



# TURVILLE BAY PROJECT FACT SHEET

→ Following the 2005 publication of the Wisconsin State Journal article “Why not try magic potion in our lakes?” about using whole-lake fluridone treatments to restore aquatic ecosystems, The Dane County Board established an Aquatic Plant Management (APM) Committee in order to evaluate APM options. The Committee concluded that high flow and narrow growth zones made the Yahara Chain of Lakes poor candidates for fluridone treatment, but called for a research project to scientifically evaluate early-season Eurasian watermilfoil (EWM) control options.

## Who was on the APM Committee?

- Dane County
- Riparian land owners
- WDNR water and fisheries biologists
- UW Center for Limnology
- Wisconsin Association of Lakes
- Madison Fishing Expo
- Lake and watershed organizations
- County board supervisor

## What did the Committee do?

- Held nine publicly-noticed meetings
- Invited presentations from lake and aquatic plant experts
- Considered scientific evidence
- Discussed APM techniques
- Determined Yahara Chain was a poor candidate for whole-lake treatments
- Recommended research on alternate options

## Why was the registered herbicide 2,4-D chosen?

A technical team conducting work in Minnesota and Wisconsin indicated early-season, low dose use of 2,4-D can achieve effective EWM control while minimizing native species impacts. Target application rates for this project of 2 ppm were within label guidelines. See <http://npic.orst.edu/ingred/24d.html> for more information on potential risks and regulation.

## Who authorized the treatment for this project?

- 1) The US EPA labeled and registered the product, requiring review of:
  - Application amount, frequency and timing
  - Storage and disposal
  - Human health impacts
  - Ecosystems and non-target species
  - Environmental fate
  - Reevaluation occurs every 15 years
- 2) The Wisconsin Department of Agriculture, Trade & Consumer protection (DATCP) registered the product for use.
- 3) WDNR permitted the project application via NR 107. Permits can be modified or denied if the proposed treatments will result in hazard to humans, animals, non-target organisms, or result in significant adverse effect on the waterbody.
- 4) Product was applied by a DATCP-certified and licensed applicator

## How does this project fit into other research going on in Wisconsin?

To support more balanced and sustainable ecosystems, WDNR has maintained a cooperative research agreement with the US Army Corps of Engineers Research and Development Center to evaluate the efficacy, selectivity, and longevity of early-season herbicide treatments to control the non-native aquatic invasive species Eurasian watermilfoil (EWM) and curly-leaf pondweed (CLP). Most projects are grant-funded and involve detailed aquatic plant surveys, spring and fall mapping of target species and herbicide concentration and water quality monitoring. To date, herbicide concentration monitoring has been conducted on approximately 70 lakes and flowages throughout Wisconsin, and are evaluating long-term native plant and water quality responses. We also continue to explore aquatic plant community composition in systems with and without EWM across the state to better understand the ecology.



# TURVILLE BAY PROJECT RESULTS

The Turville Bay Research project was designed by scientists and managers of the U.S. Army Corps of Engineers, Dane County, and WDNR to evaluate the use of early-season herbicide treatment and mechanical harvesting. We sought to increase selectivity with early-season treatment timing while assessing treatment impacts and efficacy in nuisance control and native aquatic plant restoration.

## Controlled study design

4 Treatment plots

**H** – 2 Harvested

**C** – 2 Chemically treated

3 Untreated control plots

**U** – Untreated



## How did we analyze the data?

We used statistical modelling to compare treatments while simultaneously accounting for sampling repeated plots. In this way, our analysis approach is conservative, and significance applied to the models is more robust than if data were analyzed as independent observations.

## How did we mark the treatment area?

Large marker buoys with herbicide and lake research notification demarcated the bay, and notice signs were placed at Olin-Turville Park. Signs included type of herbicide, formulation and EPA drinking water and irrigation restrictions.

## What did we find?

Significant decreases in EWM were achieved using both herbicide and harvested early-season treatment. Although mechanical harvesting produced more variable results, it is associated with reduced overall impacts to the native coontail community. One additional year of control was achieved following herbicide treatments but not in harvesting treatments.

## What happened after application?

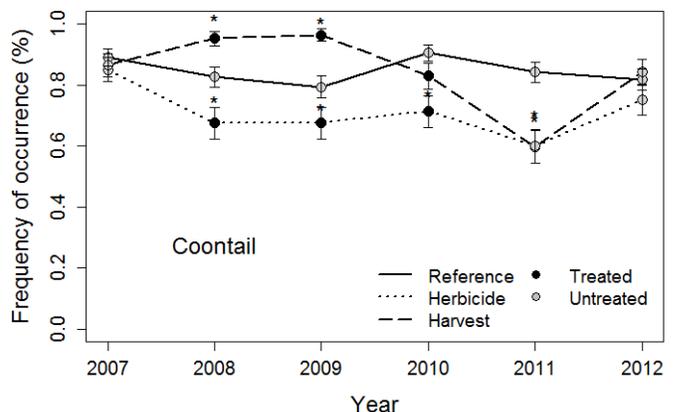
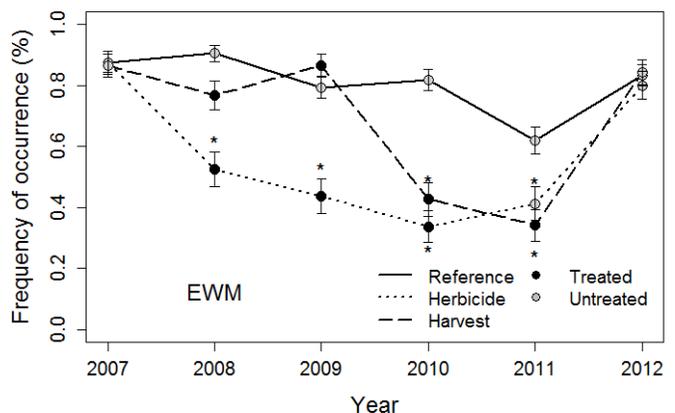
Herbicide concentrations were monitored to track the concentration of herbicide in the water

- 2,4-D dissipated quickly
- Herbicide concentrations approached detection limits (10 ppb) two days following treatments
- EPA use restrictions are < 100 ppb for irrigation and < 70 ppb for potable water use

Total 2,4-D applied to Turville Bay Research Plots			
Year	Total Product Applied (pounds)	2,4-D Active Ingredient, a.i. (pounds)	2,4-D Acid Equivalent, a.e. (pounds)‡
2008	1160	320	220
2009	1500	414	285
2010	1500	414	285
Total	4160	1,148	790

Year	Maximum 2,4-D Concentration, µg/L ae (ppb)			
	Treated Areas			Untreated Areas
	< 1 DAT*	1 DAT	2 DAT	
2008†	21	21	12	8
2009	259	ND	45	44
2010	587	98	11	39

\* days after treatment (DAT); ND - no sample collected due to weather; ‡2,4-D amount after hydrolysis in water; †results low due to lab methods



Alpha values < 0.05 indicated by \*