Stream Monitoring in Bull Creek Watershed

Suspended sediment samples were collected at the mainstem of Bull Creek (sampling point BC1) and a tributary (sampling point BC2) for water years 2006 through 2010. Logging took place in 2006 in the upper watershed of Bull Creek. Suspended sediment increases in WY2006 and WY2007 are neglible compared to the water year, WY2005, prior to logging. Majority of suspended sediment concentrations remained in the 1 to 10 mg/L range for both BC1 and BC2. Higher flows on the mainstem show little effect on suspended sediment concentrations. Because no active landslides have been identified in this watershed, fine sediment sources are linked to channel bank and bed erosion occurring naturally each water year. Charts 1 and 2 below illustrate suspended sediment discharge measurements for BC1 and BC2, respectively.

Chart 1. Bull Creek Location BC1 – Mainstem

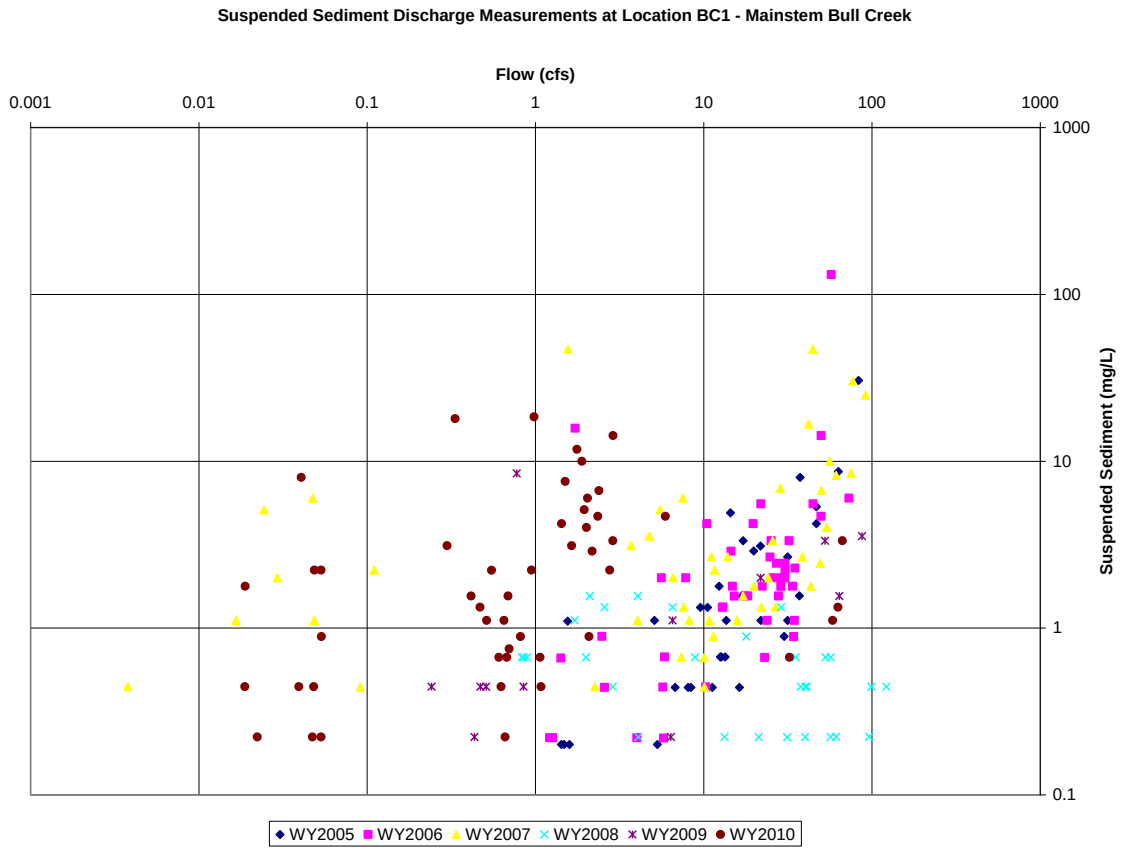
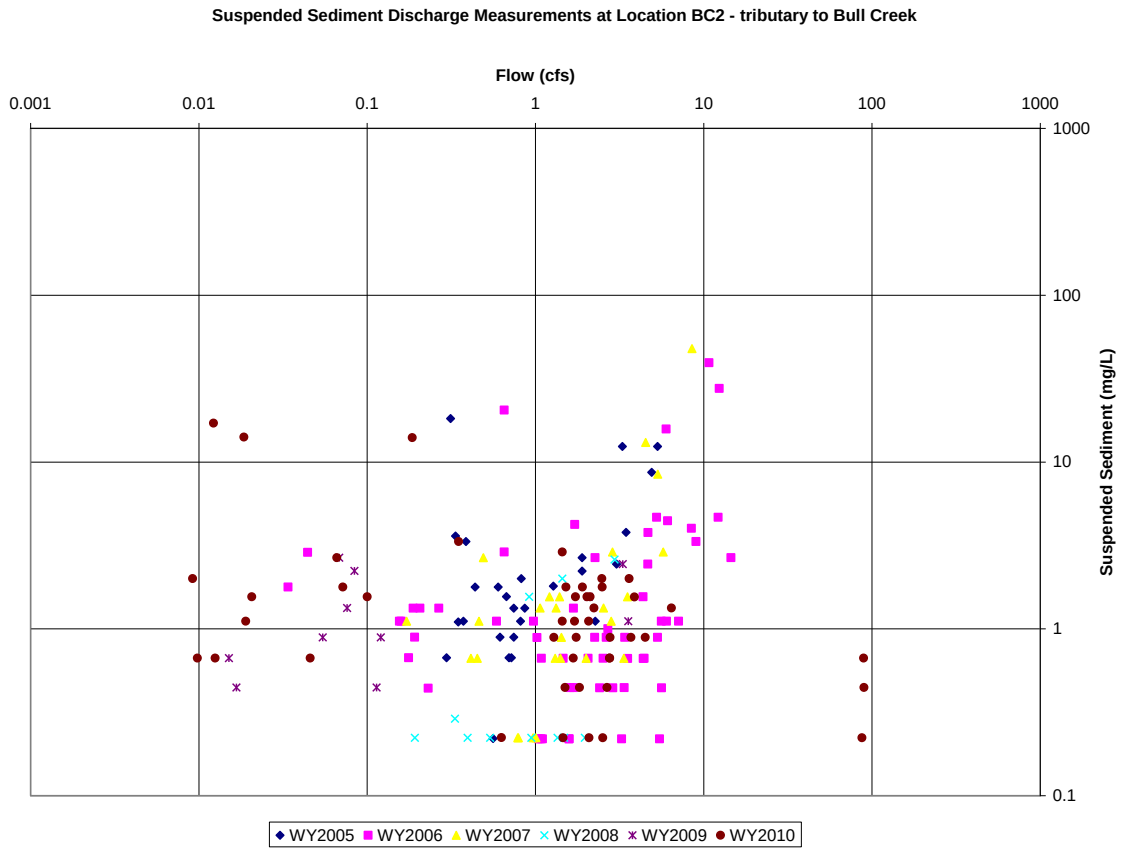


Figure 1 is interesting not for the differences in the water years, but rather the homogeny. Years 2005, 2006, and 2007 all have relatively the same distribution. This indicates that very little change in sediment. The 2007 data would be where this shows up and the distribution of sample points is still within the range of the 2006 and 2005 sample points. A slight increase can be seen, but this is expected from the road correction work. What is notable is that the 2008 and 2009 points have consistently lower suspended sediment values, as noted by the row of points at the lower edge of the suspended sediment axis. It

is also curious that 2010 has consistently lower flow values, and yet the suspended sediment more appropriately matches the 2007 distribution. With no operations in 2010, it suggests that the Deerhorn Fire on late 2009, just prior to the 2010 water year had a larger impact on suspended sediment than the timber harvest operations. As shown on the following page, Sample Point BC1 is located where Highway 96 crosses Bull Creek and collects the entire watershed. If the Deerhorn Fire were the likely source of the increased Suspended Sediment, then the same results would not be reflected on the BC2 Chart, which is shown on the following page.

Chart 2. Bull Creek Location BC2 – Tributary to Bull Creek



The initial observation between BC1 and BC2 is that the flows are lower at BC2, as would be expected due to the locations in the watersheds. Another observation is that BC2 lacks the 2010 grouping that BC1 has, which was attributed to the Deerhorn Fire. This would give strength to the assumption that the 384-acre fire, which burned through the RPZ's had a more direct impact than the 574 acres harvested under the Forest Management Plan with its RPZ protections. Another observation of the two charts is that there are similarities to the BC1 figure; the 2008 and 2009 values tend to be lower, and the 2005, 2006, and 2007 have a similar distribution.

Although this data in not conclusive and further surveying and analysis is necessary, the preliminary results indicate that it is likely the Hoopa Tribe's Forest Management Plan is adequately protecting the stream on the Reservation. It is understood that maintaining sediment levels at relatively low levels is one factor in the effort to preserve and/or restore anadromous fisheries habitat. However if a correlation can be made between similar measures such as turbidity and gravel embeddedness, then the initial observations lead one to accept that the FMP protection measures are sufficient to protect Anadromous fisheries critical habitat components. The final point to include is that because Bull Creek is a non-anadromous watershed, the protection measures are less than would be imposed on an anadromous watershed.

Chart 3. Precipitation (inches) for WY2005 to WY2010