

**Upper Feather River Watershed  
Irrigated Lands Prop 50 Update**

February 2008

Feather River Currents Working in Our Watershed

**2007 Water Monitoring Results**

Like the previous two years, most of the water leaving irrigated agriculture in the Upper Feather River Watershed is pretty clean. Most of the constituents monitored were below levels of concern (established by the Regional Water Quality Control Board's Basin Plans) and many were below laboratory detection levels. The items in gray are the constituents where we saw water quality exceedences and must take action.



**Feb 26th 2-4pm  
Management Mtg**  
2007 Pathogen Study  
Herd Health Issues  
Forage Quality Study  
**Fairgrounds**  
Local Results to Help YOU  
improve management

Constituent Monitored	Water Quality Limit
Total Nitrogen	NA
Nitrate-N	10 mg/L
Ammonia-N	25 mg/L
Total Phosphorous	NA
Phosphate-P	NA
Dissolved Organic Carbon	NA
Dissolved Oxygen	7 mg/L (coldwater fisheries)
Temperature	NA; (For Rainbow Trout <75°F)
Electrical Conductivity	150 Feather River; 700-900 for Ag. Program
pH	6.5-8.5 (Sierra Valley elevated...natural?)
Turbidity	NA (relative to background)
Total Suspended Solids	NA (relative to background)
<i>E. coli</i>	235 cfu/100mL
Metals	B (700ug/L); Al; Fe; Ni (100ug/L); Cu (10ug/L); Zn (5000 ug/L); As (10ug/L); Se; Cd; Pb
Toxicity	determined as % survivability

**Annual Stakeholder Meeting**

Over 60 people attended the 2007 meeting in Quincy. This informative interactive meeting focused on results of this year's water quality monitoring at 20 sites from Sierraville to Westwood, as well as, what the future holds for landowners regarding management under the Central Valley Regional Water Quality Control Board's Irrigated Lands Regulatory Program (ILRP).

If you were unable to attend the Nov. 15<sup>th</sup> Upper Feather River Watershed (UFRW) Prop 50 Project Annual Stakeholder meeting and would like a copy of the handouts and summary of water quality monitoring results, please check our website: <http://www.ucanr.org/ufrwwaterquality> or contact the Extension Office, 283-6270 or Carol Dobbas, Upper Feather River Watershed Group, 994-3057.

**♦WHAT: Ranch Management Meeting (Water, Livestock, Forage & Regulations)**

- ⇒ 2007 Pathogen Study Results & Discussion of *E. coli* testing methods
- ⇒ Herd Health Recommendations & Discussion
- ⇒ Soil Moisture/Forage Quality Study Results...(increase livestock production)
- ⇒ Plans for 2008-09 Irrigation Season including Your Input on local Management Plans

**♦WHERE:** Mineral Building, Plumas-Sierra Fairgrounds in Quincy

**♦WHEN:** Tuesday, February 26<sup>th</sup>, **Registration 1:45 PM** (Full Program 2-4 pm)

**♦WHO:** UC Davis Extension Vets - Dr. Rob Atwill & Dr. Bruce Hoar / Prop 50 Project Team

**You're Invited to Participate**



## On the Pathogen Tracking Trail



**We've detected elevated *E. coli* levels and people want to know the source.** The answer is probably multiple sources since all warm blooded animals shed *E. coli*. As stated previously, we need to determine 1) IF we have a health risk from 'bugs' that make you sick, THEN 2) identify the source of the organisms. Unfortunately, the tools for proving the source of *E. coli* and other pathogens are in the development stage—they are expensive and time-consuming, and their reliability has not been proven. The most promising tool seems to be **bacterial source tracking (BST)**.

**There are a variety of BST methods, but all follow the same sequence of analysis:**



1. Distinguishing characteristic or fingerprint is selected to identify various strains of bacteria
2. Library of bacterial strains (isolates) from human and animal sources in the area must be collected. (At least a few hundred isolates are needed per major source)
3. Indicator bacteria fingerprints from the contaminated water are compared to the library of potential sources, and assigned to a category based on fingerprint similarity.

**Bacterial Source Tracking (BST) methods:**

- ◆ **Molecular** : based on the unique genetic makeup of different strains of fecal bacteria. Offer the most precise identification of specific types of sources, but are limited by high per-isolate costs, detailed and time-consuming procedures, and are not yet suitable for assaying large numbers of samples in a reasonable time frame.
- ◆ **Biochemical**: based on the ability of an organism's genes to produce a biochemical substance. May or may not be as precise, but is simpler, quicker, less costly, and allows large numbers of samples to be assayed in a short period of time.
- ◆ **Chemical**: looks for compounds (such as caffeine or estrogen) that co-occur with fecal bacteria in human waste. This method can only determine if the source of the *E. coli* (or other fecal pathogen) is human.

If we had limitless funds and labor, the best option would be to use a toolbox approach, including a variety of BST methods. At the present time, extensive pathogen tracking is not feasible in the Upper Feather River Watershed. However, pathogen tracking technology is rapidly improving, and it may become more cost effective and reliable soon. Preliminary results of a 2007 study show little correlation between elevated *E. coli* levels and pathogens. Final study results and pathogen testing methods will be discussed Feb 26<sup>th</sup>.

### Interesting *E. coli* Facts...Did you know?

◆ ***E. coli* can live and replicate outside the gut** in warm, rich environments like moist sediments and pastures on a warm summer day.



◆ **Cow Fecal Material** contains 10,000,000 individual *E. coli* colony forming units (cfu) in a single gram (0.03 oz)

◆ **Humans** defecate up to 100 billion *E. coli* per day

**Upper Feather River Watershed Group Updates - Contact Carol Dobbas for more Details**

➤ The new MRP (Monitoring and Reporting Program) for the ILRP (Irrigated Lands Regulatory Program) was adopted at the Jan 25 Regional Board meeting in Sacramento. Coalitions have 6 months to submit MRP's. UFRWG Board will begin work with the help of Holly George and Ken Tate to develop a revised monitoring plan specific to our area and agriculture practices. Ideas will be discussed at the Feb 26th meeting in Quincy, bring your suggestions.

➤ Several board members traveled to Modoc County in early Jan. to meet with Goose Lake Coalition and learn about their monitoring program as they work directly with the Regional Board. Another meeting is planned for March.

➤ Holly gave an update about local ag. water monitoring to Sierra County Board of Supervisors (Jan) and encouraged their support to address the ILRP. A similar presentation will be shared with the Plumas County Board on Feb 19th.

➤ Creeks in Sierra Valley were snow covered and frozen during the January storm event monitoring - photos documenting the conditions will be forwarded to SVWQC (Sac Valley) and RWQCB (Regional Board).

Carol (994-3057) has done a great job of starting the UFRWG website. Check it out at <http://ufrwg.org>.

**Niche Meat Marketing  
Conference March 26-27  
Modesto, California**

Jim Gerrish is the keynote speaker this year. He has 20 years of beef-forage systems research plus 20 years experience of beef and sheep production on his family farm.

The two-day program will cover grass-finishing, meat goat cost study, pastured poultry, processing, sheep and goat producer panels along with marketing panel and Community Supported Agriculture, Buyers Clubs and Taste of the Hawaiian Range and more.

For a complete agenda and registration form, contact the UC Extension Office in Quincy, 283-6270.

# Should I be concerned about *E. coli* on my ranch?

February 2008

## What is *E. coli*?

*Escherichia coli* (*E. coli*) is one of the many bacteria species living in the intestines of warm-blooded animals (humans, cattle, & wildlife). *E. coli* are part of a larger bacteria group called fecal coliforms, which is part of an even larger group called total coliforms. (see drawing on the last page). *E. coli* can also live and replicate outside of the gut in warm, nutrient-rich environments. *E. coli* are important to cattle as they aid in the breakdown of forage & feed. Some strains of *E. coli* (O157:H7) can make people & animals sick if ingested from food/ water supply or during recreational activities such as swimming. The forms of *E. coli* that can cause illness in humans & animals are *pathogenic*. Remember, not all *E. coli* are *pathogenic*.

## Why does *E. coli* matter?

The presence of *E. coli* is used as an indicator of fecal contamination of surface waters. Fecal contamination increases the levels of actual pathogens (agent causing disease or illness), such as *Salmonella spp*, *Giardia spp*, and *Crypto spp*. in surface waters. Most water protection agencies are moving to adopt EPA recommendations for grab sample *E. coli* tests of 235 colony forming units (cfu) per 100 mL of water (cfu/100mL) for streams and other water bodies. It is important to note that the test for *E. coli* used in the UFRW and ILRP water monitoring programs does not determine: 1) if the *E. coli* detected is pathogenic or 2) the source of *E. coli*.



## Is *E. coli* a problem?

Each year, there has been at least one monitoring site in each of the 4 valleys (SV, AV, IV, Goodrich) that had an exceedence for *E. coli* (more than 235 cfu/100ml). Some of these sites with elevated *E. coli* are "above" irrigated agriculture. We wondered if there was a health risk.

## Steps Landowners can take to reduce *E. coli* concerns:

- ◆ Minimize livestock access to streams
- ◆ Provide off-site water for livestock
- ◆ Don't irrigate under livestock
- ◆ Minimize amount of tailwater or use veg filters before returning to creeks
- ◆ Manage vegetation to minimize fecal stream interactions
- ◆ Calve in pastures away from creeks
- ◆ Keep animals healthy

## 2007 Pathogen Study

The UFRW Prop 50 Team collaborated with Dr. Rob Atwill (UCCE Vet) during the '07 irrigation season to determine how *E. coli* correlated with the presence of pathogens. Dr. Atwill will discuss the results of the 2007 pathogen study at the "Management Meeting" on Feb. 26<sup>th</sup> at the Fairgrounds. He will also present pros & cons of different pathogen testing methodologies. UCCE staff are available to answer your questions about management tools to reduce *E. coli*.

## SOME THINGS YOU SHOULD KNOW.....

### .....2007 Water Monitoring Results:

◆ pH levels were slightly higher than acceptable at Middle Fork Feather River at the bottom of Sierra Valley just above the confluence with Grizzly Creek

- May be due to alkali soils in the area

### ◆ Exceedences at "outlet" sites at the bottom of the valleys:

- Dissolved oxygen (too low)
- Indicator bacteria *E. coli* (too high)
  - *E. coli* showed a higher number of exceedences at the "outlet" sites of all valleys in 2007 vs. 2006

### ◆ Dissolved oxygen (DO), turbidity, & dissolved organic carbon (DOC)

- Levels similar between 2006 and 2007 at the valley "outlet" sites

### ◆ 2007 stream flow lower at the onset of irrigation season than in 2006

- Due to significantly dry winter, however late season flows were comparable in both years.

### ◆ Total suspended solids - in concentration and as loads

- All valleys showed much lower (favorable) results in 2007 than in 2006 throughout the season

IF YOU HAVE ANY QUESTIONS ABOUT NEWSLETTER OR ANYTHING RELATED TO THE PROP 50 EFFORTS, PLEASE CALL:

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**Upper Feather River Watershed Irrigated Lands**

c/o UC Cooperative Extension  
208 Fairgrounds Road  
Quincy, CA 95971

Pathogen Study  
▶ Animal Health Issues  
Forage Quality Study  
Plans for 2008-09

Non-Profit Organization  
PRSRT STD  
U.S. Postage Paid  
Quincy, CA  
Permit No. 9

**Management Meeting**  
Water, Livestock, Forage & Regulations  
Feb 26th Fairgrounds 2-4pm

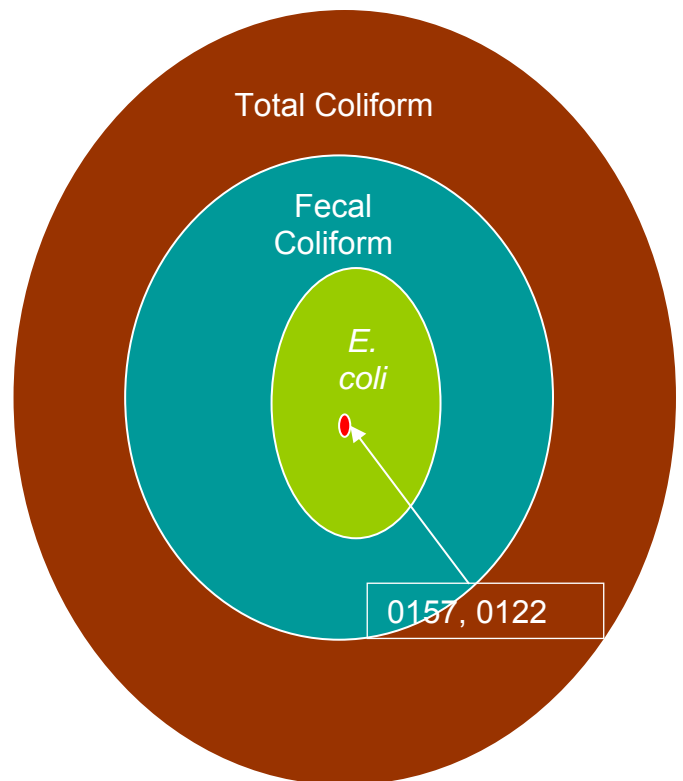
**University of California  
Cooperative Extension**

Please contact us for any special assistance regarding our programs.

**Plan to Attend Feb 26th Management Meeting**

On Tues. Feb 26<sup>th</sup>, UC Cooperative Extension will host a meeting in Quincy(2-4 pm) covering an array of ranch management topics. Dr. Rob Atwill, Extension Veterinarian will discuss our 2007 pathogen study in Sierra & Bridgeport Valleys plus pros/cons of various pathogen testing methodologies. Dr. Bruce Hoar, DVM @ UC Davis will cover the topic of beef cattle herd health. Prop 50 Project Team members will share results of the 2007 soil moisture and forage quality study, including livestock performance estimates. Ken Tate, Holly George and Carol Dobbas will facilitate group discussion about plans for 2008 and beyond (monitoring, outreach, management and reporting options for ILRP, ranch planning, future studies, funding opportunities, etc.).

***This meeting is free. Please plan to attend.***  
If you have questions, call 283-6270.



A small portion of the indicator bacteria *E. coli* are pathogenic. We need to learn IF we have a health risk in our watersheds THEN, identify sources of the pathogenic bacteria.