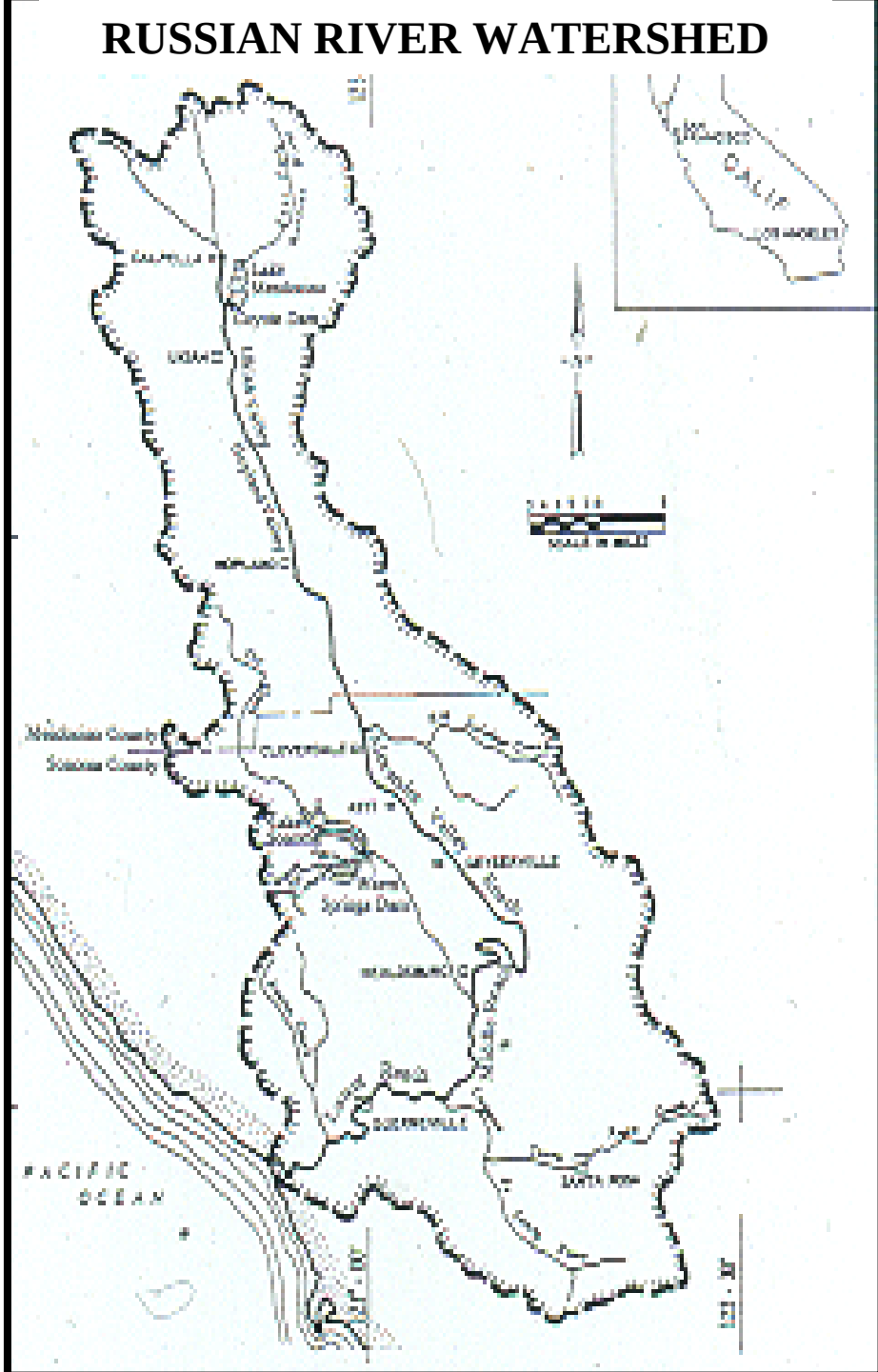
LAUREL MARCUS

EXECUTIVE DIRECTOR

CALIFORNIA LAND STEWARDSHIP INSTITUTE

The Fish Friendly Farming Environmental Certification Program started in the Russian River watershed in 1999 currently has over 25,000 acres enrolled in the Mendocino County portion of the Russian River and 23,000 acres in Sonoma County.

RUSSIAN RIVER WATERSHED



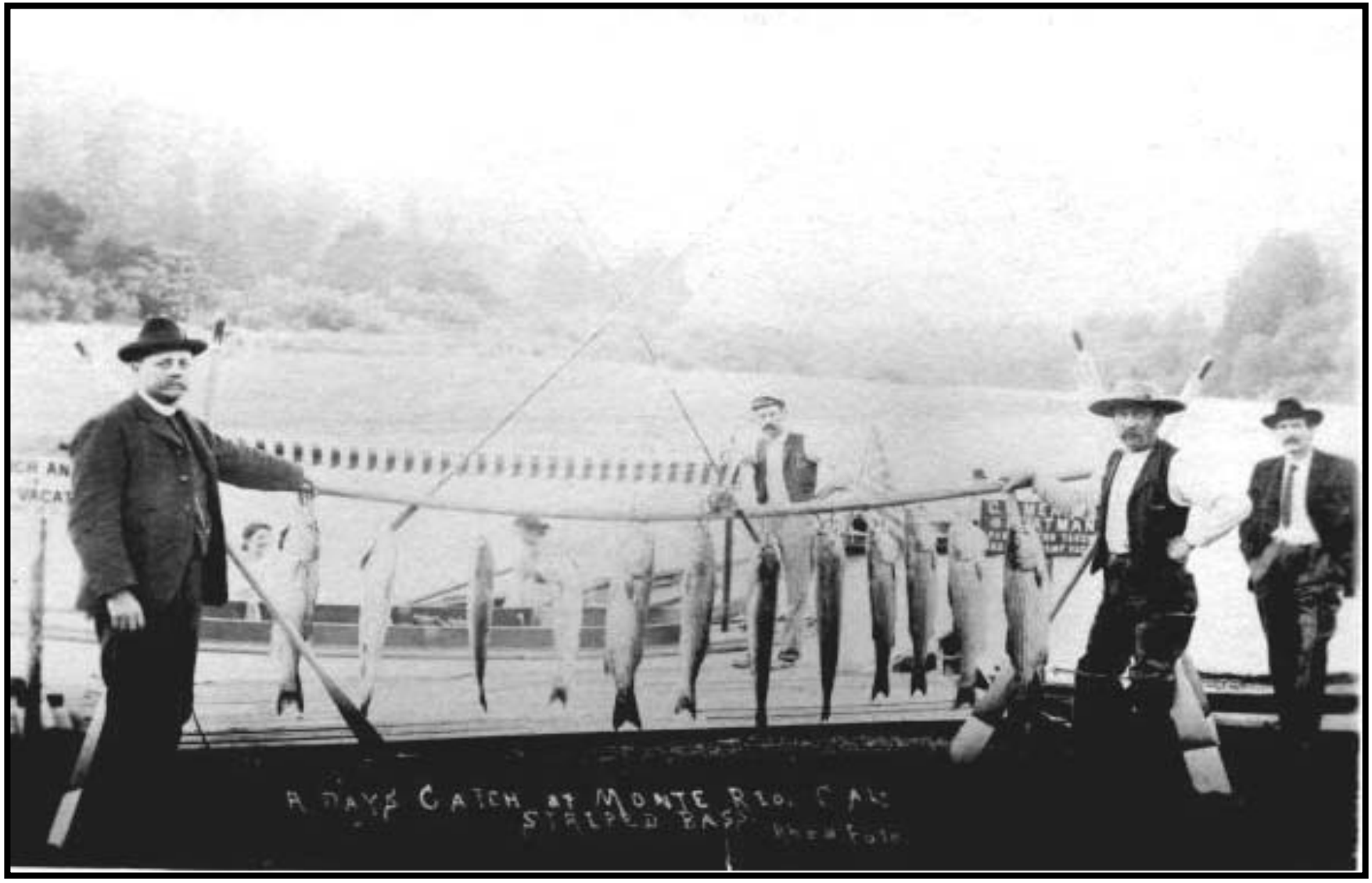
1. Take a look at processes affecting the aquatic environment of the Upper Russian River Watershed as a whole system:

- **Hydrology of the Upper Russian River**
- **Presentation of research on two tributaries – demonstrates the role of releases from Coyote Dam in creating connected flow for fish and the long term effect of Coyote Dam on stream flows**
- **It's a complex system without adequate monitoring data and simple solutions are unlikely to solve problems**

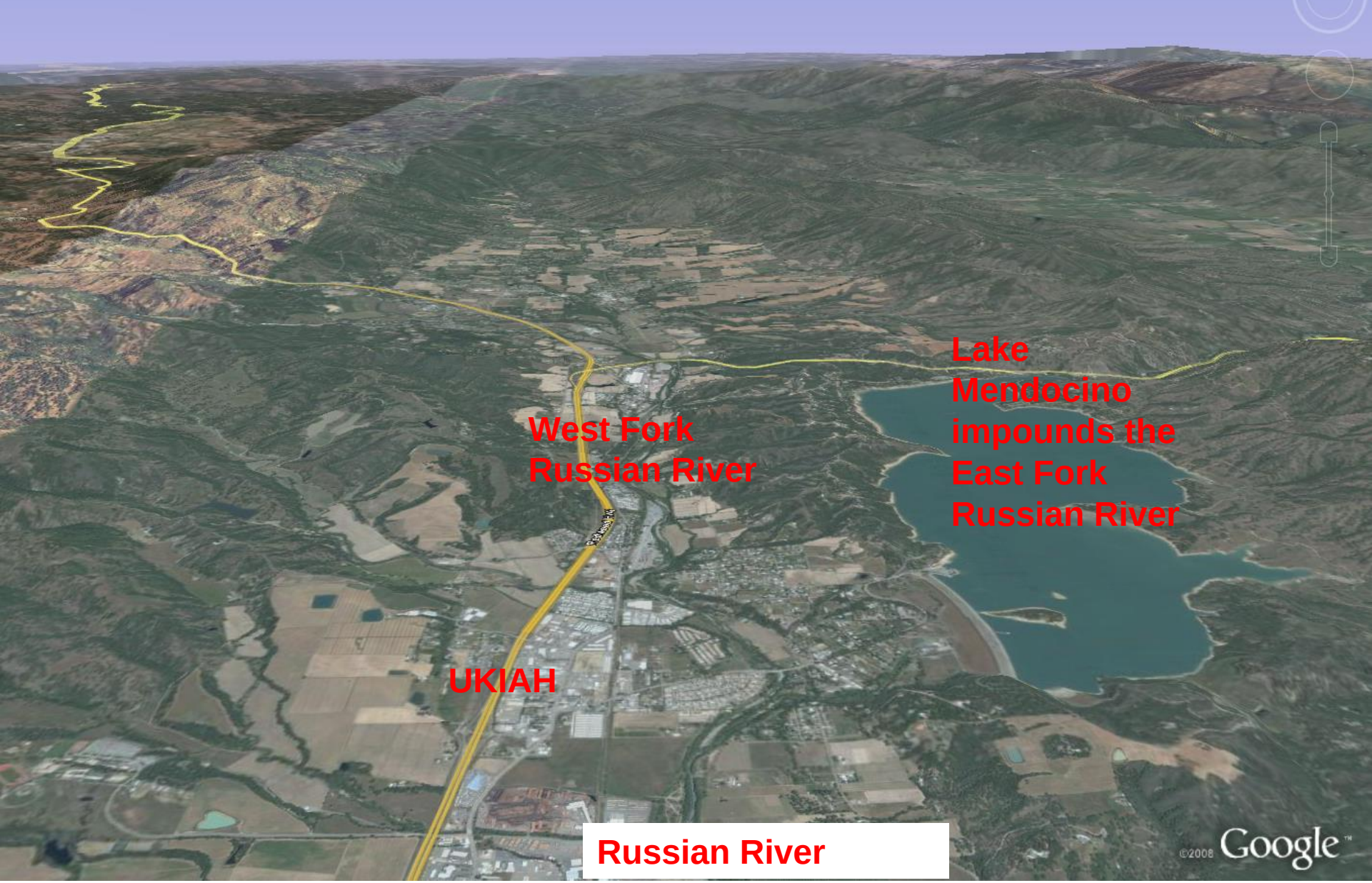
2. Current proposed project from partnership of Natural Resources Conservation Service, Mendocino County Farm Bureau, Mendocino County Russian River Flood Control and Water Conservation District and California Land Stewardship Institute:

Northern California Wine Country Agricultural Water Conservation and Water Quality Improvement Program

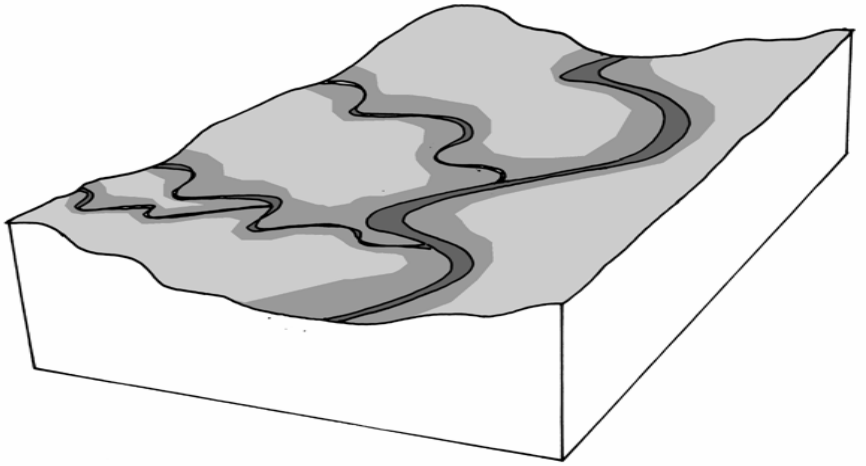
- **Addresses construction of infrastructure to provide for agricultural water management in the Upper Russian River and potential use of recycled water**

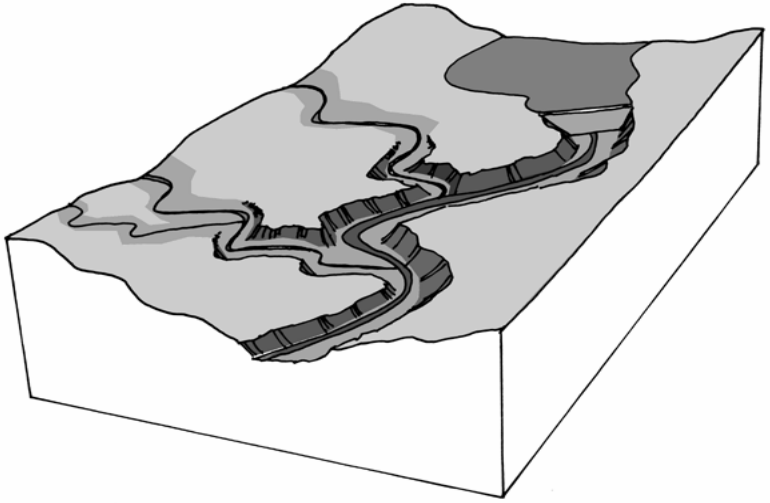


A DAY'S CATCH ON THE RUSSIAN RIVER AT MONTE RIO



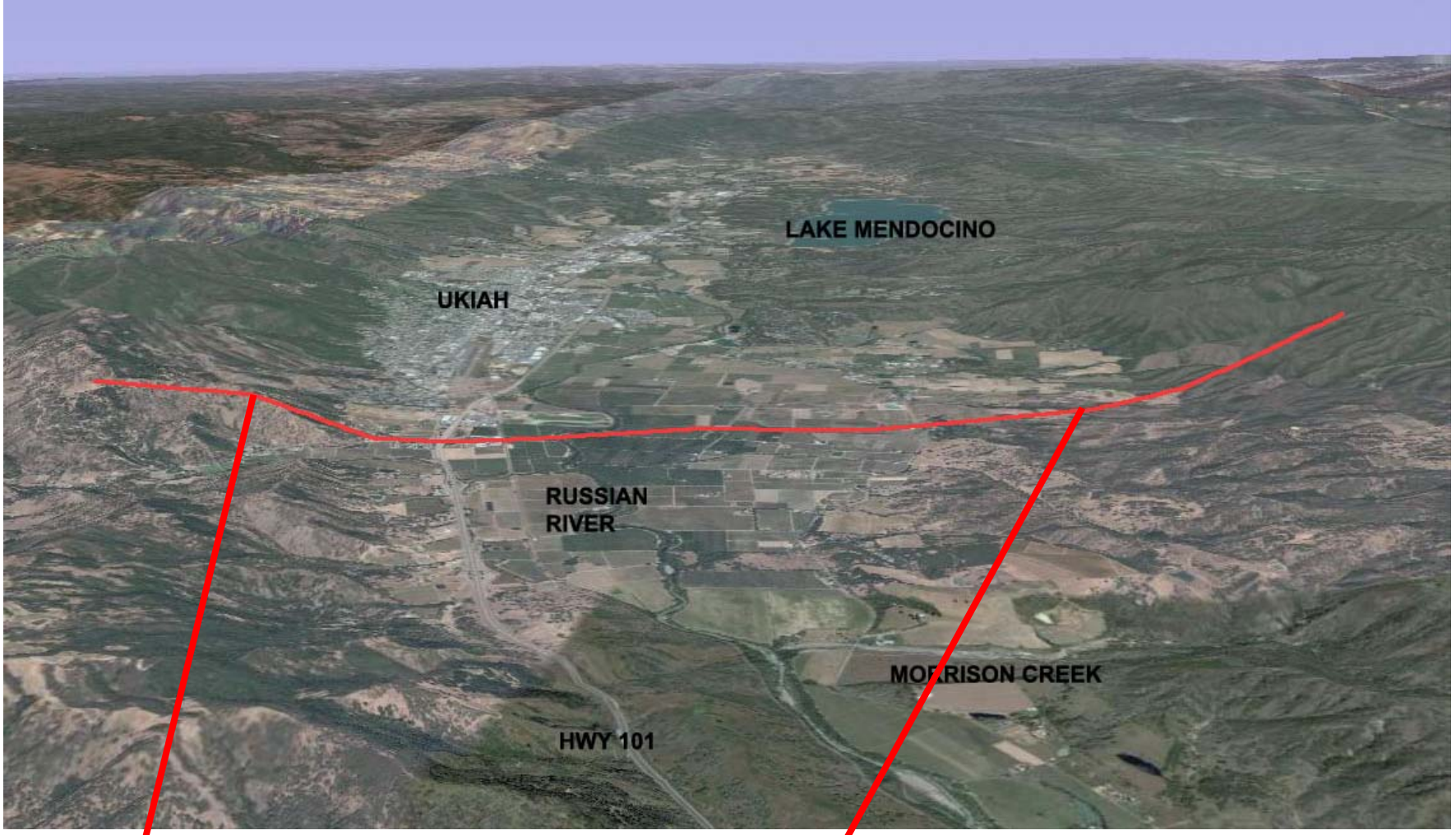
The Upper Russian River drains an alluvial basin flanked by mountains. Lake Mendocino was built 50 years ago and has significantly altered the Russian River channel and its hydrology. These changes cannot be ignored when looking at stream flow and fish habitats.

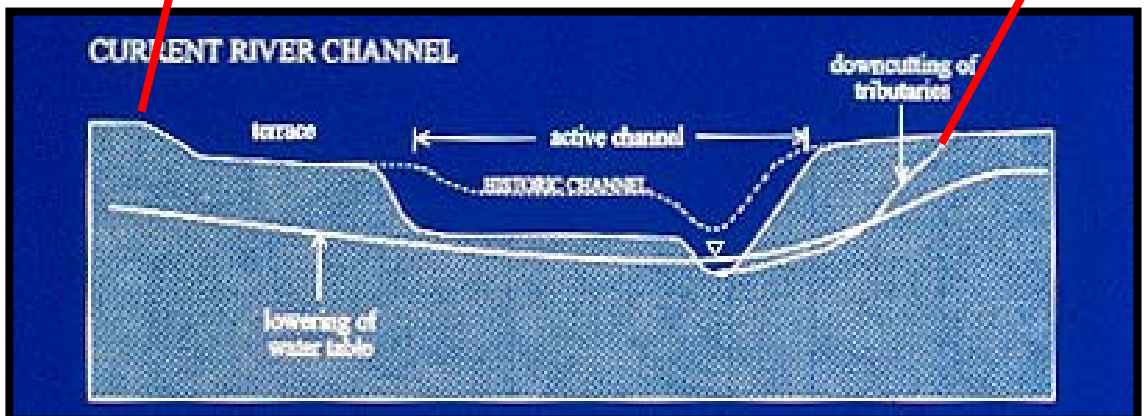




Coyote Dam has cut off sediment movement into the river causing the Russian River channel to incise or entrench nearly 20 feet into its alluvial floodplain. This change alters the timing of connected stream flow for fish to move between tributaries and the main river channel.

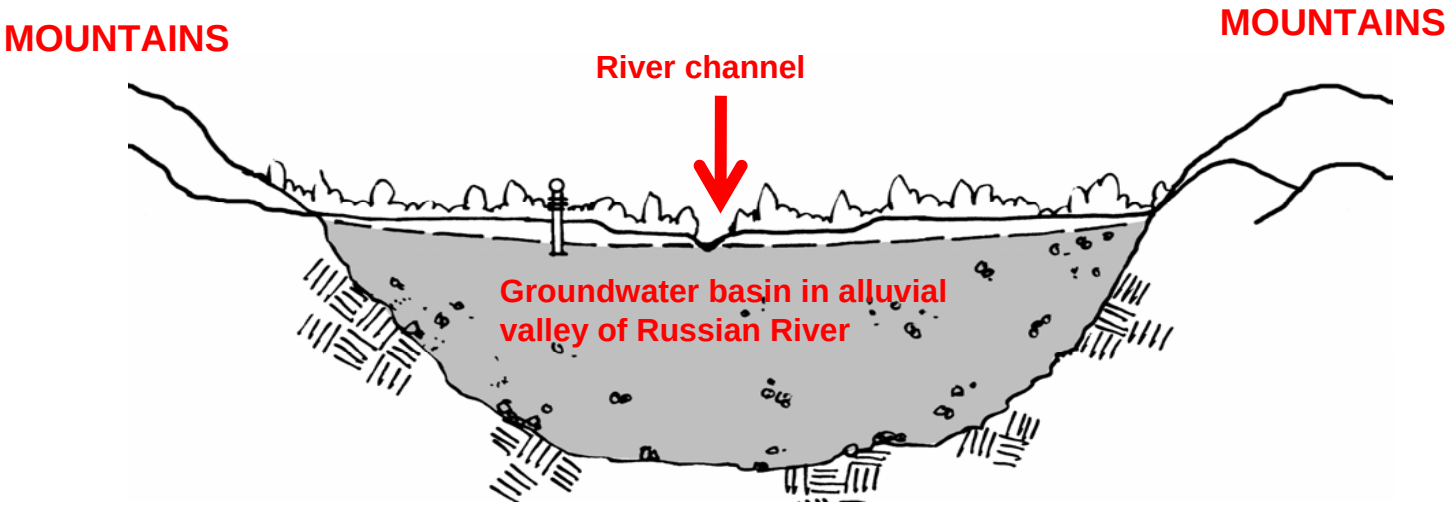
Channel entrenchment on the Upper Russian River is easily visible along the entire alluvial valley from the Dam to Hopland. The channel has dropped 20 ft with significant bank failures and loss of habitat and numerous bridges have been undercut and had to be replaced.



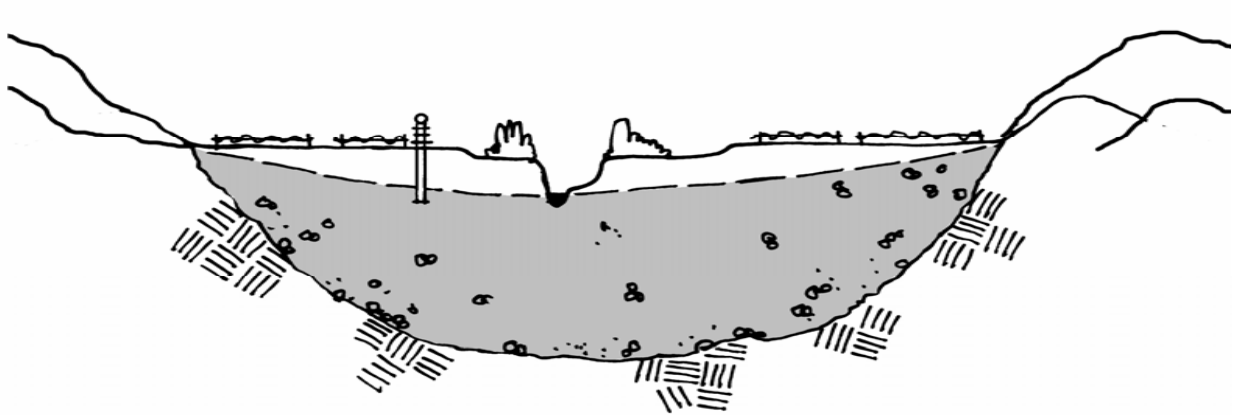


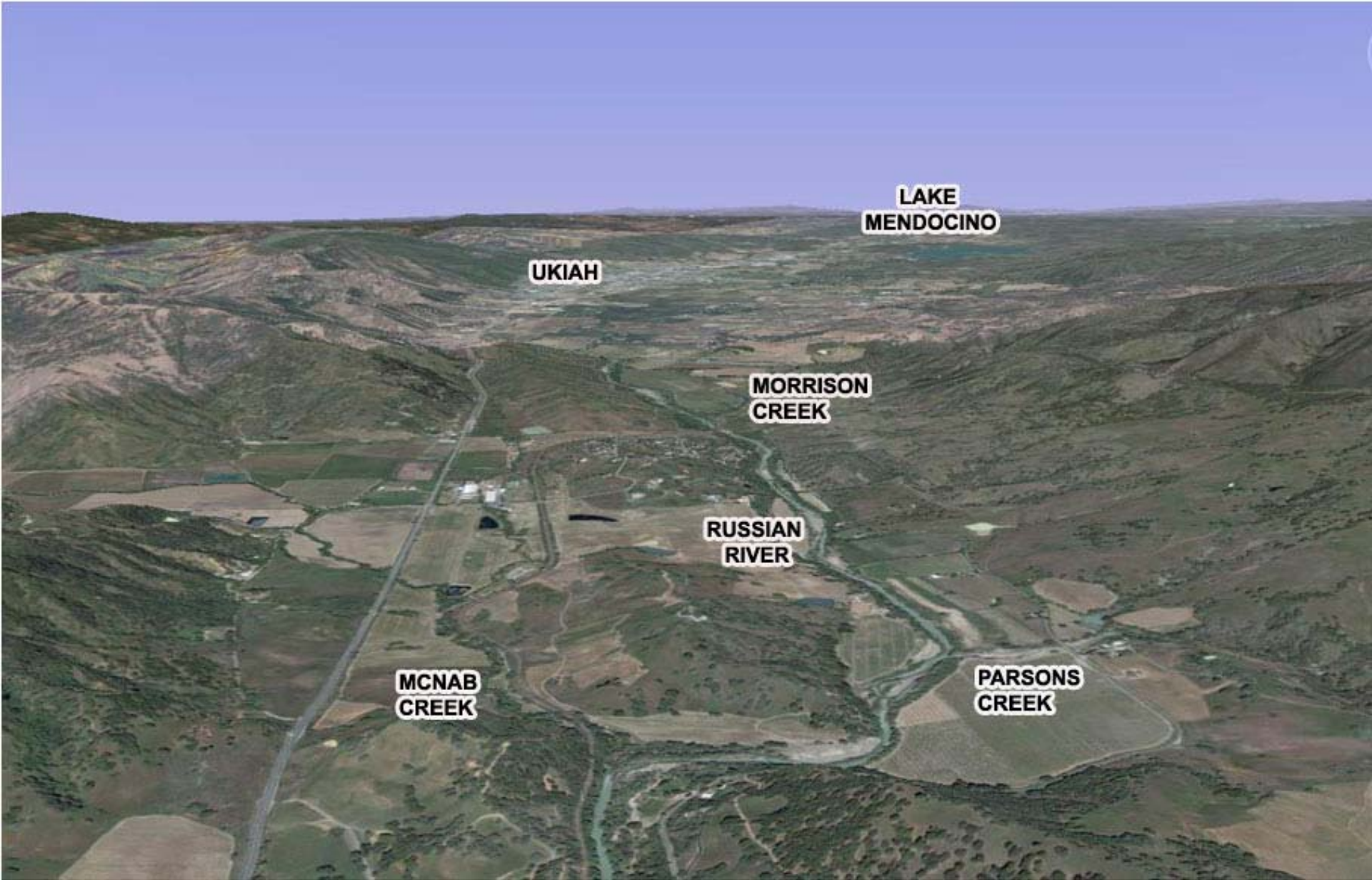
Channel entrenchment affects groundwater levels and therefore the timing and magnitude of stream flow

RIVER CHANNEL AND GROUNDWATER BASIN PRIOR TO ENTRENCHMENT

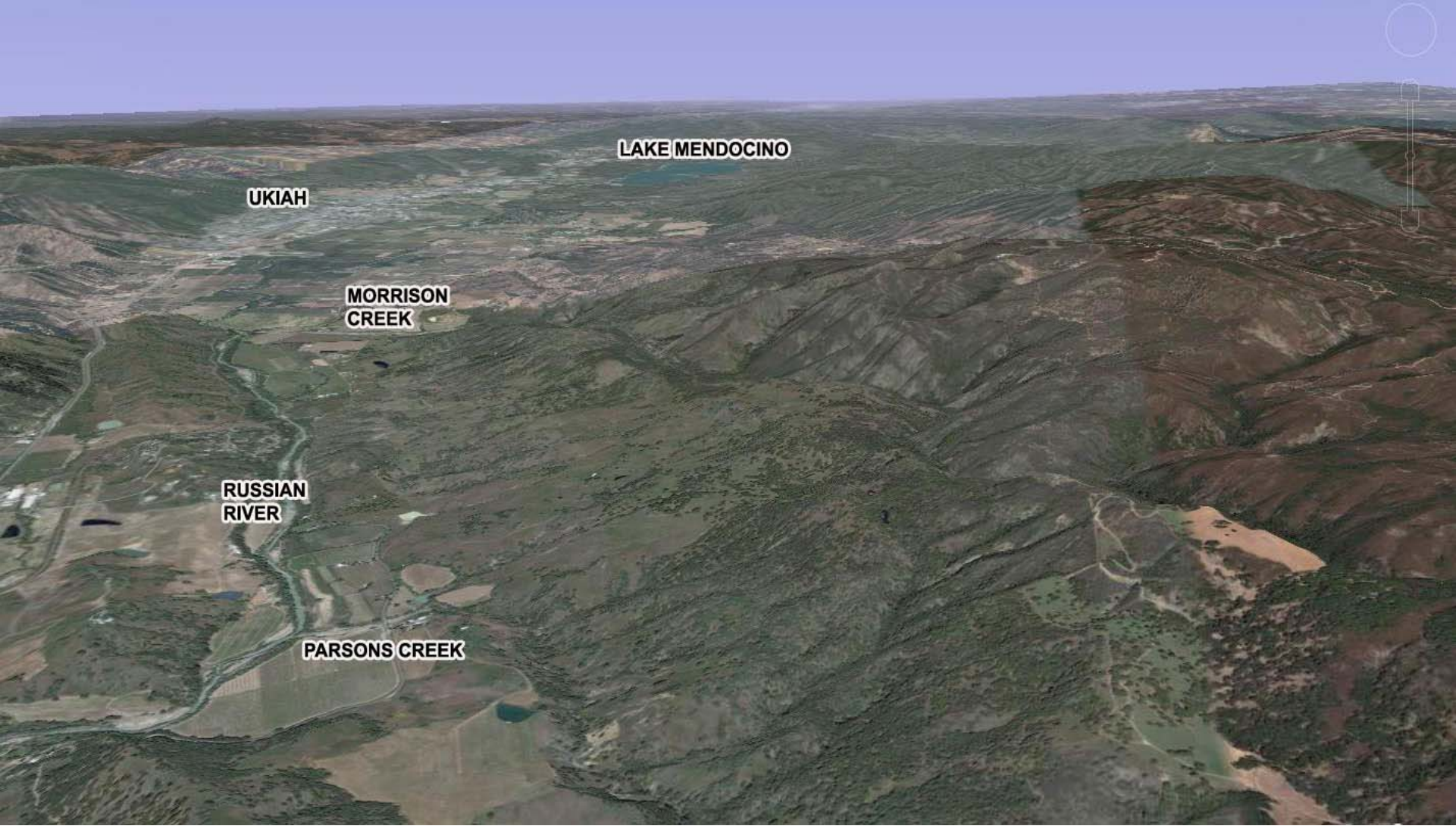


RIVER CHANNEL AND GROUNDWATER BASIN AFTER ENTRENCHMENT – SIGNIFICANT SYSTEM-WIDE CHANGE





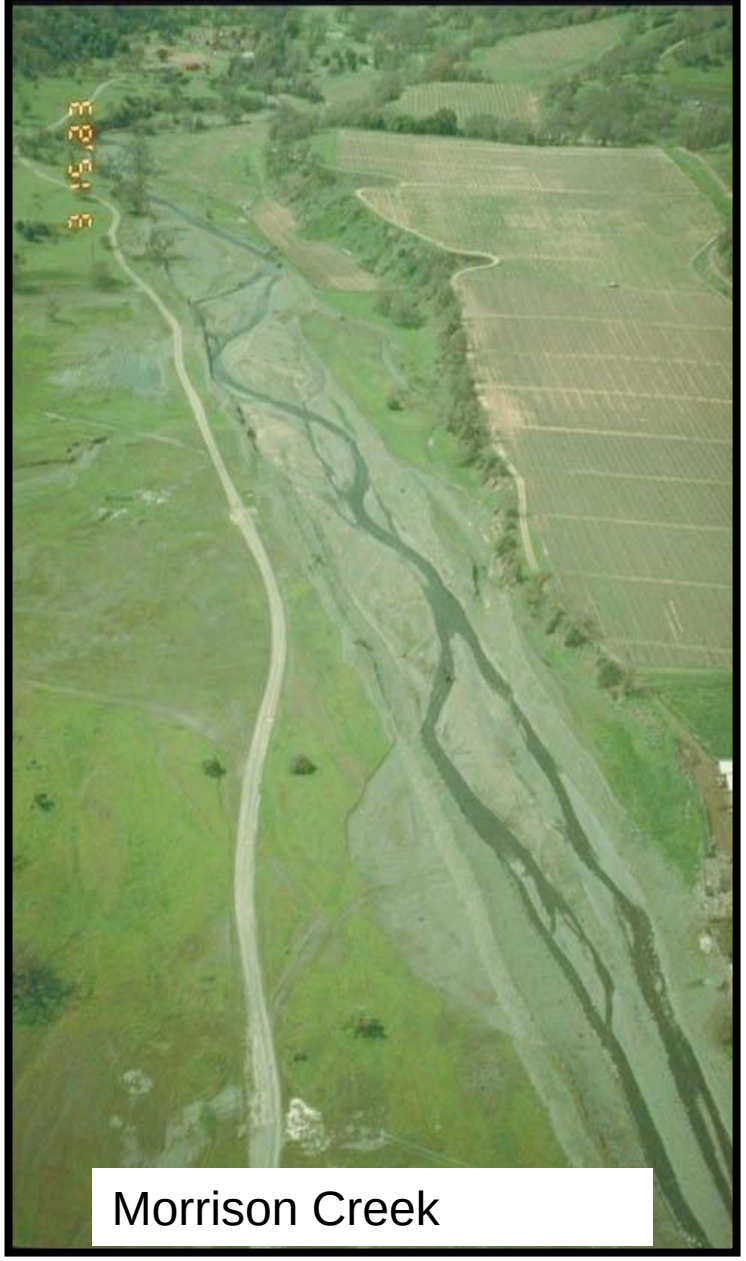
In 2001 the shallow groundwater levels of Morrison and Parsons Creeks were monitored to determine why riparian vegetation would not establish on these creeks



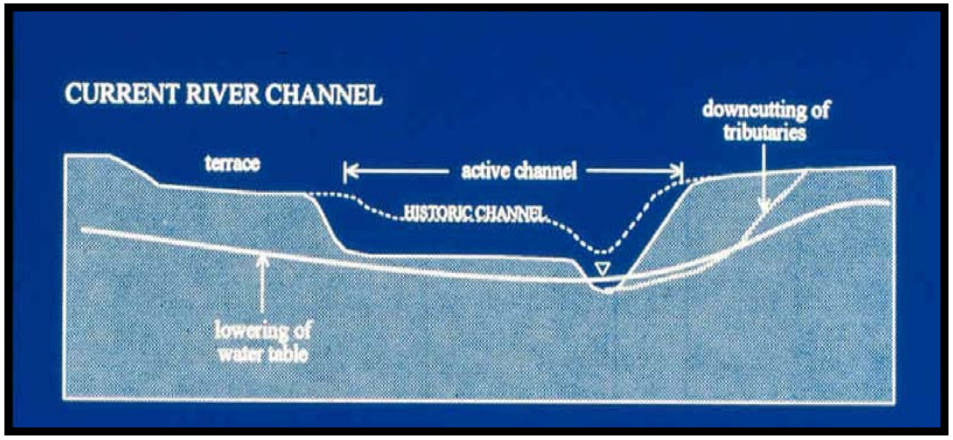
Morrison and Parsons Creeks both drain the steep mountains on the east side of the Ukiah Valley then spill out on to the alluvial valley to meet the Russian River. The monitoring was done in the alluvial valley reach of each creek. Morrison Creek has no reservoirs to affect flows and Parsons Creek has two small ponds.

Morrison Creek

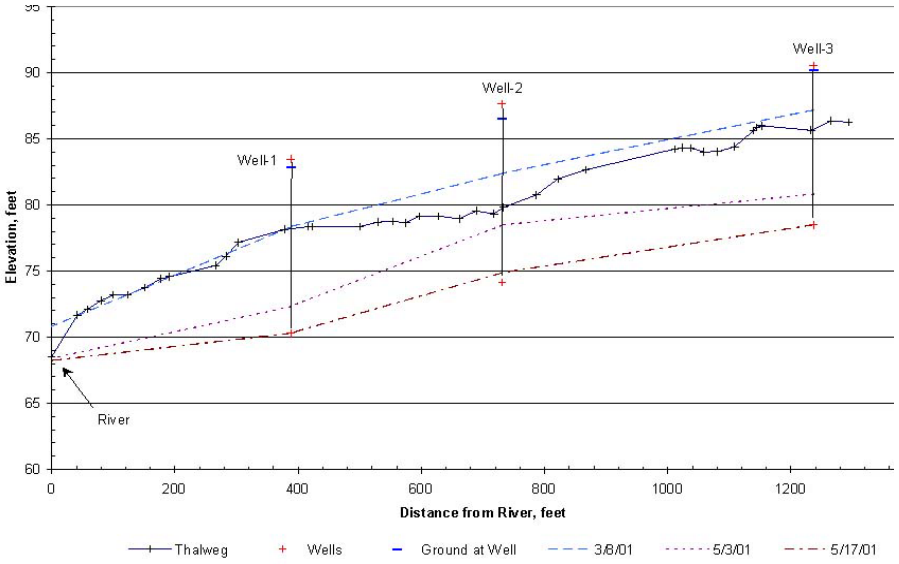
Parsons Creek



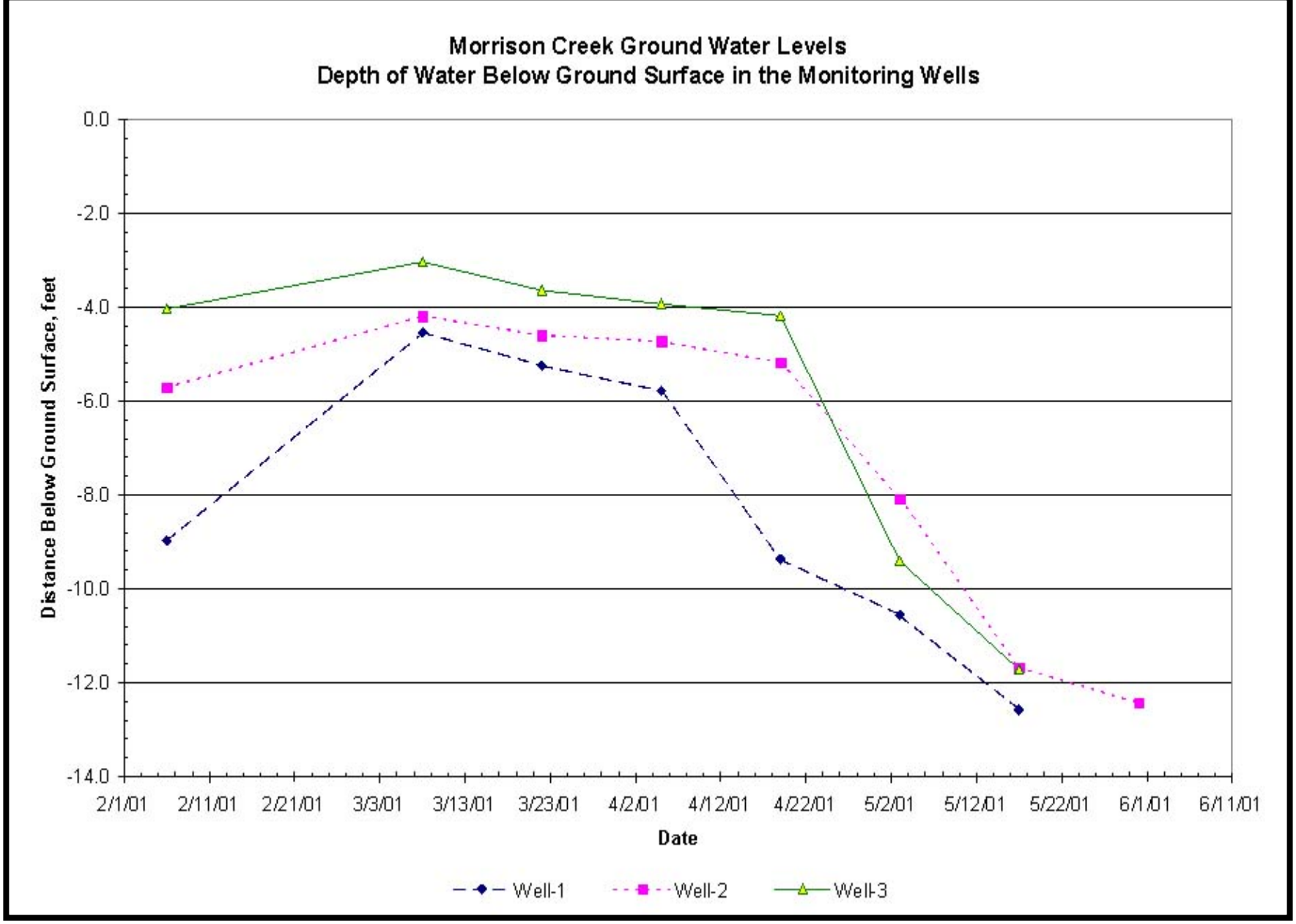
Morrison Creek



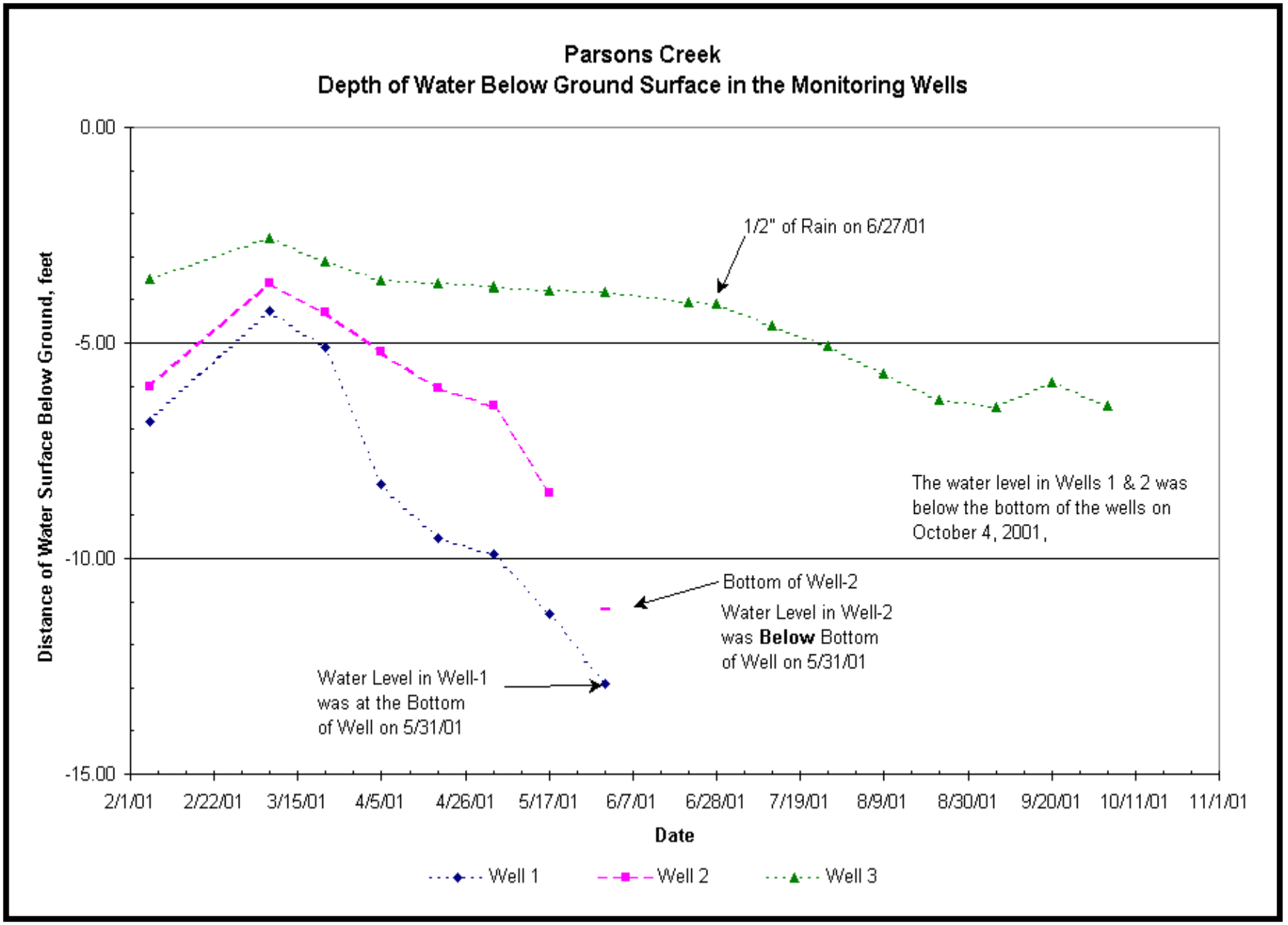
Public road bridge on Parsons Creek shows the effects of channel entrenchment in the main Russian River moving up the tributaries and eroding the tributary channel until a hard point (the bridge) is reached.



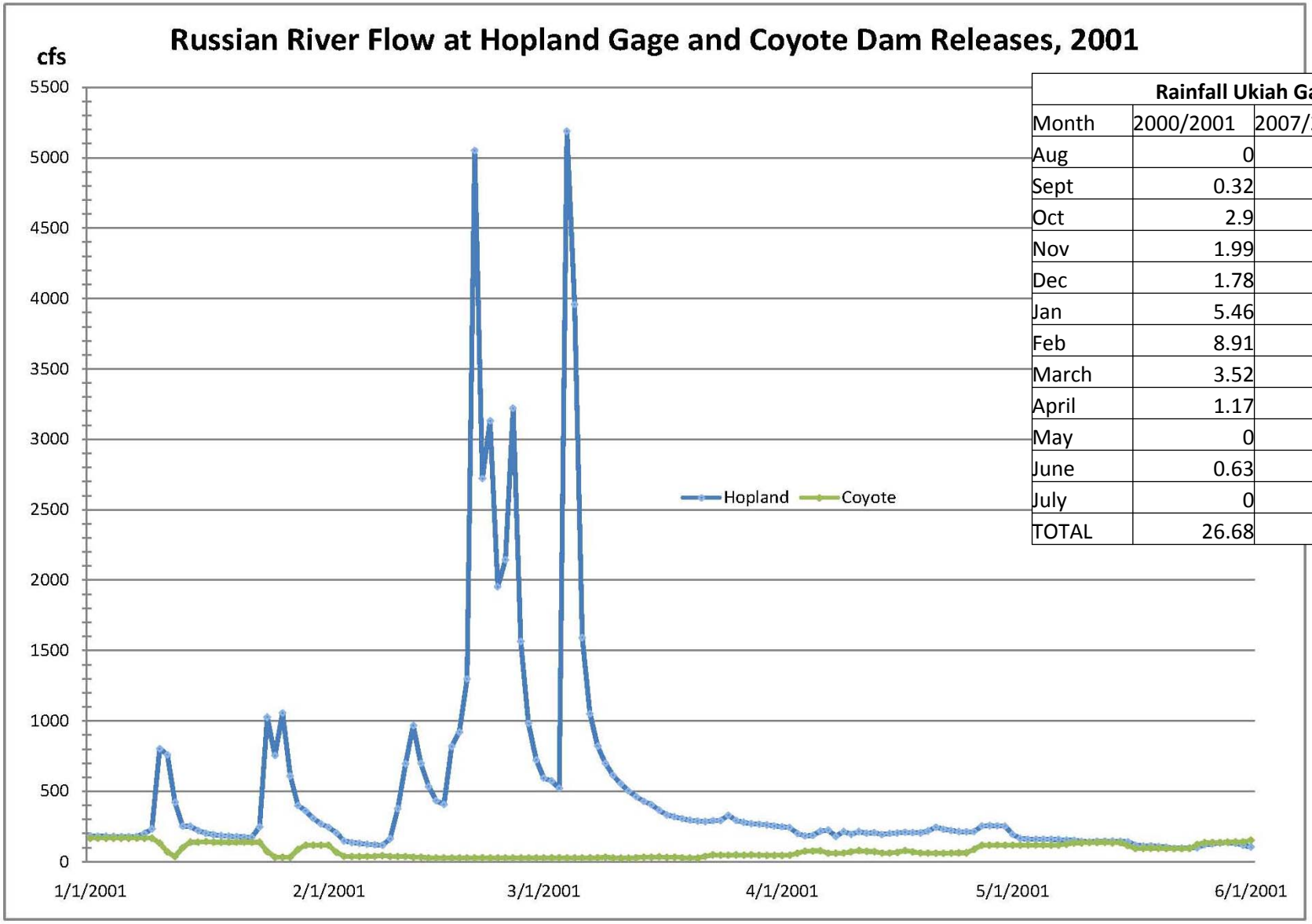
Three monitoring wells/creek were installed at scattered locations along Morrison and Parsons Creeks. Wells were 13 ft deep. No other agricultural wells were operating when readings were made.



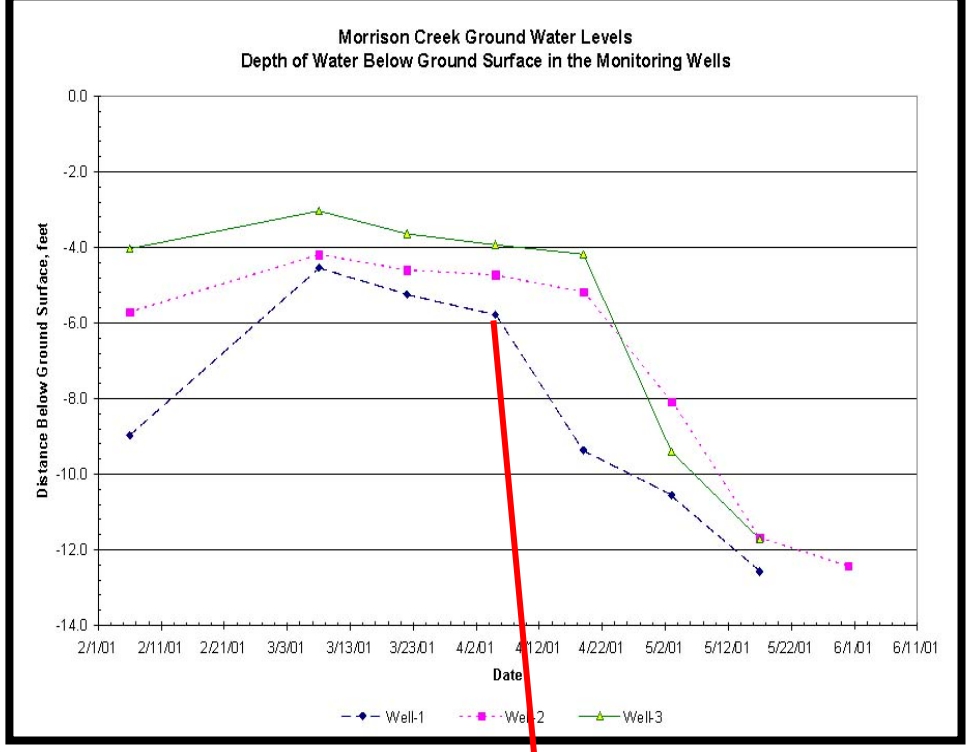
Groundwater dropped up to 9 feet in less than 3 months.

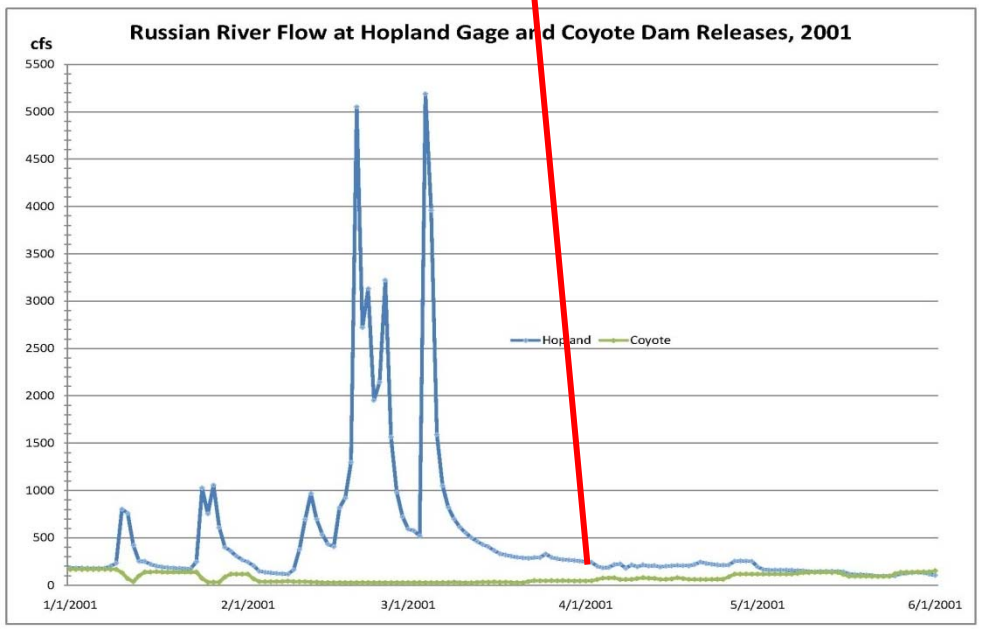


Same pattern in Parsons Creek as Morrison except for the well above the road bridge which is not as affected by river levels



Rainfall Ukiah Gage			
Month	2000/2001	2007/2008	2008/09
Aug	0	0	0
Sept	0.32	0	0.28
Oct	2.9	2.18	1.22
Nov	1.99	0.6	4.53
Dec	1.78	7.3	3.48
Jan	5.46	15.25	0.78
Feb	8.91	5.22	9.26
March	3.52	1.25	2.56
April	1.17	0.44	
May	0	0	
June	0.63	0.01	
July	0	0	
TOTAL	26.68	32.25	22.11

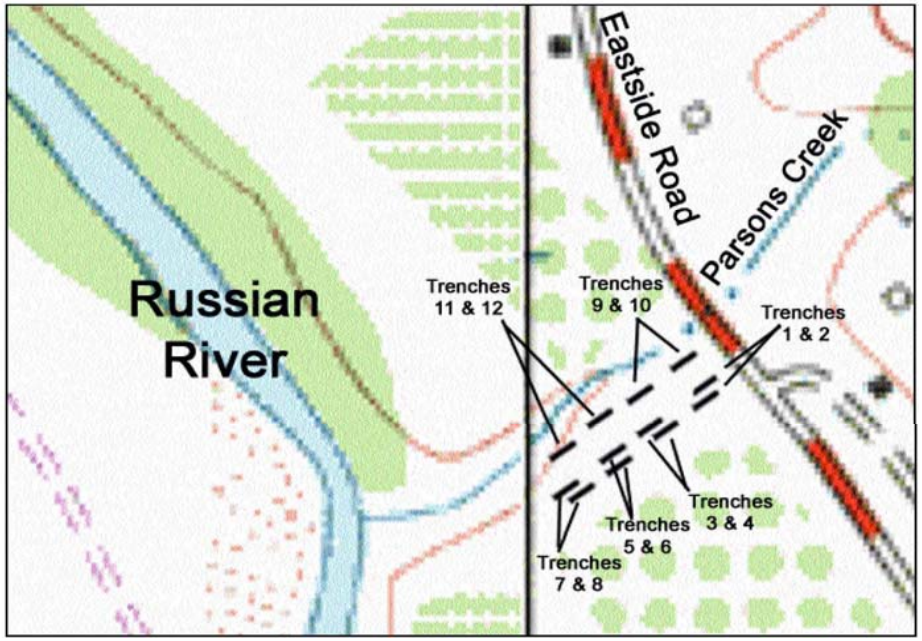




Drop in ground water levels coincides with the drop in flow levels in the main river channel and is the greatest in the well located closest to the Russian River indicating that the river's water surface elevation is controlling the dewatering of the tributaries.

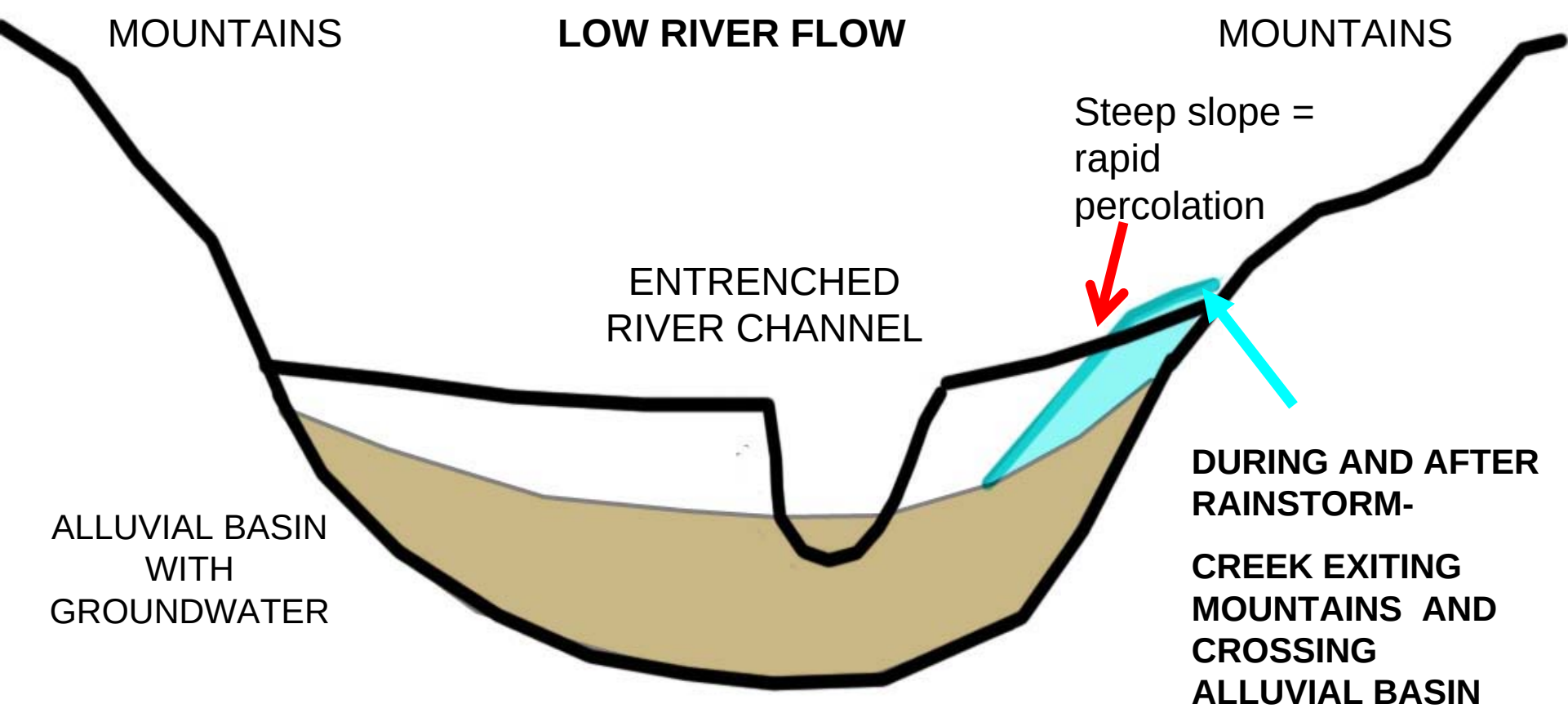
Flow in both Morrison and Parsons Creeks went subterranean as soon as the water level in the river dropped. No juvenile steelhead could have migrated out of these creeks which have year round flow in their canyons.

Dormant willow poles were placed in trenches 4 and 8 feet deep to determine if this technique would establish riparian vegetation on these creeks

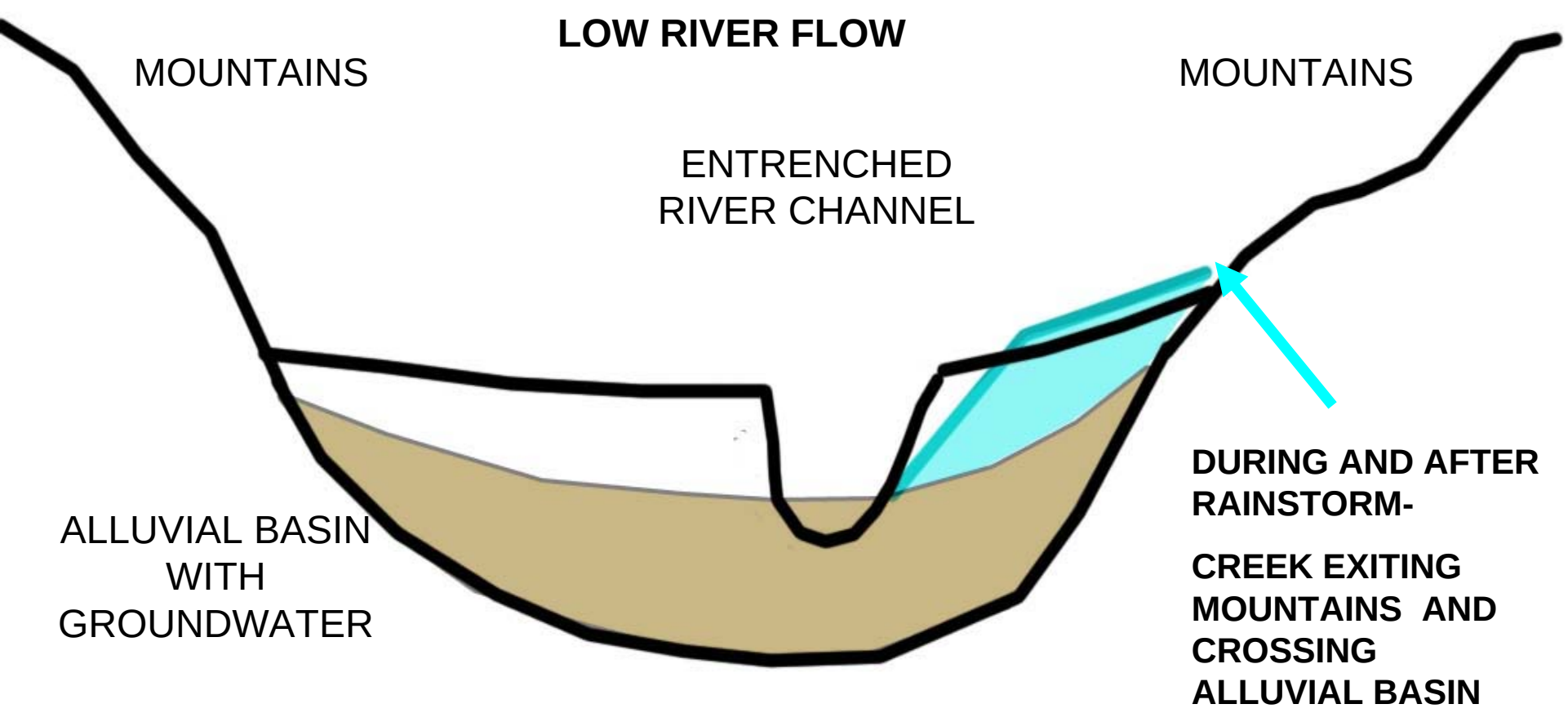


All the willows in all the trenches leafed out indicating there was sufficient groundwater in the Feb-March period

Willows survived in the most upstream trenches whether 8- or 4-foot in depth but <u>all the willows died</u> in the trenches closest to the river. The management of water levels in the main Russian River by releases from Coyote Dam has a significant effect on the function of the aquatic and riparian ecosystem in the Upper Russian River.

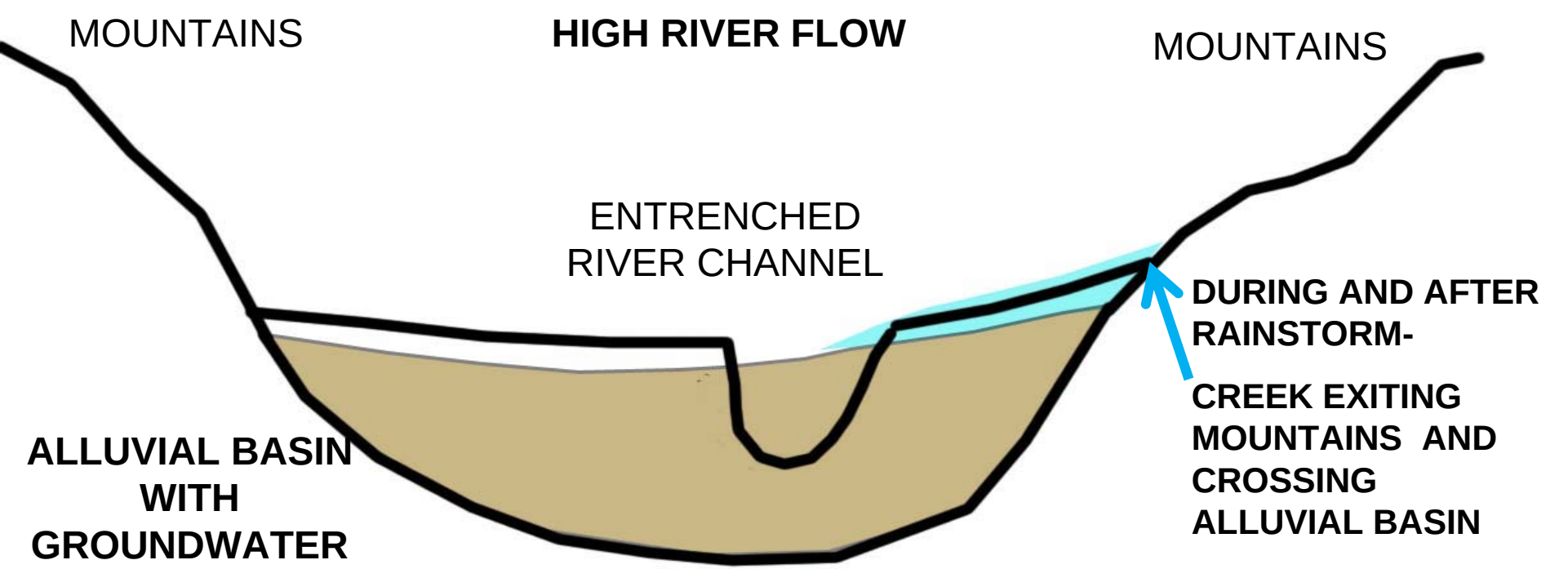


At low flow in the river channel water exiting the creek canyon onto the alluvial valley will percolate into the alluvium until the alluvium is filled with water and the river rises. The slope of the ground water basin between the creek outlet and the river level determines how quickly the water percolates

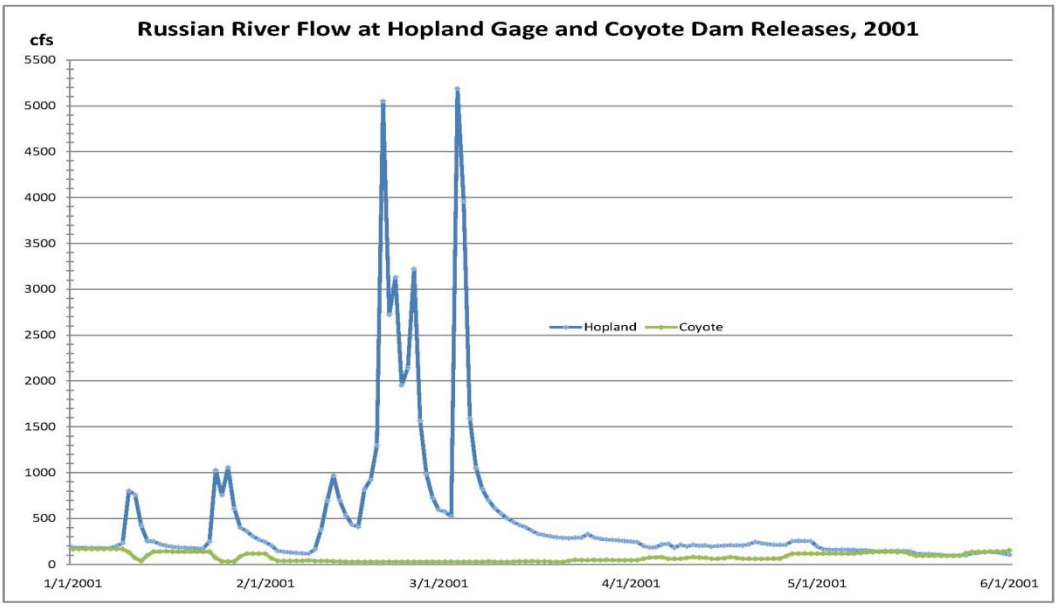


During large or intense rainfall events when the river is still low creek flow may be great enough to make it nearly to the river channel before percolating into the alluvium

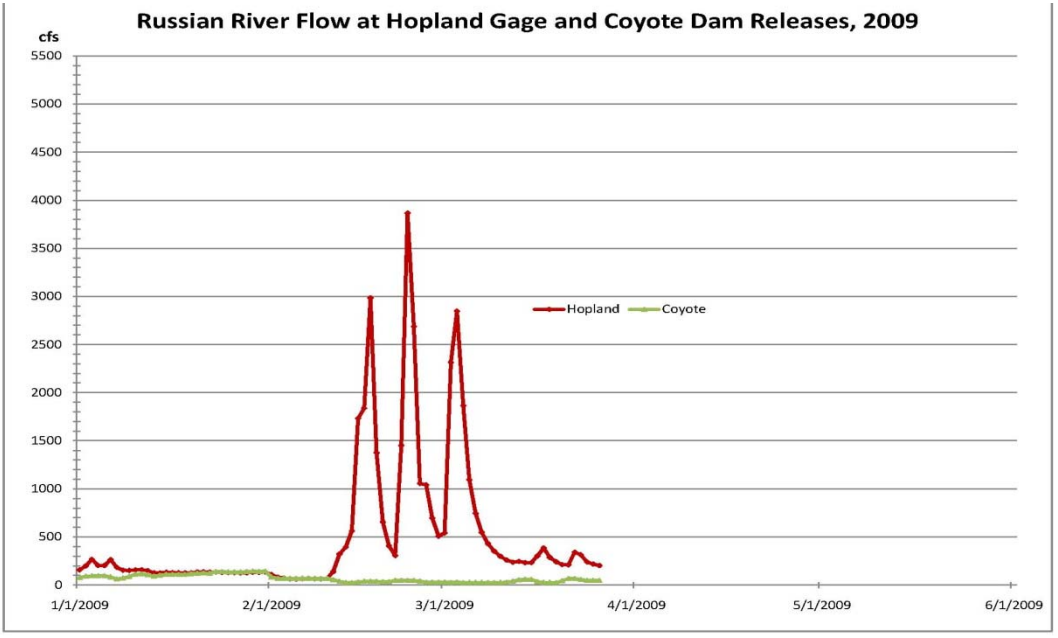
Morrison Creek in 2008/9 percolating into the alluvium near its creek outlet (above) and near the river. The Russian River is about 1000 ft. downstream from where the water is percolating into the ground in Morrison Creek. Red arrow indicates direction of flow.



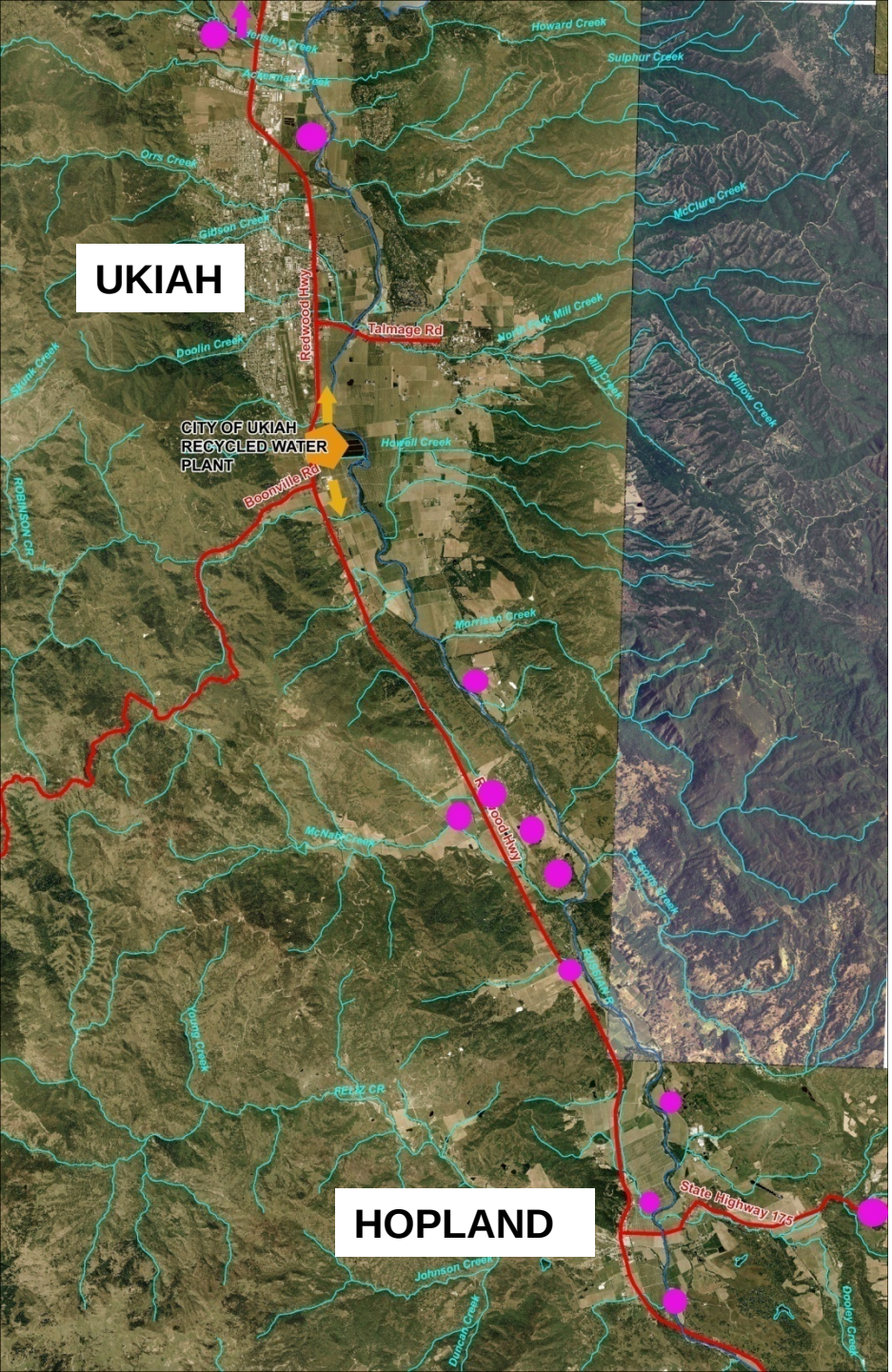
MORRISON CREEK AT HIGH FLOW IN FEBRUARY 2009. ONLY ONE PERIOD OF CONNECTED FLOW OCCURRED IN 2009.



The dewatering of tributaries recorded in Parsons and Morrison Creeks occurred due to the long term effects of the Coyote Dam on river channel entrenchment and the low level of releases in dry years. The drop in groundwater occurred well before frost season and appears to relate to low flow in the river channel. These processes may impact juvenile fish migration throughout the upper basin and need to be monitored in more locations.



The Russian River is a complex system that is lacking adequate monitoring and gaging data to determine the best course of action for water management. Creating a policy or regulation based on inadequate data regarding the causes of a problem is unlikely to solve the problem. There is not enough gaging data to allow for a water master program like the Napa river basin and the differences between the two basins are great.

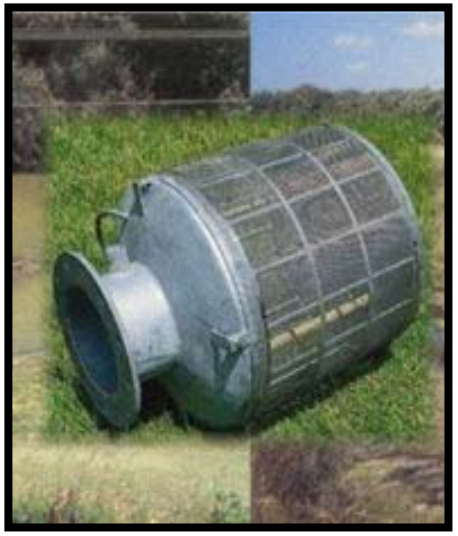


Northern California Wine Country Agricultural Water Conservation and Water Quality Improvement Program

Current proposed project from partnership of Natural Resources Conservation Service, Mendocino County Farm Bureau, Mendocino County Russian River Flood Control and Water Conservation District and California Land Stewardship Institute

Purple dots indicate proposed off stream ponds. These ponds totaling about 510 ac-ft of storage will allow for frost water supplies to be stored through slow diversion from the river during the day decreasing the large demand for water from the river during frost nights.

The ponds will also allow for storage and use of the 4000 ac-ft of recycled water available from the City of Ukiah (orange dot)



Off stream reservoir with river diversion fitted with fish screen

THE FIRST STEP IN A SOLUTION:
Northern California Wine Country Agricultural Water Conservation and Water Quality Improvement Program will include:

- **Off stream storage ponds adequate to hold over 500 ac-ft of water**
- **Stream, river and shallow ground water monitoring geared to determining optimization in reservoir releases and water management for connected stream flows and fish habitats**
- **Telemetric water meters for all of RRFC customers**
- **Technical Advisory Group of agencies to work with the agricultural community and the program sponsors to solve problems**
- **Outreach to landowners create additional phases of storage pond construction**
- **Engineering feasibility of distributing and storing Ukiah recycled water**

Current proposed funding sources:

- **Natural Resources Conservation Service Agricultural Water Conservation Enhancement (AWEP) program**

- **State Water Board federal stimulus money through the Clean Water State Revolving Fund**

The Ukiah and Hopland areas are Economically Disadvantaged Communities under the Water Board's methodology and will require funding assistance to build the water infrastructure necessary for changes in water management.