

State of California



## Memorandum

**To:** Randal C. Benthin**Date:** August 6, 2002**From:** Mike Berry  
**Northern California-North Coast Region**  
**Department of Fish and Game****Subject:** Battle Creek Steelhead

I recently provided you with information to present at a meeting regarding the fate of steelhead in Battle Creek in excess of Coleman National Fish Hatchery needs. The information I provided was based on the summary of a report completed by Kondolf and Ketzel (1991). It turns out that this information was incomplete and generated a few more questions that will be discussed at the next Battle Creek steelhead meeting scheduled for August 13, 2002. One question that needs to be answered is, how much usable spawning area is present under the current stream condition? The summary that I used earlier had some misinformation that I uncovered through further research. The errors include the stated average redd size for steelhead and the area of usable spawning gravel under full restoration. The summary states that the average redd size for steelhead is 47 feet<sup>2</sup>, further research revealed that the average size for a steelhead redd is closer to 60 feet<sup>2</sup> (Wilson and Collins 1992), (Shapovalov and Taft 1954). This summary also estimated the area of usable gravel was 166,000 feet<sup>2</sup> but the calculation was based on 109,000 feet<sup>2</sup>. The 109,000 feet<sup>2</sup> was based on usable spawning habitat at the lower elevations for fall-run and late fall-run chinook. Using the correct numbers for the amount of space available for spawning steelhead with full restoration, there is enough habitat available for 2,767 redds or 6,917 adult steelhead. This is based on the previous assumption from unpublished DFG data (that I was unable to track down) that the population of adult steelhead consists of 60 percent males. Coleman National Fish Hatchery records from 1988-2000 indicate that the ratio at the weir is closer to 50 percent male. Using this scenario, the spawning population could be around 5,534 adult fish with fully restored conditions.

To calculate the current available spawning habitat, I used the amount of spawning gravel presented in the Battle Creek Salmon and Steelhead Restoration Plan (Kier Associates 1999) and applied the previous calculations. Kier reports that there is 58,600 feet<sup>2</sup> of usable spawning gravel in the main stem Battle Creek between Coleman powerhouse and the confluence of north and south forks, 21,700 feet<sup>2</sup> in the north fork between the confluence and Wildcat Dam, 26,000 feet<sup>2</sup> between Wildcat Dam and Eagle Canyon Dam, and 5,500 feet<sup>2</sup> in the south fork between the confluence and Coleman Diversion Dam.

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This equals a total of 111,800 feet<sup>2</sup> of currently usable spawning gravel. With an average redd size of 60 feet<sup>2</sup> there is room for an estimated 1,864 redds. Assuming approximately 60 percent males in the spawning run, the estimated population of adult steelhead that the habitat can support is 4,660 fish. If you assume 50 percent males, then the adult spawning population could be around 3,728 fish.

Literature Cited

- Kier Associates. 2000. Draft Battle Creek Salmon and Steelhead Restoration Project Adaptive Management Plan. Prepared for U.S. Bureau of Reclamation, Pacific Gas and Electric, National Marine Fisheries Service, U.S. Fish and Wildlife Service and California Department of Fish and Game. 78 pp.
- Shapovalov, L. and A.C. Taft. 1954. The life histories of the Steelhead rainbow trout (*Salmo gairdneri*) and silver salmon (*Onchorynchus kisutch*) with special reference to Waddell Creek, California and recommendations regarding their management. Calif. Dept. of Fish and Game, Fish Bull. No.98. 373 pp.
- Wilson, C.E., and Collins, B.W. 1992. Life History, distribution, run-size, and angler harvest of steelhead in the South Fork Trinity River Basin. Chapter III Job III p. 51-90. In: Kevin Urquhart and Ralph Carpenter (ed), Annual Report of the Trinity River Basin Salmon and Steelhead Monitoring Project, 1990-1991 Season December 1992.186 pp.

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cc: G. Stacey, S. Turek, and H. Rectenwald