

Diagnostic/Feasibility Restoration Study – Easter Lake

Principal Investigator: John Downing

Student Investigator: n/a

Collaborators: Michael McGhee, Iowa Department of Natural Resources

Duration: September 2007 to October 2011

Funding Source(s): Iowa Department of Natural Resources, Lake Restoration

Goals and Objectives:

- To provide the Iowa Department of Natural Resources with a diagnostic and feasibility study of Easter Lake, Polk County, Iowa for planning a lake restoration program on the lake and its watershed.
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Progress:

ISU has completed all work associated with this contract. The Easter Lake Diagnostic/Feasibility Study Report was submitted to Iowa DNR in 2011. Findings from this study have been presented at numerous venues, including the City of Des Moines and Polk County council meetings and several public meetings. The Easter Lake Technical Advisory Committee is currently working with a consulting firm to develop restoration strategies for Easter Lake based on findings from this study.

Conclusions and Recommendations:

Easter Lake has poor water quality, with symptoms including low water clarity, large algal blooms dominated by Cyanobacteria (blue-green algae), high bacteria concentrations, and low oxygen concentrations in bottom waters during summer. The lake receives high loads of sediment, nutrients, and bacteria from its predominantly urban watershed, especially the Yeader Creek watershed. Currently, Easter Lake is filling with sediment that will enhance Cyanobacteria problems and shorten the useful lifetime of the lake. The Iowa DNR Lakes Restoration Program established a Water Quality Target (WQT) of ≥ 4.5 ft Secchi depth at least 50% of the time from April to September for Iowa lakes. Total phosphorus loads from the watershed would need to be reduced by 50% to meet the State WQT. Although it is not practical to achieve the State WQT through watershed and in-lake engineering options alone, goals can be met by combining effective engineering options with various best management practices (BMPs) within the watershed that reduce phosphorus loading to receiving streams by 42%. Engineering options include stream stabilization, dredging existing detention ponds in the Southern watershed, constructing in-lake detention basins in the Western and Southern arms, and fisheries renovation. A table following this summary shows predicted phosphorus savings, predicted water clarity (Secchi depth), and estimated costs associated with various engineering options. Potential BMPs to reduce phosphorus loading from the watershed include reducing phosphorus fertilizer application to lawns, removing lawn clippings, picking up pet waste, and improved street sweeping. Ultimately, the DNR, Polk County and City of Des Moines officials, watershed residents, stakeholders, and the general public will need to develop a strategy for reducing phosphorus loading to Easter Lake if state water quality goals are to be met. Water quality monitoring (at least two years post-restoration) is recommended to document the effectiveness of the Easter Lake restoration plan.