

## **Draft Problem Statement**

### **Ward Creek Total Maximum Daily Load (TMDL) For Sediment**

#### **OVERVIEW**

Ward Creek is listed under the Clean Water Act Section 303(d) for impairment due to siltation/sedimentation. Disturbances along the Ward Creek stream channel have detrimentally affected the creek's fisheries. Sediment deposition, erosion of streambanks, loss of riparian vegetation, and reduction of pool habitats have created poor conditions for spawning runs. In addition, further geomorphic changes in the creek have the potential to restrict fish passage during low flow periods.

#### **PROJECT AREA DESCRIPTION**

##### **Geography**

Ward Creek (Hydrologic Unit #634.200) is located on the west-central side of the Lake Tahoe Basin (within Placer County) and is tributary to Lake Tahoe. The watershed encompasses 2,510 acres (9.7 square miles). Lake Tahoe is located at 6,230 feet above mean sea level (amsl), with nearby peaks in the area reaching 8,878 amsl.

##### **Water Body Description**

Ward Creek is a perennial stream comprised of a number of channels. Many stream segments include steep, unstable banks and low pool to riffle ratios. Areas of the watershed and the creek were severely damaged during a rain-on-snow flood event in 1997.

##### **Geology and Soils**

Volcanic soils occur in the Ward Creek watershed. An area known as the "Badlands" exists where bare, unstable soils are present and contribute to sediment loading to the creek.

##### **Climate and Hydrology**

The Ward Creek watershed has an alpine climate with warm dry summers and cold winters. Precipitation typically occurs as snow throughout the winter, with periodic thunderstorms producing a small percentage of precipitation as rain during the summer months. Precipitation is greatest near the western summits where an average of 80 inches of precipitation falls per year. Precipitation near the mouth of the creek at Lake Tahoe is approximately 40 inches per year. The average precipitation has been estimated to be 60 inches per year, with approximately 90 percent falling as snow.

##### **Aquatic and Terrestrial Biological Resources**

There are nine fish species that occur and may spawn given the proper conditions. Gamefish species include rainbow trout (*Oncorhynchus mykiss*), brook trout (*Salvelinus*

*fontinalis*), and brown trout (*Salmo trutta*). There is a remote possibility that kokanee salmon (*Onchorhynchus nerka*) spawn in the creek, but since high stream flows are necessary to gain access to Blackwood Creek, kokanee have access only during high flows in wet years. These salmonid species typically migrate from Lake Tahoe and use the stream to spawn. Other fish species that occur in Blackwood Creek include the Tahoe sucker (*Catostomus tahoensis*), mountain sucker (*Catostomus platyrhynchus*), Lahontan redbelt (*Richardsonius egregius*), speckled dace (*Rhinichthys osculus*), and Piute sculpin (*Cortus beldingi*).

Coniferous forests dominate the hillsides. The exceptions are areas of steep, barren rock and outcrops that are most numerous in the highest areas of the watershed. Along the narrower stream corridors, cottonwoods, aspen and deciduous shrubs are the dominant vegetation. In the broader areas of the valley, willows, sedges and riparian grasses form several large meadows.

### **Land Use**

The majority of the watershed is public land and is managed either by the USFS - Lake Tahoe Basin Management Unit or California Tahoe Conservancy (CTC). Other smaller private land holdings and developments are also present in the watershed.

Numerous recreational uses, including mountain biking, hiking, fishing, hunting, backpacking, horseback riding, off-highway vehicle (OHV) travel and camping, occur primarily in the summer months. In the winter, cross-country skiing and snowmobiling are popular activities. A portion of Alpine Meadows ski resort also occupies land in the upper part of the watershed. Recreation and other land uses have increased sediment load to the creek due to vegetation disturbance, channelization of some hill slope drainages, and hill slope erosion.

Historical land uses including livestock grazing and logging were conducted throughout the watershed during the 1800s and continued as late as 1969. These practices no longer occur in the Ward Creek watershed; however, these practices led to removal of vegetative cover and related consequences, such as increased surface runoff, bank scour, and erosion. These effects have contributed to excess sediment and debris entering the stream, and have caused adverse changes in stream channel morphology.

## **LISTING BASIS**

### **Beneficial Uses**

Channel instability appears to be a major source of excess sediment loads in the main channel, resulting in impairment of beneficial uses for cold freshwater habitat (COLD), spawning habitat (SPWN), migration of aquatic organisms (MIGR), and rare species habitat (RARE) (see Basin Plan for additional descriptions). The impacts of sediment loading on beneficial uses are most significant during catastrophic stream bank failures associated with extreme flow events. Excessive sediment loads have severely impacted the stream channel morphology and function, and resulted in the loss of riparian

vegetation. Additional aquatic habitat impairments are expected to occur in areas of vegetation disturbance within Stream Environment Zones (SEZs) unless mitigated.

### **Water Quality Standards**

Narrative water quality objectives for Blackwood Creek include the following: nondegradation objective, nondegradation of aquatic communities and populations, sediment, settleable materials, suspended materials, and turbidity (refer to Basin Plan Chapter 3). Numeric standards for the above objectives have not been established; however, there are numeric standards for other constituents including total dissolved solids (70 mg/L), chloride (0.30 mg/L), total iron(0.03 mg/L), sulfate (1.4 mg/L), total nitrogen (0.15 mg/L), and total phosphorous (0.015 mg/L). Information used to identify violations of either numeric or narrative water quality standards include complaints, site inspections, and investigations conducted by the University of California's Tahoe Research Group.

### **Water Quality Impairment**

Watershed degradation has resulted in hydrologic conditions that contribute to the unstable channel conditions and the excessive sediment loads to Ward Creek. Human-influenced sediment sources include historical logging and grazing, soil and vegetation disturbance, stream channel erosion, and road and housing development. The geology, topography, and location of the Ward Creek watershed plays a large role in the sediment production that ultimately enters the stream. The Ward Creek watershed is susceptible to channel erosion and sediment transport as a result of high precipitation and runoff events on steep slopes and unstable soils. Sediment, suspended materials, turbidity, and nutrients have increased in the creek as a result of watershed disturbance. Excess sediment transported from Ward Creek impairs water quality in Lake Tahoe by reducing the clarity of that water body.

### **SCHEDULE/STATUS**

The sediment TMDL for Ward Creek is being developed in conjunction with data gathering efforts for the Lake Tahoe sediment and nutrient TMDLs. The Ward Creek TMDL may be combined with the development of the Lake Tahoe TMDL, which is scheduled for completion in 2006. Otherwise, the Ward Creek TMDL will be developed after the completion of the Lake Tahoe TMDL.

### **Contact Information**

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