UPPER DESCHUTES
WATERSHED COUNCIL

July 5, 2017

Sarah Kelly
Oregon Department of State Lands
1645 NE Forbes Rd., Suite 112
Bend, OR 97701

Re: Comment on DSL Application #60239

Dear Sarah:

I would like to provide several comments on the Mirror Pond Solutions LLC application to DSL for the dredging of the Deschutes River in Mirror Pond. Within this reach of the Deschutes River, the Upper Deschutes Watershed Council's restoration and management priorities include: improving water quality, providing fish passage at the dams, and increasing the amount of in-stream, wetland and riparian habitat available for fish and wildlife. Although this project is not related to fish passage, habitat and water quality are likely to be affected by the proposed project.

The attached table provides a summary of the habitat and water quality conditions in Mirror Pond under existing conditions, the proposed dredging condition and a potential "no action" alternative. In addition, the following are several specific comments about the application:

1. In Section 1 of the application, the applicant suggests that the proposed dredging is necessary to address siltation's "possible negative effects to fish, wildlife and water quality." While it is accurate that Mirror Pond generally provides poor habitat and the presence of the pond ("reservoir") likely contributes to poor water quality, the proposed dredging would not likely improve these conditions. More likely, the dredging would reduce habitat and water quality because of the increased capacity of the reservoir and, as a result, the increased residence time and warming of the Deschutes River. The application should be revised to include a more accurate representation of the current and potential future conditions at the site, including a complete analysis of the project's anticipated impacts to habitat and water quality.

2. In Section 3 of the application, "fish kills" are discussed as a consequence of the current conditions. To my knowledge there have not been fish kills in Mirror Pond. As summarized in the attached table, a no-action approach would likely reduce the potential for future problems with dissolved oxygen because the successional process is currently moving the river toward a condition where there will be increased velocity, reduced residence time, reduced solar heating, improved near-channel/emergent vegetation and, consequently, improved temperature and dissolved oxygen. The

proposed dredging, in contrast, could actually increase the likelihood of future water quality problems for fish because of the potential impacts to water temperature and dissolved oxygen with the increase in water residence time. As recommended above, the application should be revised to include a more accurate representation of the current and potential future conditions at the site, including a complete analysis of the project's anticipated impacts to habitat and water quality.

3. In section 7 of the application, it states that there are no ESA-listed species at the site. Given that the Oregon Spotted Frog is present upstream of the site near Colorado Avenue, there is a reasonable possibility that spotted frogs are present in Mirror Pond. There should be consultation with the U.S. Fish and Wildlife Service to determine whether this species may be present on site and, if so, what measures should be taken.

4. In section 8A of the application, it states that "sediment from the project site could be beneficial downstream." This statement is inconsistent because the proposed project is premised on the assertion that sedimentation in one location (Mirror Pond) is causing ecological harm that should be remedied through dredging, an assertion that is in conflict with the statement that potential sedimentation in another area (downstream of the project site) would provide for an ecological benefit. The potential for sediment mobilization should be quantified more specifically and the specific downstream ecological impacts, if any, should be quantified and evaluated so that appropriate protection and/or mitigation measures can be incorporated.

In addition to the above specific comments, I would like to provide clarity about the potential alternatives at this site because they are not thoroughly presented in the application. The application states in Section 5 that no action would bring "negative aesthetic and environmental effects" when current understanding of the successional processes present in Mirror Pond suggests that the no action alternative would actually improve ecological conditions in the river when compared to the proposed dredging. Under a no action alternative, the river between Galveston and Newport Avenues would continue to evolve into a sinuous channel as sediment accumulates along the margins of the pond, slowly facilitating the development of emergent wetlands as the areas of sediment deposition are colonized by vegetation. Eventually, the site would support a relatively narrow, low-gradient river channel flanked by emergent wetland and riparian vegetation. As the channel narrows and velocity increases, this would reduce the total water surface area exposed to solar heating and reduce the residence time of the water impounded in the Mirror Pond reservoir. Reducing the residence time and solar heating would likely benefit water temperature in the Deschutes River. Reductions in temperature would also likely benefit dissolved oxygen because low dissolved oxygen conditions are often tied to increased water temperature.

Emergent wetlands and/or riparian vegetation, if allowed to colonize over time through a no action alternative, would support several important ecological functions. They would contribute to fish and wildlife habitat, including areas for breeding, foraging and other functions depending on the species. Wetlands would also increase the natural uptake of nutrients that may come from run-off in surrounding areas. The Deschutes River is nitrogen limited so any reduction of nutrient inputs would benefit water quality by reducing primary production.

The type of successional process described above is common in rivers where some type of impediment (e.g., a landslide, beaver dam, human-made dam, etc.) backs up water into a pond or reservoir, reduces the gradient of the river, and causes changes in river hydraulics, sedimentation and channel geometry. An example of this successional process can be found in Bend upstream of Colorado Avenue on the Deschutes River where the former mill pond has slowly filled with sediment and wetlands have developed along the river over a series of decades. This area has changed over time, from open pond, through sedimentation, to the current condition where wetlands exist throughout the area and the river channel has narrowed. Given the similarities between the Colorado Avenue site and Mirror Pond, it is expected that this same trajectory of sedimentation and channel evolution will continue to occur in Mirror Pond in the absence of dredging. Over time, Mirror Pond would ultimately resemble the area upstream of Colorado Avenue. This successional process is important to consider because this process would ultimately improve water quality and fish habitat conditions, resulting in a condition that is healthier than both the current condition and the condition that would occur following the implementation of the proposed dredging project. This future condition would also be largely maintenance-free as repeated dredging would not be needed over time.

In contrast, under the proposed project, the dredging operation would interrupt the successional process described above and prevent the formation of the type of wetland and riparian habitat currently seen near Colorado Avenue. Accordingly, the fish, wildlife and water quality benefits of wetland and riparian habitat formation would not be realized. The proposed project would increase the capacity of the reservoir by up to 75,000 cubic yards, increasing the residence time for water in this impoundment and maintaining an artificially large surface area exposed to solar heating. The increase in residence time and solar heating would likely contribute to increases in water temperature and reductions in dissolved oxygen.

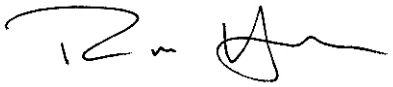
Recommendations

I recognize that DSL regulations do not protect the future habitat and water quality benefits that would result from continued succession under a no action alternative. I also recognize that this kind of succession would not likely result in the type of aesthetic condition desired by the applicant because one of the stated project objectives is to restore a ponded condition.

However, to adequately evaluate the potential effects of the project on the Deschutes River, I recommend that comments #1 - 4, above, be addressed through a study of the potential effects of the project on habitat, water temperature, dissolved oxygen and downstream sedimentation. Importantly, this study should include a detailed comparison of the proposed action to a no action alternative so that the effects of the project can be fully understood. If the study indicates that the project will result in negative net impacts to water habitat, temperature, dissolved oxygen and/or downstream sedimentation, I recommend that the project be modified and/or DSL require offsetting mitigation to ensure that there is no net impact to the Deschutes River as a result of the project.

Thank you for the opportunity to comment on this proposed project. Please let me know if you have questions or would like any additional information.

Sincerely,



Ryan Houston
Executive Director
Upper Deschutes Watershed Council

Summary of potential project changes to habitat and/or water quality

	Existing condition (2017)	Dredging as proposed	Future condition if no action (10+ years?)
Wildlife habitat (wetlands and riparian areas)	Generally poor habitat but pockets of wetland/riparian areas (e.g., in front of Harmon Park) provide some limited habitat	No changes expected unless these wetland/riparian areas are disturbed.	Wetland and riparian areas would expand as vegetation colonizes the sediment deposition areas, creating an increase in the amount of available habitat.
Fish habitat	Generally poor habitat but the formation of a primary channel through the middle of the pond has increased stream velocity through the center of the pond. Most fish use is focused in this channel.	The proposed dredging would eliminate the primary channel that flows through the center of the pond, converting the river back to a ponded condition that is less favorable to native fish as it would be a slow-moving pond environment. The rate of sedimentation in the pond post-dredging would increase beyond the current rate (sedimentation rates would increase as the velocity decreases in the larger capacity reservoir immediately post-dredging), resulting in a net reduction in the quality of habitat in these areas.	Fish habitat would improve as the channel becomes more like the existing river channel located upstream of Colorado Avenue. The growth of streamside wetlands and riparian habitat on the existing sediment flats would improve the quantity and quality of nearshore habitat.
Water quality - temperature	The Deschutes River does not meet state water quality standards because the temperatures are too high. Although the pond likely contributes to some temperature increases (compared to a "no pond" condition), these increases are likely to be very small because of the short residence time of the water.	The project would increase the residence time of water because the pond's holding capacity would increase by up to 75,000 cubic yards (or whatever amount is dredged). This increased residence time could contribute to warmer temperatures because water would be exposed to solar heating for a longer period of time. This is a very typical water quality impact	The warming in the river would likely be reduced because the narrower channel would have less surface area exposed to solar heating, and the residence time of the water in the pond would be reduced as the velocity increases in the primary channel that is forming through the middle of the pond.

		associated with reservoirs, with the degree of temperature impact varying based on many factors. The exact amount cannot be determined without water quality modeling.	
Water quality – dissolved oxygen	The Deschutes River does not currently meet state water quality standards because the dissolved oxygen levels are too low during certain times of the year. Dissolved oxygen levels are likely driven by several factors, including warm water, aquatic vegetation growth, death and decomposition, and sediment oxygen demand and/or biological oxygen demand.	The project would likely reduce dissolved oxygen because of the increased temperature that results from the increased residence time of the water. If the growth, death, decomposition cycle of aquatic vegetation is reduced because this vegetation can no longer grown on the sediment flats, oxygen uptake could be reduced, resulting in a benefit at specific times of year. The net effect of these changes cannot be determined without water quality modeling.	Dissolved oxygen conditions would likely improve because there could be reduced warming (as described above), and as wetlands begin to occupy the sedimentation areas, the amount of shallow water available for aquatic plant growth, death and decomposition would be reduced. This would reduce a source of oxygen consumption.
Water quality – overland run off	There are a few areas where natural vegetation provides a sufficient buffer to filter overland runoff.	No changes expected unless these wetland/riparian areas are disturbed.	The filtering capacity of the wetland/riparian buffers would increase as these vegetation communities grow in size over time. This would likely result in reduction in total nutrients reaching the river.