

Project: Fawn Lake Phase I Diagnostic-Feasibility Study
Location: Hawley, Pike County, Pennsylvania
Client: Fawn Lake Forest Association



Aqua Link, Inc. performed a Phase I Diagnostic - Feasibility Study for Fawn Lake and its surrounding watershed. Fawn Lake, a 147-acre impoundment, is located in Pike County, Pennsylvania. The purpose of this study was to diagnose the causes of existing lake water quality problems, to evaluate both in-lake and watershed restoration alternatives, and to develop a comprehensive lake and watershed management plan to improve lake water quality. Over the years, Fawn Lake was routinely plagued by extensive blue-green algal blooms during the growing season. These algal blooms remained persistent even after repeated treatments with copper-based algicides.

As part of the Fawn Lake Phase I Study, Aqua Link designed and implemented a comprehensive lake water quality monitoring program. Aqua Link also determined hydrologic and pollutant budgets for the lake, thereby quantifying all major sources of water, nutrients and sediments to the lake from its surrounding watershed. A bathymetric survey was performed in order to calculate the lake's water volume and its hydraulic residence time. Land use data, as determined from aerial photographs and field reconnaissance, were analyzed using GIS software.

Using the above information, phosphorus modeling was conducted in order to gain an understanding of how the lake responded to various incoming nutrient loadings and to evaluate applicable in-lake and watershed restoration alternatives for future implementation. In addition, Aqua Link assessed the lake's fishery by performing a comprehensive fishery survey. Fish were collected using electroshocking equipment via boat and seines.

Based upon the above, Aqua Link developed a comprehensive lake and watershed management plan to improve and protect lake water quality. The management plan outlined three major categories of restoration: in-lake restoration measures, watershed restoration alternatives and institutional initiatives. In-lake restoration was aimed at improving lake water quality and the lake's fishery. A large-scale destratifying aeration system was recommended to increase dissolved oxygen concentrations in the partially mixed hypolimnion and subsequently, to reduce in-lake phosphorus concentrations through iron-phosphate precipitation. To improve the lake's fishery, a supplemental fish stocking program was provided. Watershed restoration alternatives focused on reducing nutrient loadings to the lake by implementing alternate wastewater management practices (e.g., enhancing the performance of existing on-lot septic systems, constructing a centralized wastewater treatment facility), establishing buffer strips along lake shoreline areas, and implementing homeowner best management practices for lawn maintenance. Recommended institutional components of the management plan were aimed at developing an environmental education program for watershed residents, implementing a waterfowl feeding ordinance and continuing to monitor the water quality in the lake.