

April 20, 2005

To: Oregon State Board of Agriculture

From: Bear Creek Local Advisory Committee

Re: Biennial Review of the Area Plan and Rules

I. Purpose

The Bear Creek Local Advisory Committee (LAC) is submitting this report to the Board of Agriculture to summarize implementation of the Bear Creek Agricultural Water Quality Management Area Plan and Rules (Area Plan and Rules), as provided for in Oregon Administrative Rule (OAR) 603-090-0020 (4).

II. Introduction

Senate Bill 1010 authorizes the Oregon Department of Agriculture (ODA) to develop and implement an Area Plan and Rules wherever such a Plan is required by state or federal law.

The Bear Creek Agricultural Water Quality Management Area (Management Area) consists of non-Federal and non-Tribal Trust lands in the Bear Creek drainage, a major tributary to the Rogue River in southwest Oregon.

An Area Plan and Rules were developed for the Bear Creek Agricultural Water Quality Management Area because Total Maximum Daily Loads (TMDLs) were developed for phosphorus in 1996 by the Department of Environmental Quality (DEQ). Private agriculture is required to provide reasonable assurance that it will meet its load allocations for listed parameters. Additionally, stream segments were also listed on DEQ's 2002 303(d) list of water quality limited waterbodies for temperature, sediment, dissolved oxygen, and pH. Coho salmon are listed as an Endangered Species in southern Oregon and northern California in what is known as the Klamath-Siskiyou Evolutionarily Significant Unit by the National Oceanic and Atmospheric Administration Fisheries Service.

In 1997 the LAC, working with ODA and the Jackson Soil and Water Conservation District (SWCD) completed the Area Plan and Rules. The rules were adopted in June 1998. ODA then worked with the Jackson SWCD, the Natural Resources Conservation Service (NRCS), OSU Cooperative Extension, private landowners, and other partners to implement the Area Plan and Rules.

In 2000 as provided for in OAR 603-090-0020, the LAC began meeting to conduct the first periodic review and update of their Area Plan and Rules. Management Area landowners, representing agricultural commodities (orchards, cattle, vineyards, row crops, and horses) served on the LAC. Other interests included small woodland owners, irrigation districts, City of Medford, and Jackson County. The LAC reviewed the progress and effectiveness of the Area Plan and Rules in preventing and controlling water pollution from agricultural activities in the Management Area. Based on the evaluation, the LAC agreed on several revisions to the Area Rules, with corresponding updates and changes to the Area Plan. The revised Area Plan and Rules went through public hearing and comment in January 2002. The Board of Agriculture adopted the revisions in June 2002.

In 2004 the LAC met to conduct its second periodic review and update of the Area Plan and Rules. Based on the review, the LAC agreed on minor changes to Area Plan text. No changes were recommended to the Area Rules.

III. Background

When developing the Area Plan and Rules, the LAC identified several objectives that, if achieved, would significantly improve water quality in the Management Area. The LAC then developed rules that had to be met on all agricultural and rural lands. Each rule was intended to prevent pollution as close to the source as possible, and to meet agriculture's expected load allocations in the TMDL.

The mission statement for the Bear Creek Area Plan adopted by the LAC is:

Seek to achieve the water quality standards current as of March 15, 2001, for the Bear Creek subbasin by preventing and controlling water pollution resulting from agricultural activities, given the background pollutant levels documented by monitoring data.

The objectives of the Bear Creek Area Plan are to:

- Create a high level of awareness of water quality issues and problems among farmers in the watershed;
- Promote practices that limit the movement of pollutants from agricultural lands into Bear Creek;
- Promote practices that stabilize streambanks;
- Promote practices that reduce sedimentation of streams due to soil erosion;
- Seek to control water pollution as close to its source as possible; and
- Seek funding necessary to achieve the mission statement.

Summary of the 1998 Bear Creek Area Plan

- Identified the diverse agricultural history of the basin
- Identified the complex land uses in the basin
- Acknowledged high background and residential phosphorus contributions in the basin
- Acknowledged the potential contributions of phosphorus from private agricultural lands
- Committed to use existing water quality protection law to reduce agricultural contributions
- Identified ODA and Jackson SWCD roles and responsibilities

Summary of 2002-2004 Bear Creek Local Management Agency Activities

As described in the Area Plan, Jackson SWCD has worked closely with ODA, NRCS, and OSU Extension to hire a district manager and watershed technical specialist.

Randy White is currently the Jackson SWCD manager and specialist. He comes to the district with a high degree of credibility among landowners, having been the OSU Livestock specialist for the previous 10 years. In the Bear Creek Valley the following activities have been accomplished.

Activity	Number Impacted
Workshops and Tours	4 workshops/tours affecting 100+ residents
Displays	4 with potential to reach 4,000+ residents
Grazing, seeding, and hay plans and status reviews	6 on 644 acres
Articles, newsletters, and press releases	1 affecting 500+ residents
Individual landowner visits in Bear Creek Valley	33 affecting 1079 acres

NRCS has also been an active partner in the implementation of SB1010 goals in the Bear Creek basin. In the last two years, over \$14,730 actual contract dollars have been spent in the Bear Creek basin for NRCS Environmental Quality Incentive Program projects.

OWEB funded ~\$41,000 in projects related to agricultural activities in the Bear Creek basin. Most of these were related to irrigation diversion reconstruction to make them more fish-friendly.

ODA's regional representative in southwest Oregon has participated in a number of educational and regulatory visits with local landowners, responded to complaints, made courtesy visits, and taught classes to Bear Creek's affected parties, working closely with local partners, OSU Extension, DEQ, Jackson SWCD, Bear Creek Watershed Council, Rogue Valley Council of Governments (RVCOG), and local landowner groups.

Activity	Numbers Impacted
Workshop and tour presentations (irrigation scheduling, Bear Creek compliance tour, irrigation tour)	~55 participants
Reports to watershed councils, commodity groups, and local governments	~100 people
Individual landowner visits in the Bear Creek basin	14 landowners

In the 2002-2004 period ODA received one formal, written complaint in the Bear Creek management area. It was also responded to by the DEQ and Jackson County. The threat to water quality has been alleviated.

The 2004 Oregon Water Quality Index (OWQI), a single, integrated number expressing the levels of eight water quality parameters, shows a positive and encouraging trend. While overall the period of record states that the Bear Creek water quality is still poor (56 OWQI units), it is the most improved river in the state of those analyzed. It improved +16.7 OWQI units in the last four years. Other recent water quality findings are included in Appendix B.

IV. Bear Creek Area Plan and Rules Review Process

In October of 2004 the LAC and Technical Advisory Committee (TAC) were reassembled to discuss the 2002 303(d) listings and upcoming TMDLs, and to hear updates on Area Plan implementation. The TAC consists of representatives from the LAC, three irrigation districts in the basin, OSU Extension personnel, RVCOG and Oregon agency personnel (ODA, DEQ, Jackson SWCD). The LAC heard a presentation from RVCOG on its restoration and monitoring activities and presentations from ODA and the SWCD on their activities to implement the Area Plan and Rules. The LAC also reviewed the Area Plan to determine if any changes were needed.

The changes to the Area Plan recommended by the LAC consist primarily of additions to update local watershed protection activities and information. Below is a summary of the main changes to the Area Plan.

- Recent changes to the major phosphorus contributor (Ashland Sewage Treatment Plant).
- Recent water quality improvement and monitoring activities of the Jackson SWCD, the NRCS Medford Field Office, and OSU Cooperative Extension and Hanley Road Experiment Station, are cited.
- Recent water quality improvement activities of the three major irrigation districts are cited.
- Recent initiatives related to interbasin transfers (from the Klamath Basin) and wastewater reuse as a possible solution (WISE Project).
- Plan evaluation and implementation activities are listed in Appendix A.

The revisions to the plan have had several reviews by current LAC members. All revisions have been unanimously approved by at least a quorum of LAC members.

No changes were made to the Area Rules.

V. Conclusions

The Bear Creek LAC believes that the revisions of the plan and rules have been implemented successfully and are having an impact on the improving Oregon Water Quality Index numbers in Bear Creek. The Jackson SWCD directors and staff remain committed to the intent and implementation of SB1010 in their region. They have added new directors who are current Bear Creek LAC members and who believe in the importance of the task at hand.

There is growing landowner acceptance and participation in implementing the requirements of the Bear Creek Plan into their daily agricultural activities. This is directly attributable to the amount of outreach and educational work done by the local partners in this effort.

Appendix A. Monitoring and Evaluation of the Plan's Effectiveness

Below are criteria the Bear Creek LAC identified to evaluate progress in achieving the Area Plan's goals and objectives. The LAC updated this section during the 2004 review to reflect new accomplishments since the last review.

- An accounting of the number of operations with approved Voluntary Water Quality Farm Plans, the number of requests for farm plans, and the acreage they cover.
 - One voluntary farm plan has been approved by the SWCD.
 - Over 60 grazing and irrigation improvement plans have been done through SWCD and NRCS affecting over 1000 acres.
- Identification of additional agricultural sources of sediment, nutrients, and other contributors to 303(d) listed streams not addressed in the original plan.
 - The 2004 LAC knew of no additional sources of pollutants that had not already been addressed in the plan and rule language.
- An evaluation of the effectiveness of outreach and education programs designed to provide public awareness and understanding of water quality issues.
 - There is a general sense among the LAC that the small acreage segment of the agricultural community is still largely unaware of the existence, much less the implications, of the Bear Creek Area Plan and Rules. Suggestions include road signs and high profile project press from the SWCD.
- A review of projects, demonstrations, and tours used to showcase successful management practices and systems.
 - In 2001 Jackson SWCD hosted a bus tour of sites where complaints had been lodged and remediation had taken place. Also, the SWCD hosts yearly Range and Irrigation Field Days. Successful projects are highlighted and the operators talk about their benefits in conservation.
- An evaluation of the effectiveness of the sources for technical and financial assistance, which are available to the agricultural community.
 - Oregon Watershed Enhancement Board and NRCS have each published summaries of their financial assistance to agricultural conservation efforts in the basin within the last three years. Irrigation districts in the basin also list their expenditures on the part of their patrons to conserve water, change application methods, and tighten their distribution network. Effectiveness per se has not been evaluated.
- Review of load allocations as found in Bear Creek TMDL and the effectiveness of this plan in meeting load allocations.
 - At each LAC meeting for the biennial review, the DEQ representative is posed the question of the status of TMDL development for the basin and if the AgWQMP rules are sufficient to meet the standards. So far, the response has been positive.

Appendix B. Recent Water Quality Findings in the Bear Creek Watershed

This appendix includes recent water quality information included in the Water Quality Issues section of the updated Bear Creek Area Plan.

Ongoing studies along the Bear Creek mainstem and some tributary sites indicate that phosphate loads were very low in 1994, but have increased to historic values in 1995 and 1996 (Bill Meyers, Rogue Valley Council of Governments now with DEQ). Between 1995 and the middle of 1996, phosphate discharge from the Ashland sewage treatment plant has decreased by an average of 31%, but even these reduced levels are still too high to expect an improvement in Oregon Water Quality Index values. In 1995, sampling in the headwaters throughout the upper parts of the Bear Creek watershed indicated that the total maximum daily load instream criteria for total phosphorus of 0.08 mg/l was met at 75% of these sampling points, compared to 85% in 1992 and 95% in 1994 (Oregon Department of Forestry).

It is clear that little is definitively known about location, causes, and relative magnitude of the various non-point phosphorus sources located between the upper reaches of the watershed and the mouth of Bear Creek at Kirtland Road. Extrapolation from limited data sets to reach general, overall conclusion is of marginal value. It is prudent, however, to try to improve understanding of the system whenever possible. Recently, several limited studies have been done in attempts to better understand non-point source contributions (including agricultural) to Bear Creek water quality problems. Storm water sampling in six cities during October 1996 suggested that urban storm water runoff contributed little to phosphorus loading in Bear Creek (Bill Meyers, Rogue Valley Council of Governments now with DEQ).

In 1994 and 1995 studies of tail-water runoff from recently fertilized, newly tilled and planted, furrow-irrigated vegetable row-crop fields showed increased concentrations of soluble phosphorus compared to input water, and also demonstrated how improved management practices might reduce the effects of such non-point sources (Richard Roseberg, Oregon State University, and Brian Lanning, USDA NRCS).

Single day longitudinal sampling of Jackson and Griffin Creeks in mid-summer 1996 indicated that on those days, net phosphorus loading increased over the length of the study area. However, some reaches acted as net phosphorus sources, and some acted as net sinks (Gary Arnold, Oregon DEQ), although this effect may have been related primarily to changes in water flows. Future studies would be valuable if they can be designed to improve our limited understanding of causes and effects between management practices, land use, and water quality over larger geographic and/or time scales.

The Bear Creek LAC, as part of their implementation plan for 1999, wanted to measure, to the degree possible, the effects of agricultural activities on water quality in the Bear Creek Basin (during the 1999 irrigation season). The LAC asked Oregon State University to develop a water quality-monitoring project that would do the best job possible in isolating, measuring, and describing agriculture's contribution to the factors of concern. Three objectives were established for this data-gathering exercise:

- Measure changes in total phosphorus (TP), fecal coliform (FC), total suspended solids (TSS), turbidity, temperature, and flow along four stream stretches that represented predominant agricultural land use.
- Analyze measured values to identify land uses and agricultural practices that either improve or degrade the water quality as it passes through those stream segments.
- Create a high quality data set that can be used by other scientists and agencies to model stream behavior in the Bear Creek Basin.

While sampling continued during the 2000 season in several tributaries to Bear Creek, some general conclusions were drawn related to the parameters of interest stated in objective #1. Conclusions for total phosphorus and total suspended solids were mixed. In longitudinal sampling in these four tributaries, agricultural land use tended to act both as sinks and sources for those parameters. Changes in load were, by and large, positive over the entire year (the creeks contributed to the P load) but not nearly to the degree that has been estimated from single, point-in-time samples.

There was, however, a strong general correlation to fecal coliform and temperature loads because of some agricultural land uses. The highest levels of fecal coliform counts and the greatest increase in those counts as compared to the next upstream site occurred where animal access to a stream was unrestricted. Stream segments where riparian vegetation had been cleared, thus exposing the stream and riparian area to direct solar radiation, displayed the greatest temperature increases whereas heavily shaded agricultural zones had smaller increases or even decreases in water temperature. Clearly, degraded riparian areas are not a unique condition to agricultural land use. It was the riparian condition rather than the agricultural land-use per se that was implicated in varying temperature readings.

There were also some positive correlations to agricultural land use that were, while not measured, at least implied (i.e. possible springs charged by subsurface irrigation returns that actually cooled stream flows). The types of conditions that act as nutrient and sediment sinks (such as vegetated buffers and drains) should be encouraged and we should recognize the net climatic cooling effect of subsurface irrigation return flows for the transpiring greenery (croplands) where dry rangelands would dominate if left un-irrigated.

There will be a summary of the second year of data by Dr. Roseburg in the 2006-2007 biennial review.