



Statement of Support for the NEORSD's Shaker Lakes Recommendations Updated August 2022

The Nature Center at Shaker Lakes (NCSL) deeply values the natural greenspaces surrounding our 20-acres throughout the Shaker Parklands, including each of the Shaker Lakes. We appreciate the historical significance of these lakes and dams to the communities of Shaker Heights and Cleveland Heights; they are a cherished community asset.

In alignment with our mission of environmental conservation and education, NCSL recognizes the benefits offered by the Northeast Ohio Regional Sewer District's (NEORSD) recommendations to remove the dam and restore the historic streams underlying Horseshoe Lake, and to replace the dam at Lower Lake. Given our location between Horseshoe Lake and Lower Lake, we concur with NEORSD's recommendations, which will maximize stormwater flood control to reduce downstream flooding risk and improve the ecological health of the Doan Brook watershed.

The NEORSD's recommendations include replacing the Lower Lake dam and retaining Lower Lake, while removing the dam at Horseshoe Lake and restoring the natural, free-flowing stream channels of the North and Middle Branches of Doan Brook. Draining Horseshoe Lake, removing the built up sediments, and restoring the natural, sinuous stream channels and a vegetated floodplain will provide more robust and natural flood control and restore valuable native habitat. We see an exciting opportunity within this plan to create a greenspace which promotes a healthier stream and stormwater management system with compatible community outdoor recreational opportunities.

In general, the Nature Center's interest is not necessarily based on whether we would prefer a stream vs. a lake habitat, but to support an outcome that:

- (1) provides safety to the downstream and surrounding community from severe flooding;
- (2) meets critical and necessary stormwater management goals;
- (3) conserves a natural area with diverse, native habitats that benefit the ecological vitality of the Doan Brook;
- (4) provides opportunities for community enjoyment; and
- (5) has funding mechanisms to ensure implementation and sustainment of the outcome, including funds for inspection, management, repair and liability insurance over the entire life of any structure.

While early dialogue continues around this topic, we strongly encourage the NEORSD to continue offering opportunities for community input as the cities of Shaker Heights and Cleveland Heights work to balance considerations of safety, fiscal and ecological sustainability, as well as recreational opportunities. To that end, the Nature Center remains committed to preserving the accessibility, scenic beauty, educational and recreational value of the Shaker Parklands and stands ready to provide input, education, and assistance to the cities and NEORSD as they develop conceptual plans for Horseshoe Lake and Lower Lake.

Frequently Asked Questions

Updated December 14, 2021

- 1. Why does NCSL take this position?** The Nature Center's position is based on three important factors: **safety, ecology, and cost**. The safety of our staff, visitors, students, and facilities is our number one priority. As one of the first built structures located immediately downstream of Horseshoe Lake, the Nature Center has a vested interest in protecting its staff, visitors, students, and facilities from potentially catastrophic flooding due to a breach of the dam, as is the investment our community members have made to sustain and enhance our trails, habitats, and infrastructure so we can continue to offer free nature experiences to the community.

SAFETY

According to NEORSD flood modeling predictions, if the lake were full and a catastrophic breach of the dam occurred in a 25-year storm event, approximately 16 feet of water would flood Lee Road within 2 minutes and the Nature Center would receive 9.76 feet of water within approximately 8 minutes. In a 100-year storm event, approximately 11.78 feet of water would flood the Nature Center within approximately 8 minutes. This type of failure would cause catastrophic damage to our facilities, trails, and habitats and put lives at risk. In addition, an enormous amount of sediment would cover our trails and habitats.

When a lake is filled with water, the flood control offered is only that additional water that can be managed above the water line. For this reason, a developed watershed or floodplain area offers significantly more flood control and is a safer and more long-standing option.

ECOLOGY

The analysis and interpretation of NEORSD's recommendations was conducted by our staff, Natural Resources & Facilities Committee, and Board of Trustees, who represent multiple interests and educational backgrounds, and have a responsibility to uphold [our mission](#).

Specifically, our staff has a wide range of expertise in environmentalism, natural resource management, science, and education and agree that free-flowing branches of the Doan Brook offer a more ecologically sustainable alternative to a man-made lake.

Ecologically, the lake does provide habitat for a number of bird species. It is important to note that species will not flee the area entirely, as nearby Lower Lake will continue to provide similar habitat. A restored riparian corridor with native plant species will provide valuable habitat for a wide variety of birds. There is also the possibility that the forthcoming landscape designs will be able to incorporate some open water habitat, and the Nature Center will remain involved in the environmental landscape development process.

Data from [Ebird.org](#) shows that species numbers are very similar between Lower Lake, Horseshoe Lake and adjacent riparian parklands. It's also important to note that Ebird aggregates reports into "hotspots," and many sightings from the lake are actually from the surrounding riparian habitat.

[Audubon Great Lakes](#) has indicated that dam removal and habitat restoration would not be detrimental to overall bird populations.

Similarly, turtles can either be relocated or will relocate on their own; Lower Lake is a similar habitat well suited for them. Sadly, most of the fish present in the lake were non-native carp and goldfish, which are not desirable in the habitat. Studies from the 90's showed a loss of many native fish species from the Shaker Lakes.

There were few other organisms utilizing the shallow Horseshoe Lake system prior to its drawdown. A number of factors affect water quality including heavy siltation, fluctuating water levels, and impacted water quality common in urban systems, such as heavy metal pollution, high bacteria and nutrient concentrations. Organisms utilizing this system must be tolerant of impacted, lower quality conditions.

COST

The Nature Center at Shaker Lakes understands that costs associated with either option and funds allocated are a function of the cities of Cleveland Heights, Shaker Heights, and the Northeast Ohio Regional Sewer District. Maintaining a dam in perpetuity is considerably more expensive than a native, free flowing stream within a watershed. That said, it is the responsibility of the cities, residents, and representatives to determine what is in the best interest of a longer term vision for the Shaker Parklands from a cost perspective.

- 2. *Does NCSL receive funding from the NEORSD or the cities? Has this influenced your position?*** The NCSL is not receiving funding in exchange for support of NEORSD's proposal, and is not swayed by political ties nor donations. The NEORSD sponsored our 2021 annual summer Benefit, *Nature at Night*, at the \$5,000 level, which represents less than 0.4% of our annual operating budget. In addition, we receive no city tax dollars to support our mission. We receive donations from memberships, individual donors, foundations, and corporations throughout our annual giving cycle to support our operations and our environmental education programs, and this has never factored into the daily decisions required to fulfill our mission. Our stance is strictly the result of analysis of the plan through the lens of our mission. We believe that if done properly, a re-envisioned Horseshoe Park can provide a healthier habitat that connects more people with nature while enriching the surrounding community. We strongly encourage NEORSD to embrace a vision for the North and Middle Branches of Doan Brook that reflects the more natural downstream conditions and diverse habitats found at the Nature Center at Shaker Lakes. To that end, the Nature Center stands ready to provide input and assistance as NEORSD develops its conceptual plans.
- 3. *Are they really going to drain the lake and fill it with gravel?*** Gravel fill is **not** part of the proposal from NEORSD. The lake level has been drawn down for some time to prevent a catastrophic dam failure that could cause loss of life and extensive damage. The plan calls for restoration of native habitat within the Doan Brook corridor in a park setting. Future meetings and decisions will include public input.
- 4. *Is the Nature Center at Shaker Lakes trying to create a second Nature Center at Horseshoe Lake?*** NCSL does not manage the property on or around Horseshoe Lake, and has no plans to create another Nature Center at that site. Restored riparian habitat may resemble the Doan

Brook corridor that flows through the Nature Center property, but there are no plans for the Nature Center to expand or take over the Horseshoe Lake site.

5. Isn't resisting the NEORSD proposal similar to the Freeway Fight that protected the Shaker Parklands from destruction decades ago? No, this proposal is seeking to mitigate risk of loss of life, and improve hydrologic function while restoring a habitat that historically existed at this location. There is no proposal to fill the area or replace it with hard infrastructure. This is a proposal to remove an unsafe artificial structure and increase habitat quality through restoration. The area will remain parkland.

6. *Why was Horseshoe Lake drained? Why is it still empty?*

In 2018, the Ohio Department of Natural Resources (ODNR) required that Horseshoe Lake be drained due to a concern about the safety of the dam. The initial expectation was that some relatively minor temporary repairs could make the dam safe enough that it could be refilled. However, additional problems were found when the lake was drained. Problems with the dam structure include active seepage through the dam sufficient to cause sinkholes upstream and cracks in the concrete and stonework of the spillway structure. Problems with the dam are severe enough that it is considered to be slowly failing. ODNR has required that the lake remain drained until major repairs can be made to the dam. Such repairs would include bringing the dam into compliance with requirements for a Class I dam (see below for the definition of a Class I dam).

7. *Who is responsible for the Shaker Lakes?*

The cities of Cleveland Heights and Shaker Heights are jointly responsible for maintaining the Shaker Lakes dams in compliance with the Ohio Department of Natural Resources. The Northeast Ohio Regional Sewer District (NEORSD) is responsible for the lakes and waterways for water quality and flood control purposes. The NEORSD has proposed to fund the removal of Horseshoe Lake dam and necessary upgrades to Lower Lake dam as part of their Regional Stormwater Management Program (see below for more information). NEORSD will not move forward with its proposal unless the two cities invite them to do so.

8. *Is Horseshoe Lake dam safe as long as the lake is drained?*

No. The dam cannot be made adequately safe in its current configuration. Whenever there is significant rain, water backs up behind the dam, putting pressure on the structure. Though the dam is in danger of failing each time this happens, NEORSD indicates that ODNR is not 'overly concerned about the risk of immediate failure at this time with the lake drained.' For the dam to be considered safe, it will be necessary to either remove it or substantially rebuild it.

9. *Where does the Ohio Department of Natural Resources (ODNR) come in?*

ODNR is responsible for ensuring that life, health, and property are protected from dam failures. In this role, they conduct periodic safety inspections of the Shaker Lakes dams, and they have the power to take enforcement action against responsible parties if safety orders are not addressed.

10. *What are the ODNR requirements for the Shaker Lake dams? What is a Class I dam?*

Since the 1970s, ODNR has classified both Horseshoe Lake dam and Lower Shaker Lake dam as Class I dams – the failure of which would cause probable loss of life. By the mid-1990s or before, ODNR required the cities to redesign the dams so that they could safely pass the design flood for Class I dams. These redesign studies have yet not been performed. A Class I dam must be able to safely handle the Probable Maximum Flood (PMF), which is an extremely large flood. Flows for the PMF at any particular dam are modeled following procedures defined by state and federal regulations.

11. *Why are the Shaker Lakes dams classified as Class I dams by ODNR? Can that classification be changed?*

ODNR classifies the Shaker Lakes dams as Class I dams because there is risk of loss of life if the dams should fail. ODNR has indicated that the threat to densely populated downstream areas in the event of a failure of one of the Shaker Lakes dams is such that the dams will always carry a Class I designation. This includes areas of Shaker Heights and Cleveland Heights west of the dams, including the Nature Center at Shaker Lakes and Case Western Reserve University.

12. *Where does the Northeast Ohio Regional Sewer District (NEORS) fit in?*

NEORS is responsible for regional stormwater planning. Their study of the Shaker Lakes and their recommendation for the lakes is part of their area-wide stormwater management responsibilities. NEORS can only provide funding for work on the dams that aligns with the goals of the Regional Stormwater Management Program that are to address flooding, erosion, and water quality issues within their service area.

13. *What is NEORS proposing?*

As part of regional stormwater management, NEORS proposes to remove Horseshoe Lake dam and create a naturalized stream with native plants in the footprint of Horseshoe Lake (see more information on what this might look like below). They propose to rebuild the Lower Shaker Lake dam so that it meets the ODNR criteria for a Class I dam.

14. *What are the costs for dam removal and reconstruction at both lakes?* NEORS estimates that the costs for removal of Horseshoe Lake dam and reconstruction of the Lower Shaker Lake dam would be approximately \$28 million, with about \$14 million allocated for removal of Horseshoe Lake dam and \$14 million for reconstruction of the Lower Shaker Lake dam. NEORS can fully fund the \$28 million cost of their proposal through the Regional Stormwater Management Program. They cannot fund any work on the Shaker Lakes dams that does not further stormwater management. Any costs associated with work on the lakes that does not further stormwater management would need to be funded by the cities of Cleveland Heights and/or Shaker Heights.

15. *What alternatives did NEORS study?*

NEORS considered many alternatives, but narrowed it down to four scenarios for Horseshoe Lake and the Lower Shaker Lake:

- Removal of both dams;
- Reconstruction of both dams to meet Class I requirements;
- Reconstruction of Horseshoe Lake dam to meet Class I requirements and removal of the Lower Shaker Lake dam;
- Removal of Horseshoe Lake dam and reconstruction of the Lower Shaker Lake dam to meet Class I requirements.

16. *Why does NEORS propose the alternative that removes Horseshoe Lake dam and reconstructs the Lower Shaker Lake dam?*

According to the NEORS stormwater masterplan study, the shape of the watershed and the configuration of the lakes mean that Horseshoe Lake does not provide much benefit for stormwater control. As a result, they cannot justify spending stormwater management funds to restore the Horseshoe Lake dam. In contrast, the Lower Shaker Lake provides stormwater control and mitigates downstream flooding. NEORS's findings indicate that the Lower Shaker Lake is important to the

mitigation of downstream floods, and they have therefore included reconstruction of the Lower Shaker Lake dam in their proposal.

17. *What are the estimated relative costs of the alternatives for the Shaker Lakes? Who would bear those costs?*

As mentioned above, NEORSD can only fund work that aligns with the goals of the Regional Stormwater Management Program. That work would include removal of Horseshoe Lake dam and reconstruction of the Lower Shaker Lake dam to meet Class I requirements and provide flood storage. The cities would need to fund any work that is not in alignment with the NEORSD proposal.

18. *Why hasn't the community heard more about these proposals before now?*

The NEORSD study of Doan Brook and the Shaker Lakes was done as part of their Regional Stormwater Management Program. They did not feel that they had significant results to share until that study was complete. Once the study was completed, it was made public and has continued to be shared in multiple public forums.

19. *Why is the timeline for a decision on these proposals so short?*

Concern about the safety of Horseshoe Lake dam has made work on that dam a priority and created urgency about moving ahead with work at Horseshoe Lake.

20. *Why can't NEORSD pay for all or part of rebuilding the Horseshoe Lake dam?*

NEORSD can only pay for projects that further the goals of the Regional Stormwater Management Program. Because their study did not show that Horseshoe Lake has much impact on flooding they cannot fund reconstruction of Horseshoe Lake dam.

21. *What would the area of Horseshoe Lake look like if the dam was removed?*

NEORSD proposes to naturalize Doan Brook in the footprint of Horseshoe Lake and plant native plants along the restored stream course. They propose to maintain pedestrian access across the current dam alignment. They plan to work with a landscape architect and with the community on the design of the area.

22. *What impact would removing the Horseshoe Lake dam have downstream?*

Because of the configuration of the stream and watershed, NEORSD's preliminary assessment is that removal of the lake would have minimal impact on downstream flooding. Preliminary modeling shows that after recreation of the native streams, water levels would be slightly higher at the Nature Center at Shaker Lakes, but that no structures or paths would be inundated in a 100-year flood. NEORSD will continue to study downstream impacts throughout the design phase of the project.

23. *What would a rebuilt Horseshoe Lake dam look like?*

NEORSD does not have a detailed design for a configuration of Horseshoe Lake that would meet Class I dam requirements. However, the dam would certainly look quite different. Some amount of the sediment that has accumulated in the lake over almost 200 years would need to be removed, and the spillway would need to be configured to pass the Probable Maximum Flood. The cost of removing sediment is high, and the amount of sediment that would need to be removed is uncertain. As a result, the \$20 million estimated cost for reconstruction and dredging of the dam is uncertain. The actual cost could be considerably higher.

24. *What will happen to all of the sediment in Horseshoe Lake if the dam is removed?*

Some of the sediment that has accumulated in Horseshoe Lake will have to be removed in order to naturalize the stream in the lake footprint. Exactly how the remaining sediment will be handled is

uncertain. Landscape design and stabilization will need to be carefully planned to prevent sediment from being carried downstream and damaging downstream areas.

25. *If any future models show surprising outcomes, such as having a significant impact on the NCSL, what will NEORSD do then?*

NEORSD answered this question as follows, “NEORSD is very concerned with downstream impacts on all of our projects. We have thoroughly studied and modeled the Doan Brook and the recommended alternative. During the design phase, downstream impacts will continue to be studied and any adverse impacts downstream will be addressed.”

26. *What would a rebuilt Lower Shaker Lake dam look like?*

NEORSD does not yet have a detailed design for a configuration of Lower Shaker Lake that would meet Class I dam requirements. However, it is certain that the height of the bank in the northwest corner of the lake would need to be increased, and that the spillway would need to be significantly enlarged to safely convey the Probable Maximum Flood.

27. *Which entity, cities or NEORSD, will be responsible for future maintenance at the two sites?*

Final maintenance needs and responsibilities will be determined based upon the final design.

28. *Is there really much flooding along Doan Brook?*

Yes. The Lower Lake dam overtops and floods North Park Boulevard and Coventry Road every few years. While this flooding is relatively minor, flooding farther downstream in University Circle and the Cultural Gardens is more severe and can be life-threatening.

29. *What is it going to look like when complete?* The Sewer District will hire a landscape architect and stream restoration expert as part of the design team and is planning to include community input in the design. If you’ve ever been to the Nature Center at Shaker Lakes, you can see Doan Brook in a much more natural state than what we have at Horseshoe Lake Park. We want to create an improved, safe and natural asset for the community that eliminates the risk of a failing earthen dam.

30. *How will stormwater be managed if there’s no lake?* When Horseshoe Lake Dam was constructed 170 years ago, it was designed to power mills operated by the Shakers until 1889 when the community disbanded. Horseshoe Lake and its dam were never intended to provide flood control and have primarily served as an aesthetic water feature since the late 1800s. By restoring Doan Brook, adding vegetation and sinuosity (or curves along the stream) that were once there, and constructing a floodplain throughout the area, stormwater can be managed more like nature intended, reducing flooding along area roads and downstream. Lower Lake and Horseshoe Lake were not really designed for flood control because they’re already filled with water. There is minimal active storage of stormwater at Horseshoe Lake, which is the amount of additional water, above the water line, that can be stored during heavy rains. Lower Lake, on the other hand, does provide significant active storage during rain events to minimize downstream flooding and with improvements made to the Lower Lake dam during reconstruction, this dam could provide more active storage than it currently does. This is beneficial to overall flood control in the Doan Brook watershed due to Lower Lake’s position of being downstream of Horseshoe, Green and Marshall Lakes. Lower Lake serves as a point of control for managing larger rain events in the watershed.

31. *How long will this project take?* This project will take some time to design and construct, and NEORSD is just working on Horseshoe Lake now. They hope to begin the design process for the dam at Lower Lake in the next year or two. NEORSD released an RFP (Request for Proposals) for the

“Doan Brook Restoration Near Horseshoe Lake Park” on September 25, 2021. Design would not be complete until late 2023, then the project will be bid for construction in 2024. The construction duration is currently not known because it depends on design details but it may take two years to complete all construction within the dam and lake footprint.

32. *Where can I find more information?*

For more information about NEORSD’s recommendations and answers to Frequently Asked Questions, please visit their website at <https://www.neorsd.org/shaker-lakes-review-and-recommendations/>. For additional questions, please contact: Jeff Jowett, NEORSD Senior Watershed Team Leader, at JowettJ@neorsd.org.

[Click here](#) to view a presentation about the NEORSD proposal for the Shaker Lakes dams.

[Click here](#) for more general information about the Doan Brook and Shaker Lakes.

[Click here](#) for details about Doan Brook hydrology and the history of the Shaker Lakes (The Doan Brook Handbook).

The mission of the Nature Center at Shaker Lakes is to conserve a natural area, connect people with nature and inspire environmental stewardship. For more information, visit <https://shakerlakes.org/>. For additional questions about the Nature Center at Shaker Lakes, please contact: Kay Carlson, President & CEO, at carlson@shakerlakes.org.