

# Best Management Practices for Aquatic Vegetation Management

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**Goals and Objectives:**

- This proposal discusses a strategy to address concerns related to aquatic vegetation management with the ultimate goal of producing the best management practices protocol in Iowa's ponds and lakes. This information will be used to guide future aquatic vegetation management options in newly reclaimed bodies of water. Objectives: 1. Perform literature search on quantifiable plant census techniques; 2. Identify best management practices for managing aquatic vegetation in Iowa lakes and ponds; 3. Develop educational materials related to aquatic plant identification and their specific management options; and 4. Compile, analyze, and publish in federal aid documents and appropriate journals the best management practices for managing aquatic vegetation in Iowa lakes and ponds.
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## Progress:

Field collections were initiated July 2006 and have continued through the present. A total of 13 lakes across the state of Iowa are being sampled; selection was based on similarity in physical attributes (e.g., mean depth, watershed area and volume development, and past management decisions, presence of grass carp.) Physical attributes being collected include nutrient composition, pH as well as biological parameters (zooplankton and phytoplankton samples, and young of year sportfish). Aquatic vegetation samples were collected monthly using a two-sided rake along a set number of transects, dependent on lake area.

Submerged aquatic vegetation abundance was positively related to water clarity (Secchi-depth) in the 13 study lakes. The increase of chlorophyll A and total phosphorus levels in some lakes was most likely due to increased lake turbidity and phytoplankton abundance. Submerged aquatic vegetation, in turn, has limited growth potential. The lake with the highest aquatic vegetation (Red Haw) had the lowest chlorophyll A concentrations ( $11 \pm 2 \mu\text{g/L}$ ) as well as the lowest total phosphorus concentrations ( $0.016 \pm 0.002 \text{mg/L}$ ).

Lakes with little vegetation are exemplified by high chlorophyll A levels, high total soluble solids, and low Secchi-depths. In contrast, lakes that have more aquatic vegetation abundance and species diversity are noted by having greater Secchi-depths and lower chlorophyll A and total soluble solids levels.

Regardless of fish size ( $\leq 50\text{mm}$  and  $> 50\text{mm}$ ), prey selectivity was similar; however, fall and spring seasons did influence prey selection. Red Haw Lake, the highest submerged aquatic vegetation and highest water clarity of the study lakes, bluegills ( $< 50\text{mm}$ ) fed on chironomids (35% of diet) and amphipods (14% of diet) in spring. During the fall sampling period, bluegills feeding habits shifted from amphipods (2% of diet) to *Chydorus* spp. (23% of diet).

To improve recruitment in areas with minimal submerged aquatic vegetation, programs to increase submerged aquatic vegetation should be implemented. In addition, a balance between complete eradication and severe infestation of aquatic vegetation is needed. However, since all of our lakes are impoundments, lakes with natural origins might have different management guidelines. Management efforts should focus on aquatic vegetation densities that optimize lakes resources (e.g., water clarity, sport fish populations, recreational activities).

## Future Plans:

Final analyses will be completed Spring 2009. A website will then be developed to address Best Management Practices (BMPs) for the state of Iowa.