Kelsey Creek Watershed Assessment

Executive Summary

A Document of the Big Valley Watershed Council

Prepared for:

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Background

The purpose of this assessment is to collect information on past and present watershed conditions and management, to identify data gaps, to provide a basis for watershed planning, and to identify necessary watershed projects. Protecting water quality.

The Kelsey Creek watershed is located immediately south of Clear Lake in the Northern California Coast Ranges about 80 miles north of San Francisco. With an area of 45 square miles, the Kelsey Creek watershed ranges from the summit of Cobb Mountain, covered with pine and fir forests at 4,722 feet elevation, to the level farm lands of Big Valley along the shore of Clear Lake, 1,318 feet elevation. Kelsey Creek is one of the major tributaries to Clear Lake contributing approximately 16% of the stream flow to the lake. Clear Lake is a large natural lake that drains to the east via Cache Creek into the Sacramento River.

The Big Valley Watershed Council formed in 2001. Its purpose is "to protect, enhance, and improve the surface and groundwater resources, stabilize historic channel elevations, and enhance the natural systems of the Kelsey Creek watershed."

Watershed Information

This assessment assembled and summarized information about the Kelsey Creek watershed in the following areas:

- History
- Geology
- Soils
- Hydrology
- Hill Slope and Stream Channel Geomorphology
- Water Quality
- Water Supply
- Terrestrial Habitats and Species
- Aquatic Habitats and Species
- Invasive Species
- Fire and Fuel Load Management
- Social and Economic Setting
- Land Use
- Current Watershed Management

Findings and Recommendations

Protecting Water Quality

Sediment is the most widely recognized pollutant to watershed surface waters with the potential to damage stream aquatic habitats and Clear Lake water quality. It is the source of mercury and nutrients, the two contaminants under regulatory requirements for clean up in Clear Lake. Sediment studies to date have measured the total sediment load from the Kelsey Creek watershed to Clear Lake. Studies documenting localized sediment sources, and stream channel condition are lacking.

California Department of Water Resources (DWR) stream water quality samples found many primary drinking water standard exceedances for a station labeled "Bottle Rock Power Plant" during sampling carried out from 1978-1987. It was not clear whether this sample came from a stream, waste pond, or other location. Follow up sampling is needed to determine whether there is an on-going contamination problem from the Bottle Rock Power Plant, especially as the plant was re-opened in 2007 after 16 years of closure.

Groundwater studies have detected increasing levels of nitrate, a potential human health threat, in some areas of Big Valley. The nitrate source could be from agricultural fertilizers and/or human/animal waste. Additional groundwater studies are needed to determine the effects of low water levels on groundwater quality.

Managing Water Supply

Agriculture is the biggest water user in Big Valley. Because of recent changes in cropping patterns, current demand on water resources is reduced from past years. Aquatic habitats and spawning fish such as the Clear Lake hitch may benefit from this reduced agricultural water demand. It is important to plan for changes in cropping and other land use patterns that could lead to greater water demand.

Reducing Fire Hazards

Fuel loads and fire hazard are high throughout the upper Kelsey Creek watershed because it is a naturally fire-prone area and there has been no significant wildfire in the area since 1962. In addition, more people continue to move to this fire-prone area. Prescribed burning and other practices to reduce fuel load are complicated by land ownership patterns, regulatory requirements, and cost. The recently completed Lake County Community Wildfire Protection Plan prioritizes fuel reduction and fire safety projects. On a local level, residents can organize Firewise Communities to work together on fire prevention.

Reducing Illegal Dumping

The Big Valley Watershed Council has carried out annual creek clean-ups since its inception. The Lake County Public Services Department and Community Development Department Code Enforcement Division have programs to prevent illegal dumping. They work with the County Sheriff's Department and the California Department of Fish and Game (DFG) to catch violators. DFG enforces state laws prohibiting illegal dumping near watercourses.

Flood Management and Debris Jams

Property owners often need to remove debris jams to prevent flooding. Straight, clear channels, can move water more rapidly through an area, however woody debris and meandering channels help to provide diverse riparian and aquatic habitat. When possible, land use practices that allow natural stream processes to occur should be encouraged. Hydrologic studies are needed in the upper watershed to determine the cause of debris jams and streambank erosion.

Improvement of Lower Kelsey Creek Channel Conditions

The channel of Kelsey Creek below the lower falls has been altered significantly, especially from the town of Kelseyville to the lake. This section has down-cut from 10-25 feet due to gravel mining and modification of the mouth of the creek. Riparian vegetation in the heavily mined area was virtually absent in the past, but has been improving since the elimination of gravel mining in the 1980s.

Restoration of Native Fish Populations

Native fish, the Sacramento pikeminnow, Sacramento sucker, and Clear Lake hitch, were once abundant in spring spawning runs in Kelsey Creek. A local group, the Chi Council, is dedicated to restoring hitch populations. This will require surveying and removal of migration barriers and studies to better understand factors influencing hitch survival. Improvement of channel conditions and aquatic habitat would potentially benefit all three native fish populations.

Information and Data Gaps

The following data and information gaps were identified through this watershed assessment process:

- Road and trail contribution to sedimentation and erosion.
- Current channel and riparian vegetation conditions.
- Updated flood zone mapping.
- Seasonal and drought-related changes in aquifer levels and quality.
- DWR 2006 land use survey completion.
- Oak regeneration status.
- Fish migration barrier inventory.

Recommendations

Projects for watershed management and restoration that were identified through this assessment process include the following:

- Assemble watershed fuel loading information.
- Identify and implement fuel load reduction projects.
- Continue inventorying, mapping, and management of invasive plants.
- Expand oak tree propagation and education program.
- Inventory, evaluate, and enhance riparian corridor health.
- Complete hydrologic study to determine causes of streambank erosion, debris jams in upper watershed.
- Identify and implement streambank/channel stabilization projects to reduce erosion.
- Identify and implement projects to remove damaging debris jams.
- Survey unpaved road and trail conditions and encourage erosion control BMPs for repair, design, and construction.
- Monitor stream water quality above and below the Bottle Rock Power Plant.
- Complete further analysis of DWR benthic macroinvertebrate data set.
- Continue volunteer stream bioassessments to monitor watershed health.
- Continue educational and clean-up projects to eliminate illegal dumping.
- Install surveillance cameras at illegal dumpsites.
- Inventory fish populations throughout the watershed with electrofishing surveys or other methods.
- Remove barriers or develop structures to permit fish passage. Kelseyville Main St. Bridge is first priority.
- Pursue funding to study biology of Clear Lake hitch.