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# **1 FOREWORD & INTRODUCTION**

## **1.1 Foreword**

This document establishes uniform procedures to carry out the highway design functions of the California Department of Transportation. It is neither intended as, nor does it establish, a legal standard for these functions. The procedures established herein are for the information and guidance of the officers and employees of the Department.

The guidance incorporated within the following pages is neither intended to serve as a textbook nor as a substitute for engineering knowledge, experience or judgment. Many of the instructions given herein are subject to amendment as conditions and experience may warrant. Special situations may call for variation from the procedures described, subject to necessary approval as may be specifically called for.

## **1.2 Introduction**

### **1.2.1 Purpose**

Improperly designed or constructed road crossings have often become barriers to the migration and passage of aquatic organisms and have contributed to the decline in populations of many fish species in California and nationally. The purpose of this document is to provide designers with the necessary tools and information to adequately plan and design facilities that facilitate movement of fish and other targeted aquatic species in conformance with both state and federal regulations. The guidance contained within this document addresses both NOAA Fisheries and California Department of Fish and Game criteria and provides step-by-step instruction on incorporation of those features and concepts that will lead to regulatory approval.

### **1.2.2 Background**

As a component of the Department's environmental stewardship commitments, the passage of fish past the many thousands of state highway crossings of rivers and streams has long been of concern to Departmental staff. For most fish species, migration for the purposes of spawning, rearing of young or for finding suitable habitat is essential to survival. With the 1973 passage of the federal Endangered Species Act, and the recent passage of California Senate Bill 857 which amends California Fish and Game Code to incorporate specific provisions regarding Caltrans' progress in removing barriers to fish passage, that stewardship commitment also carries a regulatory context whereby the Department must provide for the unimpeded passage of various aquatic species or potentially face litigation and/or penalties for non-compliance.

The National Oceanic and Atmospheric Administration National Marine Fisheries Service (more commonly, NOAA Fisheries), the California Department of Fish and Game (DFG), and the United States Fish and Wildlife Service are the three primary interfaces thru whom Departmental staff will work to ensure conformance with state and federal fish passage standards and regulations. NOAA Fisheries and DFG have produced publications providing guidance on fish passage criteria and in many situations both entities will need to approve of fish passage designs via the permitting process. NOAA Fisheries guidance is specific to those streams supporting anadromous species (i.e., those fish whose life cycle includes extended periods in ocean waters, returning to freshwater for spawning) while DFG guidance is far broader, and applies to all aquatic organisms sustained within the stream.

### 1.2.3 General Considerations

As a document aimed at an audience of designers, the information presented herein begins with the assumption that either a condition exists that impedes fish passage or a new crossing that could affect passage is being considered, and that a determination may be made to address that condition with a Departmentally sponsored project. This document makes no attempt to describe the various funding mechanisms available for fish passage projects nor does it provide detail on the processes used by District and Headquarters Environmental staff to identify species of concern, evaluate stream habitat value or conduct preliminary passage evaluation (i.e., green-grey-red designation) of the culvert.

While the body of this document picks up at the point that the engineering designer has begun the assignment of developing the project PS&E, that does not infer that the process of incorporating fish passage begins at this point. Early discussion and coordination in the project planning phase is necessary to ensure that cost and scope of necessary right-of-way certifications/acquisitions, easements and other required elements are addressed. The designer must confer closely with district Environmental staff to clearly understand the needs of the aquatic species of concern for the stream in question and have an understanding of both the engineering and resource goals of the project.

Successful implementation of the strategies contained in this document often requires that the designer take a non-traditional approach to the project. For instance, much of the project work, and certainly much of the project assessment will likely need to take place well beyond the highway right-of-way. Construction techniques and materials may not be typical of most roadway projects, and several of the requirements established by the resource agencies will seem unusual. The degree of plan detail and specification development and involvement of District hydraulic, biologic and landscape architectural staff will also generally exceed that required by other types of construction. It is these considerations that have led to the publication of the document which follows, and which requires the designer to ensure that the final project design contains an appropriate balance of environmental compliance and safety for the traveling public.

### 1.2.4 Responsible Charge Requirements

Historically, there have been many professions that have contributed to fish passage and stream restoration projects, and in many cases the lead individuals, regardless of profession, have signed off on the plans and/or specifications. While it is still imperative that close collaboration with multiple affected functional units take place, it is the responsibility of the registered civil engineer to sign the project plans for the designs that are discussed within this document, and which will be constructed and/or maintained by the Department. Stream grade control structures, step pools, bank protection, culvert replacements or retrofits and installation of culvert baffles are engineering works, and in keeping with the Business and Professions Code pertaining to such designs, must be signed by the appropriate registered professional.