

GLOBAL PARTNERSHIP ON NUTRIENT MANAGEMENT

BMP Case Study

Overview

Name: Responses of Lake Macrophyte Beds Dominated by Eurasian Watermilfoil (*Myriophyllum Spicatum*) to Best Management Practices (BMPs) in Agricultural Sub-Watersheds: Declines in Biomass but not Species Dominance

Location/Terrain: Conesus Lake, NY, USA

Crop(s): Livestock, row crops and others

Nutrient(s): Nitrogen and phosphorus

Rationale: To determine if agricultural BMPs could decrease Eurasian watermilfoil dominance

.....

Issue(s) of Concern/Challenges:

The invasive root species Eurasian watermilfoil (*Myriophyllum spicatum*) present in Conesus Lake is responsible for reducing biomass, species richness and biodiversity of species in certain ecosystems. While strategies have been implemented to directly remove the watermilfoil from the watershed, this does not address what is fully recognized as the ultimate cause of excessive plant growth in inland waters: nutrient loading from the surrounding watershed. Currently there is little scientific literature connecting agricultural runoff and Eurasian watermilfoil growth. Thus, this study looked to see if the agricultural BMPs could decrease nutrient loading and therefore Eurasian watermilfoil biomass.

Practice Description:

Six macrophyte beds in the watershed were surveyed. Agricultural BMPs were implemented in sub-watersheds upstream from three of the macrophyte beds, while limited or no BMPs were implemented upstream from the remaining three beds. All six beds were monitored during a Post-BMP experimental period from 2004 to 2007 and the data collected was compared to trends documented for the 2001-2003 Pre-BMP baseline period.

Practice Objectives:

This study was undertaken to determine if the implementation of agricultural BMPs in small agricultural sub-watersheds could decrease nutrient loading by tributaries, thereby reducing the biomass and dominance of Eurasian watermilfoil downstream in Conesus Lake littoral zone.

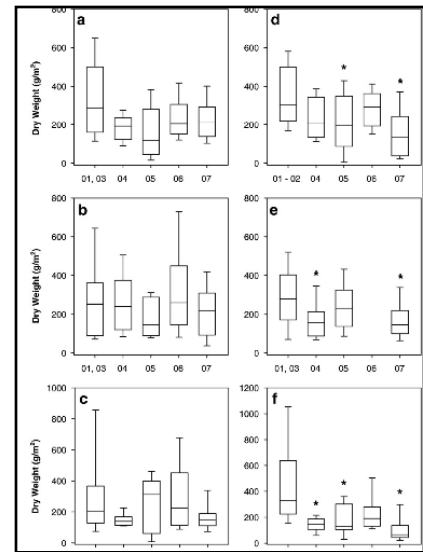
Outcomes:

In the three sub-watersheds that used agricultural BMPs, the biomass of macrophyte beds decreased by 30-50% and was significantly lower than the Pre-BMP baselines in 7 of 11 sample years (Fig. 3D-F). The three sub-watersheds that had minor or no new agricultural BMPs had a biomass that was statistically

indistinguishable from the Pre-BMP values in all 12 sample years (Fig. 3A-C). While the results of this study concluded that the implementation of agricultural BMPs reduced macrophyte population biomass, it did not reduce the dominance of Eurasian watermilfoil in Conesus Lake.

Data/Graphs:

Fig. 3. Box plots showing the Pre- and Post-BMP macrophyte biomass (g/m²) in the 2- and 3-m depth band of the littoral zone routinely dominated by Eurasian watermilfoil: (a) North Gully (b) Sutton Point Gully (c) Long Point Gully (d) Cottonwood Gully (e) Graywood Gully (f) Sand Point Gully. Each box represents the 25 and 75% confidence intervals and the capped lines are the 10–90% intervals. The single line across the bar is the median. Asterisks indicate years in which biomass was statistically different from the Pre-BMP years (2001–2003).



For more information, please contact Chuck Chaitovitz at chuck.chaitovitz@gef.org or visit www.gpa.unep.org/index.php/global-partnership-on-nutrient-management.

References:

For the full list of references, visit www.GlobalWaterChallenge.org/References2.pdf.