

1.0 Introduction

Many instream structures in the Central Valley adversely affect native anadromous fish migration. These structures, often referred to as fish passage barriers, reduce or eliminate longitudinal habitat connectivity; prevent or limit access to critical spawning, rearing, and refuge habitat; create migration delays; and create lethal or sublethal conditions for native anadromous species (California Department of Water Resources [DWR] 2012a, 2014; National Marine Fisheries Service [NMFS] 2014). Fish passage barriers associated with the Central Valley flood system trigger compliance requirements under the federal and California Endangered Species Acts; necessitate recurring fish rescues; and impel additional permitting requirements, such as long-term mitigation (NMFS 2009; Vogel 2011; DWR 2012b; Johnson and Vincik 2012; Cannon 2013; Heise 2013; Hendrick and Swart 2013).

Identification of migration impediments and associated improvement opportunities in the flood system is needed for integrated flood management planning. Fish migration improvements can be integrated into flood risk reduction projects¹ to yield cost efficiencies in the project planning and implementation phases, and they may result in long-term economic and environmental benefits (DWR 2014). Two documents, the *Fish Passage Assessment* (Attachment 9C of the Central Valley Flood Protection Plan [CVFPP]) and the *Draft Central Valley Flood System Fish Migration Improvement Opportunities* (FMIO) report have been prepared to assist in identifying and prioritizing fish migration improvement opportunities in the flood system.

1.1 Central Valley Flood Protection Plan 2012, Attachment 9C: Fish Passage Assessment

The *Fish Passage Assessment* (Attachment 9C of the CVFPP) (DWR 2012b) provides a broad overview of targeted anadromous fish species migration needs. The document discusses:

- Ecological flows for fish habitat and migration
- Barriers identified (by the California Fish Passage Assessment Database) in the Systemwide Planning Area
- An interim prioritization of fish passage barriers, based on species recovery plans, the ownership status of structures (i.e., in relation to the State Plan of Flood Control [SPFC]), NMFS geographic priorities, and biological opinion deadlines

¹ For a discussion and tabulation of how fish passage improvements can be integrated with beneficial flood risk management projects, see Conservation Strategy Section 6.0, "Integrated Flood Risk Management and Conservation Approaches."