

## Tenmile Lakes Watershed Clean Water Plan

### Background

The value and health of Tenmile Lakes is dependent on good water quality. Many in the Tenmile watershed are working to find the causes for declining water quality and are committed to reversing this trend. Nuisance weeds and algae in Tenmile Lakes have caused problems for area residents and those who use the lake for recreation. A blue-green algal bloom that occurred in 1997 triggered health advisories warning of elevated toxin levels. Continued health advisories have heightened community water quality concerns since that time.

DEQ has worked in partnership with others in the community to develop an assessment focusing on water quality goals and pollution control targets. A planning approach for improving the lake water quality over time is also included. These documents are designed to meet federal Clean Water Act (CWA) requirements and will assist in setting a baseline from which progress can be measured.



### Total Maximum Daily Loads (TMDL)

DEQ is establishing limits known as Total Maximum Daily Loads (TMDLs) in the Tenmile Lakes Watershed for nutrient pollutants, which are directly related to the weed and algae problems. The Tenmile Lakes Watershed TMDL focuses on sediment and phosphorus and describes the amount (load) of these pollutants that the lakes can receive and be expected, through time, to meet water quality standards. All lakes have some level of natural nutrient loading from things like natural landslides,

wildlife, and decaying organic material. Tests have shown that the rate the lakes have been filling with sediments has dramatically increased compared to predevelopment rates. Landowners who own property near the mouths of tributaries are increasingly alarmed by the accelerated rate of the formation of sediment bars.

Phosphorus travels to the lakes on sediment, and the amount of sediment (and phosphorus) delivered to the lakes from human-caused activities has increased. This sediment loading has exceeded the lake's ability to "digest" the accompanying nutrients. Because the lakes act like big settling basins, very little of this sediment and phosphorus load can be moved out of the lakes once it enters. This makes coastal lakes very sensitive to upland sediment inputs. In stream systems, large storms can more readily move and digest sediment loads.

The filling in of the lake facilitates the growth of weeds because they can root on the lake bottom and still get sunlight in shallow waters. Because the blue-green algae that are problematic in the lakes are able to take nitrogen from the air, lake-bottom sediments can provide some of the phosphorus they need to grow. In the summer months, phosphorus from increased lakefront activities is more readily available to algae than that stored in sediments. Reducing phosphorus present in lake water is identified as an important measure to reduce nuisance algae problems.

This TMDL takes into account contributions from all sources, including current and past agricultural, lakefront residential, urban, and forest management activities. Ground-disturbing activities can increase the amount and velocity of runoff during storms. Runoff from the City of Lakeside is addressed as a nonpoint source pollutant because of the relatively small population of this incorporated area. Recreational activities such as boating can create wakes that erode sediment from the lakefront. Nutrients from yard and garden, as well as older or improperly functioning septic systems are significant contributors during the summer months. Fisheries management can also add or remove nutrients, and different fish eat different organisms. This "preferential grazing" by fish can favor growth of blue-green algae. There are



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many factors which combine to influence the water quality of Tenmile Lakes.

### **Allocating Loads**

Determining the amount of a pollutant delivered to the lake from each source is very challenging. The Tenmile Lakes Watershed TMDL seeks to define that amount of sediment and phosphorus that can be added from human activities and still protect lake water quality. These amounts are known as “loads.” The TMDL process seeks to divide these load amounts among the various sources. The result is called the load allocation. Sediment loads depicted in tons per area from several lake tributaries were used to develop the reference condition. The reference condition was then used for setting target loads for the remaining lake tributaries. Nearly all non-point source loading has been allocated to natural sources. The annual sediment loads set for lake tributaries reflect tons of sediment that would be expected to enter the lakes in rather routine rainfall events expected to occur 95-98% of the time. Large variability in sediment loading occurs based upon the timing and size of storm events that fall in the watershed. The plan proposes sediment accrual rate load reductions related to lake sedimentation.

The accuracy and attainability of loads identified in this TMDL will be proven through time and continued monitoring is encouraged. Although further discussion is likely, most land managers and lakefront residents know that pollutant loading can be reduced from its current level.

To meet the load allocations the following activities have been identified as critical;

1. Implement basin-wide sediment abatement activities
2. Maintain and/or establish riparian vegetation to buffer nutrient inputs
3. Maintain and/or establish lakefront wetlands to buffer nutrient inputs
4. Develop and implement invasive weed management programs

### **Water Quality Management Plan (WQMP)**

The CWA as well as Oregon’s TMDL rule require that a water quality management plan (WQMP) be developed to guide implementation of the TMDL. The WQMP identifies activities that may be contributing to accelerated pollutant delivery. It then identifies entities that have authorities over such activities as “Designated Management Agencies” or DMAs. These DMA’s are asked to develop Water Quality Implementation Plans (WQIPs) that reflect how the activities they govern may impact water quality and what management mechanisms are in

place to reduce pollutant loading. These WQIPs need to identify the technologies, best management practices, and/or measures and approaches to be implemented by each source to reduce pollution.

An agricultural water quality management plan addressing agricultural activities has already been adopted for the watershed. Land management activities on the Elliott State Forest and private timber lands are governed through the implementation of the Oregon Forest Practices Act and other voluntary measures. The Oregon Department of Fish and Wildlife Tenmile Lakes Fish Management Plan guides fishery management. The Division of State Lands manages the lake bottom and bed and banks and the Oregon State Marine Board authorities relate to navigability. For other land uses, such as those governed by local jurisdictions, plans will need to be developed to identify appropriate limits, best management practices, measures and approaches to best meet the TMDL.

### **Adaptive Management**

DEQ recognizes that there are uncertainties in the development of any TMDL. It may also take a significant amount of time to achieve water quality standards. DEQ proposes to use an adaptive management approach with the Tenmile Lakes Watershed TMDL. This means reviewing the progress made towards achieving the TMDL every five years. Each management agency will need to track plan implementation and progress. If implementation or management techniques prove inadequate, the management agencies will need to revise their plans. DEQ, in consultation with the management agencies, will determine if all feasible steps have been taken to meet the TMDL. DEQ will revisit the TMDL as new water quality information is available and resources are allocated.

For more information about the Tenmile Lakes Watershed TMDL, contact Pam Blake 541-269-2721 x27. You can also contact her by email, at [blake.pam@deq.state.or.us](mailto:blake.pam@deq.state.or.us).

### **Alternative formats**

*Alternative formats (Braille, large type) of this document can be made available. Contact DEQ’s Office of Communications & Outreach, Portland, at (503) 229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696.*

