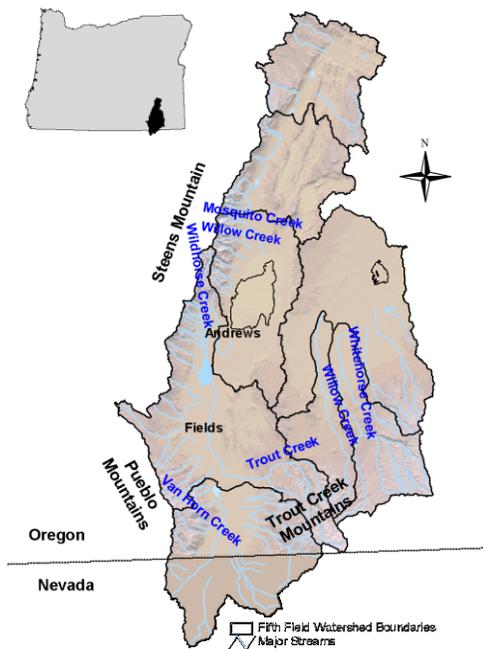


## Alvord Lake Subbasin TMDLs

### Background

The Alvord Lake Subbasin encompasses approximately 2,150 square miles in southeastern Oregon. The diverse terrain in the subbasin ranges from rugged, steep mountainous headwaters at 9400 feet elevation to the playa at the desert floor at 4000 feet.

The Alvord Lake Subbasin is a closed basin which means that its streams are not connected to the Pacific Ocean. In addition, many streams are isolated from each other. They develop high in the surrounding mountains and drain to the desert floor. There are no large streams that serve as immigration conduits for fish. As a result, the majority of streams in the subbasin do not support salmonid fish (salmon and trout) due to natural limitations.



*Alvord Lake Subbasin TMDL Area.*

In 2002, the Department of Environmental Quality (DEQ) listed six stream segments (72 miles) for not meeting state standards for water temperature and one stream segment (33.5 miles) for not meeting standards for dissolved oxygen.

The federal Clean Water Act requires DEQ to develop a plan with goals and pollution control targets for improving water quality in watersheds where water quality standards are not met. DEQ is doing this in the Alvord Lake Subbasin by establishing limits known as Total Maximum

Daily Loads (TMDLs) for each pollutant entering the water. A TMDL describes the amount (load) of each pollutant a waterway can receive and still meet water quality standards. A TMDL takes into account the pollution from all sources.

This fact sheet summarizes DEQ's upcoming plan to address water pollution in the Alvord Lake Subbasin.

### Total Maximum Daily Loads

The Alvord Lake Subbasin TMDLs address the violation of standards for two water quality parameters: temperature and dissolved oxygen.

In the TMDL for **temperature**, the pollutant is heat. The TMDL applies to all streams in the Alvord Lake Subbasin that either contain salmonid fish or that are tributaries to streams that contain salmonid fish. The federally threatened Lahontan cutthroat trout resides in the subbasin.

Water temperature can be greatly affected by a variety of human activities. The principal human-caused source of stream heating is the removal of trees and other shade-producing vegetation from stream banks. This allows direct sunlight to heat the water. Removing vegetation can also cause stream bank erosion that can result in a wider stream channel and disconnection with the floodplain.

In the **dissolved oxygen** TMDL, the pollutant is increased oxygen demand that results in increased growth of algae. Dissolved oxygen can fall below healthy levels in streams for a number of reasons. Stream temperature is a significant contributing factor. Increased solar heating of the water and warm stream temperatures contribute to excessive algal growth, which in turn depletes instream dissolved oxygen levels. This TMDL applies only to Willow Creek in the Trout Creek Mountains.

### Allocating Loads

The TMDLs define the amount of heat and oxygen demand that can be added and still be protective of the river. These amounts are known as "loads." The TMDLs divide these load amounts among the various sources. The result is called the load allocation. There are no point sources in the subbasin.



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For **temperature**, DEQ has allocated all non-point source loading to natural sources. This approach requires that nonpoint sources manage near stream areas to achieve *system potential* conditions, where any human-caused increases in stream temperature are eliminated. Under *system potential* conditions, near stream vegetation is at a climax life stage and the shade provided by the vegetation reaches its maximum. The means of achieving these conditions is through restoring and protecting riparian vegetation and, where appropriate, increasing stream flows and narrowing stream channel widths.

For **dissolved oxygen**, modeling predicted that the dissolved oxygen standard would be attained in Willow Creek through the implementation of the *system potential* conditions required in the temperature TMDL. Achieving the *system potential* conditions established for temperature would reduce algal growth and increase dissolved oxygen concentrations. As such, all non-point source loading has been allocated to natural sources.

#### **Plan implementation**

State water quality standards require that a water quality management plan (WQMP) be developed and implemented by all sources that may impair water quality in the Alvord Lake Subbasin. The plan explains the roles of various land management agencies in implementing the actions necessary to meet the allocations in the TMDLs.

Plan implementation in the Alvord Lake Subbasin will primarily be covered by activities on private agricultural land and federal land. An Agricultural Water Quality Management Area Plan, which addresses stream heating from agricultural activities on private lands, has been adopted for the subbasin by the Oregon Department of Agriculture. Stream heating on

federal lands will be addressed through Water Quality Restoration Plans which will be developed by the Burns and Vale Offices of the BLM.

#### **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 the standards.

DEQ proposes to use an adaptive management approach on the Alvord Lake Subbasin TMDL. This means reviewing the progress made towards achieving the TMDL every five years, as resources allow. DEQ expects each management agency to track plan implementation and progress. If implementation or management techniques prove inadequate, DEQ expects the management agencies to revise their plans.

If DEQ, in consultation with the management agencies, concludes that all feasible steps have been taken to meet the TMDL and attainment of the water quality standard is not practicable, DEQ will reopen and revise the TMDL as appropriate. DEQ will also consider reopening the TMDL if new information indicates that the TMDL should be modified.

#### **For more information**

For more information about the Alvord Lake Subbasin TMDL, contact Don Butcher at 541-278-4603. You can also view the plan at: <http://www.deq.state.or.us/wq/TMDLs/TMDLs.htm>

#### **Alternative Formats**

*Alternative formats of this document can be made available. Contact DEQ Public Affairs for more information (503) 229-5696.*