Bluff Lake Nature Center
Final Grant Report to the Colorado Water Conservation Board
Bluff Lake Nature Center Aquatic Habitat Improvement Project

As part of accepting the Grant Funds to assist in the completion of financing of our Year-Round Lake Project, Bluff Lake Nature Center (BLNC) agreed to certain reporting requirements. BLNC is pleased to report on the great success and completion of our project, and invites CWCB staff to come to our site to view the beautiful, year-round lake.

Bluff Lake after the conclusion of the Lake Project

Detailed report of activities carried on under the grant, and what the grant accomplished

Phases I and II of the project have been completed. Phase III is currently underway, with plans to maintain a full lake by replenishing evaporation through a cooperative agreement with Denver Water. (We are currently working with the State Engineer's Office, Colorado Department of Public Health and Environment, and other regulatory entities to coordinate a process and agreement that meets our unique combination of mission-related, environmental and water-rights concerns.)

From the time of the WSRF grant our lead engineers at Ayres Associates began surveying, design, and engineering planning on the project, including permit gathering. In November and December of 2015, geotechnical surveys of the lake bottom and dam area were conducted, in order to help define conditions more specifically for design and engineering plans.

From January through May of 2016, Ayres worked on developing the engineering plans, with BLNC staff providing review and feedback. During this time, Ayres also gathered several necessary permits for the project. Ayres also met with the BLNC Board of Directors, and the BLNC Natural Resources and Site Management Committee, twice for feedback before finalizing the plans.

Construction was slightly delayed in the summer of 2016 due to a late-spring hawk's nest within a distance that would have caused us to be in violation of the Migratory Bird Act if we had gone forward with the construction activities at that time. However, we were able to begin construction 6 weeks later, shortly after July 15, 2016.

Phase 1, which included constructing a reinforcement for our circa 1884 dam, was begun in July 2016 and was completed as envisioned in the proposal. The 132-year-old dam was leaking badly after being compromised by tree roots and animal burrows over the many decades, as its initial construction was simple packed mud and stone. To provide reinforcement to the leaking dam, a new slurry wall was constructed next to the old dam. It has been poured, hardened, and covered on the surface. The slurry wall is not visible on the surface. It runs the entire length of the old dam. The slurry wall is approximately 1,100 feet long, 28 feet deep, and 2 feet thick/wide. The bottom depths are sunk into bedrock at least 5 feet along the entire length of the wall.

Phase 2 of the project was envisioned as the installation of a lake liner. For two reasons, an actual liner was not installed, but an equivalent plan was developed and has been being instituted. First, because Bluff Lake itself was formally determined to be a "water of the State," permitting requirements were unusually onerous related to importing materials (including potential liner materials) to be placed on the lake bed. Secondly, the results of geotechnical surveys and further planning indicated that dredging the lake to a clay layer would be equally effective as the actual installation of clay liner, and would provide additional benefits due to increased hydrological mixing with additional depth. We worked with Colorado Department of Public Health and Environment (CDPHE), who gave us the lead $1.1 million grant for this project, to shift to this approach. The heavy equipment on the lake also provided significant compaction, as the lake was dredged to as deep as 10 feet in some spots (the old depth was 3-4 feet, with a maximum of 6 feet) while leaving shallow shelves on the perimeter. This phase was complete in the fall of 2016, as well. In the end, we saved money on materials, as we did not have to import liner materials. However, it appears as if we'll end up expending a similar amount of funds because of the additional dredging, which resulted in more labor and disposal costs.


The carrying capacity of Bluff Lake Nature Center for native birds, mammals and waterfowl has increased significantly since the completion of the Lake Project. Visiting students and families have had the opportunity to watch families of waterfowl, raptors, deer, coyotes and foxes raised at Bluff Lake in 2017. Bluff Lake has remained full through autumn for the first time since the property was reverted from the old airport "crash zone."

Phase 3 of the project is focused on maintaining a full lake, year-round. One element of this includes the tapping of Denver Water's recycled water line running along Havana Street just a few hundred feet to the west of our site and lake. As mentioned previously, we are currently working through the policy and regulatory issues to make certain that we coordinate a solution for augmentation that meets the call for water rights, allows us to continue our mission-focus work for natural resource management and environmental education, and continue to serve as a best Management Practice for approximately 1000 acres of storm-water management for the Cities of Aurora and Denver. The final invoice for the WSRF Grant Funds includes engineering and other work as we work toward this, including data and reports on surface areas, evaporative calculations, geography, elevations and drainage.

November 3, 2017: Students from Hansen Elementary experience nature, "up close & personal." A year-round lake provides an enormous increase in the carrying capacity of the Bluff Lake refuge for a variety of birds and mammals.