8. Future Hydraulic Conditions

8.1. No Action Alternative

No significant changes to the river hydraulics are expected under the No Action Alternative.

8.2. Dam Removal Alternative

The reservoir pools of the four dams will be converted to a free flowing river. Free flowing conditions were estimated by simulating erosion of the reservoir sediment and then computing hydraulic properties after dam removal and the river has eroded a channel in the reservoir sediment. The details of the sediment modeling are given in Section 9.

A plot of the water surface elevations at 1,000 cfs is given in Figure 8-1 and Figure 8-2 for No Action and Dam Removal Alternatives. A plot of the water surface elevations at 3,000 cfs is given in Figure 8-5 and Figure 8-6. The average depths and velocities through the former reservoir pools will be similar to the reaches upstream and downstream of the reservoirs.

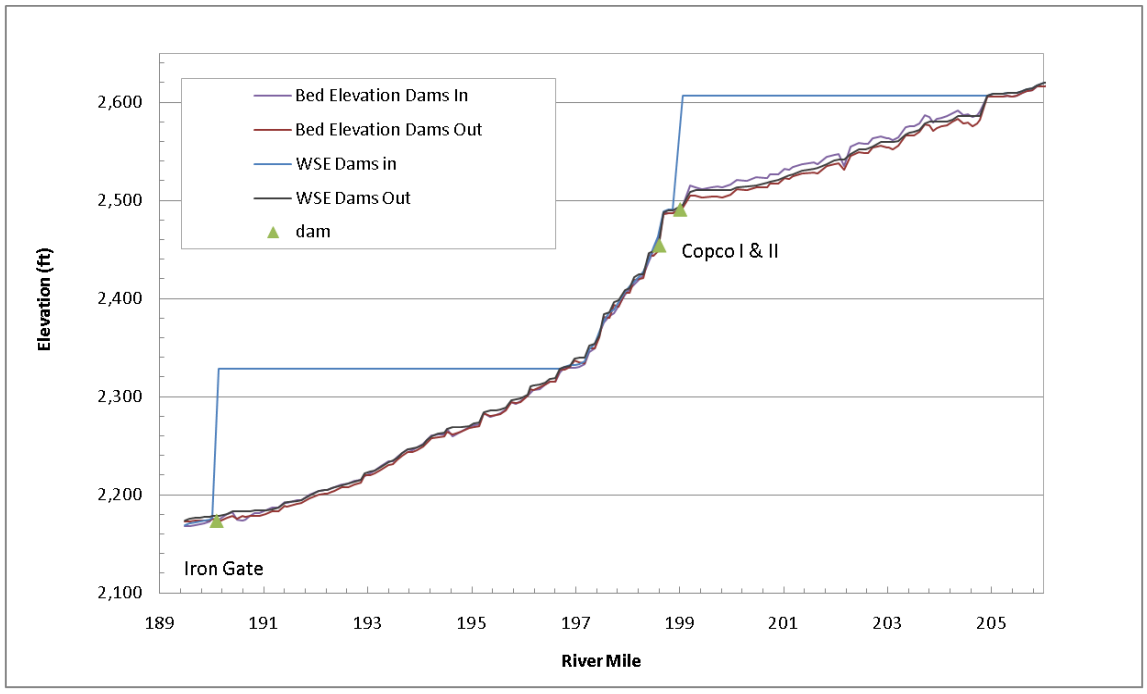

Figure 8-1. Bed and water surface profiles near Iron Gate and Copco 1 dams under No Action and Dam Removal Alternatives.

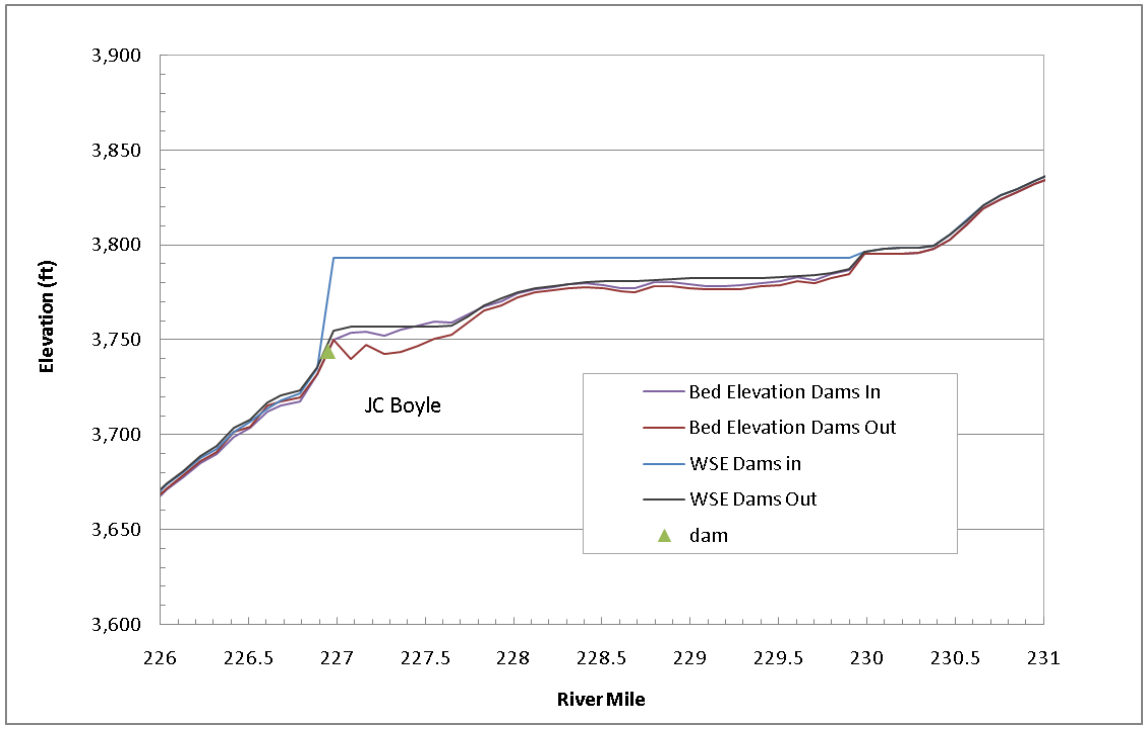

Figure 8-2. Bed and water surface profiles near J.C. Boyle Dam under No Action and Dam Removal Alternatives.

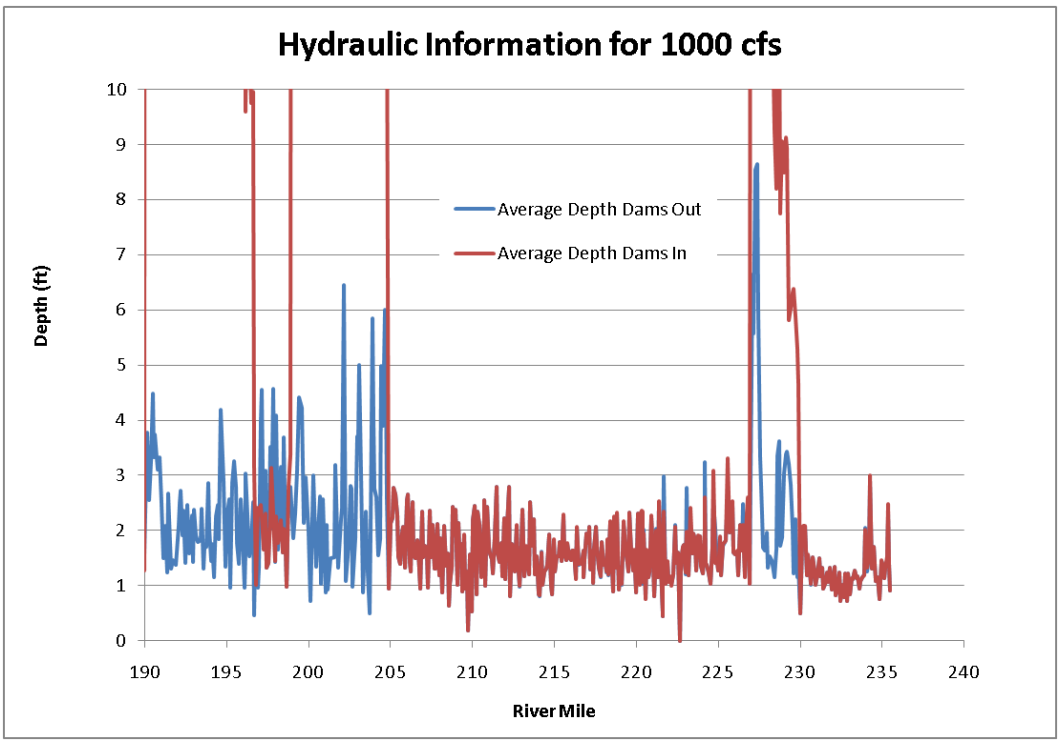

Figure 8-3. Average water depth in J.C. Boyle to Iron Gate reach for 1000 cfs under No Action and Dam Removal Alternatives.

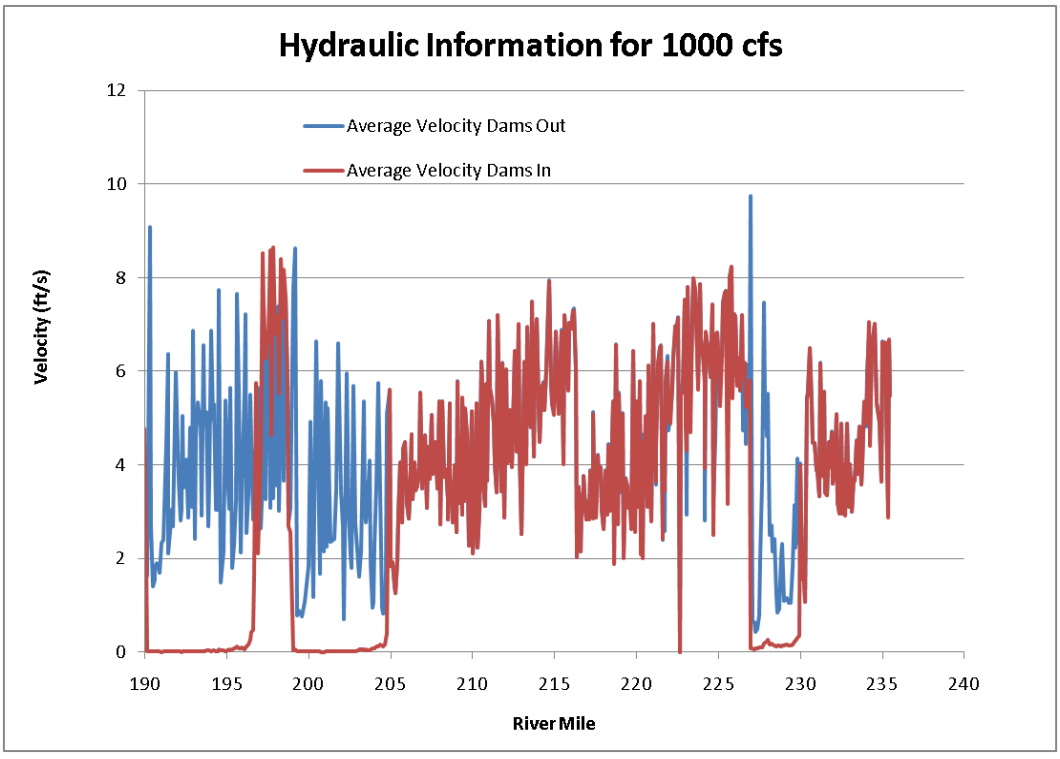

Figure 8-4. Average water velocity in J.C. Boyle to Iron Gate reach for 1000 cfs under No Action and Dam Removal Alternatives.

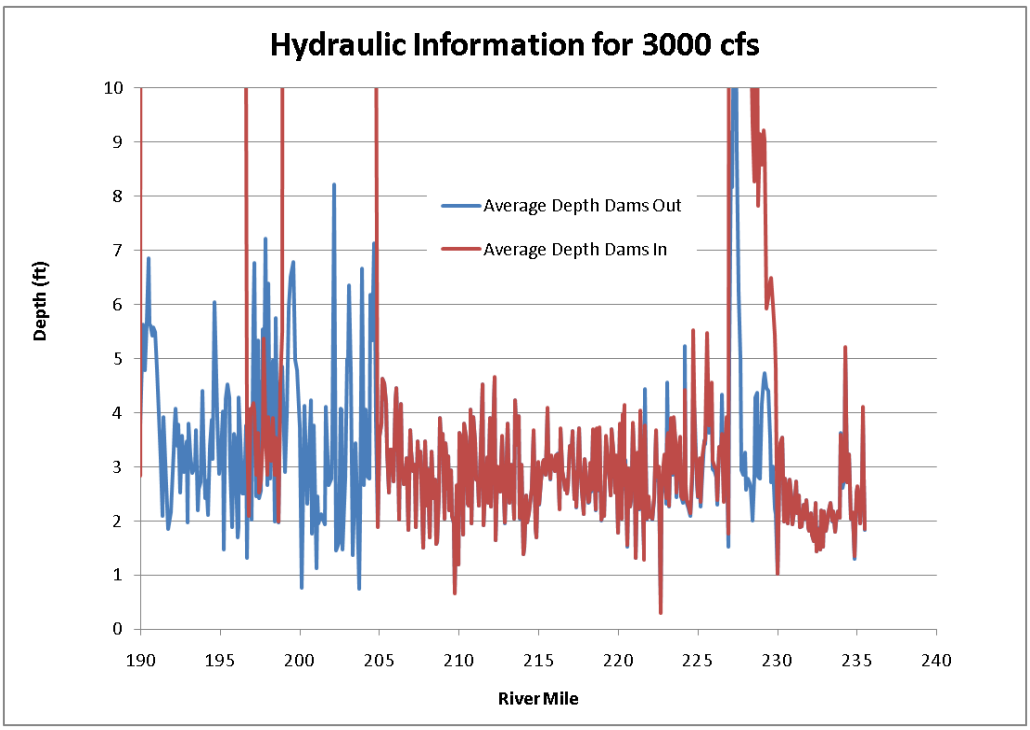

Figure 8-5. Average water depth in J.C. Boyle to Iron Gate reach for No Action and Dam Removal Alternatives at 3000 cfs.

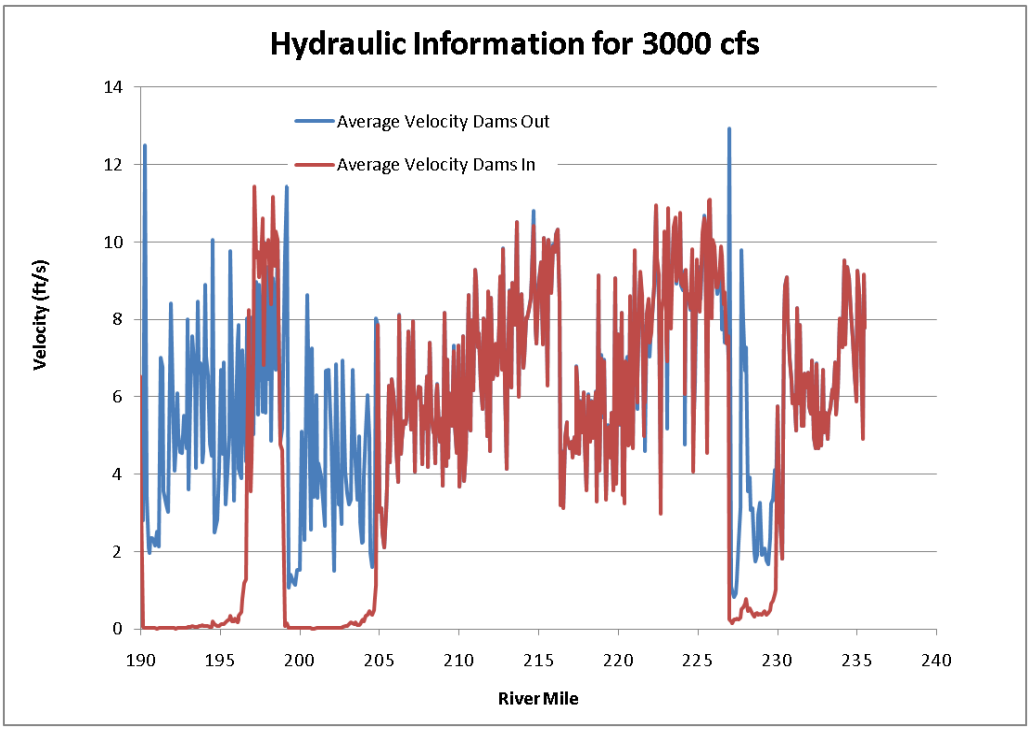

Figure 8-6. Average water velocity in J.C. Boyle to Iron Gate reach for No Action and Dam Removal Alternatives at 3000 cfs.

The 100-year floodplain may increase slightly as the result of dam removal. This is due to two affects: (1.) the removal of the attenuation of Iron Gate and Copco reservoirs, and (2.) the aggradation of the bed downstream of Iron Gate. The flood attenuation affects are quantified in Section 6 and the aggradation affects are quantified in Section 9. A plot of the 100-year floodplain for the Dam Removal and No Action Alternatives is given in "Appendix G. Mapping of 100-year Flood Plain under No Action and Dam Removal Alternatives". A plot of the increase in the 100-yr flood elevation levels is given in Figure 8-7.

It was assumed that the 100-yr flood discharge increases by 2,500 cfs for the entire length of the Klamath River downstream of Iron Gate Dam. This is an over estimate because it does not account for the fact the peak flow at Iron Gate Dam will not be perfectly timed with the peak flow from the tributaries. Therefore, the increase in the floodplain is considered to be a conservative estimate that will likely decrease as more detailed analysis is performed.

The most significant increase will occur near the dam from Bogus Creek to Willow Creek where the average increase in the 100- year flood elevations is expected to be about 1.5 feet. Downstream of the Humbug Creek, 100-year elevations are expected to increase less than 0.5 feet and the increase in flood elevations is not considered significant because there will be attenuation effects in the channel and the peak flows in the tributaries will not coincide with the peak flow from Iron Gate.

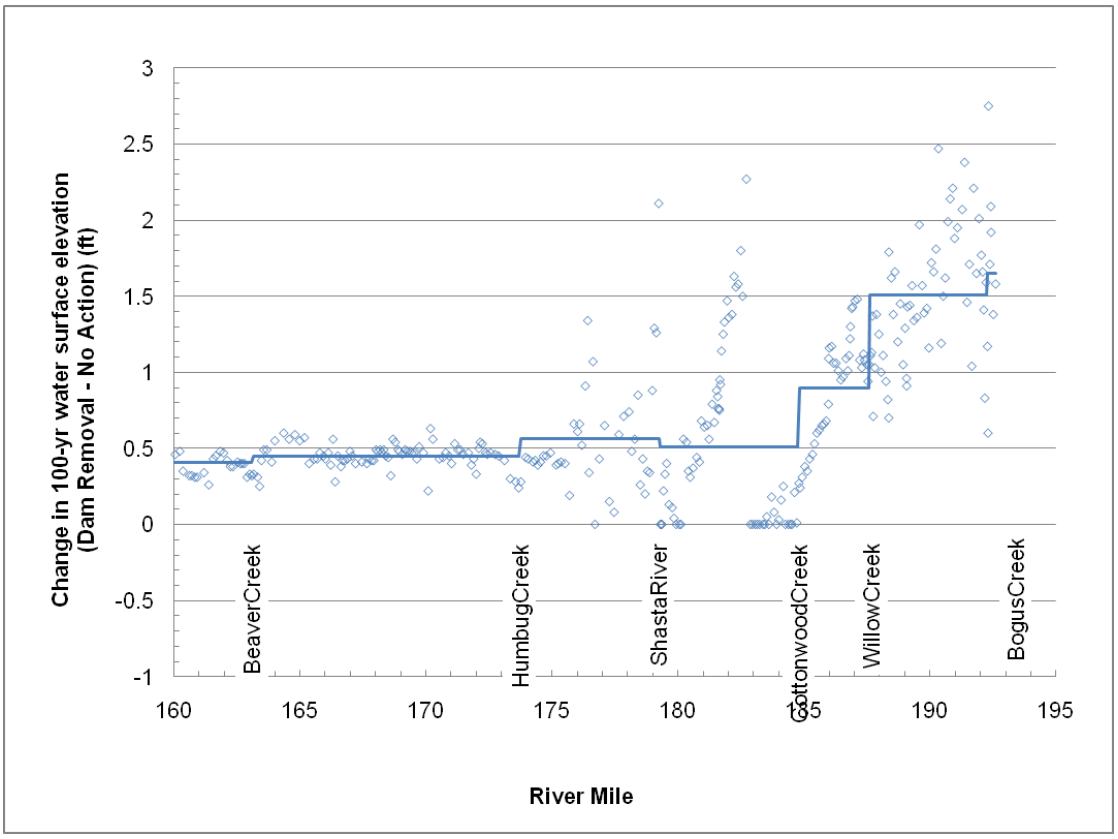

Figure 8-7. Estimate of the increase in 100-yr flood elevations as the result of Dam Removal. Below Humbug Creek, the increase in 100-yr flood elevation is not considered significant.