

MEMORANDUM

To: Art Kidman
 From: Tom Keegan TK
 Date: January 23, 1996
 Re: Comments to Long Term Study Plan



The following text describes suggested additions to the current version (November) of the Long Term Study Plan.

Dissolved Oxygen

No specific reference is made to the collection and analysis of dissolved oxygen (DO) measurements, although indications from past and ongoing TAC sampling programs are that low dissolved oxygen concentrations may be limiting fish production in the mainstem Santa Ynez River. DO levels under 5.0 ppm are generally considered to be suboptimal, and concentrations under 2.0 ppm can be lethal to rainbow trout/steelhead and other fish species. DO concentrations in the mainstem Santa Ynez River have often been measured at levels under 2.0 ppm, likely a result of algal respiration and die-off.

Dissolved oxygen monitoring plans should address three general objectives: determine the extent and/or occurrence of seasonal DO sags that may affect the quality of fish habitat in the mainstem of the lower Santa Ynez River; determine the extent of short term (i.e., diel) DO sags in refuge habitat; and determine DO profiles in Cachuma Reservoir that may affect downstream resources through flow releases.

Seasonal dissolved oxygen concentrations can be determined through the use of continuous recording (data logger) DO meters. Two or three long term monitoring stations in areas with suitable rearing habitat should be identified (preferably at existing temperature monitoring stations) for continuous monitoring.

To assess the extent that DO concentrations may be limiting refuge habitat, vertical profiles of DO concentrations should be conducted in at least six deep pools downstream of Bradbury dam (e.g, including the stilling basin, the long pool, and habitat units where cool water upwelling has been observed). Temperature and DO readings should be taken at one-foot intervals using a DO meter. Readings should be conducted

quarterly during two time periods: early morning and late afternoon. Morning readings must be taken before first light to ensure measurement of the lowest oxygen levels that occur during the 24-hour period. Evening readings should be taken during the hours of 4:00 to 6:00 to ensure measurements of highest DO levels during the 24-hour period.

Quarterly reservoir DO profiles should also continue to be conducted, along with temperature profiles as described in Job 4.

Multi-species Approach to PHABSIM Analysis

One goal of the long term study plan is to identify reasonable flow and non-flow dependent measures to improve habitat conditions for fish populations in the Santa Ynez River. The plan identifies the use of PHABSIM to relate fish use and habitat quantity and quality to various flow regimes. It is important to include those fish species currently existing in the Santa Ynez River in this analysis. However, stream-specific suitability criteria have not been developed for many of the existing species (e.g., rainbow trout/steelhead as well as various warmwater species). Therefore, development of suitability criteria for existing species should be included within the framework of examining habitat/flow relationships.

Development of stream-specific suitability criteria can be labor intensive and expensive. To minimize cost and labor, suitability criteria may be developed by reviewing published criteria for other streams, requesting input from qualified personnel, and by reaching consensus among the TAC. In those cases where consensus cannot be achieved, then focused field data collection may be required to resolve differences among the TAC. Alternatively, a range of suitability criteria sets could be used to bracket conditions and comparative analysis of estimated habitat conditions could be performed.

Genetic Analysis

Genetic data available for Southern California steelhead are extremely limited. As part of the 1994 SYRTAC sampling program, tissue samples of 26 rainbow trout/steelhead (only three of which were adult) were collected and analyzed per mtDNA sequencing. In 1995, tissue samples were collected on over 50 rainbow trout/steelhead in 1995, approximately half of which were adult. Although these samples have not been analyzed, the opportunity to perform mtDNA analysis still exists. The significance of analyzing these fish is that in 1995, streamflow below Bradbury Dam was sufficient to allow upstream migration of steelhead from the ocean, whereas in 1994, upstream migration from the ocean was not possible.

Moreover, the relatively large sample size would yield more definitive information on the existing steelhead/rainbow trout fishery of the Santa Ynez River. Mitochondrial DNA allelic frequency analysis can be used to assess population groupings (i.e., Evolutionarily significant Units), to determine genetic origins of individual fish, and to assess degree of variation or uncertainty in classification of sample groups. This information is necessary for the development of successful management strategies for both the mainstem and tributaries of the Santa Ynez River.

Both the USFWS and NMFS have expressed interest in the results of genetic analysis of these fish, stressing the importance of mtDNA data for anadromous salmonid status review. In particular, Robin Waples expected mtDNA data to be very useful in helping to identify population genetic structure of California steelhead.

There are a number of analytical methods available that need to be evaluated for appropriateness in addressing specific questions relative to various management scenarios. These methods are currently being researched for review by the TAC. Since the review will not be complete in time for approval of the Long Term Study Plan, a genetic analysis plan component should be included for future evaluation. Tissue samples should be collected from all adult rainbow trout/steelhead collected in the upstream trapping program, and from a subsample of juvenile rainbow trout/steelhead collected during downstream migration trapping and electrofishing surveys. These samples may be archived until the proper analytical method is determined.

Feasibility Analysis of Potential Management Actions

An important component of this study plan should be the analysis of potential impacts to water supply, resulting from flow and non-flow dependent habitat improvements that may be recommended as management actions to the SWRCB. Job 7 describes analysis of management actions from a biological standpoint. A feasibility analysis of potential management actions should be performed, including biological, social and economic considerations. Specific considerations in determining feasibility may include the degree of consensus, the ability to minimize conflicts, the significance of potential benefits, potential for impacts to water supply, and costs.