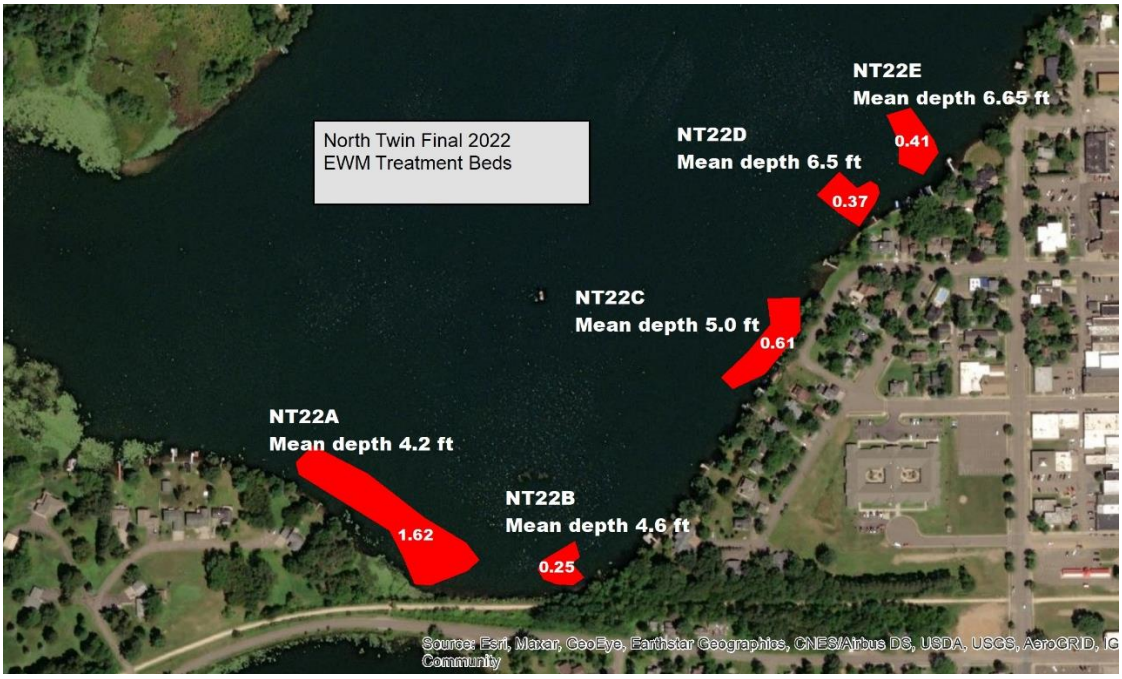
North Twin Lake, Polk County, Wisconsin EWM Herbicide Treatment Evaluation (WBIC: 2623900)

Introduction/treatment sites

On June 15, 2022, the herbicide ProcellaCOR has applied to five beds of Eurasian watermilfoil (EWM) (*Myriophyllum spicaturm*) for mitigation of the EWM. The total area treated was 3.26 acres. The table below summarizes the treatment bed characteristics and treatment conditions. The beds were delineated in August 2021 and adjusted based on the early June 2022 growth of the EWM.

North Twin Lake EWM 2022						
Bed	**Area**	**Mean D**	**Acre-feet**	**Water temp. (°F)**	**Wind velocity/ direction**	**Concentration of herbicide applied**
NT22A	1.62	4.2	6.80	72	2-6/NW	4 pdu/acre-foot
NT22B	0.25	4.6	1.15	72	2-6/NW	5 pdu/acre-foot
NT22C	0.61	5	3.05	72	2-6/NW	5 pdu/acre-foot
NT22D	0.37	6.5	2.41	72	2-6/NW	5 pdu/acre-foot
NT22E	0.41	6.65	2.73	72	2-6/NW	5 pdu/acre-foot
Total	3.26		16.14			

The map below shows the locations and sizes of the various treatment beds.



To evaluate the success of the treatment, a pretreatment survey for the EWM and native plants was conducted in August 2021. A post-treatment survey was conducted in late August 2022 using the same sample points within the treatment beds. A chi-square analysis of the plant frequency is used to determine if a reduction (or increase) is statistically significant. A p-value < 0.05 is considered significant, and the lower the p-value, the more significant the change was in the frequency.

Results

The table below shows the pretreatment and post-treatment frequency of EWM. The significance of the change in each bed and all beds combined is listed, along with the p-value. As this data shows, each bed had a significant reduction in EWM frequency, with a p-value of 1.2×10^{-15} for all beds combined.

Bed	Pretreatment frequency	Post-treatment frequency	Change/significant?	P-value (from chi-square)
NT22A	100%	0%	Decrease/yes	$2.0X10^{-5}$
NT22B	100%	0%	Decrease/yes	0.014 (small sample)
NT22C	100%	0%	Decrease/yes	$2.0X10^{-5}$
NT22D	100%	0%	Decrease/yes	0.002
NT22E	100%	0%	Decrease/yes	0.0005
All beds combined	100%	0%	Decrease/yes	$1.2X10^{-15}$

The following maps show the rake fullness of EWM within each treatment bed. The first map is before treatment (August 2021), and the second is after treatment (August 2022).

A successful herbicide treatment reduces the frequency and density of the target species (EWM) and will have little to no effect on the native plant species. The table below summarizes the native plants sampled in the pretreatment and post-treatment surveys and the chi-square analysis results.

Native species	**# sampled August 2021**	**# sampled August 2022**	**Change**	**P value**	**Significant?**
Potamogeton richardsonii-clasping pondweed	15	16	**+**	0.80	No
Potamogeton robbinsii-fern pondweed	15	14	**-**	0.80	No
Vallisneria americana-wild celery	13	15	**+**	0.61	No
Potamogeton amplifolius-large-leaf pondweed	4	3	**-**	0.69	No
Elodea canadensis-common waterweed	4	3	**-**	0.69	No
Najas flexilis-slender naiad	1	1	**n/c**	1.00	No
Potamogeton zosteriformis-flat-stem pondweed	1	1	**n/c**	1.00	No
Potamogeton pusillus-small pondweed	3	1	**-**	0.30	No
Stuckenia pectinate-sago pondweed	2	2	**n/c**	1.00	No
Potamogeton praelongus-whitestem pondweed	6	5	**-**	0.74	No
Myriophyllum sibiricum-northern watermilfoil	5	1	**-**	0.09	No
Potamogeton gramineus-variable pondweed	0	1	**+**	0.31	No

The native plant chi-square shows no statistically significant reductions in native plant species. Northern watermilfoil was close, but the p-value is just above the 0.05 threshold. Northern watermilfoil would be susceptible to the herbicide applied. These results are desired as the EWM reduced, and there were no negative effects on the native plants.

Summary

The June 2022 treatment using ProcellaCOR on five beds of EWM in North Twin Lake reduced the targeted EWM. The frequency of the EWM went from 100% to 0%. In addition, there was no significant reduction in native plants.

There were no beds of EWM remaining in September 2022 on North Twin Lake. Therefore, there should be no need for herbicide treatment in 2023. Monitoring will continue as a few single plants are viewed in new lake areas. These could expand into beds in the future.