Alvord Lake Subbasin

Total Maximum Daily Load (TMDL)
& Water Quality Management Plan (WQMP)

Response to Public Comments

State of Oregon
Department of
Environmental
Quality

Prepared by:
Oregon Department of Environmental Quality

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Introduction

This Response to Public Comments addresses comments received regarding the Draft Alvord Lake Subbasin Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WQMP) dated September, 2003. The Oregon Department of Environmental Quality (ODEQ) appreciates the time and effort that all the commentors put into reviewing the document. All comments have been considered by ODEQ and, where appropriate, have been addressed in the final document that has been submitted to the Environmental Protection Agency (EPA) along with a copy of this response. EPA will then either approve or disapprove the TMDL.

Background

The public comment period on the proposed Alvord Lake Subbasin TMDL and WQMP opened on September 29, 2003. Written comments were received during the public comment period that extended through December 5, 2003. All comments received by ODEQ were submitted in written (paper and electronic) form. A formal public hearing was held on November 17, 2003 at the Fields School in Fields, OR. Five members of the general public were present at the hearing, although no oral comments were received.

The TMDL and WQMP were available for downloading from ODEQ's website throughout the comment period. Hard copies of the document were also available for viewing at the Harney County library, the Fields Store, the Harney County Soil and Water Conservation District and at ODEQ's offices in Bend and Portland. Copies of the document were also provided to those individuals who requested copies.

List of Comments provided on the Alvord Subbasin TMDL

The following individuals provided comments on the TMDL during the Public Comment Period.

Code	Commentor	Association	Media
ONDA	Peter Lacy	Oregon Natural Desert Association	U.S. Mail
EPA	Jannine Jennings	US Environmental Protection Agency	Email and U.S. Mail

General

In the following section, ODEQ has provided their response to the comments received. The general format of this document is a summarized listing of comments and questions sorted by topic, followed by ODEQ's response. Grammatical, editorial, and formatting errors are not addressed here but corrections have been made in the document.

Summary of Comments, Concerns and Questions

1. General Comments

Is it appropriate to establish a load allocation for urban sources since there do not appear to be any urban areas in the subbasin (pages 70, 99 and 124)?

Response: ODEQ agrees that establishing a load allocation for urban sources is not appropriate for this subbasin. As such, the "Urban Source" row has been removed from Tables 2-13, 3-9 and 4-7.

2. Stream Temperature TMDL

Concerns about the definition of "*system potential*"

- **The TMDL presents a flawed assumption that *system potential* cannot consist of pre-settlement conditions.**
- **As defined in the TMDL, *system potential* conditions consist of nothing more than maintaining the status quo in land management.**
- **System potential conditions were determined in an arbitrary manner.**

Response: ODEQ does not consider it possible to accurately determine pre-settlement conditions. In some cases, *system potential* may very well be similar to pre-settlement conditions but ODEQ has no definitive information as to what constitutes pre-settlement conditions. For this reason, ODEQ must continue to rely on the definition of *system potential* presented in this TMDL. *System potential* is the riparian condition under which human activities are not measurably contributing to the heating of the stream. By definition, *system potential* is the condition that meets Oregon's stream temperature standard which prohibits any measurable increase in stream temperature by anthropogenic sources when an applicable temperature criterion is exceeded.. This methodology has been accepted by the USEPA and the scientific community as an integral component of TMDLs developed in Oregon for the past several years.

System potential conditions were not determined in an arbitrary manner. The determination of *system potential* conditions is based on a scientific assessment of the type of vegetation that can grow and reproduce on a site given the climate, elevation, soil properties, plant biology and hydrologic processes. In the Alvord Lake Subbasin ODEQ devoted three years to compiling scientific literature on this diverse and unique ecosystem, conducting on-the-ground field studies of the fluvial geomorphology and vegetative community types and densities, and collaborating with botanists, among others, to arrive at *system potential*. ODEQ was able to characterize vestiges of mature plant communities within stream corridors and headwater reaches within each of the Ecological Province subtypes such that we were able to extrapolate those data the full extent of affected stream reaches.

ODEQ believes that targeting *system potential* vegetation as described in the TMDL and giving 100% of the load allocation to natural sources is the most conservative approach to setting the load allocations. This approach requires that anthropogenic activities, including grazing, shall not impact the health of the riparian corridors to the extent that a measurable increase in stream temperature does not occur. ODEQ recognizes that there are many areas in the Alvord Lake Subbasin where *system potential* conditions are not currently being met. On the streams modeled in the TMDL, these reaches are identified. In these areas, ODEQ expects management practices to be altered so that *system potential* can be reached.

Concerns about livestock grazing

- **The TMDL does not candidly acknowledge that livestock grazing has caused, and is continuing to cause, the continued degradation of streams in the subbasin.**
- **ODEQ should make a better effort to better link identify pollutant levels that are attributable to specific casual factors, such as livestock grazing.**
- **The TMDL should emphasize "active" restoration as a way to deal with grazing damages rather than just simply encouraging "passive" restoration.**
- **Benchmarks areas without grazing should be established for defining full potential conditions.**

Response: ODEQ does recognize that livestock grazing may be responsible for much of the riparian area degradation observed in the Alvord Lake Subbasin. It was not our intent to ignore this important issue. ODEQ has added language to the TMDL and WQMP, indicating grazing as one of the possible causes of the degradation of riparian condition in the Alvord Lake Subbasin. References to grazing are now included in Section 2.4.1 under Stream Heating Processes and Section 5.2.3.1 under Human Sources of Stream Heating as suggested in the comment above.

ODEQ feels that the current TMDL analyses are robust and accurately determine the pollutant levels attributable to human caused activities, which includes grazing. In the temperature TMDL analyses, heat is the identified pollutant. The TMDL establishes that the anthropogenic contributions of nonpoint source solar radiation heat loading results from varying levels of decreased stream surface shade throughout the subbasin. Decreased levels of stream shade are caused by near stream land cover disturbance/removal and channel morphology changes. Grazing is identified as one of the possible causal factors of near stream land cover disturbance/removal.

ODEQ does believe that, in general, there is a trend towards improvement in the health of riparian areas and channel stability. This belief is based on two fundamental observations throughout the subbasin. The first includes our documentation of stable channel forms throughout the subbasin using fluvial geomorphology methods developed by Dave Rosgen. The trends for the majority of streams include stable forms of "A", "B", "C", or "E" channels. Yet, in certain instances we found "C" or "E" channels within a historic "F" channel which is an indication of a perturbation decades ago that has since readjusted to a healthy channel form (upper Willow Creek). The TMDL also discusses one region of the subbasin where ODEQ has identified a concern - the lower reach of Willow Creek in the Trout Creek Mountains. We believe this condition is directly attributable to cattle and wild horses grazing practices (see Section 3.4.3, page 91). The second observation which supports a trend towards improvement is our observation of the vegetative communities in the subbasin. Through our surveys we found a large number of streams or stream segments where the plant communities were at mid- or late-seral status. If there had been recent impacts to the riparian community, such as with intensive grazing practices, we would have observed early successional states with early pioneer species such as coyote willow. This is not to say these stream systems have reached some form of dynamic equilibrium. ODEQ believes this trend needs to continue to improve over time to reach a fully functional and healthy riparian community.

It is expected that the Implementation Plans developed by the DMAs (such as the WQRPs which BLM will need to develop) will demonstrate how their proposed management practices will eliminate human caused heating impacts. In some situations this may be able to be achieved by passive restoration, supporting current management practices. In other cases, this may require active restoration. ODEQ has added language to Section A.3.1.1.1 which encourages both active and passive restoration efforts. ODEQ will also work with both the BLM and ODA to explore opportunities in the implementation plans to monitor existing exclosures or possibly create new exclosures for this purpose. The difficulty will be finding representative reaches the full longitudinal extent of these stream systems particularly with intermixed nature of public and private lands.

ODEQ did not take a conservative enough approach in instances where there was "insufficient time to complete field studies".

Response: This comment refers to a discussion in the TMDL about the vegetative work done in the Trout Creek watershed (pages 27, 127 in the Public Notice draft TMDL). ODEQ was able to hold robust discussions with private landowners and agency staff to build consensus in the East Steens and Pueblo Mountains. Unfortunately, we did run out of time to complete similar consensus in the Trout Creek Mountains and the Willow-Whitehorse area. We need to be clear that lack of consensus or field time does not equate to insufficient data to provide a meaningful analysis. Unfortunately, we were not able to bring stakeholders together in the Trout Creeks and Willow-Whitehorse as we had in the two other Ecological Provinces and we did not collect as much data as we would have liked. We did, however, collect enough real time field data, as well as use the data collected by Angela Evenden PhD, to produce a meaningful computer model of both current conditions and *system potential* conditions in the Trout Creeks and of both Ecological Provinces. The difference is that we had to rely on our own professional judgment on the application of the data rather than capitalize on the collective wealth of knowledge of the consensus process.

In addition, ODEQ contends that we took the most conservative approach possible in all areas of the Alvord Lake Subbasin. A target of *system potential* is conservative because it is a riparian condition under which human activities are not measurably contributing to the heating of the stream. ODEQ does not believe that it is possible to be more conservative than that. In addition, the load allocations are all allocated to natural conditions; there are no load allocations for any anthropogenic activity. That, too, is as conservative as it can get.

Concerns about violations of the Clean Water Act

- **How will ODEQ ensure that the water quality standard for temperature will be met when they are not requiring the elimination of all human activities in the riparian area?**
- **If water quality standards are not achieved, then BLM will be in violation of the Act's requirement that federal agencies must adhere to state water quality standards.**

Response: The temperature standard does not require the elimination of human activities in the riparian area, but rather requires that human activities create no measurable increase in surface water temperatures if one or more of several numeric or qualitative triggers are invoked. Numeric triggers (such as 64^{o}F for salmonid rearing and 55^{o}F for salmonid spawning) are based on temperatures that protect various salmonid life stages. Qualitative triggers specify conditions that deserve special attention, such as the presence of threatened and endangered cold water species, dissolved oxygen violations and/or discharge into natural lake systems. Because the numeric triggers or 64^{o}F and 55^{o}F are exceeded in water bodies in the Alvord Lake Subbasin, the standard requires that "no measurable surface water temperature increase resulting from anthropogenic activities is allowed".

ODEQ acknowledges that there was some confusion in the language used in the Public Notice draft of the Alvord Lake Subbasin TMDL relative to what "no anthropogenic activities" means. In some cases we mentioned "minimizing" human impacts and other times "eliminating". We have clarified the TMDL document where needed to reflect that "no anthropogenic activities" refers instead to "no measurable surface temperature increase from anthropogenic activities".

The TMDL establishes that that the anthropogenic contributions of nonpoint source solar radiation heat loading result from varying levels of decreased stream surface shade. The nonpoint source heat allocation is translated to effective shade surrogate measures which provide site-specific targets for land managers. And, attainment of the surrogate measures ensures compliance with the nonpoint source allocations and the state's temperature standard.

Decreased levels of stream shade are caused by near stream land cover disturbance/removal and channel morphology changes. The TMDL therefore requires that activities in the riparian area be conducted such that the condition of the riparian vegetation (and associated shade) be managed to achieve system potential conditions. This approach does not authorize or prohibit specific land management practices, but rather puts the burden of proof on the DMAs to develop Implementation Plans which will show how their activities will achieve the "no measurable increase" portion of the standard.

BLM's responsibilities to meet state and federal water quality rules and regulations are further detailed in a Memorandum of Agreement signed between ODEQ and BLM in 2003. Several of the most pertinent responsibilities are included below.

1. BLM will manage BLM lands to protect, restore, and maintain water quality so that Federal and State water quality standards are met or exceeded to support beneficial uses, in accordance with applicable laws and regulations.
4. BLM will develop and conduct water quality and watershed monitoring; required in resource management and other area plans as well as Water Quality Restoration Plans (WQRPs) in order to strengthen the Best Management Practices (BMP) program.
9. BLM will conduct management activities on BLM administered lands consistent with WQRPs and provide updates and reports on restoration progress according to DEQ's implementation schedule.
12. BLM will implement site-specific BMPs as specified in standards, guidelines, and protocols developed to meet applicable water quality standards and guidelines in resource management plans and amendments to these plans.
13. Review and revise BMPs as necessary if BMP effectiveness monitoring indicates that BMPs are not achieving water quality standards.

ODEQ does not provide an explanation or data to support the contention that stream temperatures will still be above the numeric spawning or rearing criteria even after *system potential* vegetation is achieved.

Response: To address this comment, some additional clarifying information was added to Section 2.6. The section referred to in the comment above as been modified as follows:

> Based on available data (Figures 2-3 through 2-5), ODEQ believes that it is likely that *system potential* temperatures in the subbasin will still be above either the spawning or rearing criteria for some portion of the year, even after *system potential* vegetation is reached. This assumption is based on the fact that, with current temperatures in excess of 70^{o}F in early July, it is unlikely that the numeric spawning criterion of 55^{o}F would be met at the end of June, even with *system potential* vegetation. As such, the loading capacity for the Alvord Lake Subbasin has been completely allocated to natural sources; no assimilative capacity exists for nonpoint sources.

Further support of this assumption was also already provided in Section 2.6 with reference to the modeling that was conducted for Willow Creek in the Trout Creek Mountains. This paragraph is repeated here for further clarification.

> Thermal modeling that was conducted for the Willow Creek watershed in the Trout Creek Mountains in 1999 (presented in Chapter III) also supports this approach to determining load allocations. Thermal simulations done using *system potential* conditions on Willow Creek indicated that even under *system potential* conditions, the 17.8^{o}C (64^{o}F) rearing criterion would still be exceeded.

ODEQ would also like to reiterate that the temperature standard is more than an absolute number. Specifically, it states that, when a numerical temperature criterion is exceeded (such as the spawning or rearing criterion), there shall be no measurable increase due to anthropogenic causes. The goal of the temperature TMDL is to do just that, and, we believe it does. ODEQ feels that a conservative approach was taken by assuming the need to achieve *system potential* riparian communities and surrogate shade measurements in the absence of the more detailed temperature and hydraulic analysis.

ODEQ may upwardly adjust the temperature standard in the subbasin to support the maintenance of status quo land management.

Response: The comment references a statement made on pages 30-31 under Section 2.2.2.1about the possible "upward adjustment" of the temperature criteria. A rearing criterion of 68°F (instead of the 64°F) has been proposed by ODEQ for streams identified as providing habitat for Lahontan cutthroat trout. This proposal is based on a collective body of research over a number of years by fish biologists from ODFW and University of Nevada-Reno. The research was done to determine the thermal requirements of Lahontan cutthroat, a fish species which is endemic to the high desert regions of the Great Basin of southeast Oregon, northern Nevada and northeastern California. The research indicates that, because they are a high desert species, Lahontan cutthroat trout have adapted to the naturally warmer stream temperatures of the high desert and that a rearing criterion of 64°F is in fact over-protective of what the Lahontan trout require. See Section 2.1.2 for a further discussion of this issue.

Concerns about shortcomings in the TMDL's analytical methodology

- **The analysis is incomplete because it did not consider flow, channel hydraulics, heat transfer, effective shade and stream temperature.**
- **The analysis completely ignores the fact that flow is one of the most important stream heating processes. The analysis should at a minimum include the results of several different flow analyses showing the effects of flow on in-stream temperatures as ODEQ has done in other TMDLs.**

Response: While the stream temperature data and analytical methods presented in the TMDLs are comprehensive, there are limitations to the approach used. ODEQ agrees that the temperature analysis would have been more complete, had it been able to use the open channel hydraulics, flow routing, heat transfer processes and water column temperature modules of the Heat Source model. As described under Section 2.4.2, however, summertime flows (the defined critical time period with the warmest stream temperatures) were too low to enable accurate calibration of the model. ODEQ feels that a conservative approach was taken but assuming the need to achieve system potential riparian communities and surrogate shade measurements in the absence of the more detailed temperature and hydraulic analysis.

ODEQ agrees that flow is a very critical component of stream heating processes, and has described it as such in the TMDL. As mentioned above, an analysis of different stream flow scenarios was not possible to do in the Alvord Lake Subbasin temperature TMDL because stream flows were too low to enable accurate calibration of the Heat Source model. The other TMDLs referred to (Umatilla Basin, Hood River and Upper Klamath Lake) were able to include an assessment of different flow scenarios because the large volume of flow in those rivers enabled accurate calibration of the model. In these cases, the analytical results showed that reduced flow, in most cases, aggravated stream temperature problems.

We would like to note, however, that ODEQ is under no obligation to conduct such an analysis. Such an analysis, in fact, is pointless in a TMDL because ODEQ has no authority either under State Law or the federal Clean Water Act to address flow in a TMDL. In other TMDLs that have included flow analyses, these have been included as an educational tool to encourage water conservation practices.

Are the stream segments identified as being of "potential concern" in Section 2.2.2.2 addressed by the TMDL?

Response: A sentence was added to Section 2.2.2.2 indicating that the TMDL analysis applies to both 303(d) listed streams and streams identified as being of "potential concern".

The first sentence in the last paragraph on page 70 speaks to the meaning of a zero waste load allocation for nonpoint sources. It appears this should be a "load allocation" instead of "waste load allocation".

Response: ODEQ agrees and this sentence has been changed as suggested.

3. Willow Creek Temperature TMDL

Does this TMDL apply to only Willow Creek or the same subset of waters within the watershed which the Alvord Lake Subbasin Temperature TMDL applies?

Response: Several sentences were added to the first paragraph of Section 3.1 indicating that the Willow Creek TMDL applies to all streams in the Willow Creek watershed which are indicated in Table 2-2 and Figure 2-1 in Section 2.2. This includes Willow Creek, Jawbone Creek and an unnamed tributary to Jawbone Creek.

4. Water Quality Management Plan and Implementation Plans

How successful has the adaptive management process been in other TMDLs? What have been the results of progress reviews evaluating the efficacy of shade surrogate measures?

TMDLs are developed using the best data and estimates of pollutant loading available at the time. As discussed in the Adaptive Management section of the WQMP (Section A.2), setting TMDLs is a dynamic process that allows for refinement and adjustment as new data and scientific understandings become available. Unfortunately, the development of TMDLs using surrogates, such as the shade surrogate, is in its infancy. The first TMDL approved by EPA using shade surrogates was the Upper Grand Ronde TMDL, which was approved in May, 2000. Not enough time has passed since adoption of any of ODEQ's temperature TMDLs to begin to answer the questions posed. We too are very interested in these answers and are looking forward to the time when we can begin to assess the results of our temperature TMDL program.

ODEQ can point to an example of where the adaptive management process worked in the TMDL program by looking at the phosphorus TMDL for the Tualatin Basin. The first version of the Tualatin TMDL was done in 1988, the first in the nation. Based on data and knowledge available at that time, the TMDL established target phosphorus concentrations of 45 to 70 ug/L, anticipating that nonpoint source controls could achieve these targets. Data collected subsequent to the preliminary TMDL, however, indicated higher-than-expected natural phosphorus levels in groundwater, levels which made attainment of 45-70 ug/L target concentrations unrealistic. Based on monitoring done through the adaptive management process, ODEQ raised the phosphorus concentration targets when it revisited the Tualatin TMDL in 2001 to more accurately reflect what might be attainable through nonpoint source controls.

The WQMP should include more definitive Implementation Plans.

- **Specific Best Management Practices should be required by ODEQ.**
- **BLM should identify through its budgeting that it will provide adequate staff to implement water quality monitoring.**

Response: The purpose of the TMDL and the WQMP is to establish responsible management agencies and to allocate loads. It is the responsibility of the designated management agencies to develop and implement individual implementation plans that will contain the details for achieving targets. ODEQ is then responsible for reviewing and approving these plans. As we review the plans we will expect

scientific rigor using both qualitative methods and quantitative methods for the monitoring portion of adaptive methods.

These implementation plans are not included in the TMDL or WQMP because in most cases, the plans are developed after the TMDL has been approved by EPA. The implementation plans need to be responsive to the allocations contained in the TMDL. Oregon Administrative Rules define how TMDLs will be implemented and allow for development of specific management plans following adoption of a TMDL (OAR 340-042-0080). As required under OAR 340-042-0080, implementation plans must: identify management strategies (BMPs) that will be used to achieve load allocations and reduce pollutant loading, provide a timeline for implementing management strategies, and provide for performance monitoring with a plan for periodic review and revision of the implementation plan. The plans also need to include a discussion of costs and funding to ensure adequate resources to administer the plan.

The TMDL/WQMP should set definite targets and timelines for attainment of water quality standards.

Response: ODEQ openly recognizes the strengths and weaknesses of the TMDL. One such weakness is the lack of ability to accurately predict system dynamics of desert streams. Climate conditions have an enormous impact on plant growth yet we have no means to predict the variables, particularly in an environment that has evolved in climatic extremes such as nominal annual precipitation, poor soils, dramatic swings in day and night time temperature, and unpredictable runoff events that can "set back" plant communities as a result of hydraulic disturbance from extreme runoff. These are elements that are difficult, if not impossible, to predict in any model. Therefore, we believe the integrity of the TMDL is preserved if we state up front in the process that we do not know how long it will take to achieve system potential (likely decades) and emphasize the adaptive management process to achieve system potential as a long term commitment to improve water quality. We believe the best approach to improving water quality in the Alvord Lake Subbasin is to move forward with the TMDL and WQMP. By setting the process in motion we can then observe progress and learn from the process. Because the TMDL is a long term dynamic process there will be opportunity in the future capitalize on emerging technologies to help us better predict natural ecosystems.

How will ODEQ work with the DMAs to assure that implementation plans adequately address the required elements, especially if ODEQ's budget does not include needed staff funding to track implementation?

Response: Due to present funding constraints, ODEQ acknowledges that it does not presently have the staff resources to properly administer the adaptive management portion of the TMDL through stakeholder committees and active local involvement. Since implementation coordination will primarily need to occur with BLM and the Local Advisory Committee (LAC) for the Greater Harney Basin Agricultural Water Quality Management Area Plan, ODEQ plans to work separately with the BLM and the LAC. We believe the reality of our staffing situation places greater emphasis on our review and approval of the various implementation plans from the DMAs, particularly the BLM considering it holds the majority of land in the subbasin. As we review the WQRPs from the BLM, we will expect scientific rigor using both qualitative and quantitative methods for the monitoring portion of their plans. Section A.3.8.2 describes Implementation Plan development and review process for each DMA.

How will ODEQ determine if the planned implementation is achieving the desired results and if not, whether adjustments are needed on the ground?

Response: In Section A.2 on Adaptive Management, **t**he WQMP actually says that, as resources allow, ODEQ will review progress of the TMDL and WQMP on a 5-year basis, evaluate progress toward achieving TMDLs and implementing WQMP goals, that DEQ expects DMAs to also monitor their progress, that DMAs will be expected to develop benchmarks for attainment of TMDL surrogates in their

implementation plans, and to revise components of their implementation plans to address deficiencies when management techniques are inadequate. In the 5-year reviews, ODEQ will work with the DMAs, primarily BLM and ODA, to determine whether or not the planned implementation is achieving the desired results, and if not, what adjustments are needed on the ground. ODEQ expects the DMAs to monitor and document the progress in meeting system potential riparian community and shade targets and in-stream temperature criteria. Some additional guidance as to the type of benchmarks and monitoring to be used to track progress has been added to Sections A.2 and A.3.11.

It is disappointing to see that two DMA's, Harney and Malheur County, are not being asked to develop implementation plans. It would be a stronger, more satisfying plan if the counties would participate and take credit for their accomplishments.

Response: ODEQ agrees that TMDL implementation is an opportunity for every contributor to a problem in the subbasin to do what they can to improve water quality. ODEQ believes, however, that the contributions from the two county governments in this extremely rural area are insignificant. In response to this comment and considering the insignificance of the sources, ODEQ has decided to not include the two counties as designated management agencies.

Which DMA Plan will address the unstable channel conditions below Whitehorse Ranch Road on Willow Creek (Trout Creek Mountains)?

Response: The Water Quality Restoration Plan (WQRP) from the Vale District Office will address this area. There is also a small portion of private land which will need to be addressed under the Agricultural water Quality Management Area Plan.

There was not much of a discussion of subsurface flow and its function in temperature regulation here. Will that be looked at more closely in the future?

Response: The TMDL and WQRP do provide a brief discussion of the importance of subsurface flows in temperature regulation. This discussion was covered under the subsections on riparian vegetation rather than as a separate subsection (as with channel morphology and flow). For example, in Section A.3.1.1.1 of the WQRP, a connection is made between the establishment of system potential riparian communities and re-connection of the stream floodplain. This reconnection helps restore floodplain function, channel stability, and water storage and release as subsurface flow during warmer summer months. Subsurface flow is more difficult to measure than other parameters, but it is a thermal regulation component that ODEQ and the DMAs agree is an important component of stream restoration.

It is important to pull information together in each watershed and throughout the Alvord Lake Subbasin as much as possible. Cumulative impacts are important throughout the entire hydrologic system of the watershed.

Response: ODEQ agrees that it is important to pull together information on each watershed for assessment in how to restore natural landscape hydrologic functions. Because the watersheds in the Alvord Lake Subbasin are not connected and often just consist of one isolated perennial stream, assessment of the cumulative impacts within each watershed will be easier than it would be in a subbasin with a network of connected streams.