Appendix A

Yager Creek Subbasin

Historical Stream Field Survey Notes

Blanton Creek

Blanton Creek is a tributary to Yager Creek located at approximately RM 7.6 and provides approximately 5000 feet of stream habitat accessible to anadromous salmonids. Chinook salmon and steelhead have been recently documented to use Blanton Creek. Stream surveys were conducted by California Department of Fish and Wildlife (CDFW), unless otherwise noted, between 1980 and 2006 and the respective field notes are summarized below.

Field Note December, 1980:

The first qualitative stream survey of Blanton Creek was conducted in December, 1980. The survey report noted that there were several debris jams that often included upstream sediment accumulations. The debris and sediment jams were considered passage barriers to upstream salmonid spawning grounds. The pool to riffle ratio averaged 1:3, stream banks were consistently stable and shade canopy provided by redwood and other conifers averaged 90 percent.

Field Note April, 1982:

A second survey conducted in April, 1982 found similar debris jams and passage barriers, but also noted streamside landslides occurring on both sides of the creek about 1,000 feet above the mouth and very turbid water. Shade canopy was from alders, tan oak and redwood trees and averaged 70 percent. Both surveys made recommendations to modify debris jams to facilitate fish passage.

Field Note August, 1985:

A survey in August 1985 noted that work completed by the California Conservation Corps had been successful in removing some passage barriers but not all of them. Juvenile steelhead (yoy) were noted as abundant in the lower reach and then abundant, stressed and confined to intermittent pools in the upper reach. Low streamflow in the upper reach had replaced barriers as a limiting factor to salmonid production. Additional project work in Blanton Creek included construction of rock wing and log deflectors for bank protection, scour pool formation and spawning gravel retention structures. These are not listed in the CDFW habitat improvement database.

Field Note June, 1991 and June, 2006:

Additional stream surveys and habitat inventories were conducted on Blanton Creek by CDFW in early June, 1991 and again in June, 2006. These surveys noted approximately ten pool enhancement structures performing well in both 1991 and in 2006, as well as a functioning fishway built at the mouth in 1991. Passage barriers formed by debris jams were eliminated. In contrast to earlier surveys, the pool to riffle percent occurrence ratio had improved to approximately 1:1, but pools made up only 21 and 25 percent of the stream length in 1991 and 2006 respectively. The average residual pool depths were 1.8 feet in 1991 and 2.2 feet in 2006. The increase in pool habitat and pool depths noted in 2006 compared to 2001 may signal successful function of in stream habitat structures. In addition, cobble embeddedness measurements also showed a trend towards improvement of spawning gravel suitability, but there are still signs of bank instability and erosion that delivers fine sediments to the channel. Stream side canopy had increased to approximately 88 percent canopy over water in 2006 compared to 66 percent 1991. However most of the shade is produced form understory canopy. There is still a shortage of large redwoods capable of providing overstory shade and LWD as channel forming elements and instream shelter. Qualitative electrofishing surveys in 1991 and 2006 did not find

juvenile steelhead in high abundance, but did observe presence of both 0+ and age 1+ year classes at each sample site.

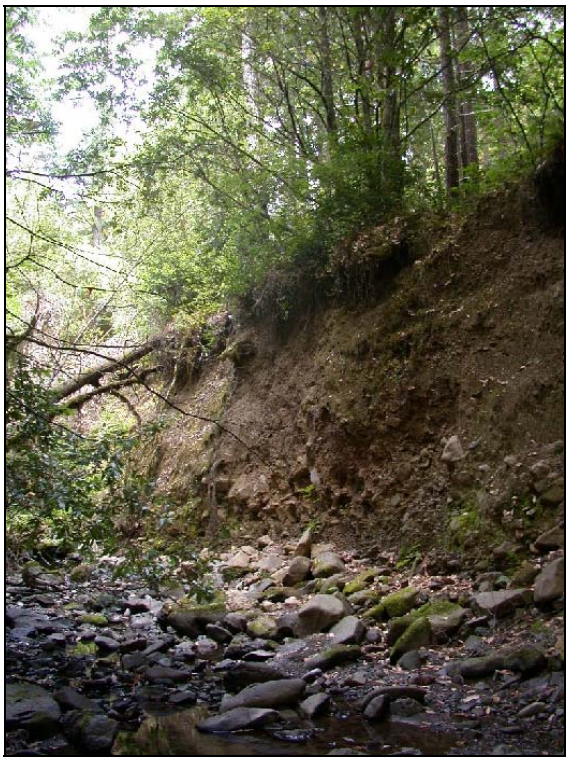

Figure 1. Photo displaying Blanton Creek's armored plane bed channel, bank erosion, intermittent flow and lack of large trees needed for shade and LWD loading.

Figure 2. Mouth of Blanton Creek, August 16, 2006.

Coopermill Creek

Coopermill Creek is a tributary to Yager Creek located at approximately RM 2.8. A stream survey was conducted in January of 1979 and the respective field notes are summarized below.

Field Note January 16, 1979:

In 1979 chinook salmon entered Coopermill Creek on Jan 10. A total of 41 redds and 21 live fish were counted on Jan. 16.

Lawrence Creek

Lawrence Creek is a major tributary to Yager Creek located at RM 9. Stream surveys were conducted by CDFW between 1938 and 1972 and the respective field notes are summarized below.

Field Note August 8, 1938:

The first survey of Lawrence Creek was conducted by CDFW in the upper reach near the Yager-Kneeland Road crossing on August 8, 1938. This early survey characterized the area as rolling grass covered hills, with some timber, but the dominant trees were oaks. The creek averaged 9 feet wide, spawning gravel was in good condition, water temperature at 12:40 pm was 58 F, the estimated stream flow was 1 cfs, pools and fish shelter were in good condition and juvenile steelhead (1 to 5 inches) were common.

Field Note June 9, 1952:

Another survey conducted on June 9, 1952 noted logging operations at the fork of Lawrence Creek above the Kneeland Road crossing and many log jams in the creek. In addition, the report notes a stream fishermen in three hours caught 33 trout ranging in size from 4 to 7 inches at log jams. Two of these were males (5 inches) that were ripe with milt.

Field Note August 26, 1964:

A third CDFW survey of Lawrence Creek was conducted August 26, 1964. The stream survey report notes that poison oak, heavy brush, and second growth redwoods grow on canyon slopes and near the streambed brush and hardwoods predominate. The average stream width six miles upstream was 5 feet with an estimated flow of 2 cfs and a depth in flatwater of 6 inches. The creek width near the mouth was 7 feet, with a depth of 10 inches and a flow of 4 cfs. Most pools throughout the survey ranged from 2-3 feet deep and there was a pool to riffle ratio of 1:1. Spawning conditions were considered excellent with ½ to 3 inch gravel in riffle areas. There was very little silt or algae covering the gravel. Instream shelter was provided by undercut banks, shaded pools and some large boulders. There was also a log jam of approximately 600 yards long and 40 yards wide located about ½ mile downstream of the Shaw Creek confluence. The log jam was considered a potential barrier to fish passage, although, numerous trout (2-8 inches) and a large number of “fingerling salmonids” were captured throughout the stream with beach seines.

Field Note December 3, 1969:

Field note from December 3, 1969 reported that a study reach about ¼ mile below Bell Creek was composed of 95% riffles by length with a good gravel bottom. Streamside vegetation provided moderate shade. During an electrofishing effort juvenile steelhead (1.5 to 2.5 inches) were common and a few fish 5 inches in length were caught. At a second location, about two miles downstream of Bell Creek, Lawrence Creek was much more open and the stream bed was composed of cobble and boulders. About 95% of the stream length was composed of small pools. Steelhead observed from electrofishing samples were noted as very abundant, in excellent

condition and in two size ranges (1-2 inches and 4-6 inches). If this the case then when this happens the dynamics of the pool will changes

A second field note prepared July 17, 1972, noted that there were no known barriers to fish passage, but five log jams were present between 5 and 7 miles from the mouth. The average water temperature was 67 F which is considerably higher than noted in previous surveys. Silver salmon and steelhead fingerlings were observed throughout the seven mile survey reach.

Shaw Creek

Shaw Creek is a tributary to Lawrence Creek located at RM 4.5. Large debris accumulation is a barrier to fish passage on Shaw Creek. The jam is located approximately 1.5 mile from the confluence with Lawrence Creek. There is approximately one mile of coho habitat located above the passage barrier.

Figure 3 displays the results of CDFW Shaw Creek Chinook salmon carcass surveys during the years of 1987 to 2009. Linear regression analysis and ANOVA tests of Shaw Creek spawner survey data indicate no significant change or trend in the redd numbers (R^2=0.024, P value=0.486) or peak numbers of Chinook salmon (R^2=0.104, P value=0.143) observed from 1987 to 2007. Number of survey efforts shown by the blue bars are also displayed numerically.

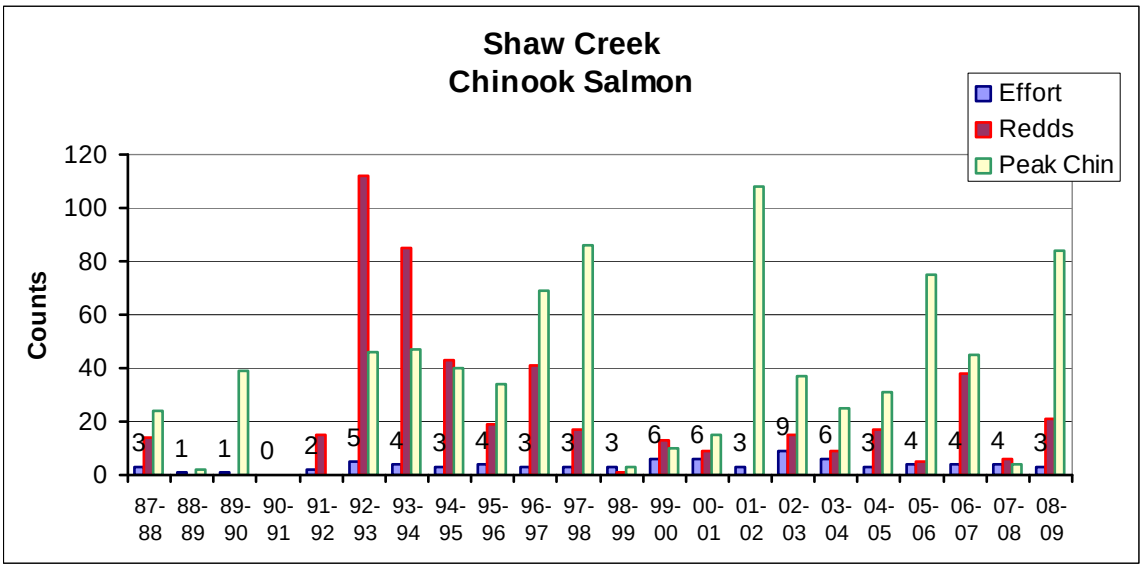

Figure 3. CDFW Shaw Creek Chinook salmon carcass surveys from 1987 to 2009.