FREQUENTLY ASKED QUESTIONS

Lincoln Park Conservatory | North Pond Dredging

Draft – 06/12/20

Prepared by Christopher B. Burke Engineering LTD. For the Lincoln Park Conservancy

Q: Why is Lincoln Park Conservancy completing this project?

A: The Lincoln Park Conservancy is finalizing a Master Plan to dredge North Pond and restore the adjacent shoreline as part of improving pond health and its surrounding natural areas. The pond is home to a number of species of resident birds, reptiles and fish, including threatened and endangered Illinois listed species, and is an important rest stop/layover for over 250 migratory bird species.

Nearly all urban ponds and lakes accumulate organic and mineral sediments over years of deposition of soil from eroded shorelines, fertilizers, leaf litter, grass clippings, branches, algae, etc., causing nutrient imbalances and shallower water from sludge accumulation on the pond bottoms. Despite runoff that occasionally helps flush out some of the nutrients and finer sediments, these ponds capture and retain (based on studies of similar ponds) up to 80% of the organic and mineral input. As a result, these ponds are reaching tipping points; requiring maintenance to improve them functionally to maintain their open water pond qualities.

As time passes, with no intervention the organic sludge accumulates on the pond bottom from the inability of microorganisms to decompose the accumulating organic debris. The organic debris overwhelms the ponds ability to provide enough oxygen to fuel the biologic processing of the organic matter. The organic matter accumulates, leaches out phosphorus and other nutrients that are then used by algae and other nuisance aquatic plants to grow, a process called eutrophication. The aquatic plant and algae lifecycle worsens the situation because as they die or go dormant, their plant matter likewise settles to the pond bottom and leaches out the nutrients for use by the next generation of plants and algae, and the cyclical pattern continues to build up on the pond bottom as organic matter and sludge.

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Q: What will dredging North Pond provide?

A: The pond will be better capable of processing the nutrient loads due to water circulation and a significant reduction of resident nutrient loads. Overtime, as sediment accumulated the pond has become shallower, calmer, more stratified, and had lower levels of dissolved oxygen (anaerobic conditions). As oxygen levels collapse, the accumulation of organic sediment accelerates because there is less biologic activity to decompose the organic material. The shallow anerobic water cannot support fish or other important aquatic wildlife and promotes stagnant water prone to algal blooms. Dredging will remove excessive nutrients from the pond, deepen the pond to allow fish and other important aquatic wildlife to establish and flourish in the pond. The improved water quality will increase the overall pond esthetic and reduce the likelihood of future algal blooms.

Q: How will the North Pond be dredged?

A: The pond will be pumped/dewatered in stages, with sections cordoned off to allow portions of the pond to remain wet for maximum protection of resident animals. Conventional excavation equipment will be used to remove the material. The excavated material will be hauled off to a suitable disposal site, used as fill material on another Chicago Park District Property or some of the material may be used for landscape mounds/berms.

Q: Why install bubble aerators in North Pond?

A: Aeration is the process of adding oxygen to water. Maintaining healthy levels of dissolved oxygen (DO) is critical to the Pond's long-term health is one of the most important water quality parameters. DO in the pond will aid in the breakdown of decaying vegetation and other sources of nutrients. This breakdown of bottom silt is carried out by microorganisms at the water/soil interface and continues to proceed a few centimeters deep in the soil.

The introduction of oxygen can:

- Speed up the rate of organic decomposition – slowing deepening or maintaining depth due to increased aerobic decomposition.
- Reduce the amount of phosphorus, which would otherwise be available for plant/algae growth.

- Improve overall water quality.
- Thermally and chemically de-stratify the water.
- Cause circulation currents that might create favorable conditions for more desirable algae to better compete with blue-green and other less desirable algae.
- Decrease the severity of algae blooms and algae die-offs.
- Shift the level of carbon dioxide by venting it into the air, which limits the amount available for use by aquatic plants.
- Help to prevent thermoclines and anoxic zones from forming in the summer, which benefits all aquatic organisms.
- Allow for greater densities and varieties of fish.
- Eliminate the potential for Spring and Fall turnover which may result in fish kills.
- Prevent winter kills caused by low oxygen levels.

Aerators are suggested to run all year, even in winter as fish can be harmed or killed when the unit is turned back on in the spring due to turnover of poorly oxygenated water from the lake bottom. Allowing the unit to operate year-round will not harm the unit and will maximize its benefits. A downfall of such operation is that the open water may attract geese and ducks in the winter. However, the benefits outweigh the loss of waterfowl that may be attracted to the open water.

Q: Why would Lincoln Park Conservatory remove some trees and access to the shoreline?

A: As we assess the current shoreline and identify strategic locations to reduce sources of sediment, or high organic deposit source material, we will take into consideration the valuable habitat the shoreline provides for a variety of wildlife. Based on our years of restoration experience, we can balance providing valuable wildlife habitat for species such as herons, while improving the human engagement experience, and most importantly, improving the pond's health. For example, there is active shoreline erosion, and trees and shrub inputs contributing to pond degradation due to nutrient and sediment loading.

The nutrient loading situation is exacerbated by how the pond shoreline has been maintained. Portions of the shoreline are densely vegetated with trees and shrubs, many trees are leaning over or have fallen into the pond. When leaves, twigs and branches fall into the water, the nutrients, such as phosphorus and nitrogen leach out in a matter of days, generating a huge

increase in soluble nutrients in the water column. The remaining leaf matter is left behind to slowly decompose over a much longer time period. This material immediately becomes a significant source of nutrients and can increase the amount of organic debris and sludge on the pond bottom, exacerbating algal blooms and eutrophication.

While the "wild" shoreline vegetation and fallen trees are beneficial to the certain wildlife, they are helping to accelerate pond degradation. Many of the current trees at North Pond are non-native, volunteer trees that were not intentionally planted, and that are in poor to marginal health. The ultimate goal of the restoration is to double the number of trees around North Pond, but some tree removal will be necessary. We believe that we can, with our approach, retain the beneficial wildlife habitat while also improving the overall pond ecology and esthetic through a comprehensive recommended program of dredging, aeration and a focused evaluation of the existing shoreline to accommodate the future human and natural community needs. To assist us in this effort, a comprehensive tree inventory and health analysis was competed this spring.

Q: What is the long-term maintenance required for these improvements?

A: We are recommending implementation of an Adaptive Management Plan (AMP) for the restored pond, shoreline, vegetation, aeration, and all improvements. The AMP is a long-term program executed for the life of the project. Initially work will consist of maintenance and monitoring of the improvements to ensure the design intent has been met and the vegetation has established as expected. Monitoring of the improvements routinely to identify action items which are addressed as soon as possible is a key step of AMP. As time passes this proactive approach will result in less overall cost to maintain. The following provides the guiding principles for AMP:

Adaptive Management Plan Principles:

Plan:

- Identify management issues (e.g. weed infestations, erosion)
- Identify management goals (e.g. weeds managed, native seeding, shoreline repaired)
- Determine management strategies available (e.g. herbicide, hand pulling, burning)
- Select appropriate management action (e.g. hand removal)
- Determine what will be monitored and how (e.g. establish a fixed point in field)
- Determine how change and success will be evaluated (e.g. absence of weeds one month or one year after removal)

Do:

- Carry out action (e.g. remove weeds, repair shoreline, reseed bare spots)

Monitor:

- Monitor results (e.g. revisit site to determine success of activities)

Review:

- Assess previous management strategy and modify plan as necessary to adapt to current site conditions
    - Execute the actions as quickly as possible while issues are minor

Q: As part of the design project, why is it important for Lincoln Park Conservatory to involve the public and other stake holders?

A: As the Lincoln Park Conservancy goes thru the design process it is important to have the public and other stakeholders involved so we can gather input on their visions and future uses of North Pond. North Pond is loved by millions of park visitors each year, each with their own unique connection to the pond and its surroundings. Our goal is to ensure that everyone benefits from the Pond's restoration; including, of course the many plants and animals that call the pond home. Beginning this summer, the Lincoln Park Conservancy will provide sample concept plans and other visual materials for input and comment from the community. This

feedback will help us shape our final restoration Master Plan draft. From there, we will host a series of public meetings this fall and winter to garner additional input on the final draft plan.

Q: Who are the project partners?

A: As North Pond's designated steward, the Lincoln Park Conservancy will serve as the project lead involved in all aspects of the project. Given the pond's location in Lincoln Park and its potential benefit to other similar park projects, the Chicago Park District will work directly with the Conservancy on the project's implementation. Christopher B. Burke Engineering (engineering firm), Smith Group (landscape planning and engineering firm) and Integrated Lakes Management (aquatic ecosystem restoration and management firm) will work under the direction of the Conservancy and Park District on key project aspects. Several organizations and institutions located on the pond's edge or that regularly utilize the pond are also key project partners and have provided critical input on the restoration plan including: the Peggy Notebaert Nature Museum, North Pond Restaurant, the Chicago Angling and Casting Club, Anglers Club of Chicago, Elliott Donnelley Chapter of Trout Unlimited, and the Chicago Ornithological Society.

Q: What is the schedule for the project?

A: Lincoln Park Conservatory is moving forward with restoration to be started by Fall of 2021 and completed by the end of 2022.

Q: What type of landscaping will be planted?

A: Details of the landscaping are yet to be defined during the visioning process, but in general, we will incorporate as much native landscaping around the pond perimeter, while keeping in mind this is an urban park that has a wide variety of visitors with a myriad of interests. Woven into the native plantings will be areas/pathways of manicure lawns and landscaping allow visitors to visit the shoreline and near shore areas. Outcroppings, scenic vistas, and other elements will provide a variety of up-close and personal views of the pond and its resident nature. The design will create a feel of wildness while accommodating easy movement and engagement around and adjacent to the pond.

Layout of the native/manicured interface will take into consideration how wildlife, in particular geese, would potentially use the area. We plan to utilize design techniques including curved

and meandering paths to give the impression to geese that they must walk through tall grass to reach lawn. In addition, many parts of the shoreline will be planted with tall grasses and forbs. Geese prefer ponds with short grass edges so that they can see potential predators. Taller grass makes geese feel less safe and the pond less accessible, which we hope will be a deterrent to geese congregating in or around the pond.

If you have questions about the North Pond Restoration project or would like to learn more, visit: lincolnparkconservancy.org or email info@lincolnparkconservancy.org.

Q: How will Lincoln Park Conservatory handle future sediment in the pond?

A: Sediment loading will be addressed through implementation of a suite of best practices.

1. Restoring the eroded shoreline. The restoration will stabilize the banks, promoting near shore deposition of sediment flowing towards the pond.
2. Installing a comprehensive aeration system. This is one of the best strategies for ongoing pond health beyond the dredging itself.
3. Planting/restoring the shoreline. The design of the shoreline will attempt to minimize organic input from excessive leaf litter and other organics while still providing appropriate cover for wildlife and the human esthetic. Setting trees back from the shoreline will provide shade and cover for wildlife while reducing the amount of leaf litter falling into the pond and their resultant nutrient loads. Following the Adaptive Management Plan, volunteer woody vegetation/saplings would be removed along the water line, as soon as possible to preserve the restoration and ensure the pond doesn't return to current conditions.

Q: Will fish be stocked in the Pond?

A: A determination of fish in the pond has not been made but will be determined this summer. We envision that the pond be stocked with appropriate native fish to help to control nuisance insects while providing food sources for birds and other shoreline creatures.

Q: Will the work improve flooding of the Park area north of the Pond?

A: Yes, the park areas immediately north the Pond that experience regular flooding and water retention will be studied as part of the project. Drainage improvements will be made where possible, including the potential storage, filtering, and release of excess stormwater into the pond as an additional water source. More information on this component will come after initial studies of this project component that are anticipated for Spring 2021.

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