Instream Flow Recommendations:
Scott Creek, Santa Cruz County

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Cover photo: Scott Creek lagoon.

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Preface

The Department of Fish and Game (Department) has interest in assuring that water flows within streams are maintained at levels which are adequate for long-term protection, maintenance and proper stewardship of fish and wildlife resources. The Department has developed recommended stream flows for Scott Creek, Santa Cruz County for transmittal to the State Water Resources Control Board (Water Board) and consideration as set forth in 1257.5 of the Water Code. Submission of these flow recommendations to the Water Board complies with Public Resources Code section 10002.

The Department is recommending instream flows for Scott Creek from stream mile 0.3 on California Polytechnic University – San Luis Obispo's (Cal Poly) property (Swanton Pacific Ranch) upstream to stream mile 0.9, about 0.6 stream miles. The recommendations are presented in form of an annual schedule, with each containing a reference to the target species and life stage.

The Department files the enclosed set of instream flow recommendations for Scott Creek that we believe to be comprehensive and substantially complete. The recommendations were based upon information gathered by the Department's Stream Flow and Habitat Evaluation Program (Snider et al., 1995) and are considered to be best available information for determining instream flows in Scott Creek. The Department has established an administrative file in the Water Branch that contains the cited references. We will make these files available upon request.

The Department may revise the attached recommended instream flows for Scott Creek at a later date based upon new information.

Statement of Findings

Scott Creek is a significant watercourse for which minimum instream flow levels need to be established in order to assure the continued viability of stream-related fish and wildlife resources. Scott Creek was selected for development of flow recommendations because it is a significant watercourse with high resource value, and it is critically important for viability of central California coast steelhead, and coho salmon populations. Scott Creek is also considered to be the southern most drainage where there exists a self-sustaining population of coho salmon.

Background

The flow recommendations for Scott Creek apply from stream mile 0.3 on California Polytechnic University – San Luis Obispo's (Cal Poly) property (Swanton Pacific Ranch) upstream to stream mile 0.9, about 0.6 stream miles. This reach of the creek provides critical habitat for steelhead and coho salmon fry and juvenile rearing, as well as spawning (Figure 1). Outlined below is the background information on the steelhead and coho salmon population status in Scott Creek and associated life history requirements. Following this brief description are the flow recommendations, followed by an overview of the uncertainty associated with climate change impacts and the Department's commitment to minimizing such impacts to the State's natural resources.

Central Coast Coho Salmon and Steelhead

California central coast coho salmon (*Oncorhynchus kisutch)* was State-listed as endangered in 2005. It was federally listed as threatened in 1996 (NMFS, 1996), uplisted to endangered in 2005 (NMFS, 2005), and after a five-year review by National Marine Fisheries Service (NMFS) listed as endangered in 2011 (NMFS, 2011a). California central coast steelhead (*Oncorhynchus mykiss)* was federally listed as threatened in 1997 (NMFS, 1997), and reaffirmed as threatened in 2006 (NMFS, 2006). NMFS later issued the results of a five-year review and concluded that California central coast steelhead distinct population segment should remain listed as threatened (NMFS, 2011b). Scott Creek, located in Santa Cruz County and the central coast region of California, is designated critical habitat for both California central coast steelhead and coho salmon populations (NMFS, 2012).

The Scott Creek Watershed is approximately 25 square miles, and contains three major tributaries: Little Creek, Big Creek, and Mill Creek. Scott Creek contains approximately 7.5 miles of mainstem anadromous habitat accessible to salmon and steelhead, in addition to limited access in the tributaries, as well as a coastal lagoon at its mouth near the Pacific Ocean. Coastal lagoons, such as the Scott Creek lagoon, are an important component of the life history of steelhead, especially for juvenile rearing (Bond, 2006). The Scott Creek lagoon has not contained suitable steelhead rearing habitat for many years over the past two decades due to several factors, including upstream water diversions (Hayes, et al., 2008).

The results of intensive investigations of the life history of coho salmon and steelhead in Waddell Creek, located 5 miles north of Scott Creek in Santa Cruz County are described by Shapovalov and Taft (1954) and outlined in Snider et al., (1995). Shapovalov and Taft (1954) also used information collected from the Scott Creek egg collecting facility to describe the life history characteristics of coho salmon and steelhead. Generally, coho salmon and steelhead spawn in the lower 6 miles of river from stream mile 1.5 to the area just below an impassable waterfall at stream mile 7.5, as well as in the lower portions of the tributaries. Coho salmon and steelhead rearing habitat extends from the spawning reaches downstream to the mouth of Scott Creek and into the lagoon (Figure 1).

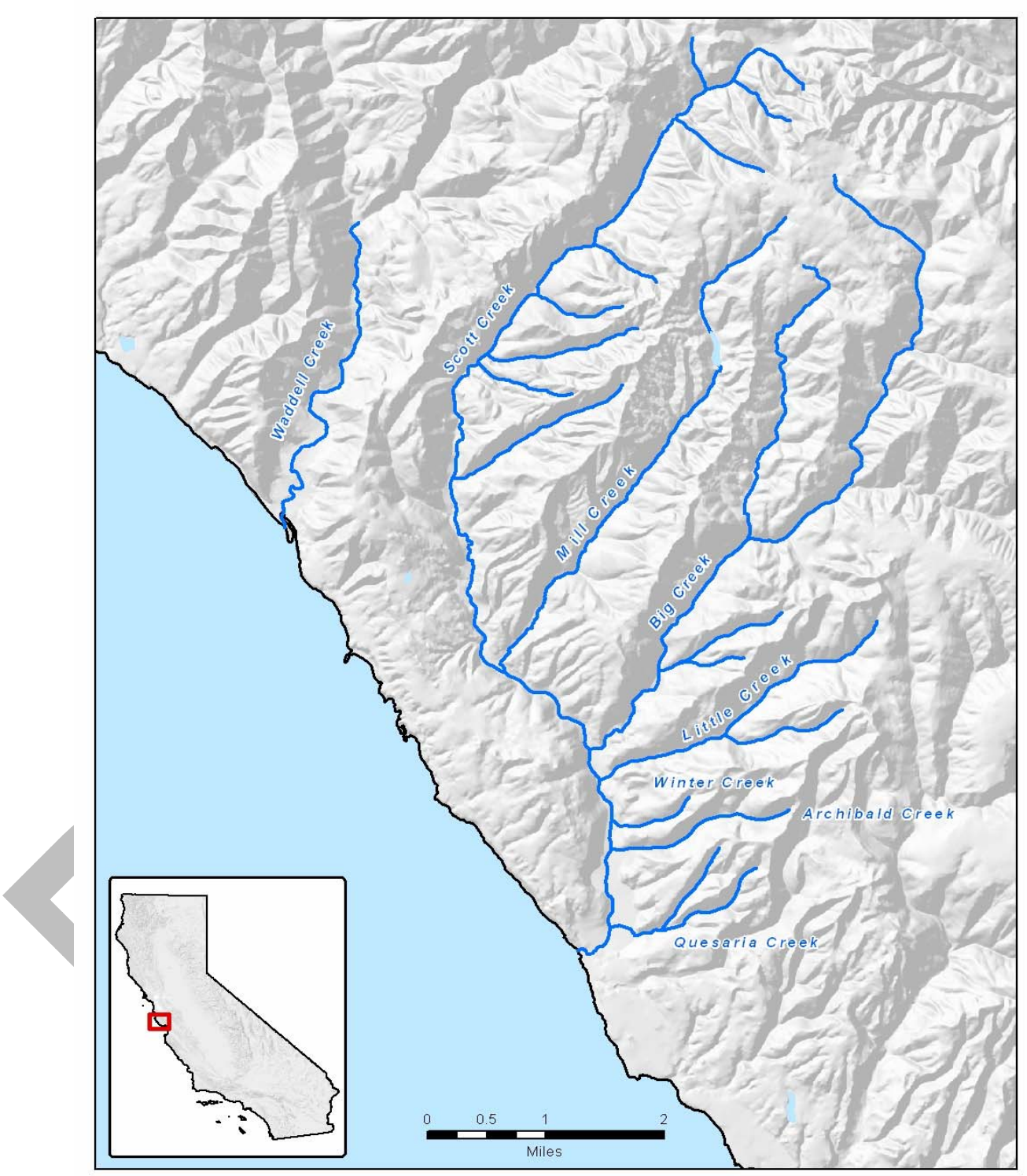

Figure 1: Map of Scott Creek watershed.

Flow Recommendations Annual Schedule

The Department's instream flow recommendations are intended to preserve the processes and functions of the river ecosystem. Each flow recommendation is presented below by month as part of an annual schedule (Table 1). These recommendations are based on an analysis of the percentage of available habitat (Weighted Useable Area = WUA) using a 1-dimensional physical habitat simulation (PHABSIM) model (Bovee, 1978; Bovee and Milhous, 1978; Milhous et al., 1981; Trihey and Wegner, 1981) for coho salmon and steelhead spawning, fry, and juvenile rearing. Recommended monthly flow conditions are based upon timing of life stage considered most critical during the month, PHABSIM model results, and flow availability.

Table 1. The Department's recommendations for minimum instantaneous flows by month and life stage for Scott Creek.

Month	Target Species/Life Stage	Recommended Flow (cfs)
January	Coho adult spawning	40
	Steelhead adult spawning	
February	Coho adult spawning	40
	Steelhead adult spawning	
March	Coho adult spawning	40
	Steelhead adult spawning	
April	Steelhead adult spawning	25
May	Coho fry rearing	10
	Steelhead fry rearing	
June	Coho juvenile rearing	6
	Steelhead juvenile rearing	
July	Coho juvenile rearing	6
	Steelhead juvenile rearing	
August	Coho juvenile rearing	6
	Steelhead juvenile rearing	
September	Coho juvenile rearing	6
	Steelhead juvenile rearing	
October	Coho juvenile rearing	6
	Steelhead juvenile rearing	
November	Coho juvenile rearing	8
December	Coho adult spawning	12

Adult Spawning Flow Recommendations

Minimum flows of 12 cfs are recommended for December and 40 cfs from January through March before any diversion can occur. Flow recommendations are reduced to 25 cfs in April to attempt to optimize adult steelhead spawning habitat availability relative to expected, lower flow conditions.

Fry Rearing Flow Recommendations

Spawning flow recommendations were used to define flows needed during most of the fry rearing period (through April). Fry flow recommendations were prioritized to define flow conditions required during May. We recommend minimum flows of 10 cfs in May before any diversion occurs in order to reasonably maximize rearing habitat for steelhead fry in Scott Creek relative to flow availability.

Juvenile Rearing Flow Recommendations

Flow minimums previously recommended for other life stages will meet the needs of juvenile steelhead and coho salmon from January through April. Previous recommendations for minimum flows in November, December, and May will provide marginally adequate habitat for juvenile life stages. Since flows greater than 5-6 cfs are needed, but can rarely be achieved from June though October with unimpaired flow conditions, our recommendation is for no diversions to occur unless flow exceeds 6 cfs. Therefore, during these low flow periods, all flow needs to be allocated to the maintenance of juvenile steelhead and coho salmon habitat.

In any month where unimpaired natural flows do not meet the minimum instantaneous flow requirements, run-of-the-river, unimpeded natural flows should be maintained.

Climate Change

The Department is committed to minimizing to the maximum extent practical the effects of climate change on the state's natural resources. Changes in temperature and precipitation could result in alteration to existing fresh water systems and an overall reduced availability of water for fish and wildlife species. In addition, these changes may impact groundwater recharge and depletion as well as impacting reservoir and hatchery brood stock project operations, fish passage, and water diversion projects. Given the uncertainty associated with climate change impacts, the Department reserves the right to modify the flow recommendations for Scott Creek as the science and understanding of climate change evolves.

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