



Midpeninsula Regional
Open Space District

Memorandum

DATE: June 22, 2022

MEMO TO: Board of Directors

THROUGH: Ana Ruiz, General Manager *AR*

FROM: Brandon Stewart, Land and Facilities Manager

SUBJECT: Natural Ecological Succession of Schilling Lake to a Meadow and Eventually a Forest

BACKGROUND

Schilling Lake is approximately half an acre in size and located within the town of Woodside. The lake drains 153 acres of mostly steep wooded hillside and is prone to erosion and landslides given the surrounding geology and topography. More than eighty percent (>80%) of the land draining into the lake is in private ownership, with the remaining land owned by the Midpeninsula Regional Open Space District (District). A non-engineered dam, 25 feet high and 200 feet wide, was originally constructed in the late 1800s to power sawmills on Dennis Martin Creek and subsequently used as an irrigation source for extensive gardens that had existed on the property. The earthen dam retains the water and connects to a 13-foot-wide concrete spillway that directs water from the lake to Dennis Martin Creek.

In September of 2008, the District Board of Directors (Board) received a presentation to discuss a technical memorandum prepared by Wetland and Water Resources (WWR), Inc., that evaluates management and enhancement options (R-08-103) at the lake. Among the five key findings listed in the report, WWR determined that the lake would not be a priority for any enhancement options because much of the lake's surface is shaded by aquatic plants, which reduce the growth and photosynthetic action of phytoplankton and inhibit the gas exchange between the atmosphere and the water surface. Additionally, no special status species, such as California red-legged frog or western pond turtle, were present in the lake nor were there any nearby populations to colonize the lake.

During the presentation, staff identified *Option 2: Minor Intervention* as the preferred interim management alternative, which included the following actions:

- Completion of a downstream inundation study (and share conclusions with the Town of Woodside Engineer).
- Outreach to Woodside neighbors, particularly downstream, to explain the results of the inundation study.
- Pending results and recommendations of the inundation study, removal of trees and other woody vegetation from the dam-top and dam-face for structural integrity of the dam.
- Establishment of simple protocols for monitoring dam movement.

- Additional geotechnical assessment of dam stability and outlet works.
- Periodic removal by hand of duckweed and *Azolla* species of water fern to maintain open water habitat and improve the aesthetic appearance of the lake.

In May of 2009, the Board received a report discussing the results of the Schilling Lake Inundation Study at Thornewood Open Space Preserve (R-09-57). The study showed that dam failure at the current lake volume posed no risk of downstream flooding at any residences, other structures, or road/stream crossing between Schilling Lake and Searsville Lake, including Old La Honda Road, Portola Road, and Family Farm Road.

In April of 2010, the Board approved an amendment to the Use and Management Plan for Thornewood Open Space Preserve to implement a long-term management plan for Schilling Lake (R-10-58) that adopted *Option 2: Minor Intervention*. The long-term management approach for the lake more specifically included:

- Removal of six redwood trees growing on the earthen dam to maintain dam integrity.
- Partial removal of duckweed to enhance lake aesthetics and water quality.
- Cattail removal near the spillway to allow unimpeded flow of water through the spillway to help with the flushing of duckweed.
- Long-term monitoring of the dam and spillway.

DISCUSSION

District staff began implementing the management and enhancement options identified by WWR starting in 2008. Planning staff completed the prescribed inundation study and shared conclusions with the Town of Woodside, facilitated a meeting of the Planning and Natural Resources Committee (formerly known as the Use and Management Committee) where notifications were sent to 111 interested parties and neighbors, and completed a geotechnical assessment of dam and spillway stability. Visitor Services staff established a dam monitoring program to measure water levels and a plan for notifying the Office of Emergency Services (OES) if water levels substantially changed.

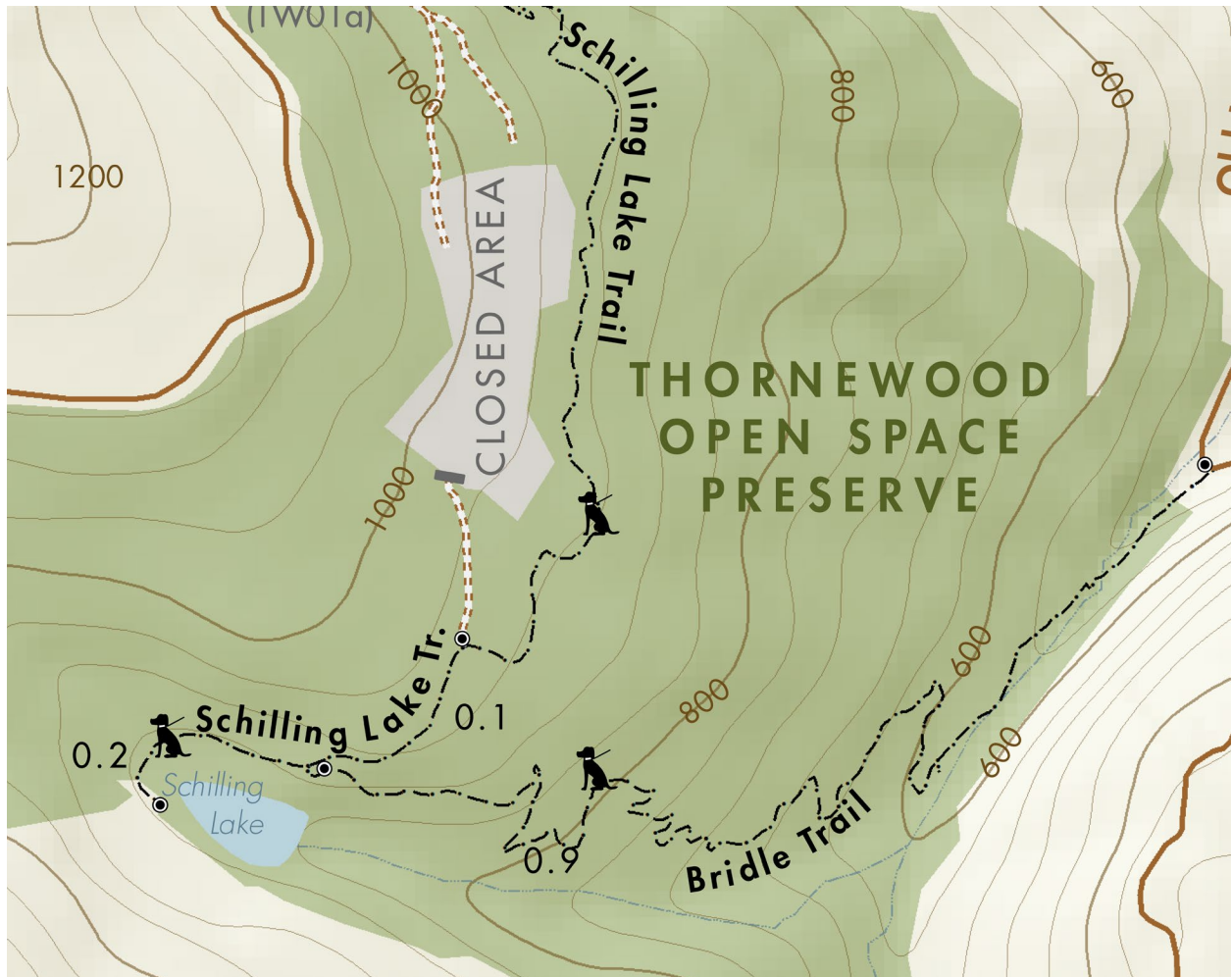
Additionally, Land & Facilities periodically removed duckweed (genus *Lemna*), aquatic fern (genus *Azolla*), and cattail (genus *Typha*) from the lake and spillway entrance. Six large redwood trees were removed, and staff has controlled any regrowth from the remaining tree stumps.

Even with the prior and ongoing maintenance, the lake has continued to experience heavy sediment deposition and the expanded colonization of cattail and willows (genus *Salix*). The eventual infill of Schilling Lake was anticipated under Option 2, which provided for only minor intervention of natural ecological succession. The combination of sediment accumulation and expanded vegetation growth has significantly reduced the extent of open water. As a result, the surface area that still retains suitable conditions where duck weed or water fern can grow has been greatly reduced. Therefore, Land & Facilities have suspended efforts to remove duck weed and water fern from the lake surface. Moreover, there is no longer a benefit to clearing the cattails from the spillway to allow the lake to flush out duckweed and water fern. However, annual preventative maintenance tasks to ensure proper flow of water through the concrete spillway, tree maintenance management throughout the site, and monitoring of the dam and spillway will continue while the site retains standing water to ensure that the water flow infrastructure remains functional. As indicated earlier, Option 2 fully anticipated the eventual natural succession of the lake to a meadow and eventually to becoming a part of the surrounding mixed evergreen forest. Once the lake fully transforms to a forest (or potentially sooner), the water flow infrastructure will no longer be necessary, and its maintenance would cease.

NEXT STEPS

As discussed above, staff will continue annual monitoring of the site, spillway and dam and maintenance of the water flow infrastructure until the lake fully transitions to a forest or sooner if deemed appropriate by expert staff through site inspections. An interpretive sign describing the natural ecological transition and succession of the pond to a meadow and eventually a forest will be developed and installed at the site.

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Pictures Depicting the Succession of Schilling Lake from East to West (Dam)



