SECTION 9: WATERSHED CONDITION EVALUATION

9.1 Summary of Key Information Collected

Ever since Native Americans resided along Carpinteria Creek, the area has been used for some type of agriculture/fishing/hunting/gathering activity. When the Europeans arrived, they found the land to be full of oak trees, but with little water. Today, a wide variety of crops are grown in the Carpinteria valley, but they are either drought tolerant, or are irrigated. The 1800's saw a wide range of climate anomalies, including a reported tsunami, tropical simoom, and major flooding all typically followed by periods of drought, and some extreme drought. Today the watershed seems to undergo three to five years of low rainfall and then a high rainfall year.

Lemons and avocados were introduced in the 1920's, and water development increased, along with improvements in technology for extracting water, such as methods for drilling deep wells. James Blick reported in his 1950 thesis a general decline of the water table, of as much as 27 feet in wells north of Shepard Mesa between 1935 and 1947. Interestingly, it was during the mid 1940s that the last big steelhead runs were seen in the creek.

Fire has also played a major role of disturbance in the watershed. The first major fire occurred in 1932 was called the Matilija Fire, which burned 219,200 acres. The Coyote fire of 1964 (64,000 acres burned) and the flood of 1969 prompted the Army Corp of Engineers to build the Gobernador debris basin in 1971, and most likely the Lillingston Canyon debris basin on Carpinteria Creek at the same time. The Flood Control District reports that the Gobernador debris basin has a design capacity of 46,500 cubic yards and was completely full in 1998 when it was last cleaned out. Before that, over 30,000 cubic yards of sediment was removed from the basin following the 1995 El Niño season.

Land values increased as it became utilized for agriculture and the population of the Carpinteria Valley increased dramatically during the 1920-1950's. Highway 101 was built through Carpinteria in the mid-1950's and large population increases continued through the 1970s. In the last 25 years, growth has been minimal at about 3%.

The Mediterranean like climate of the Carpinteria Valley provides the area with highly seasonal rainfall, mostly during the months of October through April. The steep, mountainous headwaters, mild slopes of the coastal plain and short transitional foothills combined with large, short storms provide for high velocity flow and flashy runoff.

Recent field surveys of the creek show that the lower part of the watershed, which contains about 4.3% impervious surface due to urbanization, is in fair health and provides marginal steelhead spawning and rearing habitat. Benthic macroinvertebrate diversity is low, which coincides with poor water quality conditions. Dissolved oxygen content is variable, along with a low stream discharge during the summer months. High bacteria

counts have been measured in the upper watershed, and elevated nutrient, metals and pesticide levels were found in the lower watershed.

The upper main stem of Carpinteria Creek, which is below the confluence but above Highway 101, also was found to have marginal habitat for steelhead, due to very intermittent surface flow, decent water quality, but conditions similar to the lower stem with the infrequency of deep pools, poor riparian cover, and low levels of large woody debris.

The lower portion of upper Carpinteria Creek, which is below the debris basin but above the confluence, has similar conditions in terms of surface flow, although flow is perennial down to about one-half mile below the debris basin. This area is fair for steelhead rearing, with cool, clean water, high dissolved oxygen content and few deep pools with good cover. The few pools observed had only a few good spawning cobbles and gravels and were covered with fine sediment. Upstream of the debris basin, Carpinteria Creek and its tributaries provide good to excellent spawning and rearing habitat for steelhead.

In Gobernador Creek, excellent year-round spawning and rearing conditions exist above the debris basin. Below the debris dam, conditions are similar to that of upper Carpinteria creek. Surface flow below the debris basin is usually perennial down to within one mile of the confluence, providing good spawning and rearing habitat for steelhead.

Water quality monitoring has indicated that pollutant concentrations in the creek are highly variable, with levels greatly exceeding standards during storm events. Even after a storm, bacteria have remained elevated (SB County EHS, 1998) even in upper Gobernador Creek (PCW, 2002).

Geological and soil conditions indicate that normal sediment delivery is low in the watershed (SCS, 1981). However, large rainfall events under current land-use conditions, have eroded huge volumes of sediment in 1998 and earlier years. Creek reaches below the debris basins and below some of the seasonal road crossings had significant sand and silt sized sediment covering the cobbles and gravels (Ecology Consultants, 2003) thus impacting steelhead spawning habitat.

Keller et al. (1997) found that stream morphology changes drastically after a fire, as pools fill up with coarse sediment. Impact of fire on sediment loads is short term, as long term sediment yield due to fire which is about 10% of mean unburned yields (Warrick, 2002).

9.2 Data Gaps and Missing Information

The Conception Coast Project has done an excellent job of identifying barrier removal projects in the creek. Each of these projects must be looked at specifically from a channel alteration and restoration perspective. The Community Environmental Council

(CEC) has directed specific site studies on two of these projects and is proposing similar study of four more.

Once a barrier removal project is installed monitoring should take place to determine how effective the treatment turns out to be. The same type of effectiveness monitoring should be applied to vegetative restoration projects in the creek.

Arundo donax has been mapped in the watershed, and the weed management agency is moving forward on an Arundo removal project. There are very significant infestations of Cape Ivy and other weeds that need to be mapped so that control projects can be initiated.

Farm water quality management plans are a new undertaking by the RWQCB that proposes many practices be implemented on private land. Monitoring of these projects on each farm to indicate if management is effective will also be required by the RWQCB. The Agricultural Watershed Coalition will be coordinating these projects and monitoring of related water quality.

While some organizations like SCCWRP have conducted modeling on a county wide basis to estimate mass emissions from a variety of sources to the Pacific Ocean, this modeling needs to be conducted on a watershed scale.

Water quality data, while dating back to 1979, contains missing information from the mid 1990's. While coliform concentrations are monitored by EHS, this is only at the mouth of Carpinteria Creek. DNA testing would help identify the source of elevated coliform concentrations. DNA testing for sources of bacteria has been conducted on a limited basis by the County of Santa Barbara, but is an expensive procedure, and is not scheduled for the future. Due to budget cuts, PCW has been unable to continue monitoring at its sites in various parts of the watershed. Nutrient constituents are monitored by LTER, but funding is limited and it is unknown how long this will continue.

Water withdrawals have an impact on the biological resources of the creek. Landowners report that water flows freely one day and the next week flows cease. It is unknown how much surface water is diverted from the creek and how much groundwater is extracted. Perhaps a landowner survey could provide useful data and direction in regards to water supply.

On the ground vegetation surveys have not been conducted in the watershed. Thanks to local community members, a list native and nonnative plants is available. The Conception Coast project, along with the Southern California Wetlands Recovery Project is finalizing a GIS based vegetation model of the Carpinteria Creek watershed. This model will be ground verified at various locations in the watershed to see how accurate the modeling is.

Fauna surveys are also missing from this assessment. The information provided is from recent field work and a list provided by DFG of species known to occur in the area.

9.3 Issues Requiring Additional Prioritization

- The Carpinteria Creek Watershed Coalition needs to be funded on a long-term basis and needs to have a designated coordinator who will work with the various groups and agencies to implement the watershed plan.

- Barrier removal projects need to be accompanied by erosion control plans and practices, including revegetation, and in-stream habitat improvement.

- Water quantity and quality will become major issues in the watershed as barriers to fish passage are removed, and need to be addressed.

- Riparian Modeling needs to be completed and related to erosion control and water temperature management.

- Effectiveness monitoring of all implemented practices and projects should be prioritized.

- Continued water quality monitoring needs to take place, especially using BMI methods.

- Monitoring of pathogens will need to address the RWQCB requirements for creating TMDL loading limits.

- Fire and fuel load management will become critical as alternatives to the debris basins are considered. The U.S. Forest Service should prioritize programs that address this subject.

- Arundo removal and removal of pipe and wire revetment will need to be accompanied by erosion control assessments and treatment.

- Any streambed alteration conducted for Flood Control purposes should include creation of a more diverse channel bottom, as in creation of in-stream habitat instead of a purely rectangular channel.

- A landowners committee needs to be organized, which could report project progress to the Carpinteria Creek Coalition.

- Educational workshops need to be presented on topics such as streambank re-vegetation and restoration and in-stream habitat installation.