



2022 Year-End Summary Report

Barefoot Lakes

Firestone, CO

Submitted to:
St. Vrain Lakes Metro District
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Project Background

Barefoot Lakes is a housing development with three home builders located in Firestone, CO. The lakes are a focal point for the development, centered around nature and designed for use by the community. On the East Lake, the public can enjoy recreational activities including paddle boarding, fishing, and non-motorized boating activities. The lakes are home to a healthy population of aquatic life including fish, birds, amphibians, and turtles. The West Lake is approximately 30 surface acres (SA) and the larger East Lake is about 50 SA. The lakes are separated by a short section of land with large equalization pipes between them. The lakes are filled from precipitation, runoff, and St. Vrain Creek.

These resources have a history of severe nuisance algae, aquatic vegetation growth, as well as cyanobacteria (blue-green algae) blooms. Water quality conditions vary significantly at different times of the year (see *2022 Water Quality Monitoring Report - Barefoot Lakes*).

SŌLitude Lake Management began managing Barefoot lakes in 2016 with the objective of enhancing aesthetics and mitigating nuisance algae and vegetation growth. Nutrient remediation, contact and systemic herbicides, beneficial bacteria, dye application and algaecide treatments have been implemented and successful at maintaining the two lakes. A bottom diffused aeration system was installed in the cove near Peninsula Park in July 2020 and has done an excellent job in circulating nutrients and preventing stagnant water.

The water quality in the lakes has been monitored for the last few years in order to establish baseline conditions and track changes over time. The monitoring report that overviews water quality from 2022 has been provided under a separate cover but will be referenced in this document.

Aquatic Resource Management

During the 2022 season, SŌLitude Lake Management visited the lakes approximately every 2 weeks from May through September with one visit per month in April and October to manage the water quality and appearance. At each visit, visual inspections were conducted on water levels, clarity, surrounding environmental conditions, as well as nuisance algae and aquatic weeds. Conditions were noted and algae and aquatic weed treatments were completed if necessary.



At the beginning of the season, nutrient remediation was completed to reduce the excessive nutrients to limit the potential for algae and weed growth. Each month, aquatic dye was added to both lakes to enhance aesthetics and limit light penetration for photosynthetic processes. During the season, the lakes were treated for aquatic vegetation and nuisance algae as needed. Treatments were focused to preserve aesthetics while maintaining aquatic vegetation in some areas for fish habitat. Water levels decreased mid-season increasing the potential for an algae bloom.

In July, a planktonic algae bloom was observed in both lakes with a higher density in the West lake. Both lakes were intermittently treated with algaecide and water quality enhancer for the remainder of the season. Based on the water quality results and visual observation, planktonic algae density steadily decreased after the treatments performed in July. With temperature increases filamentous algae was observed along the shoreline of the West Lake. A granular algaecide was directly applied to the algae mats and proved to be effective in disintegrating the algae.

Throughout the 2022 season, no nuisance vegetation was observed. Shoreline weeds remained under control this season and were left untreated to keep fish habitats intact and maintain ecological balance. Maintenance on the aeration system was performed in April and October. In April, the aeration system was running properly and no issues were identified. Throughout the season, the breaker would trip and cause the aeration system to turn off. Each service appointment, SŌLitude biologists flipped the breaker switch to turn the aerators back on. A meeting was held with Daryl Fields in October to give an overview on the services performed and the electrical maintenance required on the breaker.

In June, SŌLitude Lake Management performed an electrofishing survey. From this survey, the majority of nuisance fish species such as carp and catfish were removed from both water bodies. Beneficial fish species were measured and weighed to collect pertinent data on the ecology of Barefoot lakes. A summary of the findings was delivered to Doug Campbell and can be resent upon request.

Due to continuous algaecide treatments along with the application of beneficial bacteria and dye, Barefoot Lakes remained in safe conditions for recreational activities to presume over the summer. Overall, the conditions of Barefoot Lakes have continued to improve since management began in 2016. The continued proactive management that has been implemented over the last 5 years has contributed to these improvements.



Conclusions and Recommendations

During the 2023 season, SŌLitude biologists plan to use nutrient binding products and continue algaecide treatments as the season progresses. Aquatic dye should continue to be added since it fades in the water column over time. SŌLitude biologists will continue to monitor any changes or cyanobacteria blooms in conjunction with water quality sampling efforts and adjust the management accordingly. This adaptive management will maintain the water quality, fishery health, and optimal aesthetics of the lakes.

Annual or bi-annual fisheries assessments, removals, or stocking is recommended to continuously mitigate Common Carp overpopulation and increase the health of the fishery. To determine if the lakes are viable for fish stocking, it is essential to analyze the water quality results of May and June. Stocking fish in poor water quality conditions can stress the fish and trigger a fish kill.

Based on the water quality results, a full lake phosphorus inhibiting treatment will be applied to the East Lake. If visual inspections and water quality demonstrate improvements after treatment, SŌLitude will apply the same treatment to the West Lake. By inhibiting phosphorus in the water column and sediment, nitrogen and phosphorus binding will subside in turn decreasing algae growth. Reducing phosphorus and algae growth will conform all other nutrients to ideal levels.

Increasing the aeration diffusers to cover the entire East Lake will greatly benefit the water quality creating optimal conditions for fish to thrive in. By establishing a monthly aeration maintenance program, SŌLitude will be able to better ensure the system is running properly throughout the season by changing filters and testing electrical currents to the system.

SŌLitude Lake Management will continue to monitor and implement recommendations in the annual maintenance service to help further improve the lakes. SŌLitude Lake Management® appreciates the opportunity to work on Barefoot Lakes to maintain water quality and appearance for the community and safety of the environment.

