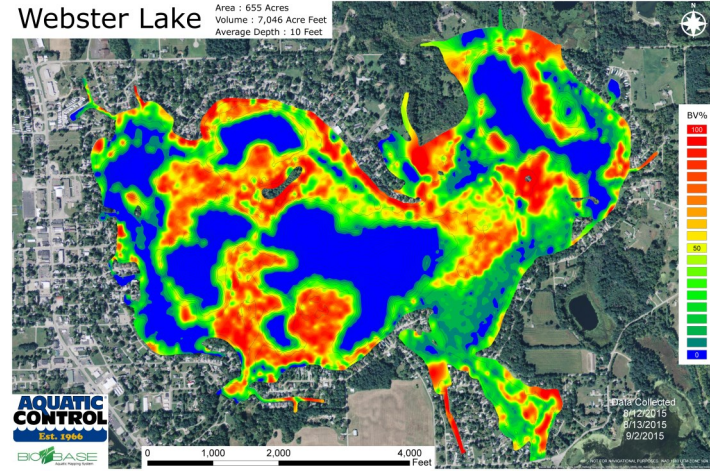


AQUATIC CONTROL[®]

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Proposal for Plant Sampling and Development of an Aquatic Plant Management Plan

Prepared for:
Indian Lake Advisory Group
July 7, 2022





The information and pricing presented in this proposal are confidential and intended only for review by decision makers at the Indian Lake Advisory Group. We greatly appreciate your discretion.

Background

Aquatic plants play a significant role in aquatic systems as they provide food and habitat to fish, wildlife, and aquatic organisms. Plants can also improve water clarity and stabilize sediments. When invasive plant species are introduced to aquatic systems, they can become a nuisance by forming monotypic areas of growth that hinder human uses of water and threaten the structure and function of diverse native aquatic ecosystems. Considerable resources are often expended to manage infestations of invasive aquatic plants. Prior to engaging in management of the infestation it is important that lake managers have an aquatic plant management plan prepared. A well-prepared plan will allow for quick and more effective short and long term management of nuisance vegetation. It also allows for better communication with all stakeholders. A comprehensive aquatic plant management plan should contain information on the watershed and waterbody characteristics, present waterbody uses, a problem statement, management history, characterization of the plant community, public involvement, project management, objectives, evaluation of control techniques, a detailed action plan, and outline future monitoring and plan evaluation.

Aquatic Control works with the lake manager/association to develop a custom aquatic vegetation management plan based on the identified management goals, lake user input, budget, the designated uses for the water, water characteristics, and the specific invasive plant problems associated with the lake. Aquatic Control biologists will be tasked with gathering initial data on the plant community. This data will be gathered in a variety of ways including individual point sampling, bathymetric mapping (if feasible), plant biovolume mapping (if feasible), and invasive plant bed identification. Data will be used in the creation of a detailed action plan and allow for a baseline when evaluating the results of the initial actions.

Aquatic Vegetation Management Plan for Indian Lake, OH

Indian Lake contains approximately 5,104 surface acres of water with an average depth of less than 10 feet. The lake has recently experienced a rapid increase in invasive plant density and abundance. These dense beds are impacting navigation, recreation, having negative effects on property value, local economy, and impacting lake ecology. The initial step in creation of the plan will involve assessment of the plant community. This will be conducted by Aquatic Control biologists in late summer 2022 and include a variety of repeatable plant community assessment techniques. It is vitally important to have this step completed before large-scale management is initiated so that this objective data can be used to assess the effectiveness of control techniques and impacts on the native plant population.

Following data collection Aquatic Control biologists, along with local lake leaders, will organize a public meeting that involves all stakeholders. The main objective of the meeting will be to gather



information on lake use and how it is being impacted by the invasive species. In addition, this time will be used to familiarize the public with the basics of aquatic plant ecology, management, and address any initial questions. With the help of the lake leaders, Aquatic Control biologists will take the data gathered from the sampling and meeting to formulate the vegetation management plan. A draft of this plan will be presented to stakeholders in the winter of 2022/2023. The plan will contain objectives, an action plan designed to reach those objectives, and a budget detailing the potential costs of each action.

In addition to sampling aquatic vegetation, it is recommended to have a baseline fish population survey completed prior to initiation of large-scale plant management activities. Reduction in plant biomass will create changes within the fish community. Without a baseline dataset and follow-up surveys, the impact of plant management on the fish population will be left to rumor and speculation which can derail vegetation management efforts.

Fee Schedule for 2023-2028 Indian Lake Aquatic Vegetation Management Plan

Baseline Aquatic Plant Sampling

Point Sampling (Tier 2 Survey):

Total = \$15,000 per sampling event

The survey would follow Indiana DNR's Tier 2 survey protocol and includes rake pulls at 400 locations throughout the littoral zone of the lake. Price includes travel, sample collection data analysis and map creation. Point sampling is recommended in late summer 2022, spring 2023, summer 2023-2028. This survey data can be used to assess the effectiveness of treatment and the impact on non-target vegetation.

Invasive Plant Bed Mapping:

Total= \$2,900 per sampling event if completed during point sampling, \$9,000 per event if stand-alone.

The survey would include data collection needed to create invasive plant bed maps that can be utilized when selecting invasive plant control priority areas. Beds will be classified as dense, moderate, or sparse. Surveys should be completed in late summer 2022, spring of 2023-2028.



Bathymetric Map Creation:

Total=\$20,000

Hydroacoustic depth data will be collected and uploaded into Biobase software. Data will be used to calculate total lake volume and creation of a 1-foot contour map. Hard and electronic copies will be provided to client. Data will be valuable when calculating treatment rates to the whole lake or select areas.

Aquatic Plant Biovolume Mapping

Total=\$2,000/event if completed along with bathymetric map or \$22,000/event when collected without bathymetric map.

Price includes hydroacoustic collection of plant biovolume data. Aquatic Control will collect data and use Biobase software and technicians to analyze. This dataset will provide data on the overall plant biovolume. It is recommended that this survey be completed late summer 2022 or late spring 2023. This dataset will establish a pre-management biovolume level within the lake. Annual sampling events should be completed to assess the effectiveness of plant management activities.

Aquatic Plant Management Plan Creation

Public Meeting:

Total=\$1,850 per meeting

Recommend a minimum of one public meeting per year for all interested lake users. Aquatic Control will lead the meeting with the help of lake leaders who will provide a location and assist in notification for the event. Aquatic Control will conduct a survey of lake users at this event, discuss the basics of aquatic plant ecology and management, and help answer questions. Survey data will be used to help in the action plan creation.

Plan Creation and Presentation

Total=\$14,500 initial plan/\$10,000 for annual updates

Plan will contain information on the watershed and waterbody characteristics, present waterbody uses, a problem statement, management history, characterization of the plant community, public involvement, project management, objectives, evaluation of control techniques, a detailed action plan, and outline future monitoring and plan evaluation. This information will be presented in an easy-to-read format and designed to be updated on an annual basis. Plan will be presented in an electronic and hard copy form.



Fish Community Assessment

Baseline Electrofishing Survey

Total=\$12,000 per event

Aquatic Control fisheries biologists will use electrofishing equipment and survey 8 randomly selected transects. This survey should be completed prior to initiation of the project and repeated at least every 3 years at the same location and time of year to assess any major changes in the fish community. Sport fish will be collected, weighed, and measured to calculate relative weights. Data will be presented in an easy-to-read report form. Completion of survey will be dependent on obtaining permits/permission from ODNR.

We look forward to supporting you on this project. If you have questions, need additional information, or would like to see any changes made to the proposal, please do not hesitate to contact me at my office (812) 497-2410 Ext. 2430 or by email at natel@aquaticcontrol.com.

Sincerely,

Nathan W. Long
Executive Vice President, Aquatic Control, Inc.

Lake Management Capabilities

Since 1966, Aquatic Control has been providing high-quality products, services, and staff for managing lakes, ponds, and other water resources. Our professional staff includes plant scientists, fisheries biologists, factory trained fountain specialists, aquatic biologists, and licensed aquatic applicators. Our services include vegetation management plans, treatment programs, fountain/aeration system installation, fish population management, laboratory services, harmful algal bloom management, and lake mapping.

Aquatic Control owns and operates 56 boats and 45 trucks that can be rapidly mobilized to handle a wide variety of problems on a wide range of waterbodies throughout the mid-south and mid-west. Aquatic Control biologists have completed aquatic plant surveys and management plans on numerous public lakes throughout the Midwest. Many of these plans are available for viewing on Indiana Department of Natural Resources websites. For purposes of this project, Aquatic Control would be utilizing 16-foot Yankee and Alumitech airboats equipped with 350 CI General Motors engines and Lowrance GPS/Sonar units or 18-foot Carolina Skiff reservoir boats equipped with 90HP Mercury engines. For fish sampling purposes Aquatic Control would be utilizing two custom built electrofishing boats.



Aquatic Control also has an in-house laboratory that specializes in water quality analysis and provides services to help monitor and evaluate risks in ponds and lakes due to growth of blue-green algae that form harmful algal blooms. The lab is set up to analyze water to screen for harmful algae as well as enumerate cell density to provide a metric for the level of risk.

Meet our Lead Lake Management Staff

Nathan W. Long
Executive Vice President

Mr. Long is the Executive Vice President at Aquatic Control, Inc. In 1997, he received a B.S. degree in Fisheries and Aquatic Science from Purdue University. Following graduation, he spent the winter of 1997-1998 in the Bering Sea working aboard a trawler vessel as an observer of the National Marine Fisheries Service. From 1998-1999, Mr. Long was employed as a Fisheries Biologist Aid with Cinergy in Plainfield, IN.

Aquatic Control employed Nathan in February of 1999. His primary responsibilities included aquatic vegetation management, lake management consulting, planning, and conducting electrofishing surveys, writing fish survey and vegetation management reports, aquatic vegetation identification, and supervising a team of aquatic applicators. In January of 2004 Nate was promoted to Manager of Lake Management Services. He was appointed to the Aquatic Control Board of Directors in November 2005, elected as Vice President of Lake Management in December 2006, and elected Executive Vice President in 2016.

Mr. Long is a member of the Indiana Chapter of the American Fisheries Society, Indiana Lakes Management Society, Aquatic Plant Management Society, Midwest Aquatic Plant Management Society, and Aquatic Ecosystem Restoration Foundation. Mr. Long served on the Indiana Lakes Management Society board of directors from 2007-2011 and served on the board of directors of the Midwest Aquatic Plant Management Society from 2014-2017 and was elected president in 2018. Mr. Long is a certified and licensed aquatic pesticide applicator in Indiana, Pennsylvania, Iowa, Kansas, South Carolina, Illinois, Kentucky, Tennessee, Ohio, Minnesota, Missouri, Arkansas, and Michigan.

Leif N. Willey, M.S.
Lakes and Special Projects Supervisor

Mr. Willey became the Seymour Office Lake & Special Projects Supervisor for Aquatic Control, Inc. in January 2018. Leif grew up in Seymour, IN and graduated from Seymour High School in 2006. After high school, Mr. Willey continued his education at Purdue University and majored in Fisheries and Aquatic Sciences. In college he interned at Aquatic Control, which led him to further his education in the management and biology of aquatic plants and algae. Post-



graduation, Mr. Willey was accepted into the University of Florida Graduate School under Dr. Michael Netherland. He completed the required coursework for his degree as a graduate research assistant for Dr. Netherland, while also conducting his own research project for completion of his thesis. Mr. Willey presented regular updates on his research project at many national and regional Aquatic Plant Management Society meetings and won several student presenter contests and the MAPMS graduate research grant in 2012. Mr. Willey graduated in December 2012 and was hired by Dr. Netherland as a research assistant at the Center for Aquatic and Invasive Plants in Gainesville, FL. In November 2013, he began a new job as Research Biologist with Aquatic Systems Inc (now owned by Solitude/Rentokil). in Pompano Beach, FL and in February 2016, he accepted an offer to be the Aquatic Technical Specialist at SePRO Corporation in the Ohio Valley territory. Mr. Willey's duties at Aquatic Control, Inc. as the Lake & Special Projects Supervisor include scheduling, planning, and completing lake treatments; managing Indiana LARE projects; employee supervision and review; and proposal/contract creation. Mr. Willey is also currently serving as Editor on the Board of Directors for the Midwest Aquatic Plant Management Society and has been published multiple times in the Journal of Aquatic Plant Management for his research in the field of invasive aquatic plant management. He has also given several guest lectures at the University of Florida and at Indiana University's School for Public and Environmental Awareness (SPEA). Leif Willey is a licensed aquatic plant applicator in Ohio and Indiana.

C. Adam Charlton
Supervisor of Satellite Office Operations

Mr. Charlton is the Director of Satellite Operations for Aquatic Control. Adam received a Bachelor of Science degree in Fisheries and Aquatic Sciences with a 4.0 cumulative GPA from Purdue University in May of 2006. While attending Purdue he worked on several graduate research projects including mosquitofish behavioral studies in Indiana, lake whitefish recruitment and survival in Lake Michigan, and lake sturgeon rehabilitation in Wisconsin. After graduation, he worked as a Fisheries Biologist II with the Florida Fish and Wildlife Conservation Commission's Eustis Freshwater Fisheries Research Lab in Eustis, FL. In March of 2008, he accepted a supervisory position at the Florida Fish and Wildlife Conservation Commission's Northeast Regional Office in Ocala, FL. As a Fisheries Biologist II with the Division of Freshwater Fisheries Management, Adam supervised two positions, sampled, and evaluated sportfish populations across a 12-county region, evaluated fishing regulations, held public meetings/events, and assisted in the creation of a new 14,000-acre reservoir.

Adam joined Aquatic Control, Inc. in July of 2009. He worked out of our Northern Indiana office until 2011 when he was promoted to Manager of the Kentucky office. His primary responsibilities as the manager of the Kentucky office included contract proposals, aquatic plant management, installation and maintenance of fountain and aeration systems,



assisting in electrofishing surveys, writing fish survey reports, and assisting pond and lake owners with fisheries related issues. He holds aquatic applicator licenses in Kentucky, Arkansas, Missouri, Illinois, Tennessee, and Indiana. Mr. Charlton is a certified PADI Open Water SCUBA diver.

Ciera M. Baird, Ph.D.

Aquatic Ecotoxicologist: Specializing in HAB Management

Dr. Baird received her B.S. degree in Wildlife Biology in May of 2012 with a minor in chemistry from Keystone College in La Plume, PA. Shortly after graduating college, she moved on to pursue graduate education at Clemson University, located in Clemson, SC. Throughout her graduate career, her studies were focused on water resource management. For her Master's degree thesis, she worked on a project funded by two major oil companies in Alberta, Canada with the overarching goal of treating wastewaters generated by oil sands mining using constructed wetland treatment systems.

While working on her M.S. degree, she collaborated on research with colleagues in her program regarding management of noxious and invasive algal species with algaecides in water resources ranging from residential ponds to large potable water reservoirs, and she also published an analytical method for confirmation of hydrogen peroxide-based exposures from algaecides in water resources.

Dr. Baird graduated with her M.S. degree in Ecotoxicology in December of 2015 and continued in her program to pursue her Ph.D. Her doctoral research involved evaluations of human health and ecological risks related to toxins (specifically microcystins) produced by cyanobacteria (blue-green algae) in freshwater resources, as well as studies which were focused on more efficient and effective use of copper-based algaecides for control of toxin-producing cyanobacteria. She also evaluated a solar photocatalytic process that could be used to remove microcystins produced by cyanobacteria from drinking waters during in-plant treatment or as a stand-alone process in developing countries. Dr. Baird graduated with her Ph.D. in Ecotoxicology from Clemson University in August of 2018 and has over 20 peer-reviewed journal publications. She is a member of the Society of Environmental Toxicology and Chemistry, Aquatic Plant Management Society, and various regional chapters of the Aquatic Plant Management Society (Midwest, Midsouth, South Carolina, and Northeast).

Wesley Goldsmith

Fish Management Specialist

Mr. Goldsmith is the Fish Management Specialist for Aquatic Control at the Seymour, Indiana office. He was born and raised outside of Oldenburg, Indiana and graduate from Batesville High School in 2011. Wes received a Bachelor of Science degree in Fisheries and Aquatic Sciences from Purdue University in May 2011. While attending Purdue he worked on several graduate research projects including silver and bighead carp telemetry studies along the



Wabash River, stream community diversity studies in Northern Indiana, and a habitat assessment study in a backwater of the Ohio River.

After graduation Wes completed his second stint with the Indiana Department of Natural Resources as a Seasonal Aide. While in this position he aided in several lake management surveys, big rivers surveys, and helped around the Cikana Fish Hatchery. Other duties included writing small reports, aging scales of various species, and providing maintenance on nets and other equipment. In December of 2015 Wes began a position with Marsh & Associates as a Fisheries Technician in Phoenix, Arizona. After assisting in several projects, he quickly was promoted to Fisheries Biologist I. In this position he began to lead multiple projects including a telemetry study on Utah Lake, a razorback sucker telemetry study on the Colorado River, and an Amargosa pupfish study in Death Valley National Park. Responsibilities included supervising field technicians, analyzing data, writing reports, and presenting at professional conferences.

Mr. Goldsmith began his career with Aquatic Control in the summer of 2017 as an aquatic biologist. In July of 2018 Wes was promoted to Fisheries Biologist and in 2020 he was promoted to Fish Management Specialist. His duties include scheduling and performing fish surveys, writing fish survey reports, conducting pond clinics, and aquatic plant management. He is a certified and licensed aquatic pesticide applicator in Indiana and Ohio. He is a member of the Society of Lake Management Professionals and Indiana chapter of the American Fisheries Society.