016
- PF in finishing pond



September 2016



# Management option evaluation

## External consultation

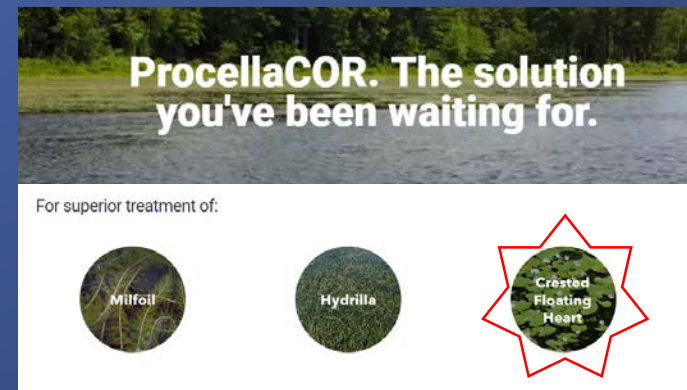
- Previous treatment experience in Michigan

## Management options

- Hand pulling- not practical likely ineffective due to rooted plants
- Excavation/lining- costly, destructive,
- Herbicide- success with previous sites, some limitations due to flow and NPDES permit requirements

## Internal Consultation

- DEQ Water Resources Division staff- AIS, Aquatic Nuisance Control Permits, NPDES Permits, Aquatic Toxicology Unit







# PF management

- Oct 2016 - Triclopyr
- August 2017 - Triclopyr
- September 2017 - Triclopyr
- Adaptive integrated management
- November 2017- Biomass removal
- Rebound in 2018





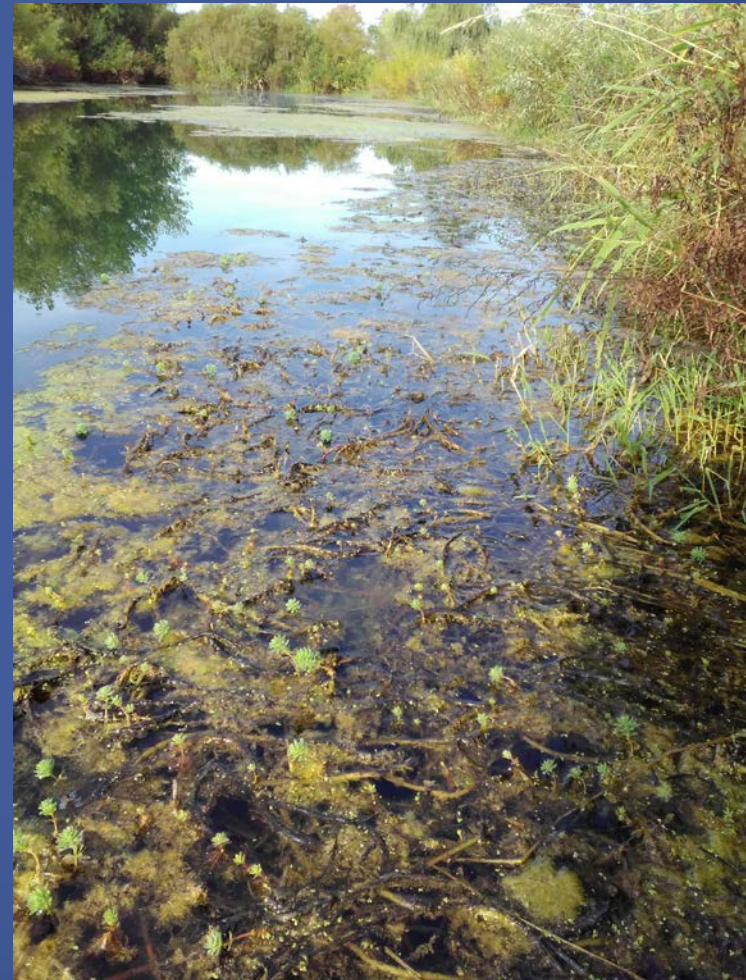


# 2017 Results

July 2017: Pre-treatment



Sept 2017: Post 2 Triclopyr applications







# Management option evaluation

## External consultation

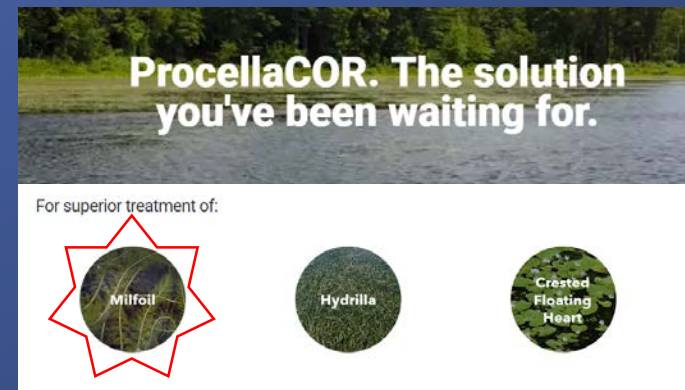
- Herbicide companies and applicators

## Management issues

- Treatments not killing plants
- Short retention time = short herbicide contact
- Dense mats impede herbicide contact
- Limited herbicide options with NPDES compliance

## Internal Consultation

- DEQ Water Resources Division staff- AIS, Aquatic Nuisance Control Permits, NPDES Permits, Aquatic Toxicology Unit





# 2018 PF ProcellaCOR treatment

Aug. 2018 Pre-treatment



Oct. 2018 Post-treatment



Treatment conducted by AquaWeed. Few stems found.  
Viability unknown.





# Next steps

- Continue monitoring
- Surveillance downstream for spread





# Treatment costs

## Indian Brook PF

- Single treatment 2018
- ~ 1 acre pond
- 22 oz product used
- 2.5 Prescription Dose Units (PDU) application rate
- \$1,575 (product + application cost)

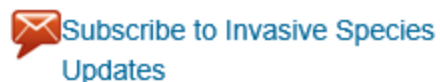
## Lubbers YFH

- Single treatment 2018
- ~0.3 acre pond
- 8 PDU/acre application rate
- \$560 (product + application cost)





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[www.michigan.gov/invasives](http://www.michigan.gov/invasives)

***Acknowledgements:***  
***Lubbers Farm, Indian Brook Trout***  
***Farm, SePro, PLM, AquaWeed***



Michigan's Invasive Species Program is cooperatively implemented by the Michigan Departments of Agriculture & Rural Development, Environmental Quality and Natural Resources.

