

# Devils Lake Management Update Plan

by Devils Lake Water Improvement District Staff

September 2018

## Board of Directors

Kent Norris, Chair

Tina French, Vice Chair

Steve Brown, Treasurer

Bill Sexton, Director

Kathy Kramer, Director

**This document is intended to be an update of the existing Devils Lake Plan. Its primary purpose is to update the DLWID Board's Vision Statement, Goal Statements, and to highlight various plans and accomplishments.**

## EXECUTIVE SUMMARY

---

Devils Lake is a shallow, 680-acre coastal lake that has long suffered from the effects of inputs of excess nutrients. Most prominent of these effects was the domination of the lake by nuisance aquatic plants in the 1970's. Aquatic weed infestations largely choked the lake covering over 60% of the surface. Recreation was greatly impacted, and property values were in decline. In 1984, a local government/special district entity, the Devils Lake Water Improvement District (DLWID), was formed with the purpose of improving water quality, improving the environment for fish and wildlife, and generally reestablishing beneficial uses, including safe navigation and public access.

Long-standing concerns in the watershed that affect Devils Lake continue to be ongoing inputs of creek-borne, E-coli bacteria from Thompson and Rock Creeks, historical and on-going lake-wide inputs of nitrogen and phosphorus from residential septic systems, increasing sedimentation, erosion, storm water inputs, intermittent cyanobacteria blooms, and the threat of the return of nuisance aquatic plants to the lake. This update plan has been developed to update lake management strategies for Devils Lake best management practices, and to achieve the District's mission and goals. This document is intended to be adaptable and updated as necessary to support the DLWID Board.

With the impacts of unwelcomed and detrimental nutrients coupled with a relatively shallow lake environment, the direction for the management of Devils Lake will first concentrate on an increased emphasis on water quality testing, analysis, and results posting to notify the lake users of current water quality during the typical late spring-late summer recreation season. Second, the Devils Lake Water Improvement District will continue to commit to the lake aeration project design and implementation with the goal of raising dissolved oxygen levels at the lower water column and reduce thermal stratification. Significant Devils Lake aeration project research has been completed leading to a design solution that included options of aeration, biomanipulation (reduction of European carp, revegetation, and control of excess small fish), algaecides, dredging, wetland filters, and macrophyte harvesting. Aeration was chosen based on cost, effectiveness, land use, and the potential to improve the environmental long-term health of the lake. The aeration project is under contract and is expected to begin during early October 2018.

The operational and accompanying improvement projects are complimentary. The water testing results provide valuable data points that are closely analyzed to determine water quality and support the requirement for the execution of the Devils Lake aeration project.

The Devils Lake Water Improvement District was established in 1984 for the purpose of “**restoration, maintenance, and enhancement of Devils Lake**”. In 1988 property owners in the watershed voted to financially support the District with a permanent tax base. This ongoing financial support is budgeted each year to accomplish specific objectives that seek to meet the overriding mission of the District listed below:

- Improve and maintain the water quality in Devils Lake
- Improve the environment for fish, wildlife, and humans in Devils Lake and its watershed
- Improve recreational opportunities in and on Devils Lake
- Improve and maintain safe and efficient navigation through Devils Lake
- Increase public access to Devils Lake
- Improve the economy of North Lincoln County through the restoration and maintenance of Devils Lake
- Increase public awareness and public education of Devils Lake

**Goal 1. Improve and maintain Devils Lake by water quality testing, monitoring, analysis, and water quality status reporting.**

**Background.**

Water quality field work, laboratory analysis, review and reporting has been ongoing for years. The sampling was completed on a weekly basis by taking grab samples either from the shoreline or from a boat. Water clarity was estimated via Secchi disk. This work was undertaken to only determine the presence of e-Coli (fecal coliform) in the Devils Lake water column. Another sample procedure provided weekly lake level and water temperature. If blue-green algae were identified, regulatory agencies were provided notice and the lake was posted with warning notices by signage postings. Electronic postings were sent via a variety of websites. Water quality reports were distributed post-sampling on a weekly basis from Memorial Day to Labor Day each year.

**Action 1.**

The official and documented sample locations for the updated water quality testing regime is now in-lake only. Three set-aside/indicator (but still registered) samples are taken on Park Lane, where Thompson Creek crosses under the road, the outlet of Thompson Creek just west of East Devils Lake Road where the creek out-flows from an under-road culvert and enters the lake finger, and at Rock Creek where it crosses under East Devils Lake Road. The samples taken at the outlet of Thompson Creek have tested highest positive for E-coli bacteria since the testing regime began.

Updated protocols and work practices have been instituted during the last year for water testing, laboratory analysis, analysis posting, and the district has developed a plan centered around a new water quality testing regime. New water quality testing equipment was funded by DLWID and a grant from the Confederated Tribes of Siletz Indians. This equipment includes a multiprobe sonde with sensor probes installed to identify and

record the presence of electrical hydro conductivity and temperature, dissolved oxygen, ph, turbidity, algae, and nitrate. These findings have provided the basis for an improved water quality testing regime that are automatically recorded on either hand-held or other electronic devices to greatly ease water sampling data capture. Additionally, data graphing, reporting and data distribution will be far more efficient. Water quality testing continues to be accomplished on a weekly basis from Memorial Day through Labor Day each year. The results are posted in a variety of electronic and print media to inform the public of real-time water quality and notify them of any water quality concerns. Water testing, and laboratory analysis, and results posting is accomplished by a combination of trained volunteers, student interns, and DLWID staff through the recreational use period. DLWID has no plans to modify this well-tested team approach and process.

In support of the upcoming aeration project, data gathering is expected to continue from this fall for 2-3 years in nine lake locations; five in the deep-water central lake, two each in the mid-depth north and south lake locations. Our goal is to conduct weekly testing, weather permitting, providing results for temperature, turbidity, nitrate, algae, dissolved oxygen, ph, and conductivity. This extended water quality testing period will be accomplished to record the positive effects of the operating aeration system considering changes in water temperature, ambient air temperature and large increases in precipitation.

## **Action 2.**

DLWID staff are currently working with Lincoln County Health and Human Services personnel on all matters relating to the Thompson Creek E-coli issue. Through Lincoln County, coordination has been made with Oregon Department of Environmental Quality (Eugene office) to develop a program to ultimately identify sources (locations) of E-coli within the Thompson Creek system. We expect the development of this program will continue for an undetermined amount of time. The identified specific sources of E-coli, once known, will be regulated by state and federal agencies with the goal of reducing the E-coli source to a point of non-detect. Additionally, DLWID staff has had meetings with the Ducks Unlimited Manager of Conservation Programs and Senior Regional Engineer for Oregon, Washington, Idaho, and Alaska to form a mutually beneficial partnership that hopefully will produce several projects at Devils Lake. One supporting this Action is the design and creation of an E-coli bacteria mitigation artificial wetland or filtration system to be located at the lower portion of Thompson Creek. Staff is currently reviewing suitable locations for the citing of this potential project.

## **Goal 2. Improve the environment for fish, wildlife, and humans utilizing the Devils Lake System.**

### **Background.**

Devils Lake is one of the more popular fishing locations on the Central Oregon Coast. Equally strong fishing opportunities are found in the Salmon and Siletz Rivers and Schooner and Drift Creek. Specifically, to Devils Lake:

In 2018, the Oregon Department of Fish & Wildlife (ODFW) stocked Devils Lake with 13,500 rainbow trout during March and April for the Youth Fishing Derby and general spring and summer fishing opportunities. The most popular method of Devils Lake fishing is from the bank with worms or salmon eggs. Many people troll with their own boats or those rented from Blue Heron Landing, a marina located on West Devils Lake Road. Local trout fishing is especially good during the spring and summer seasons. Anglers have found that Devils Lake also hosts

many largemouth bass, and clubs hold fishing derbies at the seasons peak. In additions to trout and bass, the lake also has a fluctuating population of yellow perch, crappie, bluegill, and catfish, and Pacific Lamprey.

*Oregon Coast Coho salmon are currently listed as threatened under the federal Endangered Species Act. The National Marine Fisheries Service (NMFS) completed its most recent 5-year Status Review in 2016 and concluded the Oregon Coast Coho salmon evolutionarily significant unit (ESU) should remain listed under Endangered*

*Species Act (ESA) as threatened. ODFW worked closely with NMFS on the development of their Oregon Coast Coho Recovery Plan, which was finalized December 2016.*

*The Pacific Lamprey is considered as a Species of Concern. In April 2010, the USFWS released the Best Management Practices to minimize adverse effects to Pacific Lamprey.*

The forests, beaches and marshes surrounding Devils Lake are home to millions of insects, birds, frogs, squirrels, deer, elk, and bear. The mature forests and estuaries nearby support black tail deer, with evergreen and riparian zones providing habitat for harbor chipmunks, rabbits, porcupines, weasels, and badgers. Raccoons and possums are also commonly found.

Another species is the coyote, which preys on insects, birds, rodents, and small animals. Every year, a few residents report viewing of black bears in remote areas of the lake. Other carnivores, more seldom seen include mountain lions and bobcats. The rivers/creeks that feed Devils Lake support populations of beaver, muskrat, nutria, and otter. Beaver dams can be seen in close vicinity to the lake.

On Devils Lake, populations of geese, wood ducks, mallards, blue herons, and egrets are enjoyed by recreational visitors, local anglers, and residents.

The small seabird, Marbled Murrelet are suspected to be present in close proximity to the lake, nesting in large coniferous trees. Additionally, osprey, and the American Bald Eagle are frequently observed in trees around the perimeter of the lake.

*In 1992, the USFWS federally listed the Oregon and California population of the Marbled Murrelet as a Threatened Species.*

## **Action 1.**

The DLWID board has committed to an important project to design and install a lake aeration system in Devils Lake with the goal of raising dissolved oxygen levels at the lower water column and reduce thermal stratification, thus improving water quality and improving lake health. This, of course will promote an improved habitat for fish, wildlife, and humans.

This project will provide for the installation of a central- lake, deep water array of aeration diffusers located on the bottom of the lake/on top of the sediment layer interface. This diffuser array will provide compressed air fed by a compressor station located nearby on the lakeshore. The project will promote a water turn-over rate of 26.6 million gallons per day, or 1950 acre-feet per day. The total volume of treatment area is 600 acre-feet for the array size of 50 acres. The system is designed for and expected to turn over and oxygenate more than three

times the volume of the treatment area each day. We are executing this project with the expectation of significant aeration benefits for a large distance beyond the treatment area.

## **Action 2.**

Promote aquatic vegetation and shoreline terrestrial plant material growth and health through the development of a monitoring plan and Save our Shoreline (SOS) Committee activities. This proposed monitoring plan is to be developed utilizing drone or aerial photography technology to create a base map to determine the percent of aquatic/shoreline vegetation presence. This then will be broken down to invasive and non-invasive species categories. The base map will be updated on an annual basis to track overall growth trends and consolidations by location. SOS committee members and other volunteers will provide additional expertise via on-lake/boat observations to specifically identify vegetation species and memorialize their findings. DLWID staff will be developing a cost model to deploy the drone or aerial photography technology and will be presented through the SOS Committee to the board at a future meeting.

Additionally, the SOS Committee promotes vegetation planting projects for lakeshore residents. This program includes a definable project "charter" identifying a planting schematic with typical plant material listings. This may be submitted to the committee by a resident for DLWID board partial-project funding. The committee holds educational meetings to update residents of this opportunity and to promote the benefits of participation in this program. This committee will plan on another "open house event" early in year 2019 to promote private property vegetation planting projects.

For year 2017-18, a demonstration project was planned, designed, and constructed. It consists of a floating garden (planter island) and is based on a European concept of a floating wetland with appropriate plant species selected to flourish in an aquatic environment.

## **Action 3.**

Develop a project to remove sediment in front of Hostetler Park, near the D River. Prior material removal estimates total 2000 cubic yards of sand. This project was brought to the District by a group of individuals that wished to volunteer their efforts and equipment to reduce the sand buildup that has occurred during the past twenty years. While initially it was to be physically conducted by volunteer efforts, the District has determined the project scope exceeds the labor and equipment capabilities of the all-volunteer force.

DLWID staff are working with City staff to explore the possibility of re-permitting the D River, Corps of Engineers Emergency sediment removal permit to conduct planned maintenance action sediment and woody debris (drift wood) removal from the D River. This material is transported by high tide wave energy to not only the D River but also the lowest 300-400 feet of Devils Lake. A modified permit would allow for a significant deposition to be removed from the lower lake zone and transported to the D River for removal along with the River excess material.

**Goal 3. Support the improvement of recreational activities at Devils Lake through Executive Director/Lake Manager coordination with various City recreational activity promotion agencies/offices and the Devils Lake Special Projects/Events & Communications Committee.**

Lake-front marina with a variety of boat rental opportunities

Support motorized and sail boats

Support canoes, kayaks, paddle boarding events

Support safe swimming activities (safety buoys, life vest stations, safety kiosks)

Support local fishing derbies/events

Support community, state-wide and national boating races and events

**Goal 4. Improve and maintain safe and efficient navigation through Devils Lake through management liaison between the Executive Manager/Lake Manager and Lincoln County Marine Patrol.**

Ensure lake vegetation is not impeding boat traffic

Ensure lake level is adequate for safe navigation

Ensure near shore location are adequately marked with safety buoys

Coordinate with local jurisdictions, especial Marine Patrol for any impediments to safe navigation

**Goal 5. Increase public access to Devils Lake.**

Work with local jurisdictions and the Devils Lake Neighborhood Association (DNLA) to monitor and report any access points presenting an impediment to access

Continue discussions with City and State Parks departments relating to access improvement possibilities relating to sand deposition and woody debris

**Goal 6. Improve the economy of North Lincoln County through the restoration and maintenance of Devils Lake.**

This is addressed in Goal 7.

**Goal 7. Increase public awareness and public education of Devils Lake.**

Promote public involvement through increased citizen knowledge of lake management practices and activities. This is basic communication, outreach and education. It is expected that the Devils Executive Manager/Lake Manager will be involved in this effort by attending public functions with ties to Devils Lake activities and providing lake management messaging of interest to the public. As new lake practices and education pieces are developed, the Executive Director/Lake Manager will invite the public to become informed and involved with the management practices of the lake. Typically, the DLWID website and Constant Contact are promoted to educate and inform the public of meetings and educational opportunities.

The District formed committees to develop citizen interest and involvement related to the promotion, operation, and improvement of the lake experience. We believe these committee activities are very important and add greatly to the success of lake management. The committees are:

Sewer Committee

Special Projects/Events & Communications Committee

Save our Shorelines/Water Monitoring (SOS) Committee