

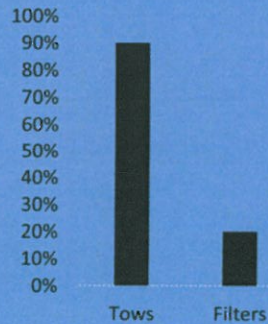
Using Environmental DNA to monitor for aquatic invasive species in Lakes: Variable detection rates between sampling methods and seasons

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Plankton Tow Net vs Filter Paper Sampling



	Plankton Tow Net	Cellulose Nitrate Filter Paper
Pore Size	60 micron	0.45 micron
Water Filtered	3,000 liters	5 liters



We collected pairs of tow net and filter samples at 39 locations across 3 lakes. Percent of milfoil detections in pairs of tow and filter samples in which at least one method detected milfoil. Statistically significant, Wilcoxon Signed Rank Test, N=10

Plankton tow samples detected milfoil significantly more often than the filter samples did.

Environmental DNA (eDNA) is swiftly becoming an inexpensive and fast way to detect rare or endangered species and aquatic invasive species. However, eDNA is still quite new, and optimal sampling methods are yet to be determined.

In this study, we evaluated the sensitivity of plankton tow net vs filter paper sampling, summer vs fall sampling, and individual vs composite sampling.

We used Northern watermilfoil (*Myriophyllum sibiricum*), a native species, as a proxy for detecting Eurasian watermilfoil (*Myriophyllum spicatum*) and other weeds.

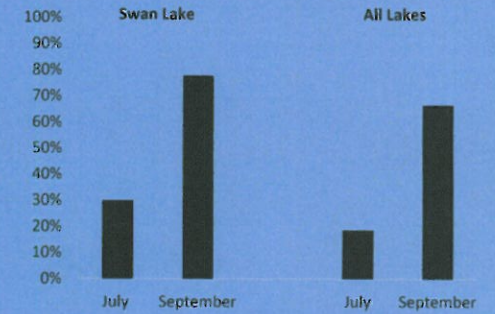


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Summer vs Fall Sampling



Percent of plankton tow samples that detected milfoil in Swan Lake in July (N= 10) and September (N=9) and in 'All Lakes': Swan, Van and Holland Lake, in July (N=16) and September (N=15).

Plankton tow samples detected milfoil more often during September than during July.

Individual vs Composite Tow Sampling

Combining multiple eDNA samples into a single composite sample could cut analysis costs, but composite samples may be less sensitive.

	Individual Samples	Composite Samples
Salmon	+ + - - -	-
Salmon	+ + + + -	+
Seeley	+ + - - -	-
Seeley	- - - - -	-

We collected five plankton tow samples from Salmon and Seeley Lake on each of two sampling dates. We tested each individual sample for milfoil separately, and then tested a composite of the 5 individual samples. "+" indicates a milfoil detection. "-" indicates a non-detection.

Composite plankton tow samples may detect milfoil less often than individual samples do.