



**Oregon**  
Department  
of Agriculture

# Middle Deschutes Agricultural Water Quality Management Program

**SPRING 2012**

## Improved land conditions and water quality to be demonstrated

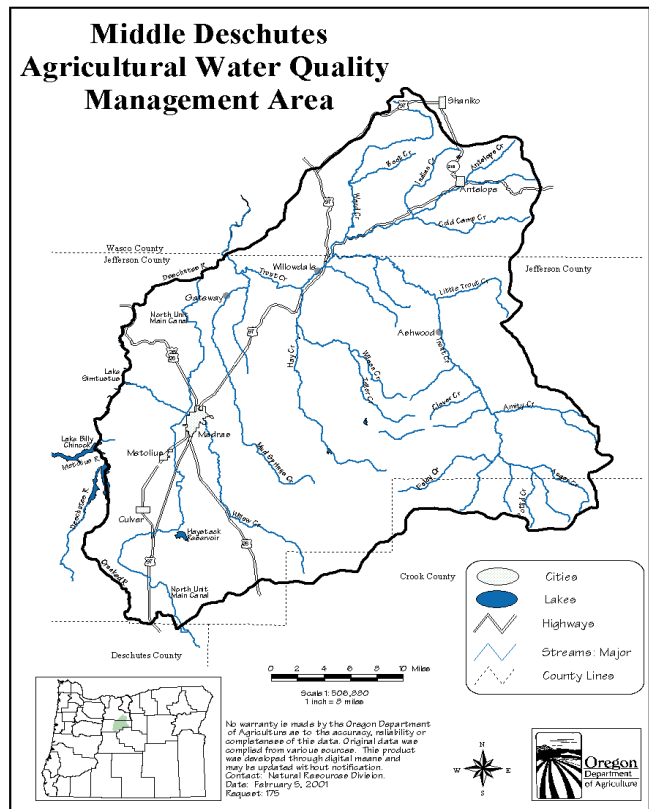
So many areas to choose from!

It was difficult for the Middle Deschutes Agricultural Water Quality Local Advisory Committee (LAC) to decide which areas to recommend for demonstrating improvements in streamside vegetation and water quality. Trout Creek and Mud Springs Creeks were the primary contenders.

The LAC met March 19, 2012, for their biennial review of the Middle Deschutes Agricultural Water Quality Program.

At the meeting, staff from the Oregon Department of Agriculture (ODA) encouraged the LAC and the Jefferson County Soil and Water Conservation District (JSWCD) to discuss how to quantify improvements in streamside vegetation and water quality. Trout Creek was a priority area already due to funding from the Bonneville Power Administration. And, water quality monitoring had focused SWCD attention on the Mud Springs Drainage. Landowners in both areas have treated hundreds of acres and miles of streambanks with improved irrigation and livestock management practices.

However, many landowners are still unaware of the Agricultural Water Quality Program. The LAC recommended that success stories be submitted by the JSWCD to the Madras Pioneer, Bend Bulletin, and Central Oregon Rancher.



*The Middle Deschutes Management Area includes the Trout Creek and Willow Creek drainages, and all the lands flowing into the Deschutes River between Willow Creek and the Crooked River.*

### LAC Members

Roy Hyder, Chair  
Lowell Forman, V-Chair  
Mike Britton  
Lori Campbell  
Lloyd Forman

Mickey Killingsworth  
Brad Klann  
John Morgan  
Evan Thomas  
Bryce Vibbert



## Jefferson County SWCD Accomplishments

The SWCD received almost \$1 million and worked with many partners to improve water quality.

### PLANNING & PROJECTS

- Helped obtain funding and design for 35,000 feet of buried pipe for North Unit Irrigation District (NUID) Laterals 58-9 and 58-11.
- Developed one off-site livestock watering facility.
- Helped landowner in Metolius River Watershed fence livestock out of riparian areas and manage pastures.
- Upper Trout Creek:
  - Relocated 250 feet of channel, which eliminated one road crossing and ¾ miles of split channel.
  - Planted 2,650 trees/shrubs in buffers.
  - Seeded 50 acres of range/riparian areas disturbed by feral pigs.
  - Treated 652 acres of "A list" noxious weeds in uplands and riparian areas.
- Antelope Creek streambank enhancement: constructed 150 feet of log/root wad, pool-glide-riffle enhancement.
- Installed three drip systems; buried 5,000 feet of mainline.
- Installed shallow well for irrigation, eliminating one diversion.
- Installed 2,200 feet of buried mainline and 640 feet above-ground mainline to convert from flood to sprinkler irrigation.

### OUTREACH & EDUCATION

- Produced and distributed water quality brochures for streams, tail water, irrigation water management, manure, winter feeding areas, and canals/ditches.
- Distributed 2,500 Jefferson County Rural Living Handbooks.
- Annual tour of Trout Creek and Antelope Creek.
- Tour of tailwater design, capture, operation and maintenance.
- Distributed Annual Reports at Central Oregon Farm Fair.
- Sponsored tour with NUID for landowners at the Wickiup Facility.
- Submitted newspaper article regarding completion of piping Lateral 58-9.
- Conducted aquatic macroinvertebrate ID field day and groundwater demonstration for 4H.
- Groundwater presentation to 85 students at Madras High School.

### MONITORING

- On-going water monitoring, begun in 2006, identified Mud Springs as a priority watershed for a groundwater study and to implement conservation practices.
  - Applied to OWEB and DEQ 319 funds to conduct a groundwater study to determine the movement of some identified nutrients.
  - Input water quality data from the monitoring activity into the DEQ Laser Website database.
  - Worked with staff from ODA, US Geologic Survey, and NRCS, and with a Portland State University graduate student to review the groundwater information available from the monitoring.



## Background

The LAC advised ODA on the development of the Area Plan and Area Rules (Oregon Administrative Rules 603-095-3400), which were adopted by ODA in 2001. The LAC reconvenes every two years to review progress towards meeting Plan goals. LAC members represent farming and ranching, biologists, private timberlands, NUID, and the JSWCD.

The LAC identified objectives for the following water quality concerns, while acknowledging that these parameters are present at some natural level:

- Sediment: keep soil on the land and out of streams (minimize soil erosion and amount of soil-laden runoff; maintain adequate riparian and upland vegetation).
- Nutrients: keep nutrients on-site and out of streams (apply at appropriate rates; minimize amount of nutrient-laden runoff and percolation to groundwater).
- Toxics: keep pesticides and municipal sludge on-site and out of streams (apply pesticides and municipal sludge at appropriate rates; prevent runoff).
- Temperature: maintain adequate riparian vegetation based on-site capability and enhance channel morphology.
- Bacteria: keep livestock waste and municipal sludge on the land and out of streams.
- Dissolved oxygen: reduce agriculture's contribution to high temperatures, low flows, high nutrients, organic carbon and sediment.
- Habitat modification: maintain adequate riparian and upland vegetation; enhance channel morphology; minimize impacts of irrigation diversions.
- Flow modification: encourage efficient irrigation; improve the ability of uplands to capture, store, and beneficially release water.

Area Rules:

1. Streambanks must have sufficient **vegetation** for bank stability and stream shading.

Sediment must be filtered out with vegetation or an equally effective erosion control device before entering perennial streams.

2. **Temporary irrigation diversions** must be constructed and operated only during periods of irrigation, must not hinder channel carrying capacity between November 1 and March 1, and must not contribute to channel instability.
3. No agricultural activity may violate **water quality standards**. Exceptions are made for unusual weather events and activities out of the control of the landowner.
4. **Nutrient application** rates and timing must not exceed specific crop requirements.

## Complaint Investigations

ODA investigated two complaints in the last two years.

One investigation started in 2009 and addressed excess sediment entering Mud Springs Creek from over-irrigation by a center pivot and from excessive livestock use along a tributary to Mud Springs Creek. The resolution of this complaint also involved working with three adjacent landowners to prevent their livestock from contributing manure and sediment to the tributary. As a result, all four landowners were in compliance with Area Rules.

The second investigation involved concerns that runoff from a feedlot was polluting a tributary to Mud Springs Creek. The investigation showed no pollution from the operation of the feedlot. However, the lessee of part of the property had pumped water from the manure lagoon to an irrigation pond, planning to irrigate his crop. The pond drained to a tributary to Mud Springs Creek, and E. coli numbers in the pond outlet violated state water quality standards. The landowner received a Letter of Warning. ODA staff will return to the property during the 2012 irrigation season to determine whether the property has come into compliance.



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## ***NITRATES IN GROUNDWATER***

Three years of water quality monitoring indicated that some wells and springs in the Management Area have unnaturally high nitrate values. However, the nitrate source is still unknown. The likely source was assumed to be leaching of fertilizer from irrigated fields.



Two years ago, the LAC recommended the following actions:

- Age-date groundwater where springs surface
- Map groundwater flow patterns
- Determine flow volumes and nutrient patterns of natural springs

Current studies are trying to measure the age and flow paths of groundwater to determine whether current or historic agricultural practices contribute to nitrates in groundwater.

Groundwater flows through two different basic geologic formations. The John Day Formation (at the east edge of the study area) recharges at one inch per year; the Deschutes Formation recharges at 10 inches per year.

In 2010 and 2011, the SWCD collected samples from 12 springs and wells and sent them to the University of Miami for age dating. (Nitrates had previously been measured in these springs in 2008 and 2009.) The lab uses concentrations of three different chlorofluorocarbons to estimate the age of water. The accuracy is three years or less.

Age dating indicated that the spring water was generally 20-35 years old, except for one spring located in the headwaters of Mud Springs Creek that was about 50 years old. This spring was the only one located in the John Day Formation.

Several soil samples analyzed by the NRCS Soils Mechanics Lab and Umatilla Soils Lab showed unexpectedly high nitrate values. These results suggest that some Management Area soils may be naturally high in nitrate. Soils that naturally have more than 1 mg/L of nitrate are extremely rare.

The LAC recommends that monitoring continue over time to track changes in nitrates and other potential pollutants in ground and surface water.

*We're on the Web!*

[http://egov.oregon.gov/ODA/NRD/water\\_quality\\_front.shtml](http://egov.oregon.gov/ODA/NRD/water_quality_front.shtml)