Cachuma Project Hearing, Phase 2
United States Bureau of Reclamation Applications 11331 and 11332
Statement of Stacy K. Li, Ph.D.

Qualifications:

- Ph.D. University of California at Davis in 1976. Emphasis of graduate studies was in animal behavior, ecology, and evolution.
- Employed at a variety of consulting environmental firms (Don Kelley and Associates, EIP Associates, Holton Associates, Beak Consultants) from 1980 to 1989 as a fisheries biologist.
- Founded and owned Aquatic Systems Research, an environmental consulting firm, since April 1989.
- Joined NOAA Fisheries in February 2001 as a water rights and instream flow specialist.
- Worked on over 200 streams, 42 California counties, and the states of Washington, Oregon, Nevada, and California since 1980; have performed over 30 instream flow studies, with 20 of those were PHABSIM studies.
- Adapted search and rescue techniques to perform a PHABSIM study on the Tuolumne River, a class III-V white water stream.
- Testified before the SWRCB as an expert witness in instream flow assessment at the Green Creek Hearing, the Mammoth Creek Hearing, and the Mono Lake Hearing.
- Responsible for the study designs of the Rush Creek and Lee Vining Creek instream flow investigations.

Steelhead Investigations

Determining adequate flow regime for the various freshwater life-history phases of steelhead involves the consideration of a number of physical and biological factors, and the use of a number of basic investigations and methodologies.

1. The function of geomorphologic processes in the mainstem of the Santa Ynez River must be understood before instream flow recommendations can be fully developed.

    a. Perform a historical stream channel study to understand the change in morphology of the mainstem of the lower Santa Ynez River below Bradbury Dam from pre-dam conditions until the present.

    b. Evaluate the role of the riparian community along the mainstem of the Santa Ynez River below Bradbury Dam in providing channel stability and habitat

structure, e.g., which species occur with root systems that are conducive to bed stability?

2. The water table in the lower Santa Ynez River has effects on surface flow and, therefore, has to be understood.

   a. Study surface water/groundwater interactions in the mainstem of the Santa Ynez River below Bradbury dam to better manage flow releases to facilitate steelhead migration and emigration: Specific investigations could include:

      i. Longitudinal and seasonal synoptic streamflow measurements to evaluate where there are flow gains or losses by season along the lower Santa Ynez River.

      ii. Use forward-looking infrared remote sensing to identify synoptic relationships between surface flow and water table.

      iii. Install piezometers and observation wells along the mainstem of the Santa Ynez River downstream of Bradbury Dam to determine water table level by location (feet downstream of the dam or feet away from the river channel) and season (during ascending hydrological limb and descending hydrological limb).

3. Water is diverted or stored at three major dams on the mainstem of the Santa Ynez River: Juncal, Gibraltar, and Bradbury. To determine the flow release regime necessary to support the various freshwater life-history phases of steelhead the following investigations should be undertake:

   a. Conduct a Physical Habitat Simulation (PHABSIM) study to assess instream flow so that study results are comparable with other watersheds that have been studied in the state. The objective of the PHABSIM model is to understand which stream flow levels provides how much habitat and which macrohabitats gain more habitat at what flow.

   b. Produce a habitat map the mainstem of the Santa Ynez River and major spawning tributaries (above and below Bradbury Dam) focusing on habitat types, levels of embeddedness, channel stability, and steelhead spawning gravel availability. The use of standard quantitative methods such as the Habitat Suitability Index (HIS) would allow comparative analysis between reaches up and downstream of Bradbury Dam. Procedures of Hankin and Reeves (1988) may be incorporated to provide genera fish abundance relationships associated with the habitat proportions.

   c. Identify all flow deliveries using the Santa Ynez River and determine whether these also support steelhead habitat.

d. Evaluate the rationale for the proposed target flow releases in the main stem of the Santa Ynez River below Bradbury Dam in light of the results of the PHABSIM study.

3. The Santa Ynez estuary may be an important habitat used by steelhead for rearing as well as acclimation to transition between the freshwater and the marine environment. The following estuarine related investigations should be undertaken as part of any comprehensive management of the steelhead resources of the Santa Ynez River system:

    a. Measure water temperature, dissolved oxygen concentrations, and salinity in relation to estuary length and stream flow so that essential habitat conditions are understood.

    b. Document steelhead relative abundance by season (e.g., the smolting season and the summer season). Steelhead smolts generally stage in an estuary to recoup fat reserves before entering the ocean. Steelhead juveniles may use the estuary for the entire summer or may periodically enter the estuary for sometime before moving back upstream.

    c. Study steelhead growth and diet in the estuary, and determine the primary steelhead food resources in the estuary.

4. Bradbury Dam has precluded steelhead from a major portion of the historical spawning and rearing habitat within the Santa Ynez River watershed. The following investigations should be conducted to provide a basis for re-establishing steelhead fish passage between the upper and lower reaches of the Santa Ynez River watershed:

    a. Investigate alternative means of providing steelhead passage at Bradbury Dam and Cachuma Reservoir

    b. Investigate instream flow requirements that would support migration, spawning, and rearing above Bradbury Dam and Reservoir.

References

Hankin, D.H. and G. H. Reeves. 1988. Estimating total fish abundance and total habitat area in small streams based on visual estimation methods. Can. J. Fish. Aquat. Sci. 45: 834-844.

Instream Flow Council, The. 2002. Instream Flows for Riverine Resource Stewardship. www.instreamflowcouncil.org:410