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**PHYSICAL WORKGROUP TECHNICAL MEMORANDUM**

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**TO:** ERNIE CLARKE, TRRP SCIENCE COORDINATOR; JOE POLOS, CHAIR OF FISH WORKGROUP

**FROM:** ANDREA DAVIS, CHAIR OF PHYSICAL WORKGROUP

**SUBJECT:** OVERVIEW OF GRAVEL QUALITY QUESTIONS FOR FISH WORKGROUP

**DATE:** 7/5/2012

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At the Wednesday, February 15 Physical Workgroup meeting, there was some uncertainty over the intent of the Physical Workgroup's request for input on gravel quality assessment needs. There was a request that the Physical Workgroup summarize their questions on gravel quality assessment needs so that the Fish Workgroup could better address the Physical Workgroup's request.

**BACKGROUND**

The Trinity River Flow Evaluation Study Final Report (TRFEFR) prioritizes habitat restoration actions that alleviate fry rearing habitat limitations, yet also acknowledges that increases in other habitats (spawning, adult holding) will also be needed. At the time of publication, the TRFEFR did not consider spawning habitat quantity or quality to be limiting smolt production from the system, and thus since completion of the TRFEFR and signing of the ROD, little effort has been allocated towards assessing spawning gravel quantity and quality. The primary exception was the report prepared by Graham Matthews and Associates (2010) that assesses surface and subsurface gravel quality at seven sites between 2001 and 2009. Sample sites were in riffles, and three samples were collected on a cross section through the riffle in approximately the same riffle location for 2001 and 2009. Additional samples were collected at Steelbridge Campground and Steiner Flat to compare with samples collected in 1991-1993, and a new site was sampled upstream of Rush Creek where considerable spawning was observed. The seven study sites suggested between 80% and 94% egg-emergence survival in 2009 using the Tappel and Bjornn (1983) survival index. While this result suggests that gravel quality is good, the study was limited to number of study sites and samples, so there is some uncertainty on how well these results can be used to characterize overall spawning gravel quality in the Trinity River.

Recent reports prepared by TRRP staff and reviewed by the Physical Workgroup also address fine sediment issues: 1) a fine sediment budget (Gaeuman 2010), and 2) evaluation of Hamilton Ponds sediment control plan (Gaeuman and Krause 2011). Both reports provide physical process analyses and results, but do not address biological ramifications. One of the primary conclusions to the Hamilton Ponds report is:

“The potential sediment deliveries from GVC have declined to as little as a third of the delivery potential that existed when the ponds were constructed. With this decline in mind, it is suggested that the continued maintenance of both Hamilton Ponds is unnecessary. Either of the two ponds has the capacity to impound all the sediment delivered from GVC in most years, as well as the capacity to capture the majority of the sediment delivered even in very wet years. Some spillage from full ponds in very wet years would probably not significantly harm the Trinity River fishery, since large flow releases during very wet years have proved to be effective in flushing sand from the system.

However, the magnitude of the present delivery potential is still large enough that failure to maintain at least one pond would likely produce a noticeable increase in the percent of sand on the bed surface and in the substrate downstream from GVC. It is suggested that under a no-dredge option the substrate characteristics in the reaches between GVC and Indian Creek would assume characteristics similar to those presently observed downstream from Weaver Creek. *Whether that magnitude of change would be biological meaningful is beyond the scope of this brief [emphasis added].*”

#### PROBLEM STATEMENTS (QUESTIONS) AND POTENTIAL DECISION TREE FOR FISH WORKGROUP

1. Does the Fish Workgroup feel “comfortable”, given the results of GMA (2010) and inherent gravel sample grain size variability, that spawning gravel quality is not limiting smolt production from the upper river at this time, and priority focus should remain on fry rearing habitat and water temperature efforts? If the answer is “yes” for all reaches, and Hamilton Ponds will continue to be dredged in the immediate future, then no further action is needed at this time.
2. If the answer to 1 is reach-dependent and “no” or “we don’t know” for certain reaches, then does the Fish Workgroup recommend that a more refined study plan be developed to assess spawning gravel quality in those reaches consistent with IAP Section 3.2 (page 94)? If not, then should this topic be revisited (reprioritized) by the Fish Workgroup and Physical Workgroup in X years?