

**TRINITY RIVER RESTORATION PROGRAM****CHANNEL REHABILITATION MONITORING PROPOSAL SUMMARY****Monitoring Proposal Title:**

Habitat relationships to the prey-food base for juvenile salmonids in the Trinity River

**Proposal Submitted by:**

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**Restoration Goal:**

*Briefly state goal of Channel Rehabilitation Project element(s) that is(are) to be monitored*

The availability of habitat and food for fry rearing are potential factors limiting salmonid production in the Trinity River. Substantial mechanical reconfiguration of channel areas has been undertaken to increase rearing habitat. However, studies of the prey food base in the river are limited to invertebrate sampling on a single riffle (Boles, 1980), effect of scarifying riffles with dozer blades to loosen the bed and promote invertebrate production (Turek, 1986), and analysis of stomach contents for steelhead trout (Boles, 1990). The prey food base for rearing juvenile salmonids in the Trinity River remains undefined, as does the impact of food availability on fish growth and condition factor. Addressing these knowledge gaps will inform restoration designs on ways to bolster the aquatic food chain utilized by salmonid fry and increase adult salmon returns to the Trinity River.

**Monitoring Question:**

*Explicitly state monitoring objective into testable question or hypothesis*

Our hypothesis is that the prey food base is not limiting fry production in the Trinity River.

**Monitoring Design Plan:**

*Describe or summarize proposed monitoring plan in one page or less. Identify the channel rehabilitation project properties that are to be measured and proposed methods. Identify how monitoring addresses Monitoring Question. Attach additional information to the proposal summary if desired.*

The proposed study will determine how surface grain-size distributions, water temperature, proximity to stream banks, habitat type (i.e. hydraulic conditions), and distance from Lewiston dam (i.e. reservoir water quality) interact to control the density and diversity of the prey food base targeted by rearing juvenile salmonids. Measurements will be stratified by habitat type and location within the 40-mile section of the Trinity River from Lewiston Dam to the North Fork Trinity River (hereafter restoration reach). At study locations in the restoration reach, water temperature monitors will be deployed and prey targeted by fry will be determined by analysis of stomach contents for fry captured by electrofishing, netting, or other suitable techniques. Grain-size distributions will be quantified with photo-analyzing software (e.g. Sedimetrics) at locations where benthic macroinvertebrate (BMI) densities are quantified with standard BMI protocols. Measurements of fry length, weight, and condition factor will be compared to invertebrate densities and diversities, with secondary comparisons made with habitat type, grain-size distributions, and water temperature, and tertiary comparisons of stomach contents and prey food base to verify that fry are rearing on the sampled prey base.

The expected product from this study will be a matrix table indicating combinations of variables that promote fry growth, which can be compared to habitat conditions at restoration sites to enable designs to specifically address food-factors that may be limiting fry production.

**Monitoring Locations and Number of Sites:**

*Identify Projects and locations within Projects to be sampled*

The five reaches included in the river corridor planning effort, including Sawmill, Poker Bar Steel Bridge, McIntyre, and Deep Gulch.

**Monitoring Frequency:**

*Identify when sampling will be performed, frequency (e.g., one-time, annually for five years)*

Weekly to continuously, depending on the metric, February through June for three different water year classifications.