Unified Lower Eagle River Chain of Lakes Commission

Eagle River Chain of Lakes EWM Management Project

Informational Meeting

November 17, 2021

ACEI-240-20

Eddie Heath

Onterra LLC

Lake Management Planning

Unified Lower Eagle River Chain of Lakes Commission

Presentation Outline

- Project Overview
- EWM Intro
- Best Management Practices & Integrated Pest Management Strategies
- EWM Population in the ERC
  - Lake-Specific Survey Results
  - Chain-Wide Survey Results
- 2022 Strategy Development Discussion
  - Evolved Management Perspective
- Concluding Comments

Project Overview

- Coordinated EWM monitoring & management
  - 2008-current w/ Onterra (8 WDNR Grants)
  - ULERCLC-sponsored
  - Involvement with WDNR/USACE research
- Comprehensive Management Plan (Dec 2019)
  - ERCLA-sponsored
  - 4 phases/WDNR grants
- February 2020 WDNR AIS Grant Award (65%)
  - 3-years of monitoring & hand-harvesting (2020-2022)
  - Chain-wide point-intercept surveys (2022, 5yr interval)

Eagle River
Chain of Lakes Association

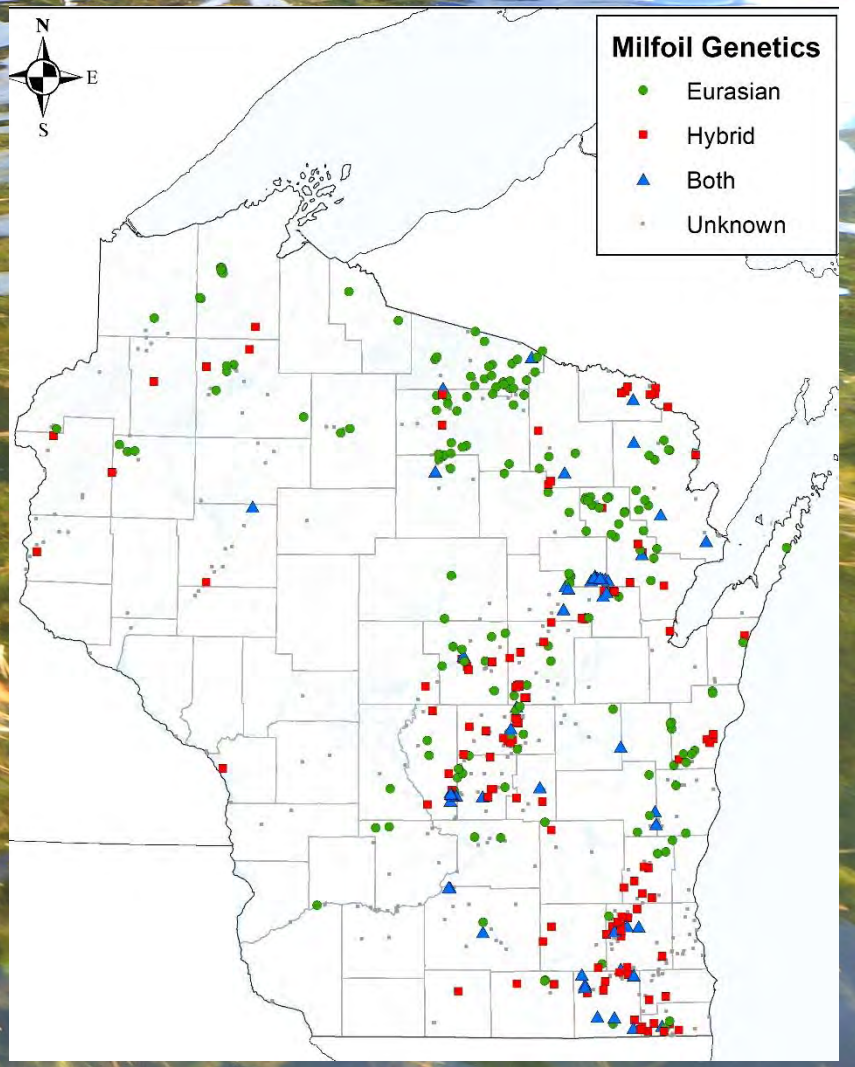
Eurasian Watermilfoil (EWM) Introduction

Non-Native Aquatic Plants

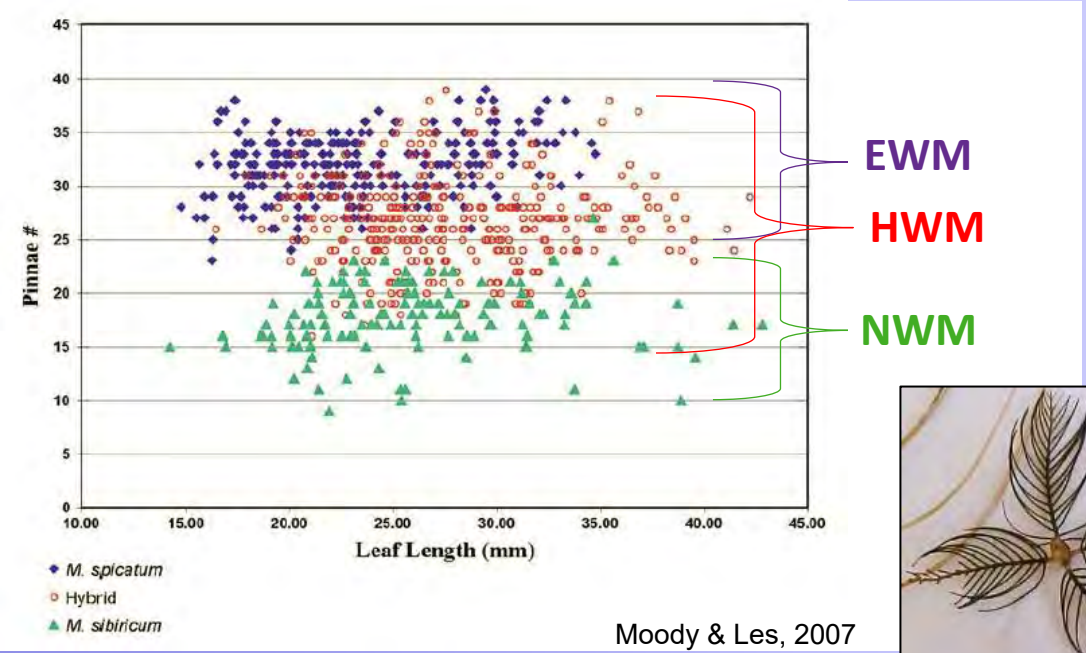
Eurasian Watermilfoil

- First “officially” documented in 1992
- Actively managed since 2001
- Onterra hired in summer 2007
- DNA testing only yielded pure-strain EWM to date

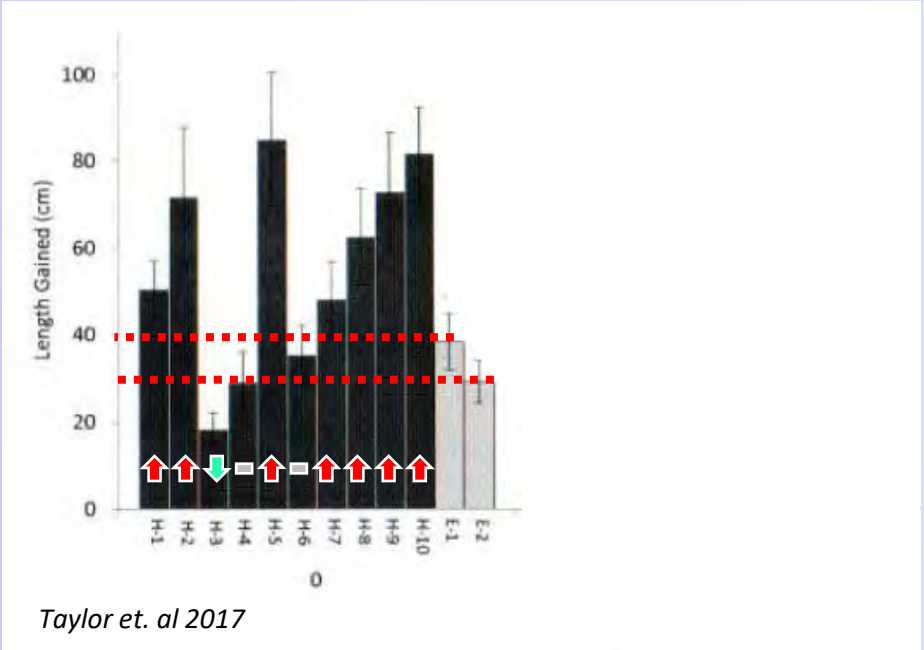
	Years Tested	Results
Cranberry	2002	EWM
Catfish	2013	EWM
Voyageur	-	-
Eagle	2002, 2020	EWM, "fail"
Scattering Rice	2013	EWM
Otter	-	-
Lynx	-	-
Duck	-	-
Yellow Birch	-	-
Watersmeet	-	-



Science on Invasive Watermilfoil Hybridity



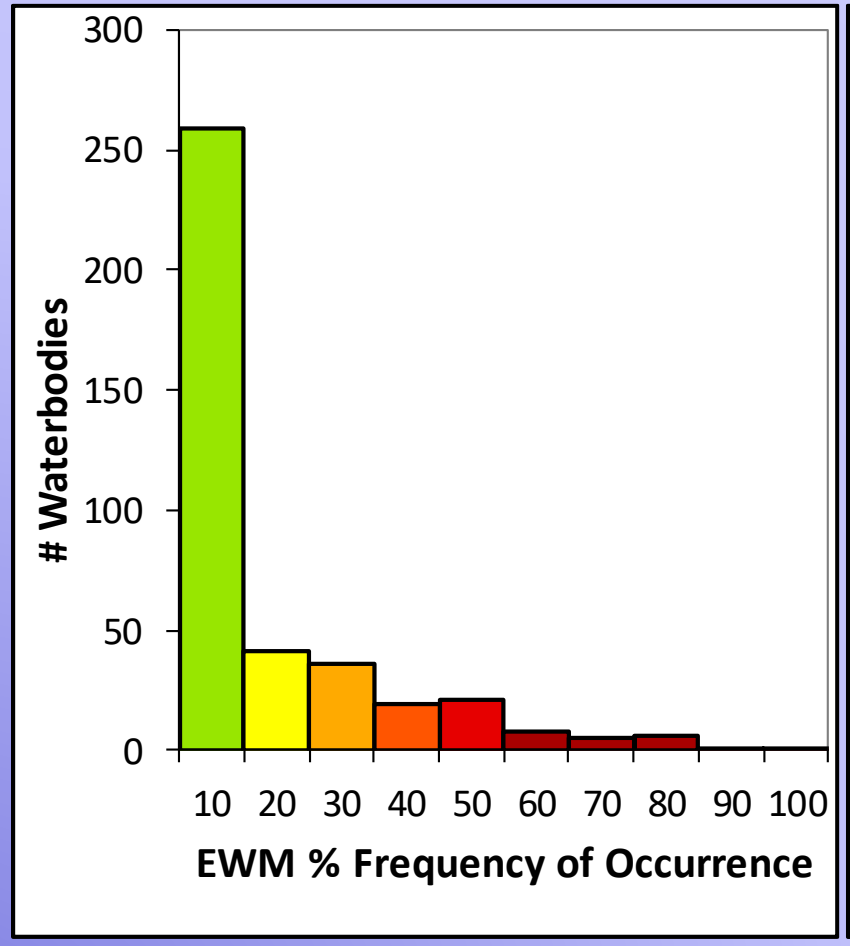
Moody & Les, 2007

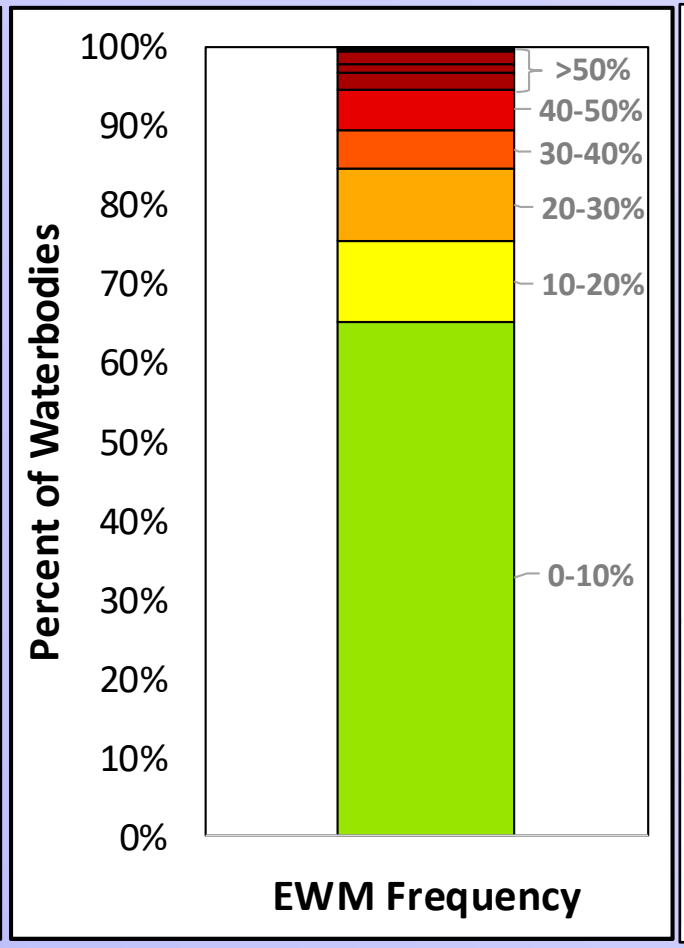


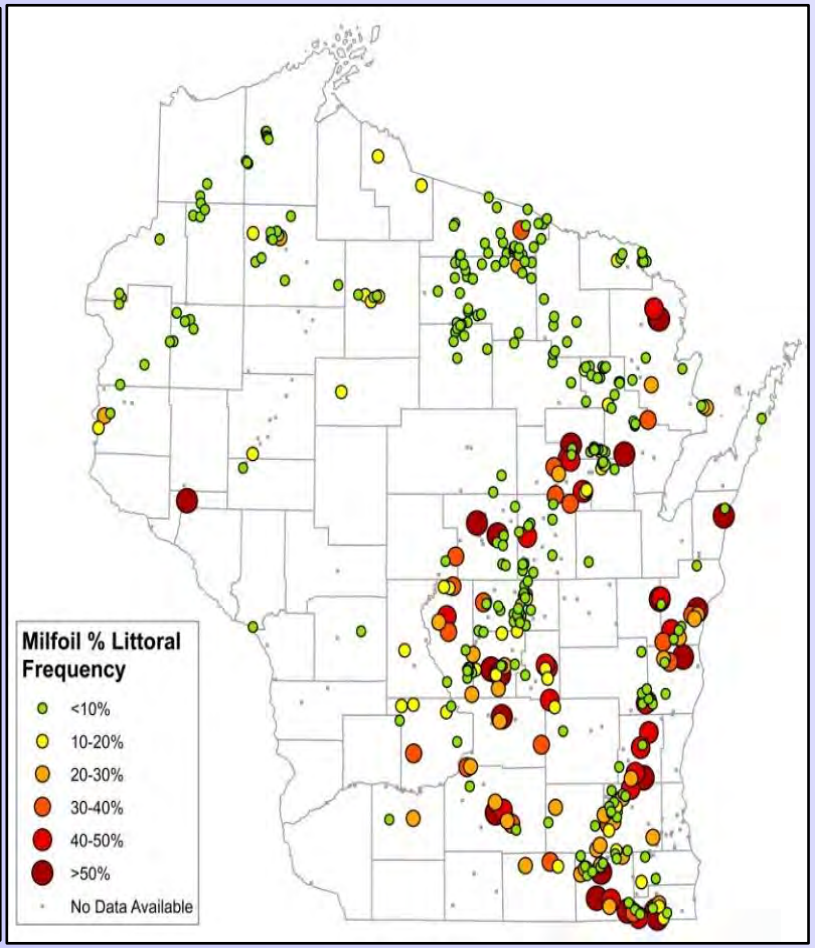
Taylor et. al 2017

Wisconsin EWM Population Trends

n = 397 lakes with confirmed EWM populations, 2015



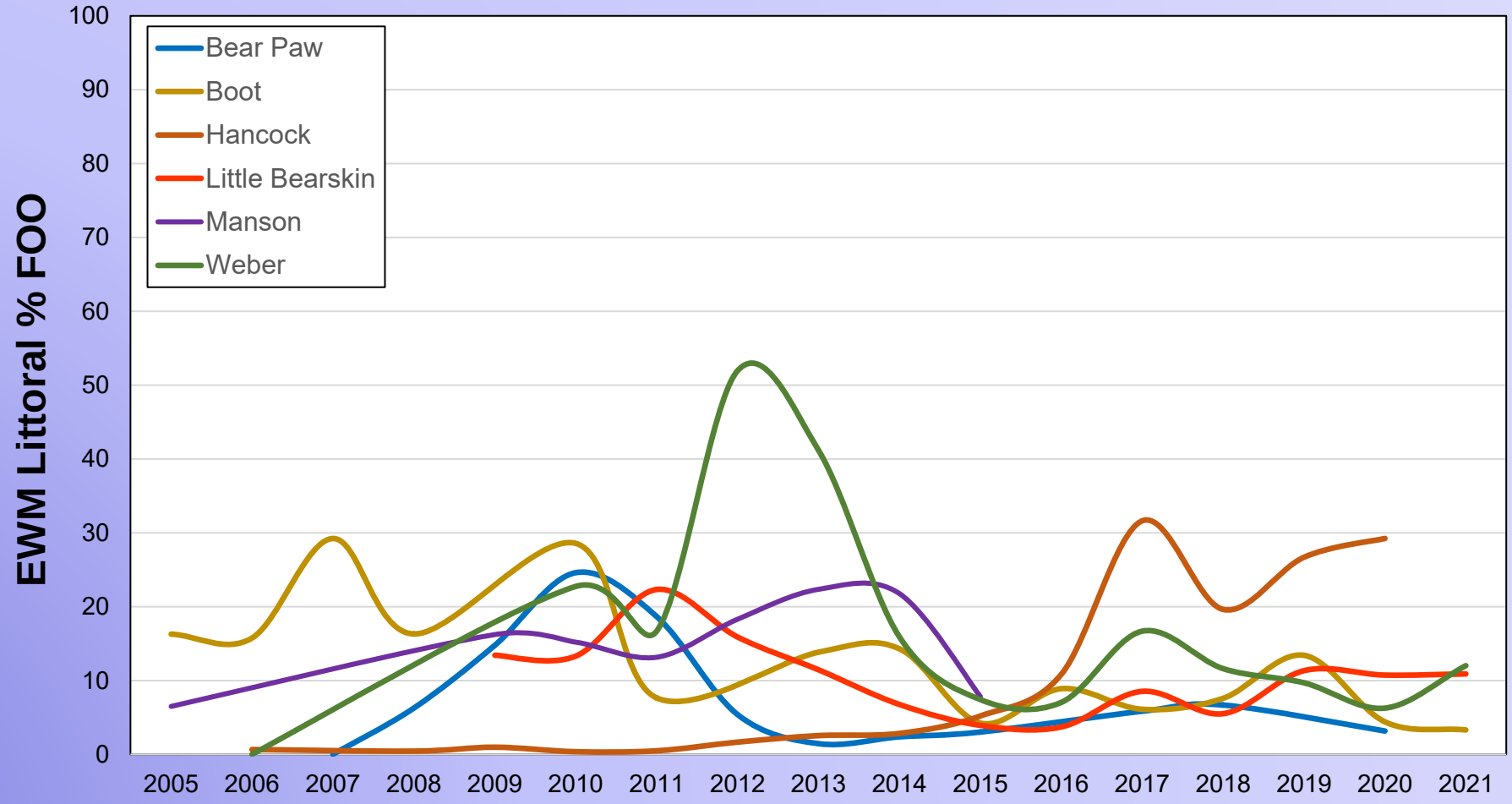




The science behind the "so-called" superweed. Nault 2016

WDNR EWM Long-Term Monitoring Trends

NLF Ecoregion – Unmanaged



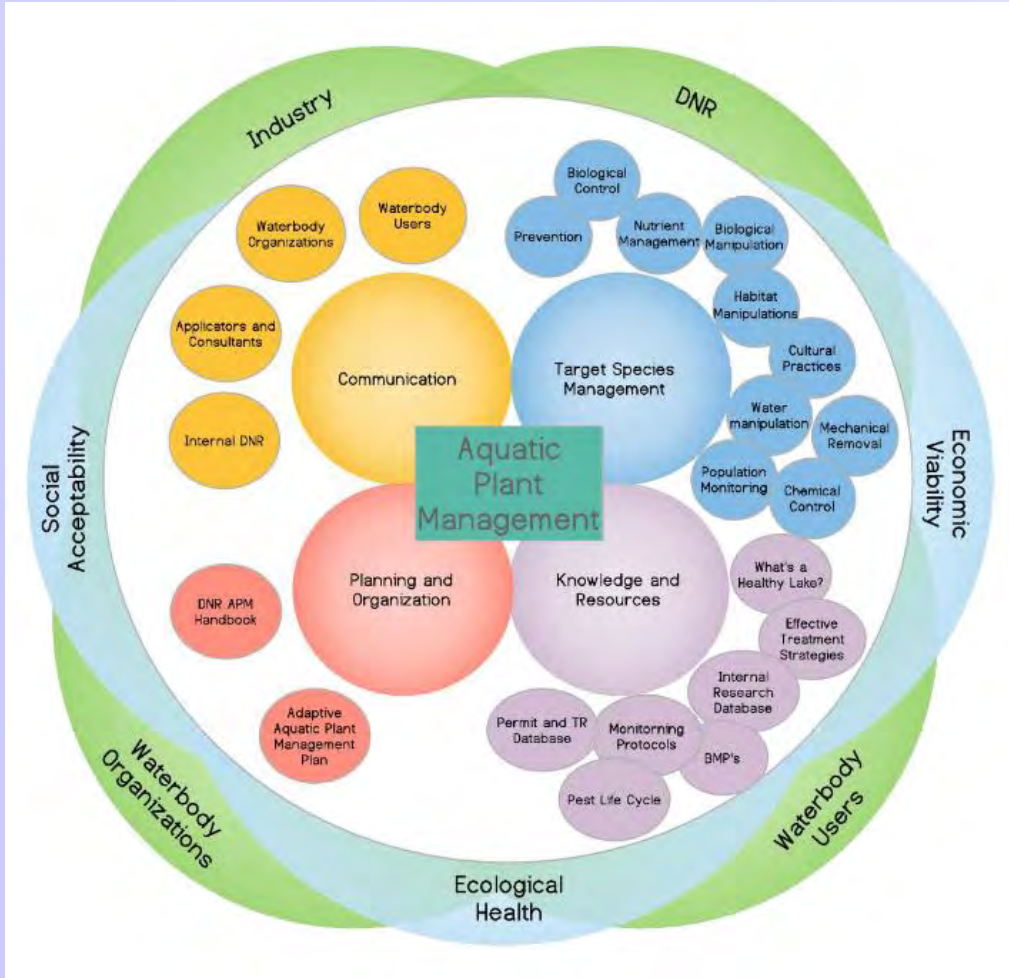

Best Management Practices
(BMPs)
&
Integrated Pest Management
(IPM) Strategies

Best Management Practices (BMPs)

- **A "placeholder" term to represent the management option that is currently supported by that latest science and policy**
- **Definition evolves over time**
  - Pre 2010 - small spot treatments with granular 2,4-D
  - Early 2010s - larger spot treatments with liquid 2,4-D
  - Mid 2010s – whole-lake treatments, spot treatments with herbicide combos, hand-harvesting/DASH
  - Current– nuisance maintenance vs population management, mechanical harvesting, increasing human tolerance, new herbicides

Integrated Pest Management Strategies (IPM)

- **Considers all the available control practices such as:**
  - Prevention
  - Biological control
  - Biomanipulation
  - Nutrient management
  - Habitat manipulation
  - Substantial modification of cultural practices
  - Pesticide application
  - Water level manipulation
  - Mechanical removal
  - Feasibility planning
  - Population monitoring



Hand-Harvesting of EWM

- **Removal of entire root material required to reduce rebound**
- **Scale limitations, not for large or dense areas**
- **Diver-Assisted Suction Harvest (DASH) can increase efficacy**
- **Limitations**
  - –Density of EWM & native plants
  - –Clarity of water
  - –Sediment type
  - –Obstructions

Herbicide Treatment of EWM

- **Introduces greater need for risk assessment discussion**
  - Known impacts of herbicides
  - Unknown impacts of herbicides
  - Public sentiment
- **How they work**
  - Concentration & Exposure Time (CET)
  - Herbicide dissipation
  - Spot vs whole-lake (whole-basin)
  - Herbicide formulation

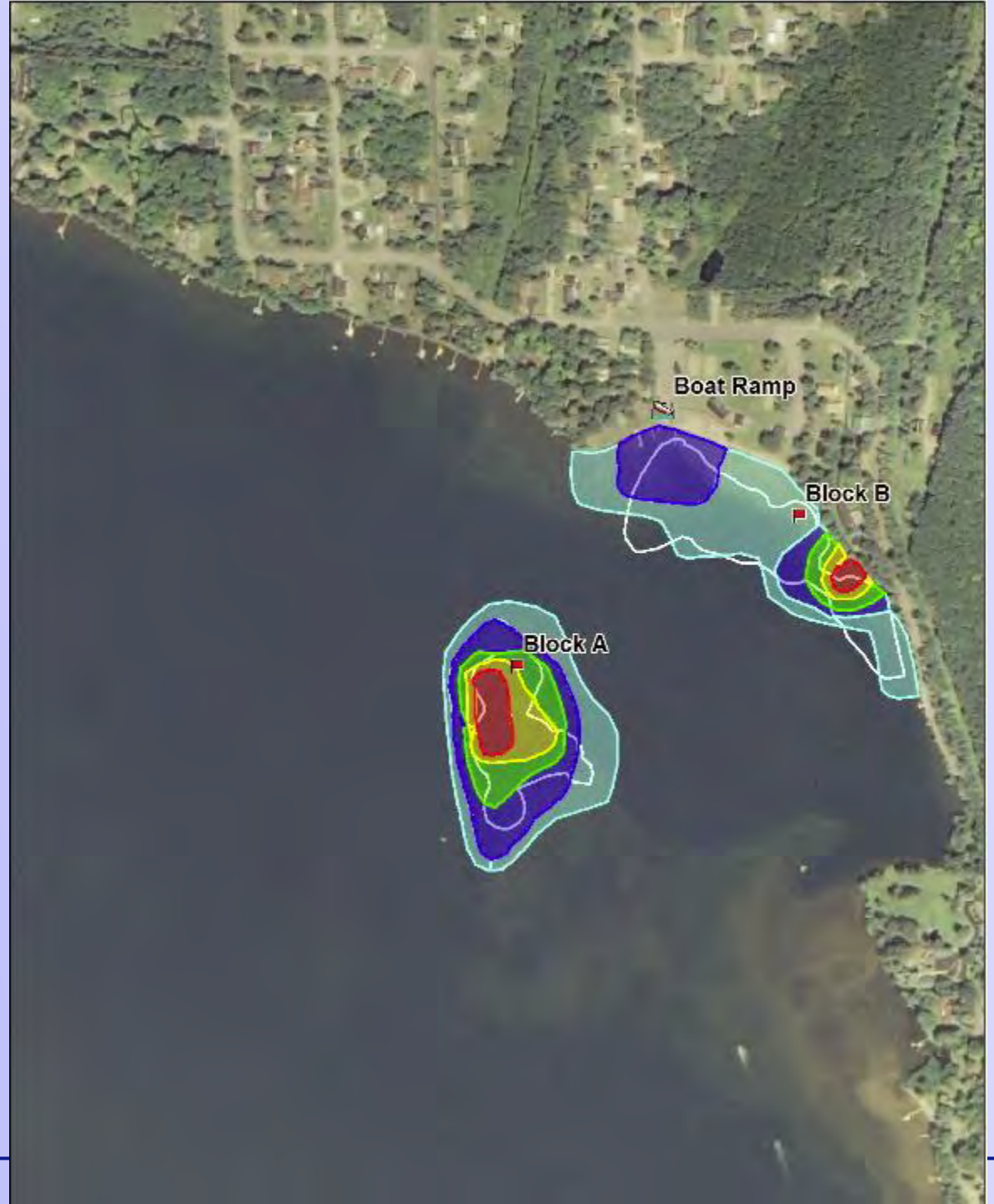
Photo Credit: Schmidt's Aquatic, LLC

Herbicide Treatment on Lake Metonga

- Tracer Dye (Rhodamine WT)
- A-15 (south) ~ 3 acres
- B-15 (north) ~ 5 acres

1 HAT

75-100%
50-75%
25-50%
10-25%
5-10%



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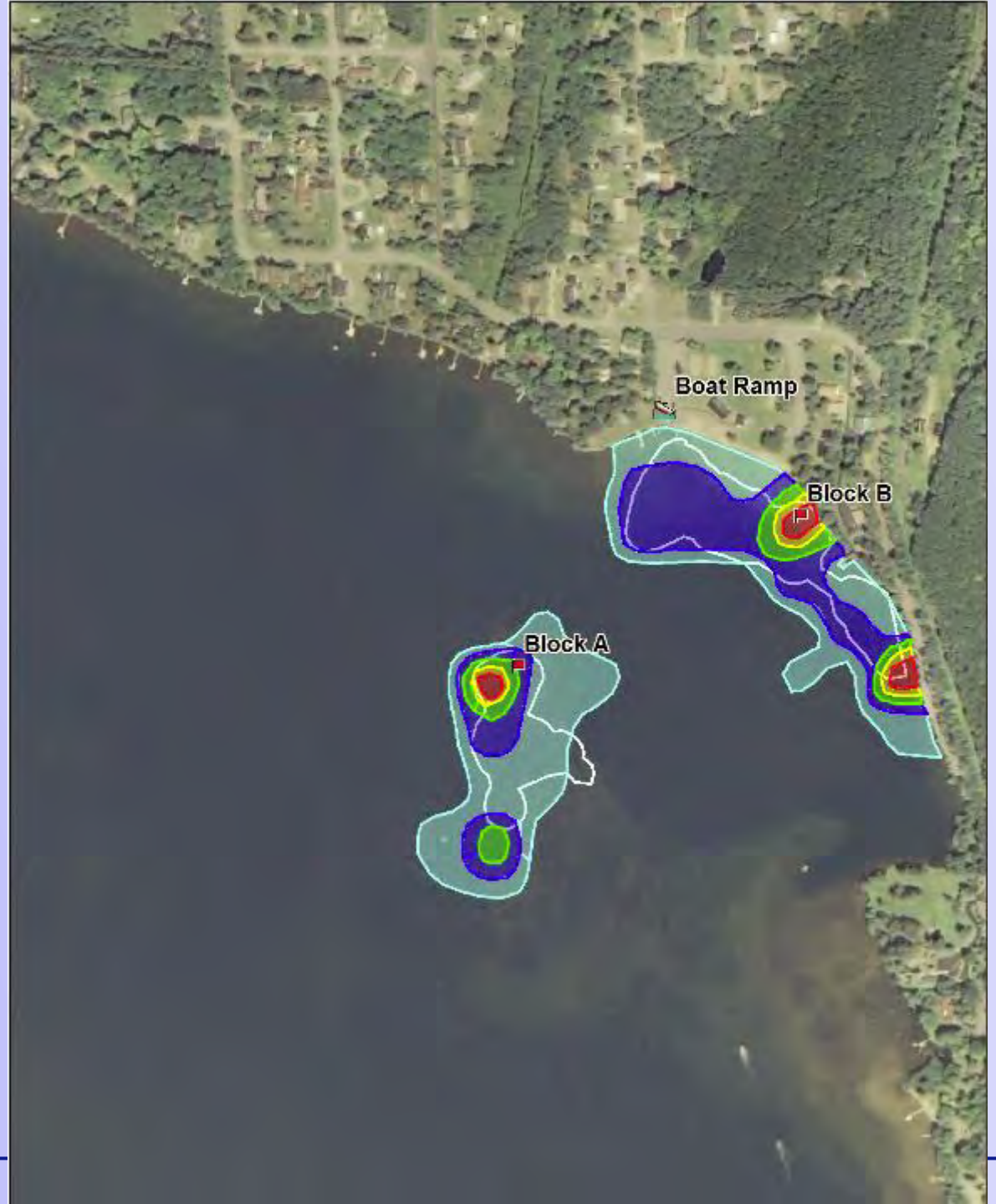
2 HAT

75-100%
50-75%
25-50%
10-25%
5-10%



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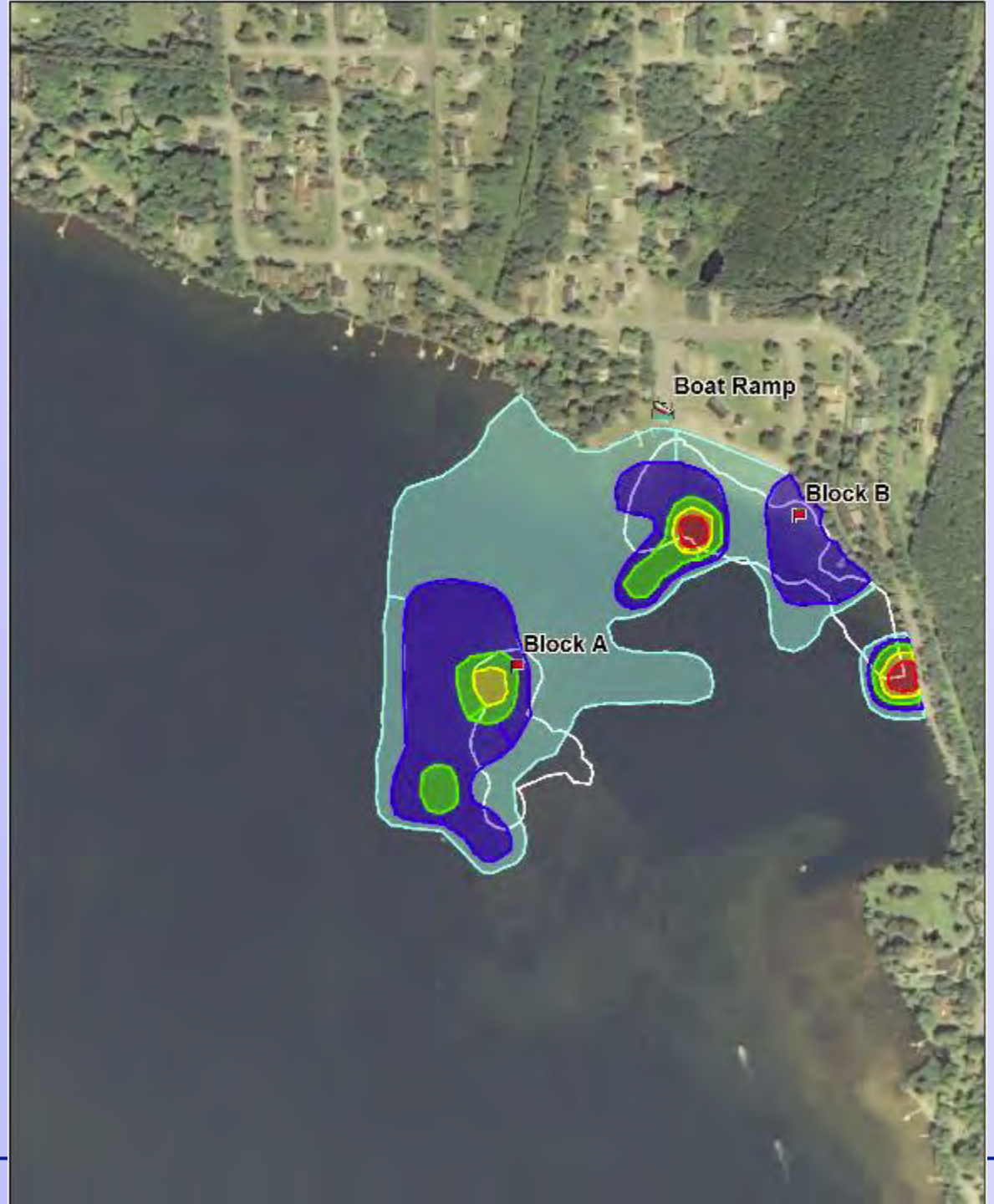
3 HAT

75-100%
50-75%
25-50%
10-25%
5-10%



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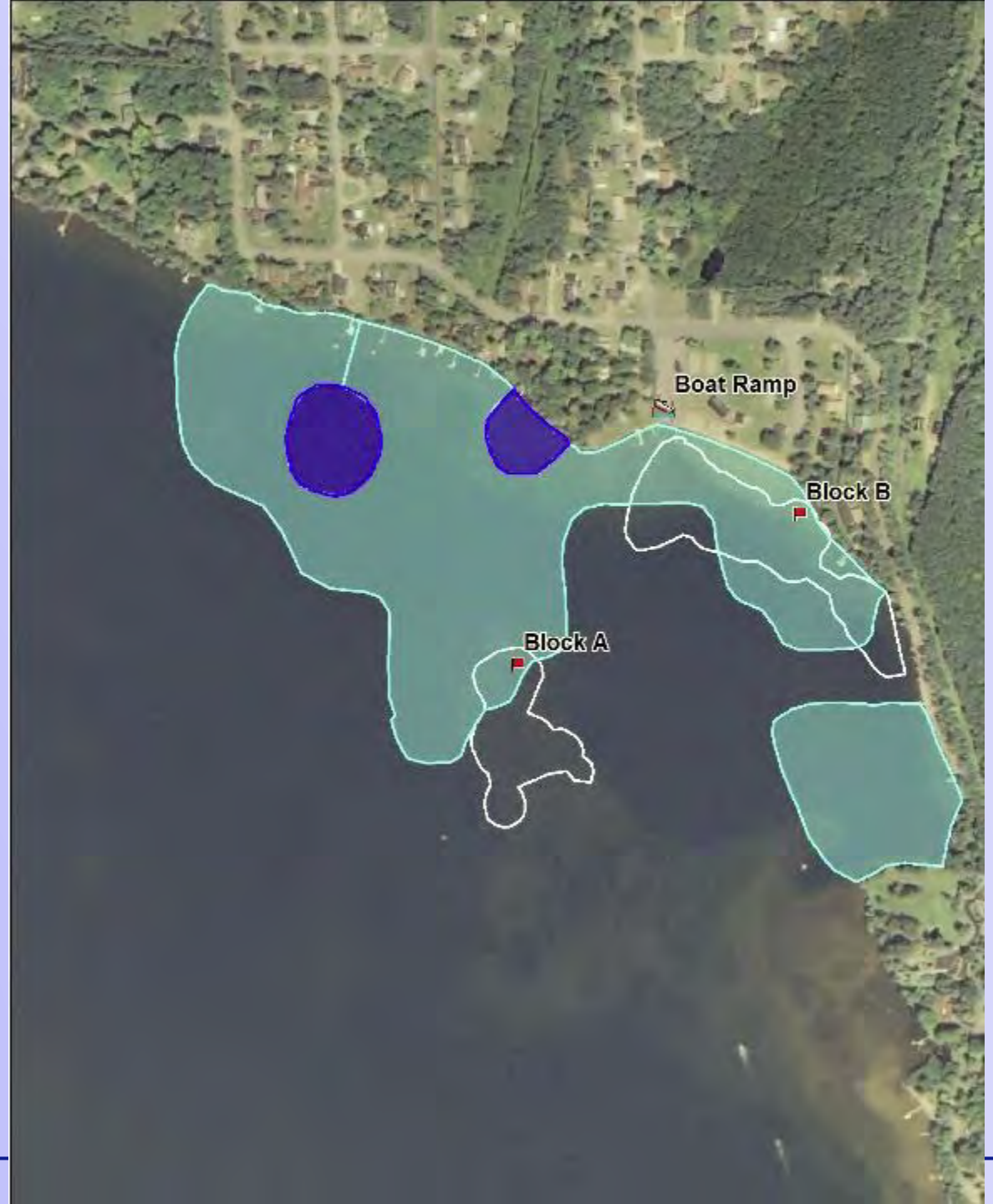
5 HAT

75-100%
50-75%
25-50%
10-25%
5-10%

2,4-D CET needed for EWM control based upon published studies:

- **sustained 4.0 ppm for 12 hours**
- **sustained 2.0 ppm for 24 hours**



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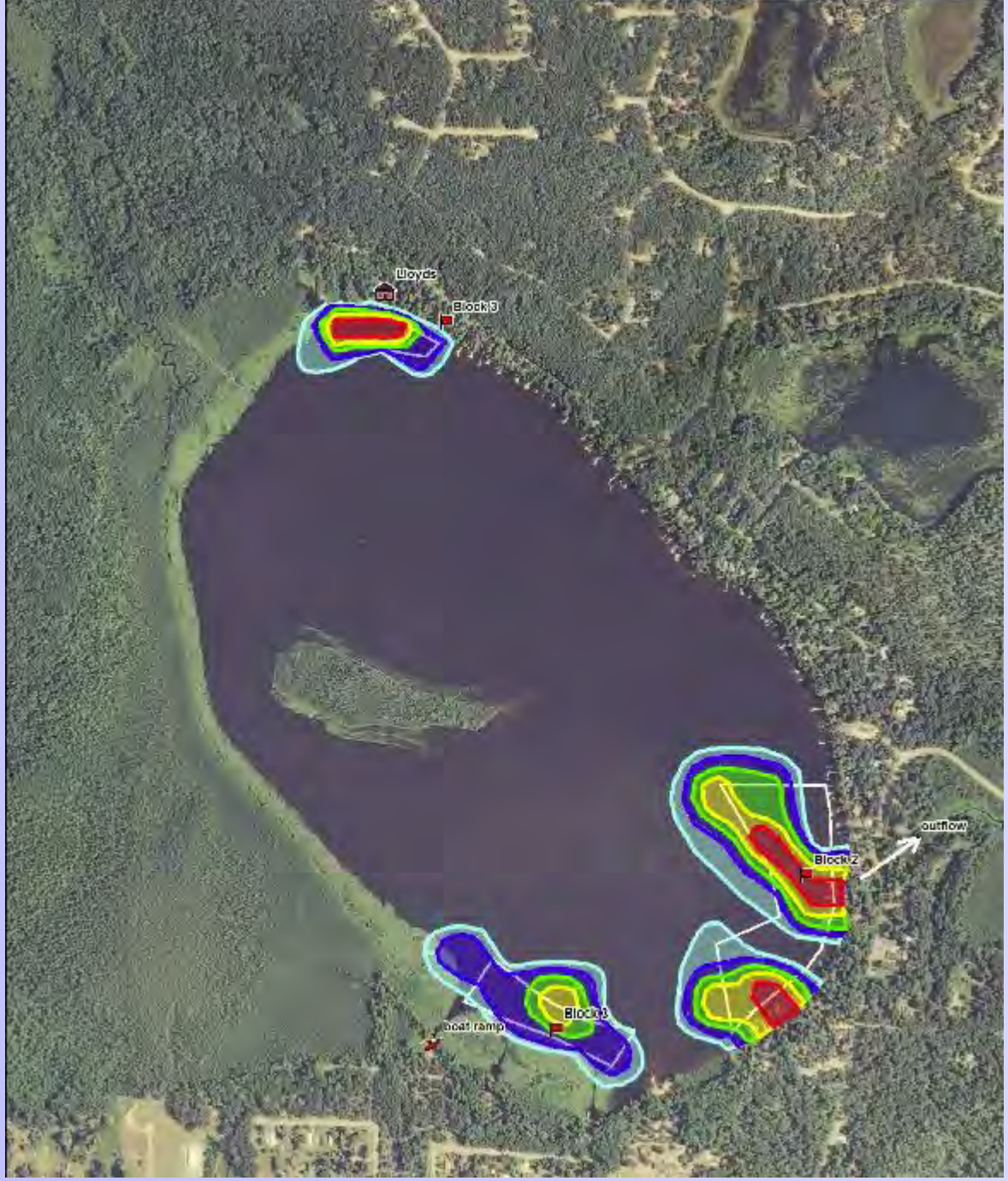
Herbicide Treatment on Loon Lake

- Tracer Dye (Rhodamine WT)
- ~24 acres of 305 acre lake (7.8%)

1 HAT

75-100%
50-75%
25-50%
10-25%
5-10%



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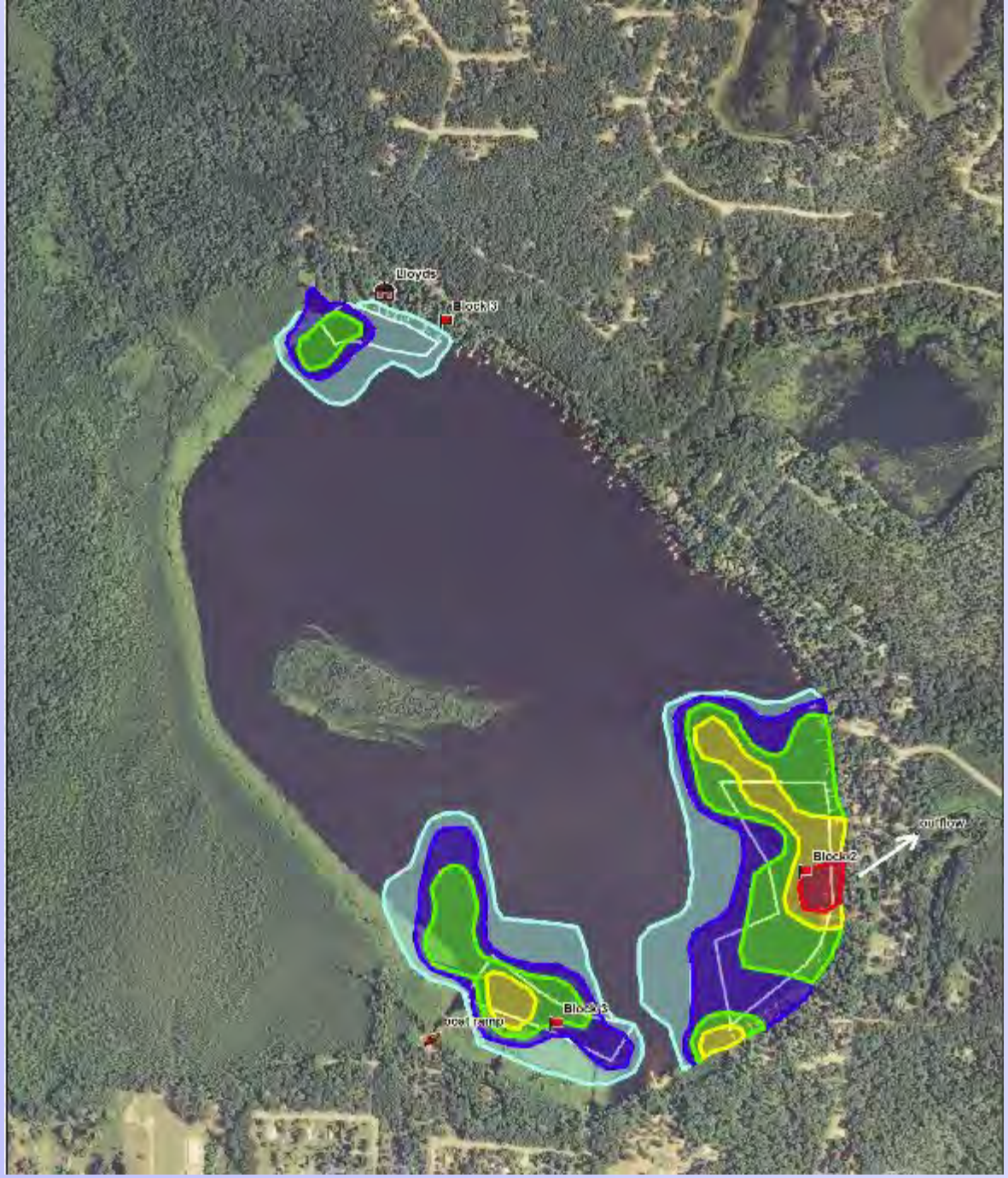
2.5 HAT

75-100%
50-75%
25-50%
10-25%
5-10%



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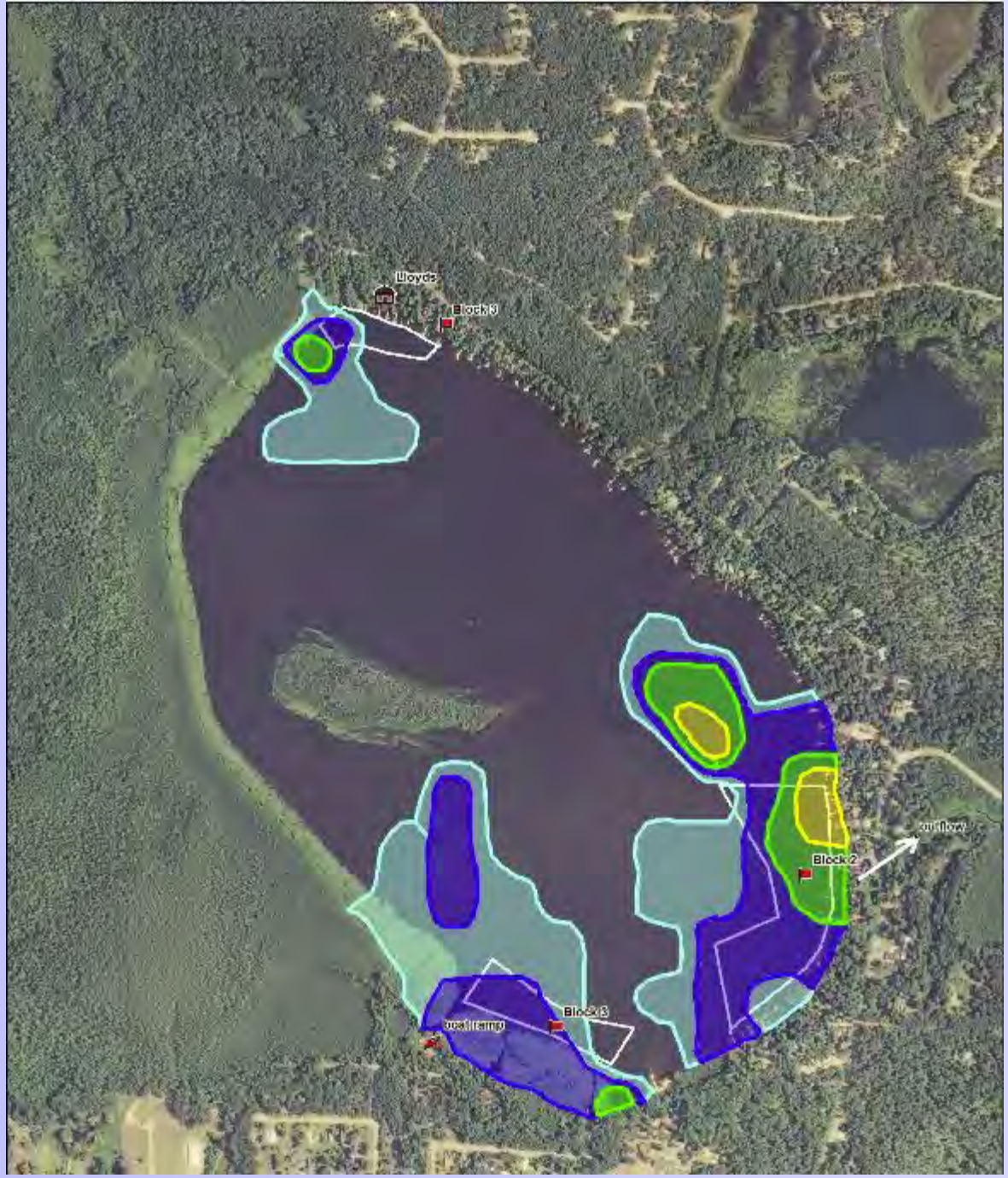
4 HAT

75-100%
50-75%
25-50%
10-25%
5-10%



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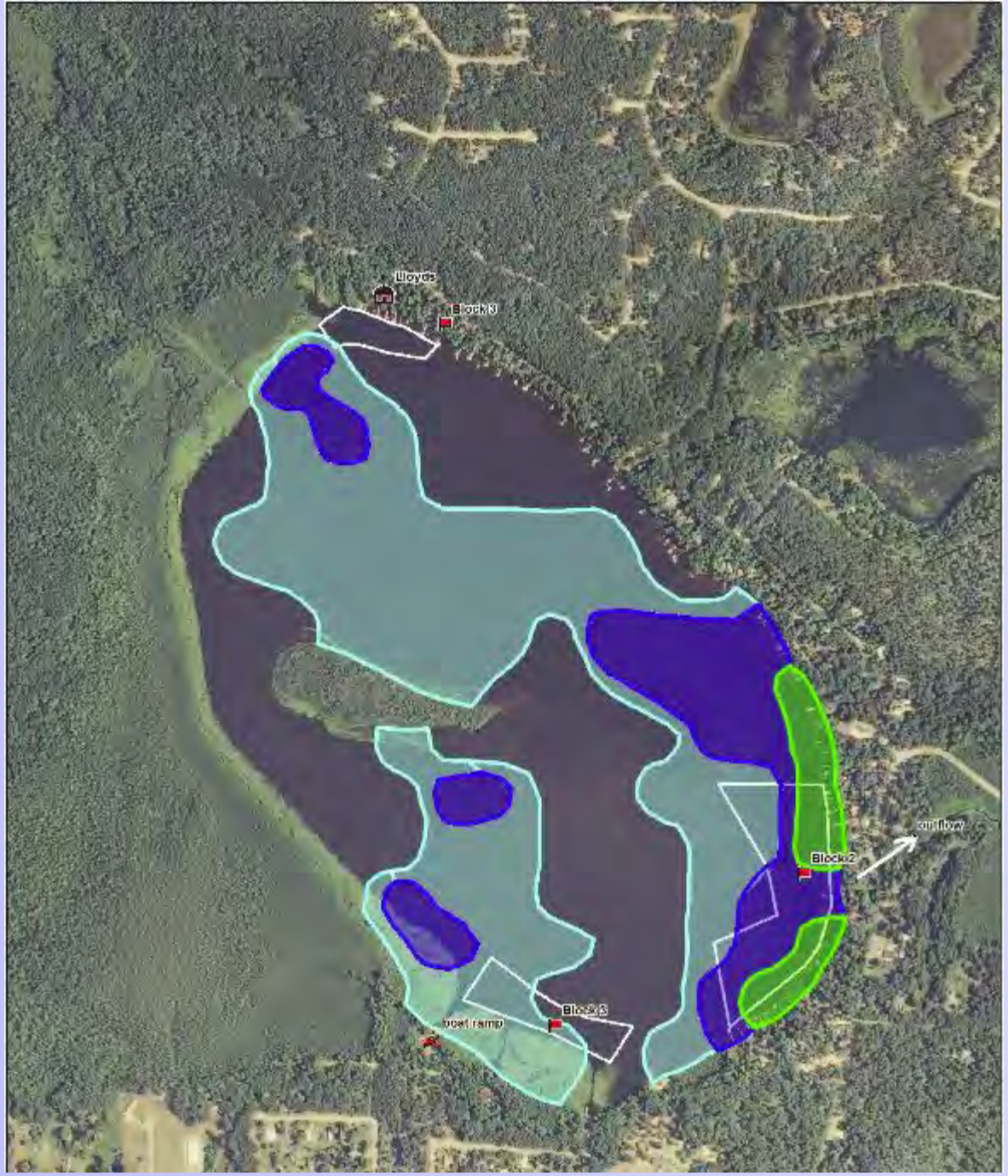
6 HAT

75-100%
50-75%
25-50%
10-25%
5-10%

2,4-D CET needed for EWM control based upon published studies:

- sustained 4.0 ppm for 12 hours
- sustained 2.0 ppm for 24 hours
- 0.1-0.3 ppm for 6 weeks+ (whole-lake)



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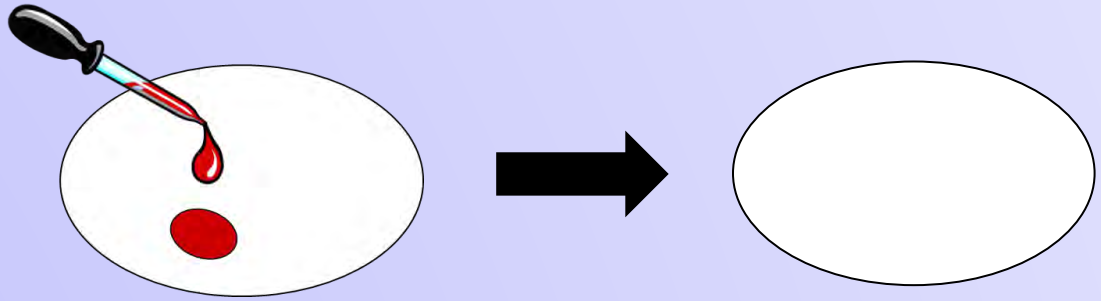
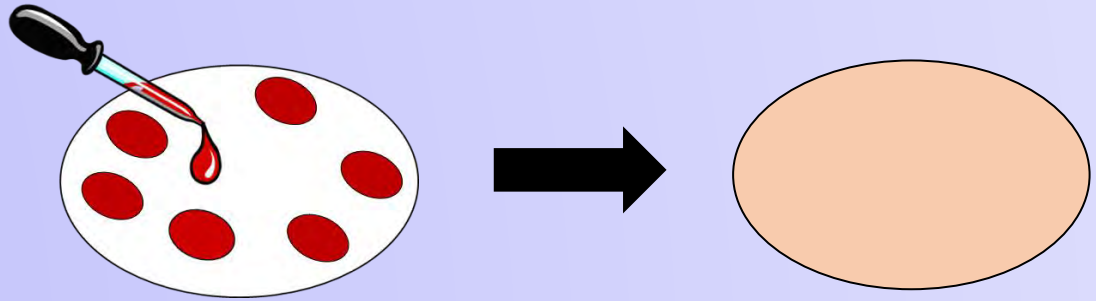
Ecological Definitions of Herbicide Treatment

Spot Treatment: Herbicide applied at a scale where dissipation will not result in significant lake wide concentrations; impacts are anticipated to be localized to in/around application area.



Whole-Lake (basin-wide) Treatment: Herbicide applied at a scale where dissipation will result in significant lake wide concentrations; impacts are anticipated to be on a lake wide scale.



Herbicide Spot Treatment BMPs

- **Factors that lead to longer exposure time**
  - Larger size (working definition: > 10 acres per site)
  - Broader shape (hold concentrations in core of treatment area)
  - Protected location (limit dissipation direction)
  - Stagnant waters (flow increases dissipation)
- **New Management Directions**
  - Alternative herbicides (ProcellaCOR™, herbicide combos)
  - Modify conditions (dam operations, barrier curtains)

ERC's Evolved IPM Strategy

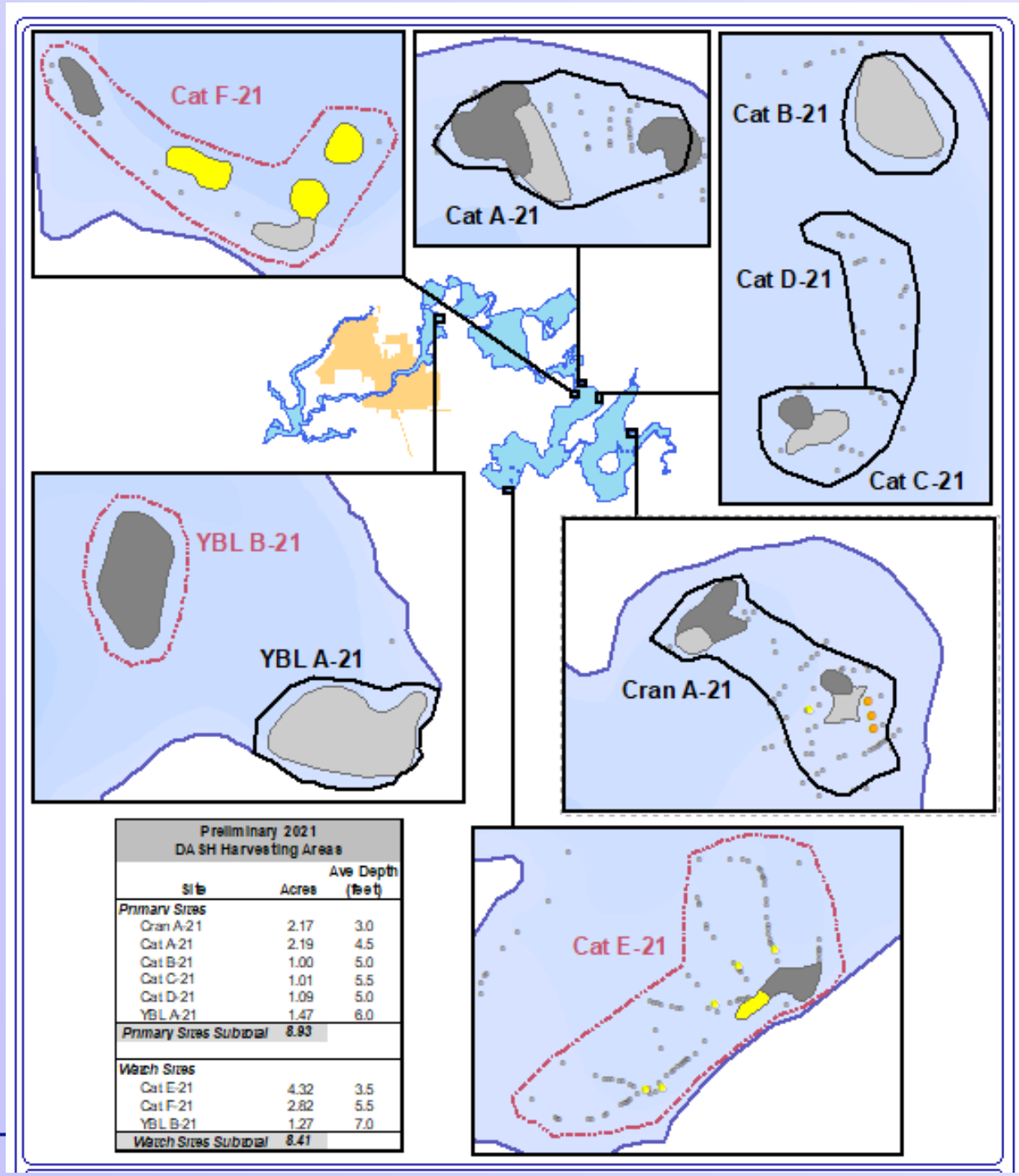
- **EWM populations have been greatly reduced**
  - Remnant areas too small to effectively controlled using herbicides
  - Most colonies below levels that cause ecological impacts or cause impacts to navigation or recreation
  - <u>Herbicide Treatment Trigger:</u>

    colonized EWM of *dominant* or greater density, with preference to high-use areas, that have a high likelihood of the treatment being effective (factors discussed in "Spot Treatment Guidance")

    ✓ No areas met this threshold since 2014 (spring 2015 treatment)
- **Maintain positive strides through hand-harvesting**
  - Need to balance a level of EWM population tolerance while not allowing population to return to pre-management levels

2021 Hand-Harvesting Plan

- Primary Strategy (8.93 acres)
- Watch Sites (8.41 acres)
- Educate and encourage riparians on legal EWM removal



Preliminary 2021
DASH Harvesting Areas

Site	Acres	Ave Depth (feet)
Primary Sites		
Cran A-21	2.17	3.0
Cat A-21	2.19	4.5
Cat B-21	1.00	5.0
Cat C-21	1.01	5.5
Cat D-21	1.09	5.0
YBL A-21	1.47	6.0
Primary Sites Subtotal	*8.93*	
Watch Sites		
Cat E-21	4.32	3.5
Cat F-21	2.82	5.5
YBL B-21	1.27	7.0
Watch Sites Subtotal	*8.41*	


2021 Late-Season
EWM Survey Results

Current EWM Mapping Program

- Onterra surveys entire littoral zone of ERC in late-June/early-July (ESAIS Survey)
- Data are loaded onto dedicated GPS units
- Volunteers mark all EWM occurrences outside of where found during ESAIS
- Onterra conducts Late-Season AIS Survey (LSAIS, EWM Peak-Biomass Survey) visiting
  - All EWM locations mapped during ESAIS Survey
  - All current and previous years' management areas
  - All areas identified through volunteer surveillance

Professional EWM Mapping

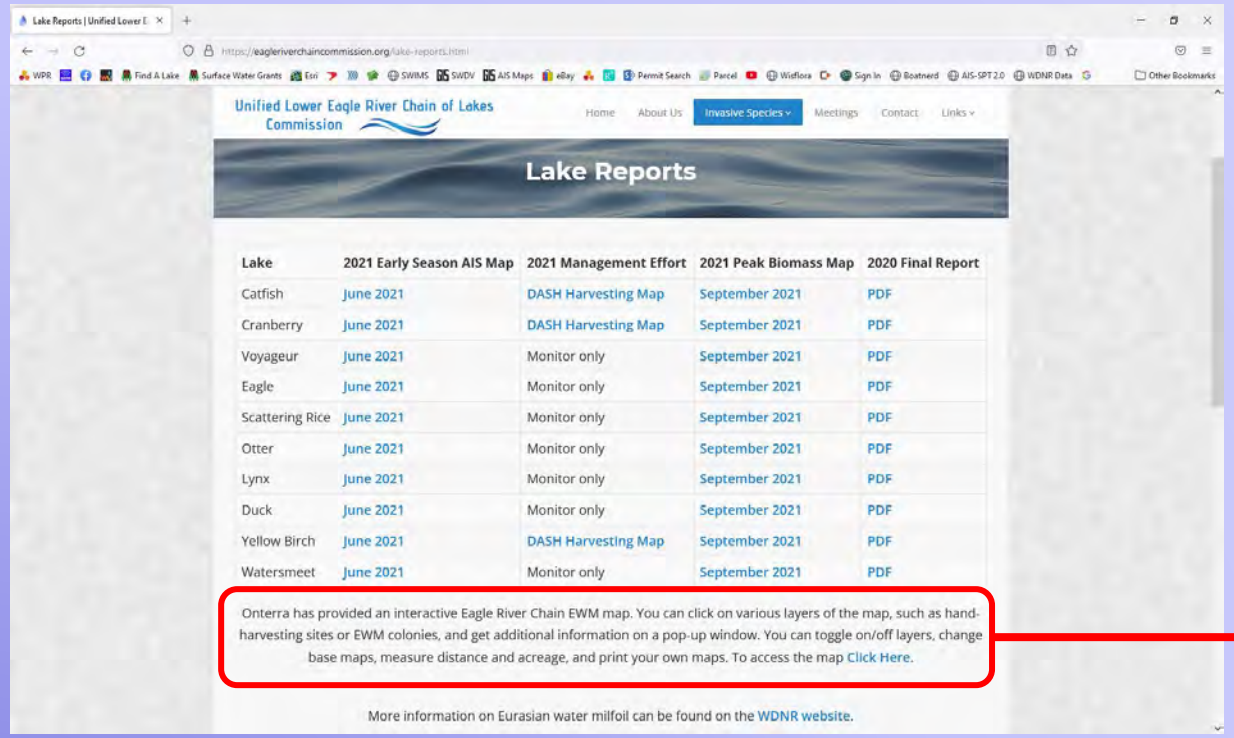
Point-Based Mapping

- Single or Few Plants
- Clumps of Plants
- Small Plant Colony

Polygon-Based Mapping

- Highly Scattered
- Scattered
- Dominant
- Highly Dominant
- Surface Matting

Interactive EWM Mapping Data



Unified Lower Eagle River Chain of Lakes Commission

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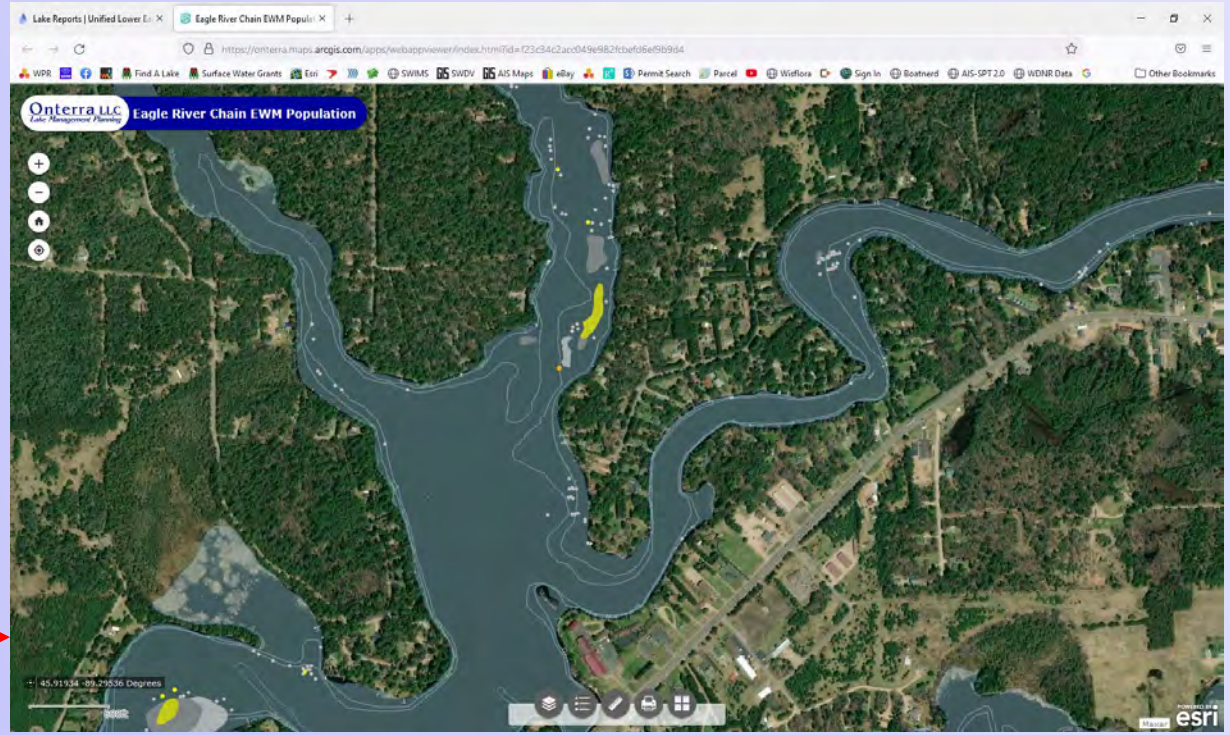
Lake Reports

Lake	2021 Early Season AIS Map	2021 Management Effort	2021 Peak Biomass Map	2020 Final Report
Catfish	June 2021	DASH Harvesting Map	September 2021	PDF
Cranberry	June 2021	DASH Harvesting Map	September 2021	PDF
Voyageur	June 2021	Monitor only	September 2021	PDF
Eagle	June 2021	Monitor only	September 2021	PDF
Scattering Rice	June 2021	Monitor only	September 2021	PDF
Otter	June 2021	Monitor only	September 2021	PDF
Lynx	June 2021	Monitor only	September 2021	PDF
Duck	June 2021	Monitor only	September 2021	PDF
Yellow Birch	June 2021	DASH Harvesting Map	September 2021	PDF
Watersmeet	June 2021	Monitor only	September 2021	PDF

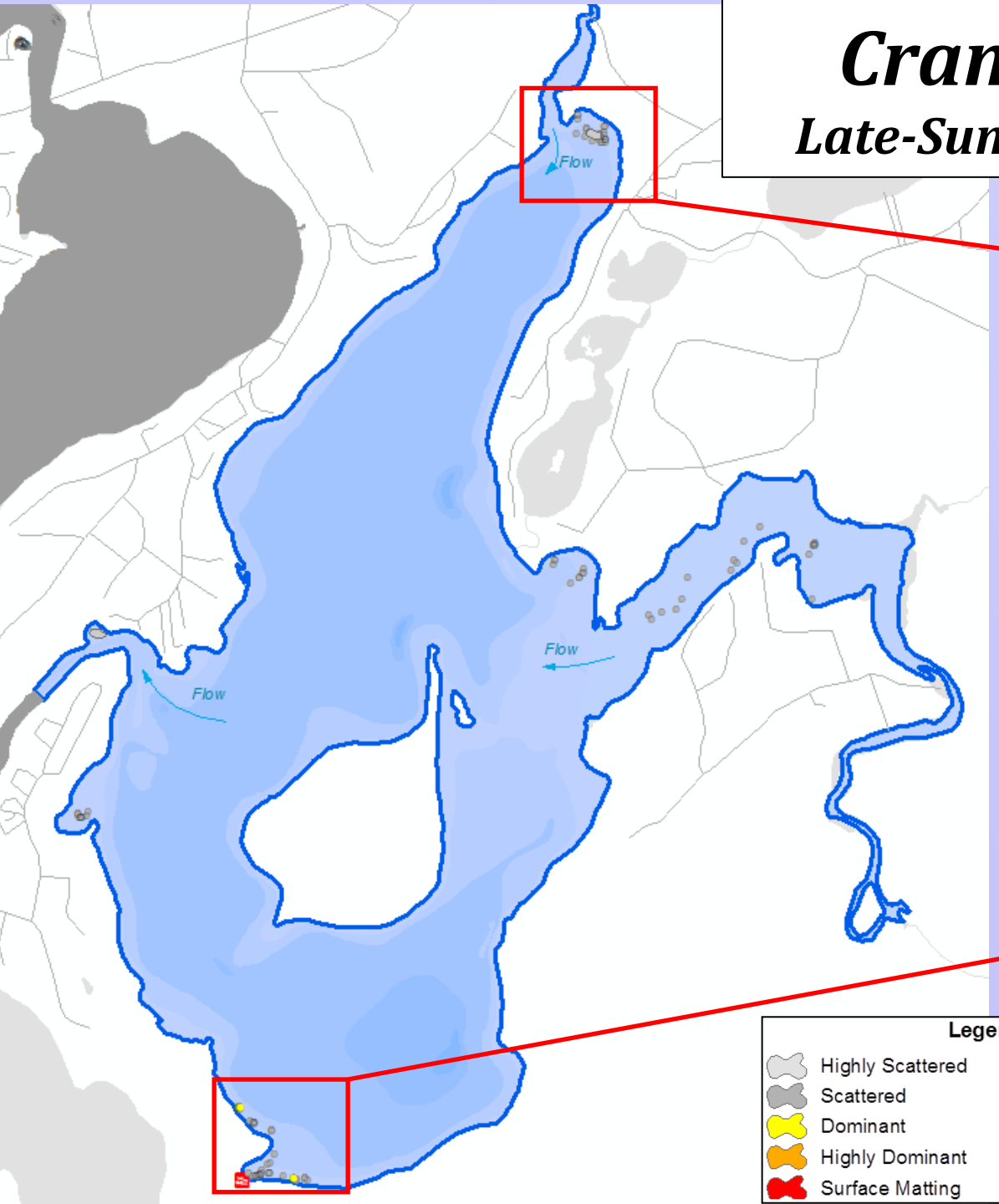
Onterra has provided an interactive Eagle River Chain EWM map. You can click on various layers of the map, such as hand-harvesting sites or EWM colonies, and get additional information on a pop-up window. You can toggle on/off layers, change base maps, measure distance and acreage, and print your own maps. To access the map Click Here.

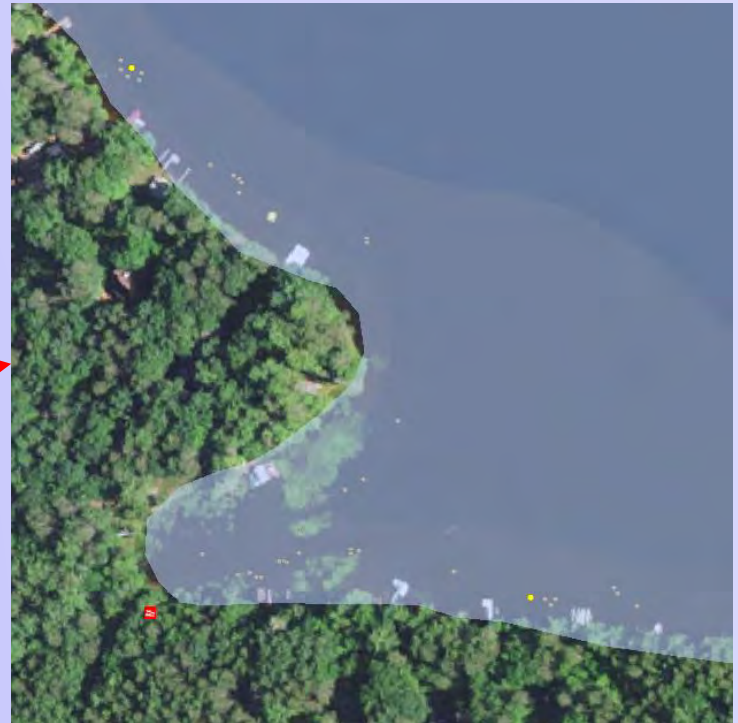
More information on Eurasian water milfoil can be found on the WDNR website.



Cranberry

Late-Summer 2021

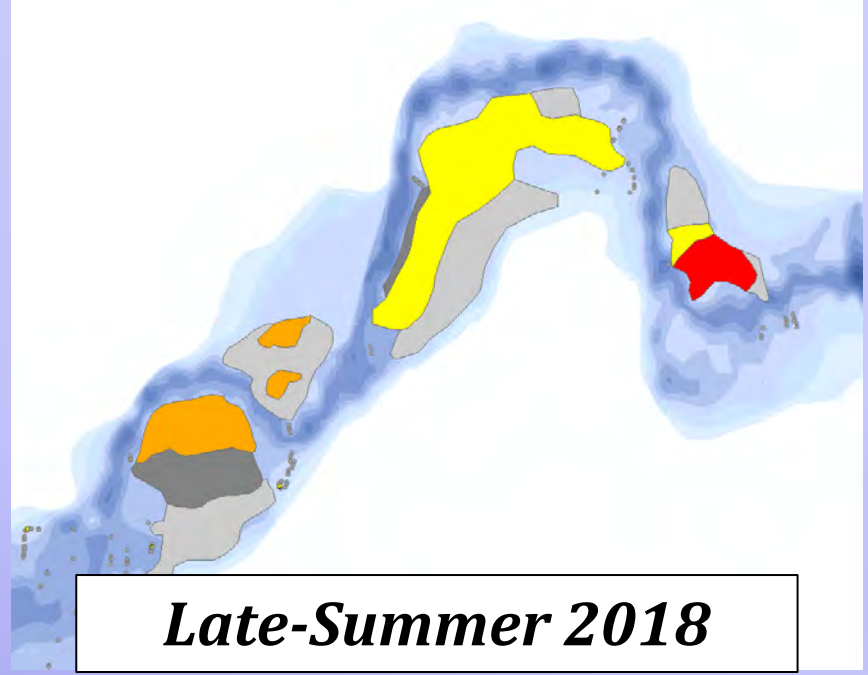




Legend

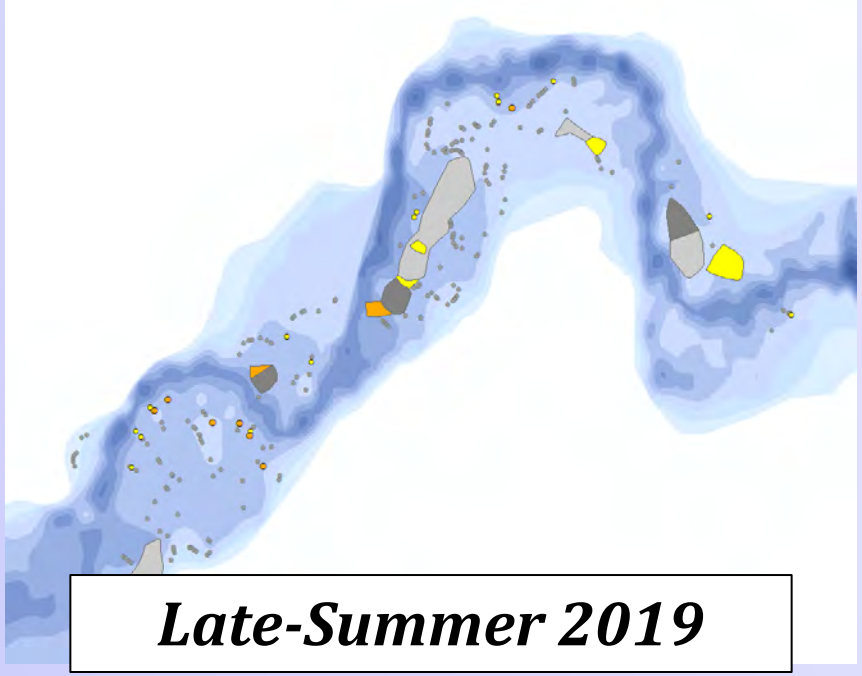
- Highly Scattered
- Scattered
- Dominant
- Highly Dominant
- Surface Matting
- Single or Few Plants
- Many or Clumps of Plants
- Small Plant Colony

Upstream Cranberry Channel

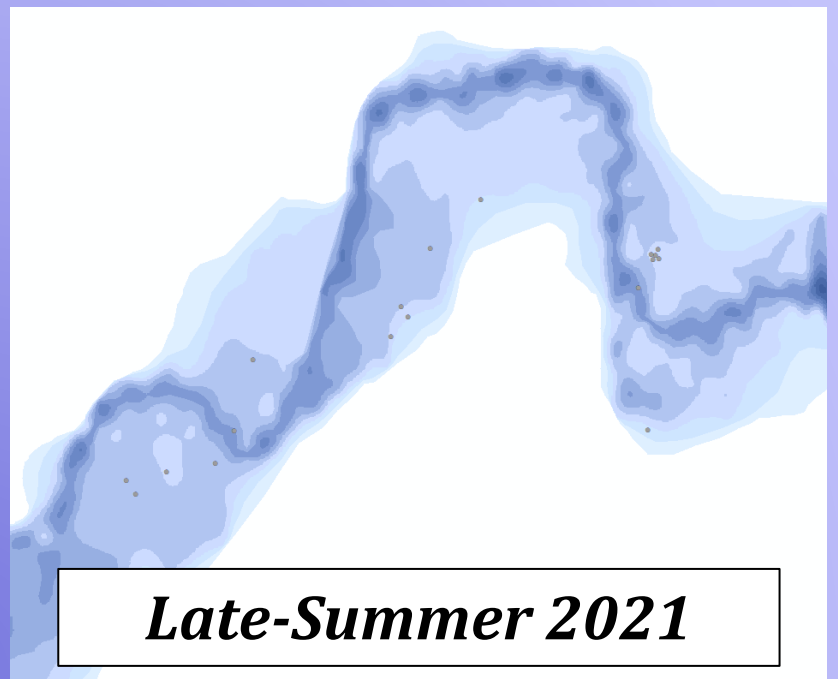


Late-Summer 2018

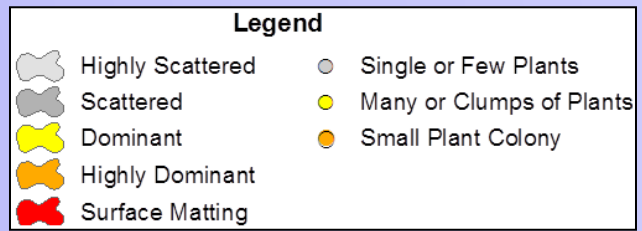
SubPI '18, '19, '22

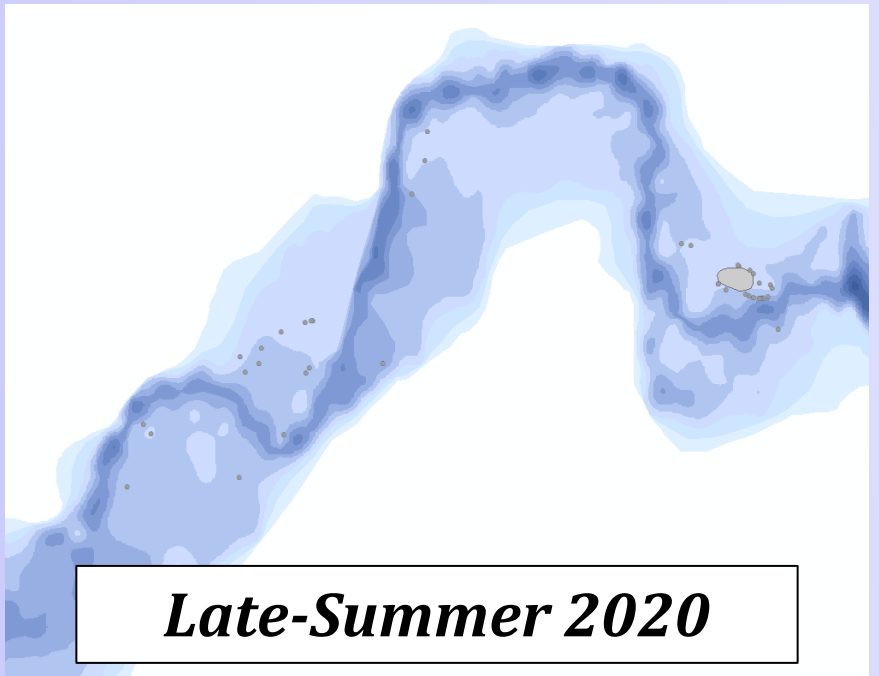


Late-Summer 2019



Late-Summer 2021

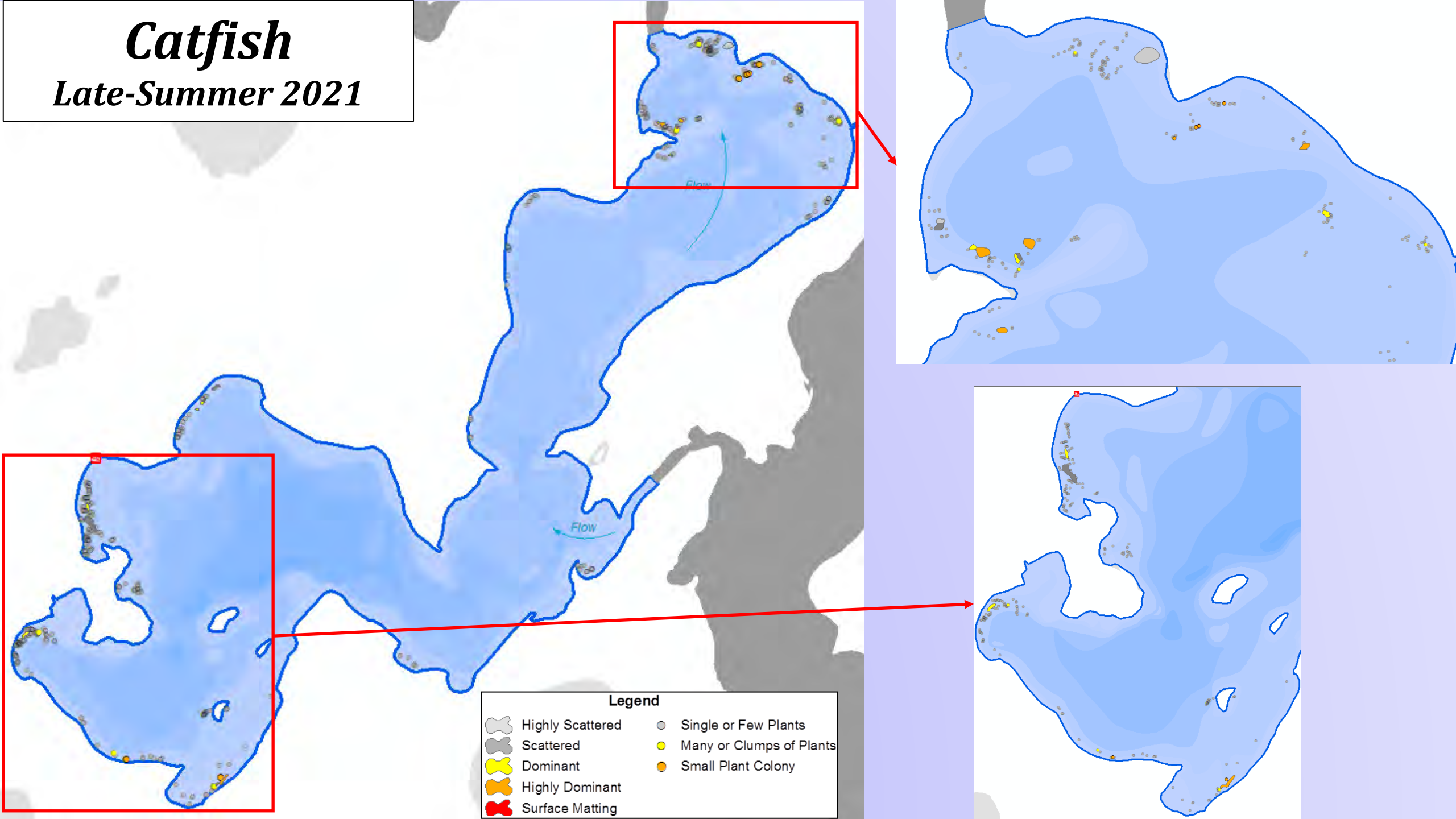




Late-Summer 2020

Catfish

Late-Summer 2021



Voyageur

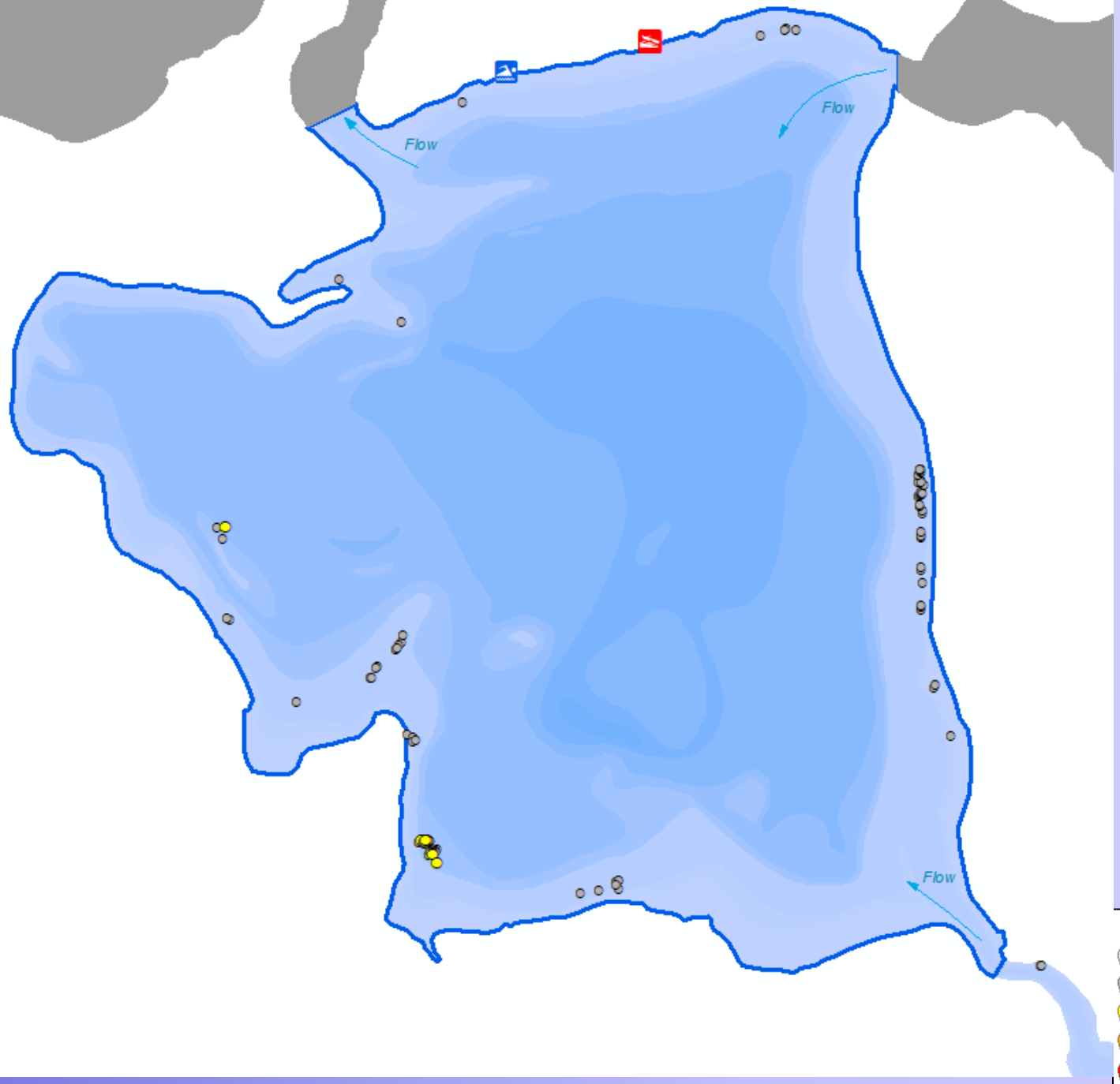
Late-Summer 2021

Legend

- Highly Scattered
- Scattered
- Dominant
- Highly Dominant
- Surface Matting
- Single or Few Plants
- Many or Clumps of Plants
- Small Plant Colony

Eagle

Late-Summer 2021



Legend

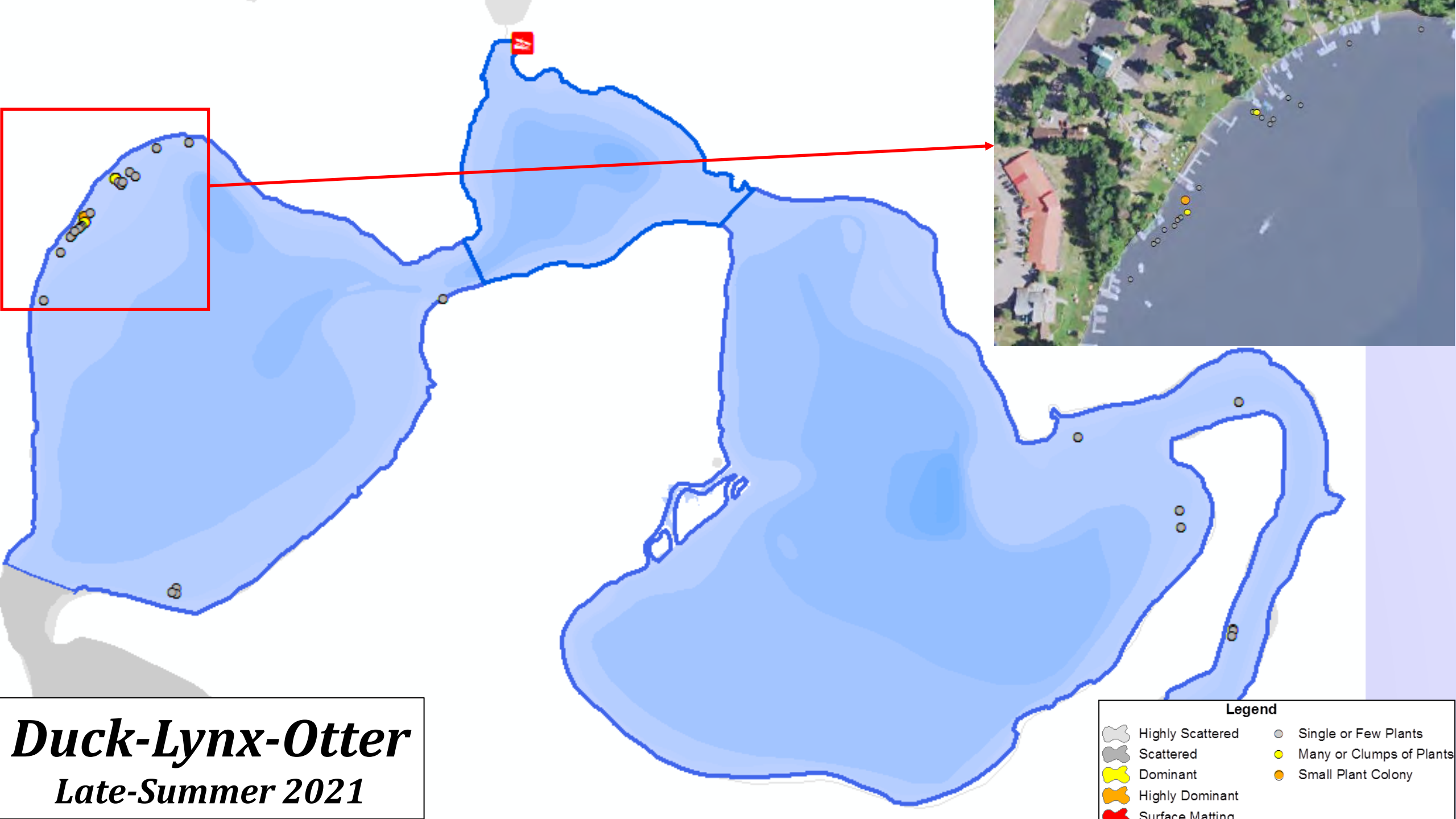
- Highly Scattered
- Scattered
- Dominant
- Highly Dominant
- Surface Matting
- Single or Few Plants
- Many or Clumps of Plants
- Small Plant Colony

Scattering Rice

Late-Summer 2021

Legend

- Highly Scattered
- Scattered
- Dominant
- Highly Dominant
- Surface Matting
- Single or Few Plants
- Many or Clumps of Plants
- Small Plant Colony

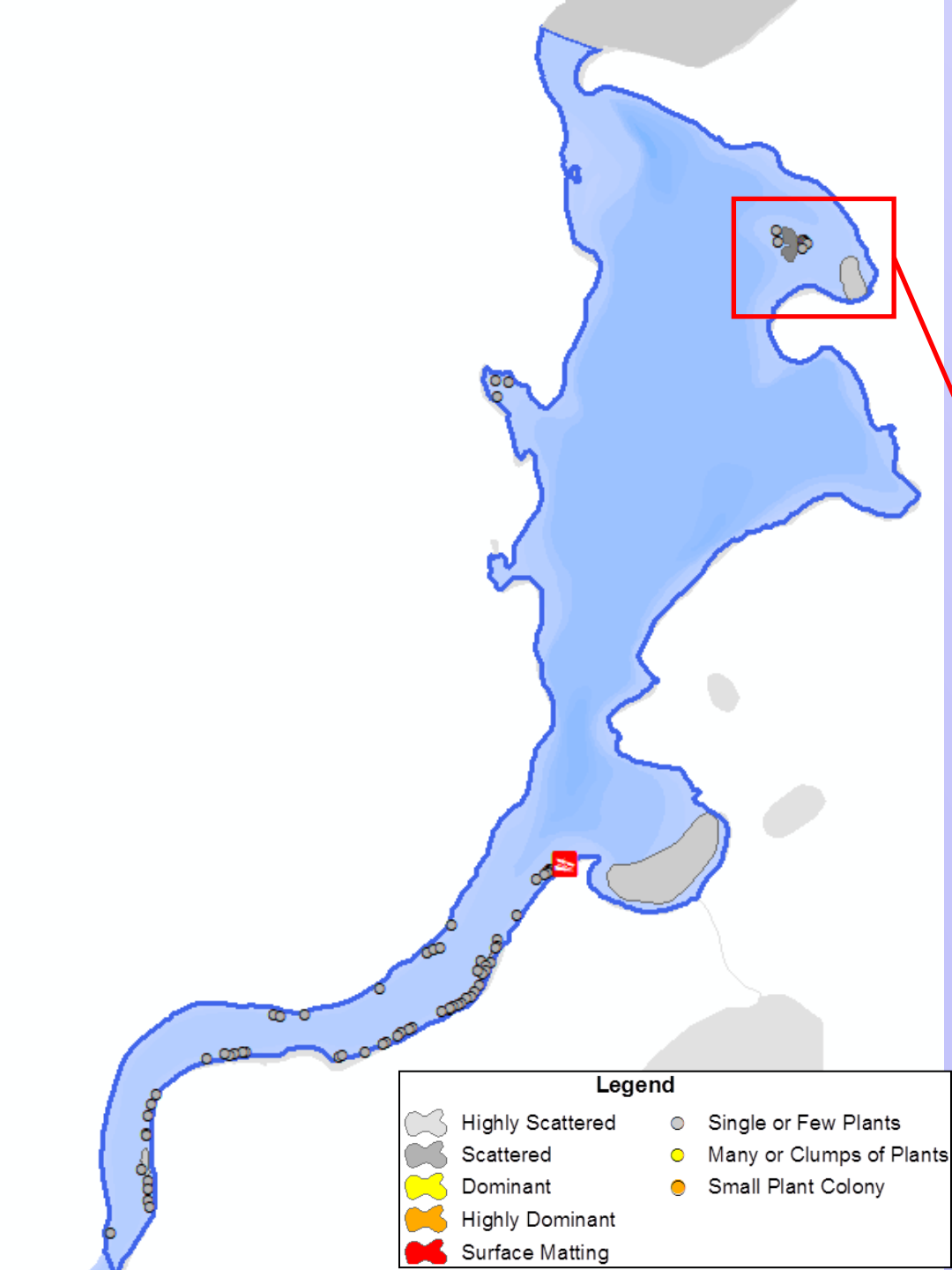


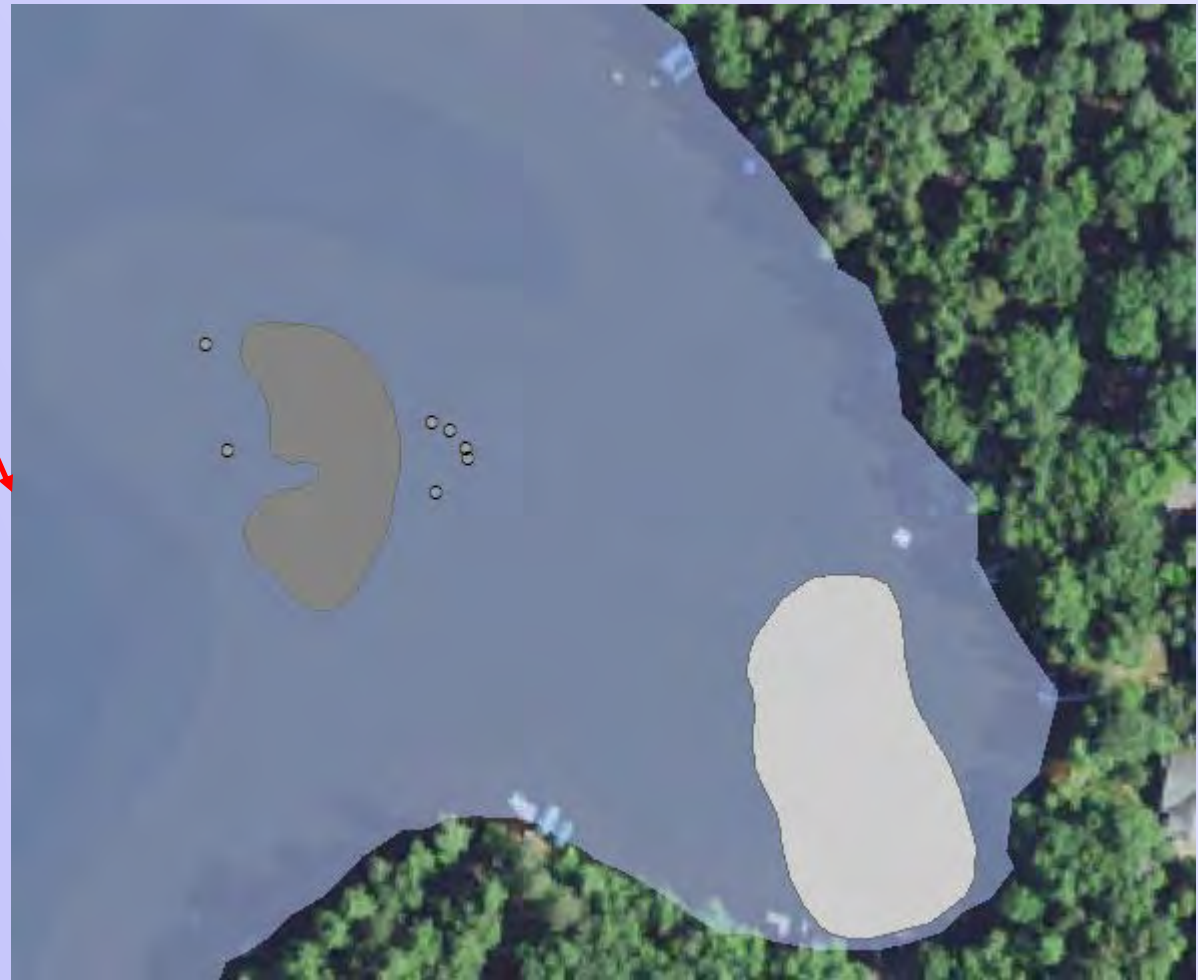
Duck-Lynx-Otter

Late-Summer 2021

Yellow Birch

Late-Summer 2021





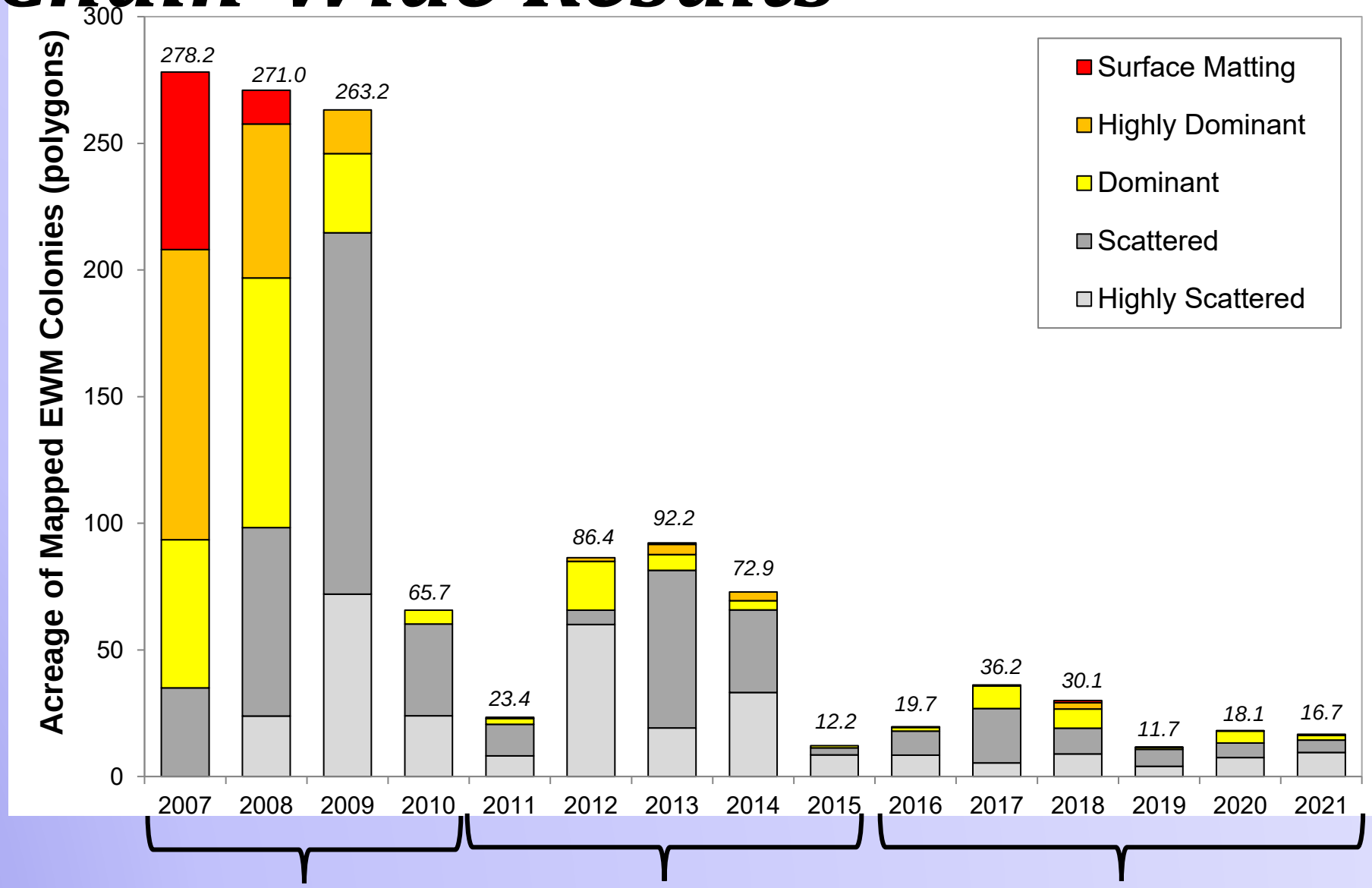
Watersmeet

Late-Summer 2021

Chain-Wide Results

EWM populations is currently low

1. Result of management

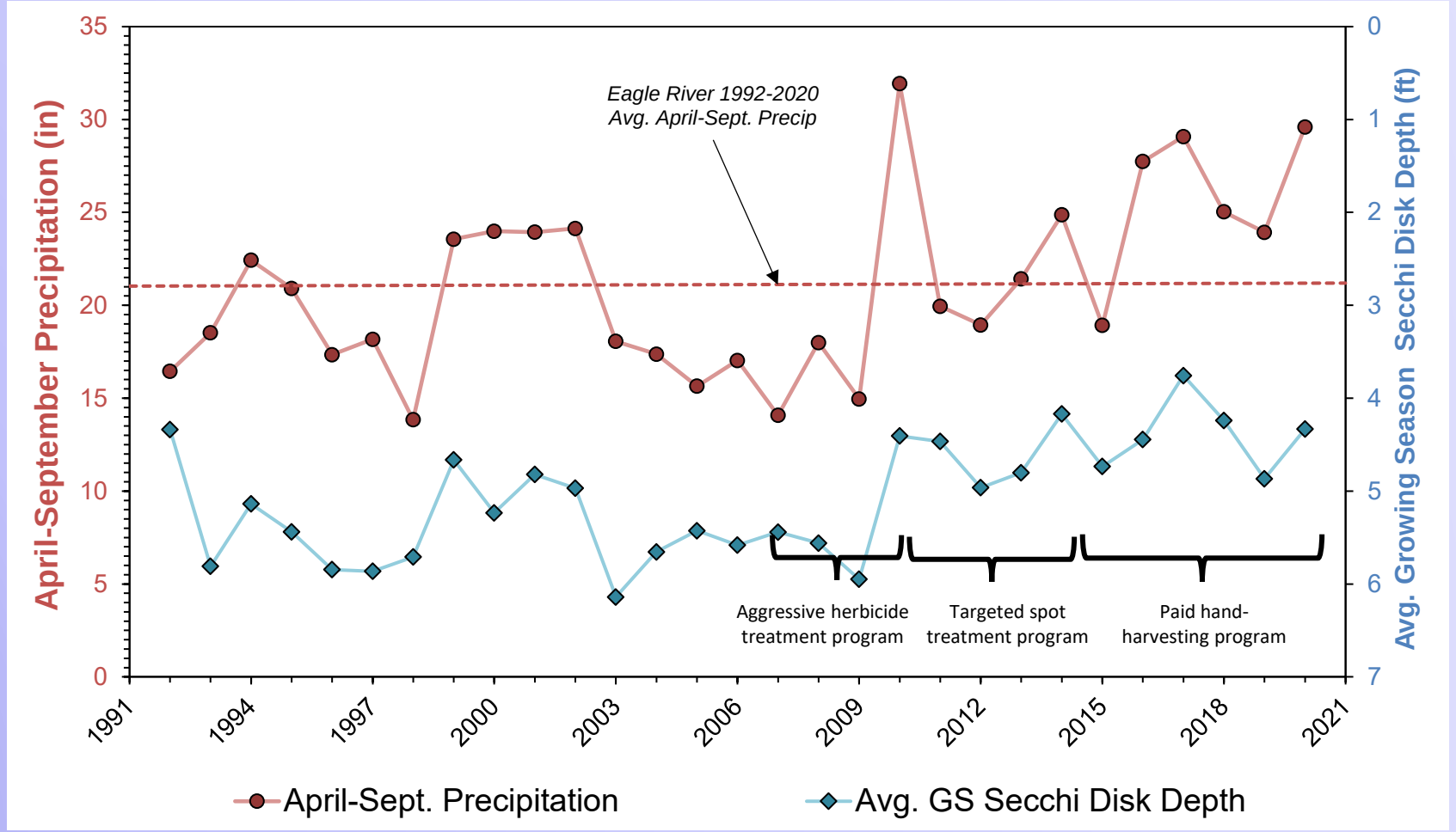


Chain-Wide Results

EWM populations is currently low

1. Result of management
2. Reduced water clarity

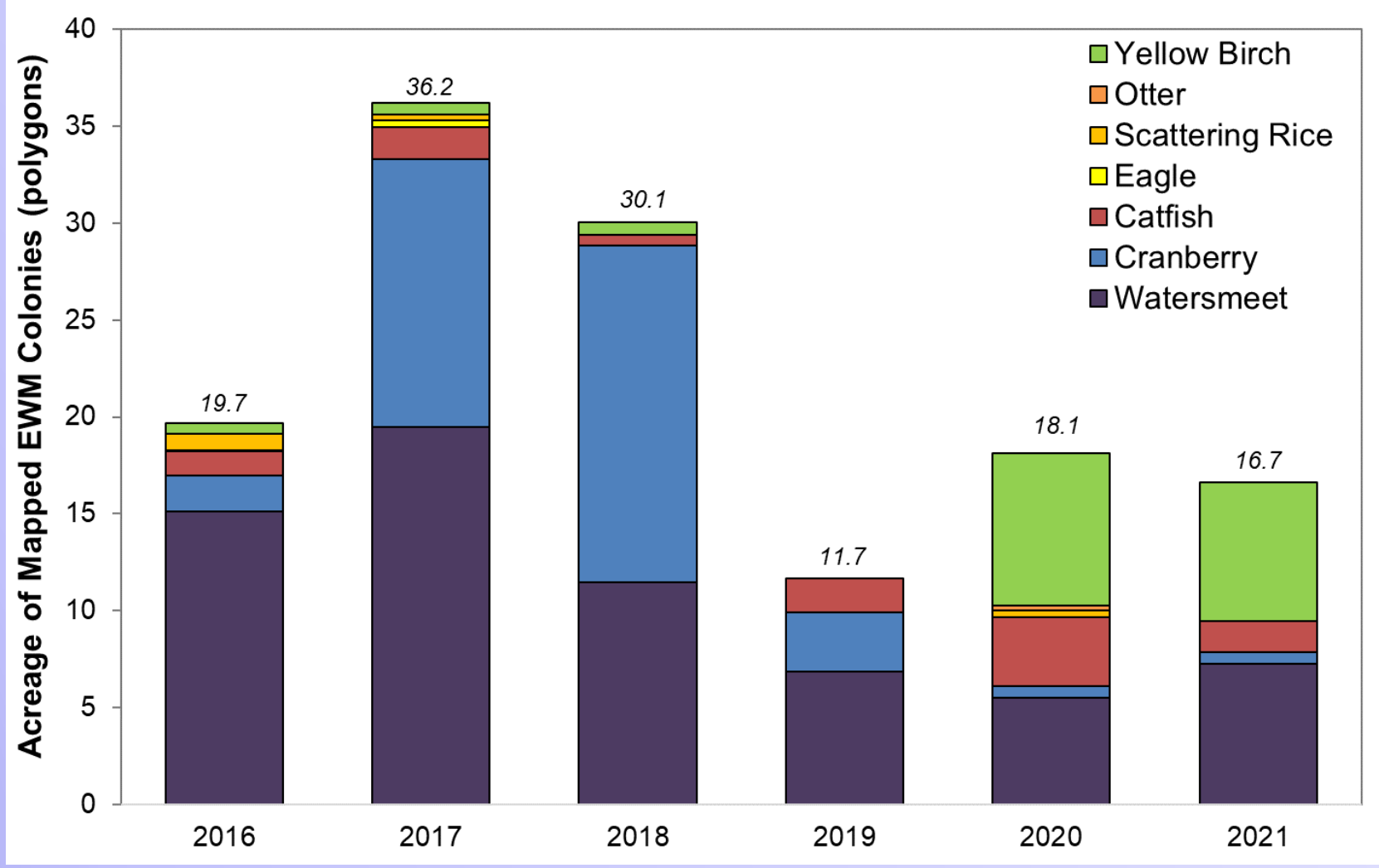
Increased environmental stress from low water clarity results in management being more effective and population rebound more difficult



Chain-Wide Results

Since Herbicide Management Ceased

- Cranberry Channel spring 2015 treatment
- Professional hand-harvesting program
  - 2016: Voyageur
  - 2017: Voy, ScatRice, Wat
  - 2018: YBL, ScatRice, Wat
  - 2019: ScatRice, YBL, Wat
  - 2020: Cran, Cat, Voy
  - 2021: Cran, Cat, YBL



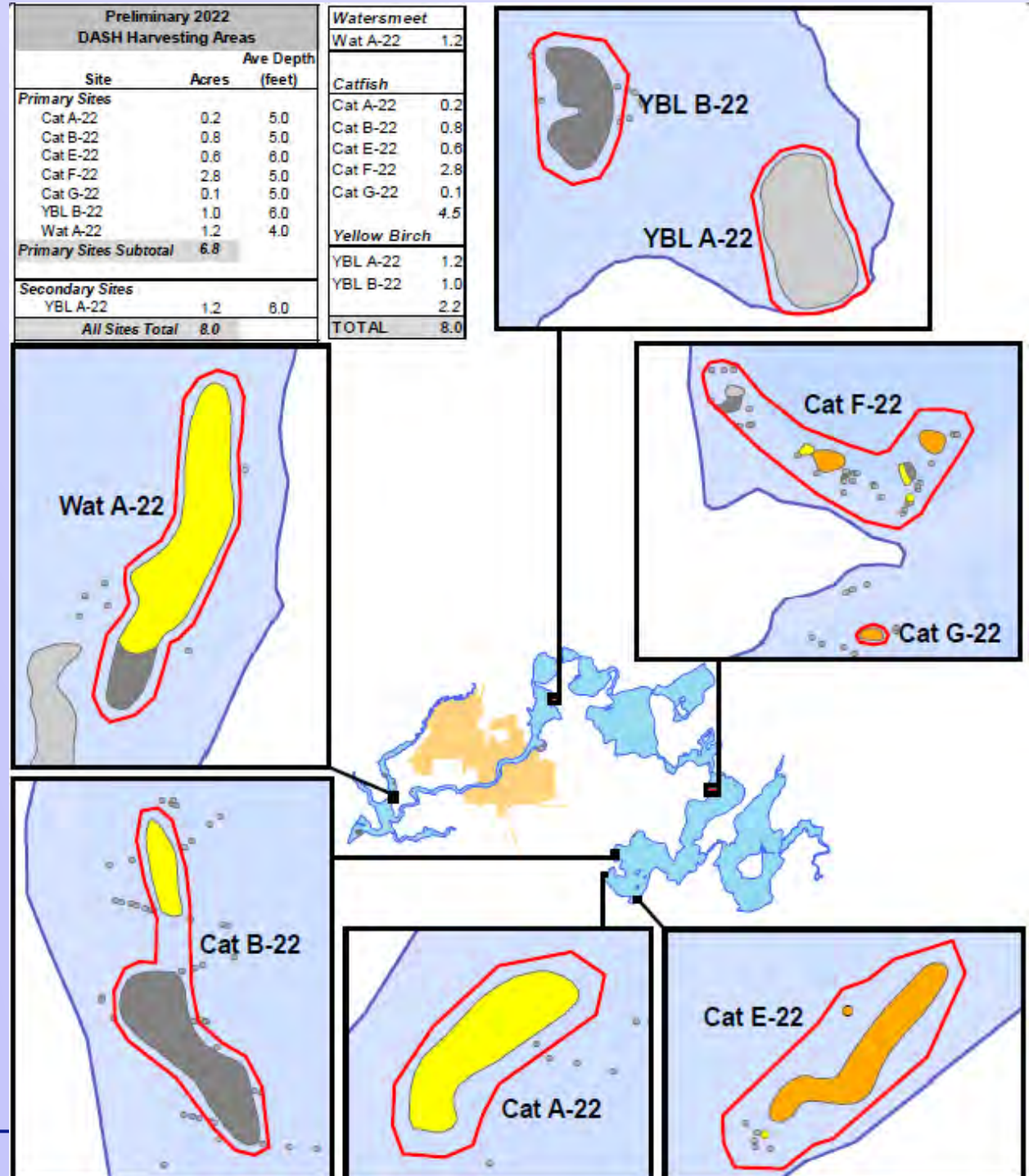
2022 Preliminary Management Strategy

2022 Preliminary Hand-Harvesting Plan

- Primary Sites (6.8 acres)
  - –5 sites in Catfish
  - –1 site in Yellow Birch
  - –1 site in Watersmeet
- Secondary Sites (8.0 acres)
  - –1 site in Yellow Birch
- Volunteer-lead Strategy
  - –Bullpen of YBL
- Continue to Educate and encourage riparians on legal EWM removal

Preliminary 2022 DASH Harvesting Areas		
Site	Acres	Ave Depth (feet)
Primary Sites		
Cat A-22	0.2	5.0
Cat B-22	0.8	5.0
Cat E-22	0.6	6.0
Cat F-22	2.8	5.0
Cat G-22	0.1	5.0
YBL B-22	1.0	6.0
Wat A-22	1.2	4.0
Primary Sites Subtotal	*6.8*	
Secondary Sites		
YBL A-22	1.2	6.0
All Sites Total	*8.0*	

Watersmeet	
Wat A-22	1.2
Catfish	
Cat A-22	0.2
Cat B-22	0.8
Cat E-22	0.6
Cat F-22	2.8
Cat G-22	0.1
	4.5
Yellow Birch	
YBL A-22	1.2
YBL B-22	1.0
	2.2
TOTAL	8.0



ACEI-240-20: 2020-2022 EWM Control & Monitoring Strategy

2022 Project Components

- Volunteer & Onterra EWM mapping surveys
- Whole-lake point-intercept surveys on all lakes
- Sub-sample point-intercept survey on upstream Cranberry Channel
- Integrate volunteer-based invasive wetland management/monitoring data
- Final reporting
  - Plan for reappropriation of remaining grant funds
  - Determination of *Plan* amendment/addendum to be eligible for future AIS Control Grants (revised NR193)

ERC Project Conclusions

- **Overall, significant reduction of EWM since start of the program**
  - Maintaining low EWM population is going to be difficult, particular if/when water clarity returns to normal
- **No Herbicide Treatment Proposed AGAIN for 2022**
  - Will be 7 consecutive years without herbicide management
- **Conduct Professional-Based Hand-Harvesting in 2022**
  - Based on the ESAIS Survey (early July), the strategy will be finalized
  - Early implementation of hand-harvesting program has been helpful
  - Discuss potential for traditional hand-harvesting vs DASH methods
- **Important to Continue to Improve the ERC**
  - Work on implementing protection & enhancement goals outlined in *Plan*
  - Navigate additional science, changing technologies, and regulatory environment

Thank You

Onterra, LLC

Lake Management Planning