

STRATEGIC FRAMEWORK 2018–2023

BACKGROUND INFORMATION

California Fish Passage Forum

Updated July 2021



interested parties to discuss ways to restore and recover anadromous fish populations by improving fish passage at man-made barriers. This effort was part of CNRA's effort to implement an eight-point California Coastal Salmon and Watersheds Program. One of the major focal points in this program involves coordinating fish passage activities in the anadromous waters of California, and thus addressing the major limiting factor identified in most recovery plans for listed anadromous fish species. The outcome of the initial convening was the creation of the California Fish Passage Forum (Forum), a collaborative group that works to implement and coordinate fish passage activities across the anadromous waters of the state.

The Forum is now one of 20 national fish habitat partnerships, which attempt to conserve freshwater, estuarine, and marine waterways and fisheries in the United States.

The Forum recognizes that funding for design, implementation, and monitoring of fish passage projects is often limited and inhibits the number of projects that can be implemented in a timely manner. To address this issue, the Forum actively seeks ways to coordinate fish passage funding, identify optimal locations to make strategic investments, contribute to science and data associated with fish passage issues, and foster new or alternative funding sources. The Forum is uniquely positioned to leverage partnerships, skillsets, and knowledge to expedite recovery and conservation of California salmonids.

FACTORS IMPACTING ANADROMOUS FISH HABITATS IN CALIFORNIA

Many anadromous aquatic habitats in the western United States have been highly altered from their historic condition. The habitat changes are the result of natural and human-induced stressors, including changes in runoff patterns and water storage, land use and natural resource extraction activities, spatial and temporal changes in connectivity, non-native species introductions, increased predator populations, commercial and recreational fishing, hatchery operations, natural environmental variations, and both natural and human-induced wildfires.

To address these and other stressors, habitat restoration activities, many of these locally based and relatively site-specific, have occurred in California and the Pacific Northwest. In addition, regional assessments of restoration needs and prioritization related to anadromous fish and their habitats have occurred. Many of these assessments ranked connectivity as the top priority for strategic regional restoration (Roni et al. 2002, Hooybar 2003) because connectivity-focused projects have the highest likelihood of success, are cost-effective, show immediate results, are long lasting, and can guide where other restoration activities should be implemented based on restored access to larger areas of habitat.

In California, several recent documents related to recovery and management of federally and state listed fish species have also designated fish passage as a high priority.

- The Recovery strategy for California Coho Salmon (2004) and the Steelhead Restoration and Management Plan for California (1996), both published by the California Department of Fish and Wildlife (CDFW), list fish passage as high priority recovery tasks.
- The Open Rivers Initiative (NMFS) and the National Fish Passage Program (USFWS) are based on the fundamental concept that removing fish passage barriers is a priority action for species recovery.

- National Marine Fisheries Service (NMFS) Recovery plans for Coho salmon and steelhead identify fish passage barriers as a major limiting factor in the recovery of listed salmonids in California. Pacific Lamprey is proposed for listing, and Green Sturgeon have been listed as Threatened, and fish passage barriers are identified as a major threat to their populations.
- Other federal (Natural Resources Conservation Service [NRCS]), state, and regional fish passage programs have been created because of fish passage barriers. The U.S. Fish and Wildlife Service (USFWS) has completed recovery plans for shortnose sucker and lost river sucker populations, and identifies removing fish passage barriers as a primary action to recovering both sucker populations.

The Forum recognizes that fish passage is an important issue to numerous aquatic species in anadromous and non-anadromous waters. The Forum also acknowledges the importance of other limiting factors for anadromous fish survival, such as healthy riparian habitat, and water quality and quantity. Many of the Forum Memorandum of Understanding (MOU) signatories also work to address issues of water quality, quantity, policy and practice modifications, and other forms of in-stream and riparian habitat restoration that will improve the overall anadromous and resident fish populations within the Forum's geographic scope. The Forum recognizes, through its focus on fish passage issues, that without access to freshwater habitat, other anadromous fish restoration efforts will not succeed.



*Figures 2 and 3. The top photo features an example of a fish barrier that was remediated on the Shasta-Trinity National Forest. The bottom photo features the solution to the barrier—an open-bottom arch composed of natural streambed. This barrier remediation project created newly accessible habitat for Coho Salmon, Klamath Mountain Province steelhead, and Pacific lamprey.
Photo credits: Shasta-Trinity National Forest.*

FISH SPECIES IMPACTED BY PASSAGE BARRIERS IN CALIFORNIA

Anadromous Species

California streams and rivers with access to the ocean were historically home to several native anadromous fish species. These include Chinook Salmon, Coho Salmon, Chum Salmon, Pink Salmon, steelhead/rainbow trout, coastal cutthroat trout, green sturgeon, white sturgeon, Pacific Lamprey, river lamprey, eulachon, and threespine stickleback. American shad and striped bass are also prevalent non-native anadromous species in many systems.

Historically, anadromous fish passage efforts in California have focused on Chinook Salmon, Coho Salmon, and steelhead. Pink Salmon have only occurred rarely in California since the latter half of the 20th century. Chum salmon are slightly more common than Pink Salmon, but have a limited presence in California. Coastal cutthroat trout are a State of California Species of Special Concern, but have no federal status and have generally not been the focus of fish passage efforts. Passage impacts on green and white sturgeon are almost exclusively limited to large dams, therefore, passage improvement projects for sturgeon are complex, expensive, and uncommon. Efforts are underway in up and down the West Coast to analyze and mediate the impact of barriers on lampreys. These efforts are often linked to passage projects associated with salmon and steelhead and once refined, will likely consist mainly of additions or alterations to traditional salmonid passage designs. Passage does not likely have a major impact on eulachon as they are found in the lower reaches of coastal rivers and streams and spend very little time in freshwater. Threespine sticklebacks are very adaptable and demonstrate a wide variety of life history strategies that likely greatly reduce the impact of barriers.

Other Species

California has a limited number of federally listed fish species, or fish species included in the State Wildlife Action Plan, that occur in anadromous waters. Delta smelt are listed as threatened under the federal and California Endangered Species

Act (ESAs). Longfin Smelt are listed as threatened under the California ESA, but are not listed federally. Both delta and longfin smelt have been subjected to degradation of their native habitats, however passage is not considered an important factor in the declines of these species.

Shortnose suckers are listed as endangered under the federal and California ESAs. Klamath largescale suckers are included in the SWAP but are not listed under the federal or California ESA. Both sucker species are uncommon in the anadromous reach of the Klamath River.

The Forum will continue to focus on fish passage assessment, prioritization, and implementation for salmonids and lamprey. Additionally, the Forum will consider actions to address other anadromous and resident species in anadromous watersheds as the need arises and cost-effective passage methods are developed.

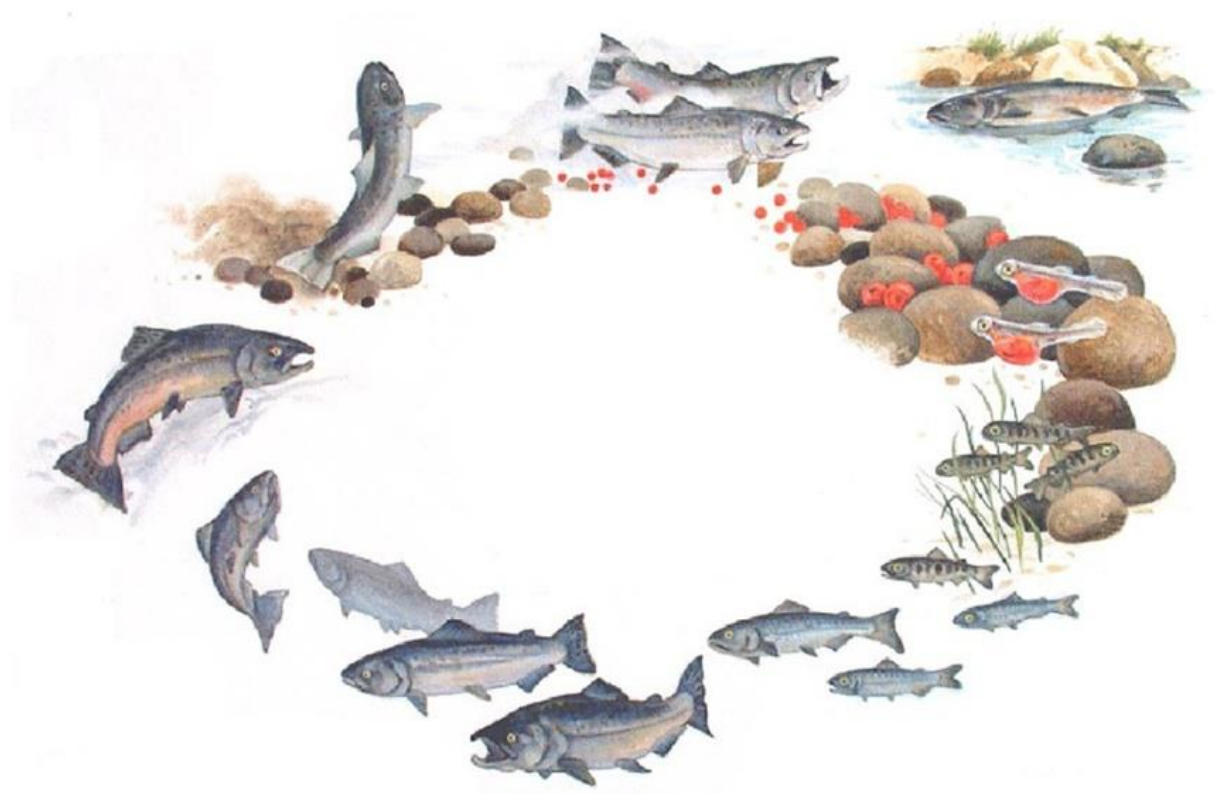


Figure 4. The salmon life cycle. Graphic credit: Beth Campbell, USFWS Stockton office.

HISTORY OF THE FORUM



California's historically bountiful anadromous fishery depends on the ecological integrity of dozens of streams and rivers that flow into the Pacific Ocean along the state's 1,100-mile coastline. These streams provide the habitat that salmonids and other anadromous fish require during the spawning and juvenile phases of their life.

During the 19th and 20th centuries, as roads, bridges, and dams were built on public and private lands along waterways, and as water was diverted by various means, thousands of barriers were erected, blocking the passage of anadromous fish. These barriers impact both adult and juvenile fish by preventing full use of available habitat or altering habitat and hydraulic conditions. Consequently, many salmon, steelhead, cutthroat trout, lamprey, and sturgeon populations have experienced significant declines, and the tribal, sport, and commercial fisheries that depended on some of these populations have been impacted and, in many cases, cease to operate.

Man-made barriers to fish passage include road/stream intersections, pipeline or other infrastructure crossings, erosion control/flood control structures (rip-rap, concrete channels, e.g.), and dams that block or delay migration. In some cases, previously installed fish passage structures, such as fish ladders, act as barriers because of poor design, or construction, operation, and lack of maintenance.

In October 1999, the California Resources Agency (CNRA) established the eight-point California Coastal Salmon and Watersheds Program, which called for the coordination of state, federal, and local partners working toward the goal of restoring salmon and steelhead populations to naturally sustainable levels. At the time, fish passage, although recognized as a major threat to anadromous fish species in California, was also determined to potentially yield the greatest cost-

efficiency for short-term restoration activities. Based on this recognition, the program included an objective to coordinate fish passage activities in California.

To accomplish this objective, the CNRA convened a group of interested state, local, and federal agencies, fisheries conservation groups, researchers, restoration contractors, and others to discuss ways to improve fish passage at man-made barriers. The success of this coordination led to the establishment of the California Fish Passage Forum, of which many agencies and organizations are members.

The Forum identified the need for improved efforts to identify barriers, evaluate and prioritize restoration opportunities, and implement projects in a timely fashion. It also targeted administrative, financial and technical impediments to addressing these issues, including information gaps, lack of watershed-level assessment and planning, and poorly coordinated project review and permitting processes. Forum participants worked together to develop short-term solutions for these types of problems for several known high priority fish passage projects. The Forum also established subcommittees for coordinating activities related to fish passage inventory and assessment protocols, data format and access protocols, information and literature collection, permitting, training, and public education and outreach.

THE PASSAGE ASSESSMENT DATABASE

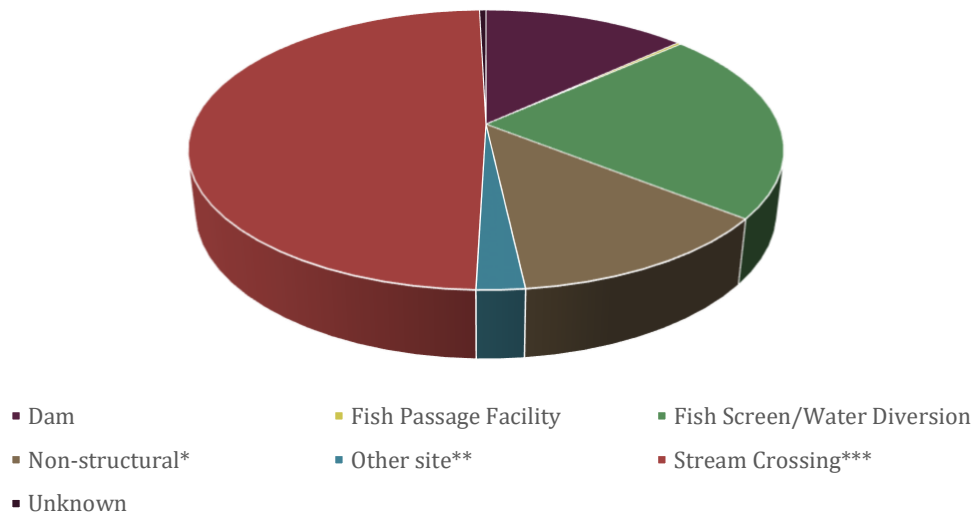
The Forum's first step in charting a course for restoring passage for California anadromous fish was to determine the quantity and severity of existing migration barriers. In collaboration with the California Coastal Conservancy and the Pacific States Marine Fisheries Commission, the Forum developed the Passage Assessment Database (PAD). The PAD is an ongoing map-based inventory of known and potential barriers to anadromous fish in California, compiled and maintained through a cooperative interagency agreement. The PAD compiles currently available fish passage information from many different sources, allows past and future barrier assessments to be standardized and stored in one place, and enables the analysis of cumulative effects of passage barriers in the context of overall watershed health.

The PAD database identifies and compiles information on more than 16,000 potential barriers to fish passage in California's coastal and Central Valley watersheds. Of the structures that are of human origin, at least 1,500 are severe or impassable.

Correlated with state and federal recovery plans for endangered Coho salmon and steelhead, the PAD is a tool that helps to inform high priority fish passage barriers in critical watersheds.

The database is designed to capture basic information about each potential barrier. It is designed to be flexible; as the database grows, other modules may be added to increase data detail and complexity. The PAD also makes it possible for Forum members to track project implementation (Figures 5 and 6).

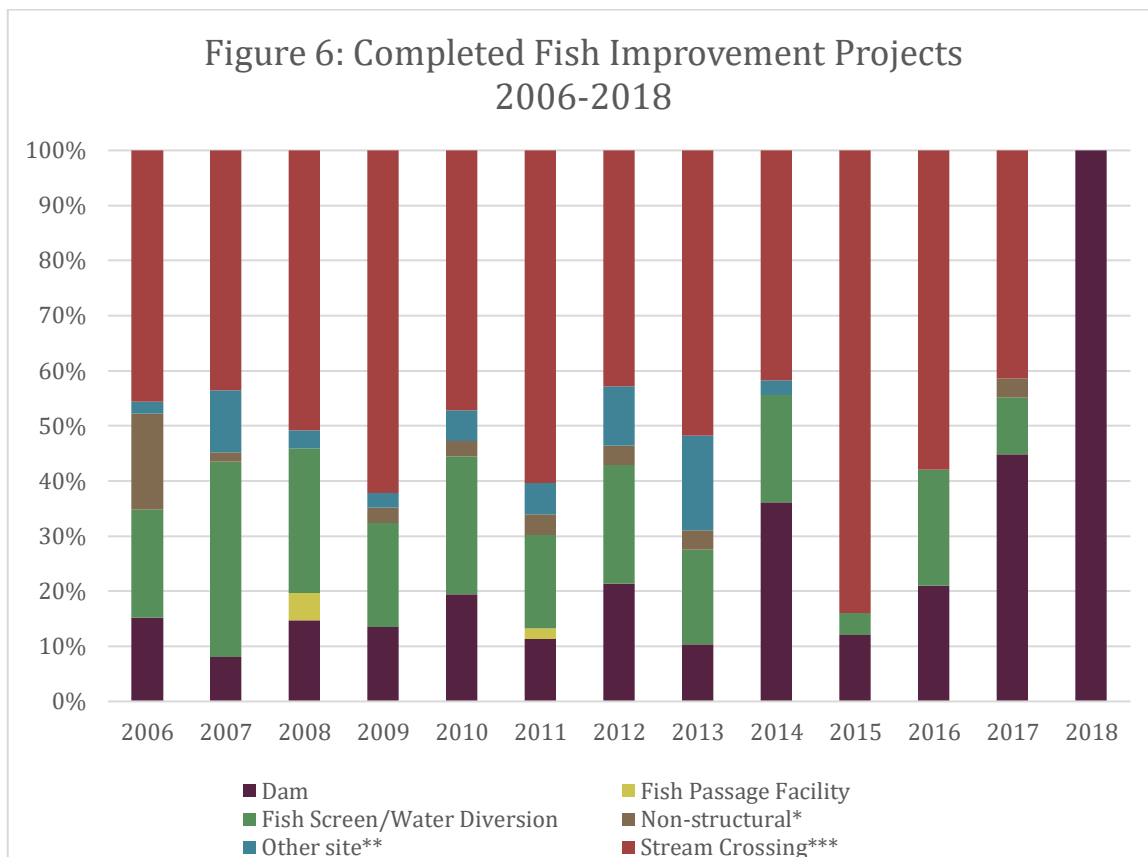
Figure 5: Fish Passage Barrier Types Dominant in California Anadromous Watersheds



*Includes non-structural (waterfall, grade, temperature, insufficient flow, landslide, velocity, etc.) and log jams.

**Includes flood control channels, grade control, flow measurement weir, gravel/borrow pits, tide gates, fish traps and other barrier types.

***Includes road (culvert, bridge, low-flow, etc.) and utility crossings.



The table includes barriers that were total, partial and temporal barriers prior to remediation and in some cases where projects are still a barrier (temporal or partial) but where passage has improved to the best of the PAD's knowledge.

At this point, the remediations that occurred the previous year may not be completely represented in the PAD and the number of stream miles opened may be an underestimate.

**Includes non-structural (waterfall, grade, temperature, insufficient flow, landslide, velocity, etc.) and log jams.*

***Includes flood control channels, grade control, flow measurement weir, gravel/borrow pits, tide gates, fish traps and other barrier types.*

****Includes road (culvert, bridge, low-flow, etc.) and utility crossings.*

Source: California Department of Fish and Wildlife, Passage Assessment Database, December 21, 2018 version (www.calfish.org/pad/). Created by Anne Elston, PAD Administrator.

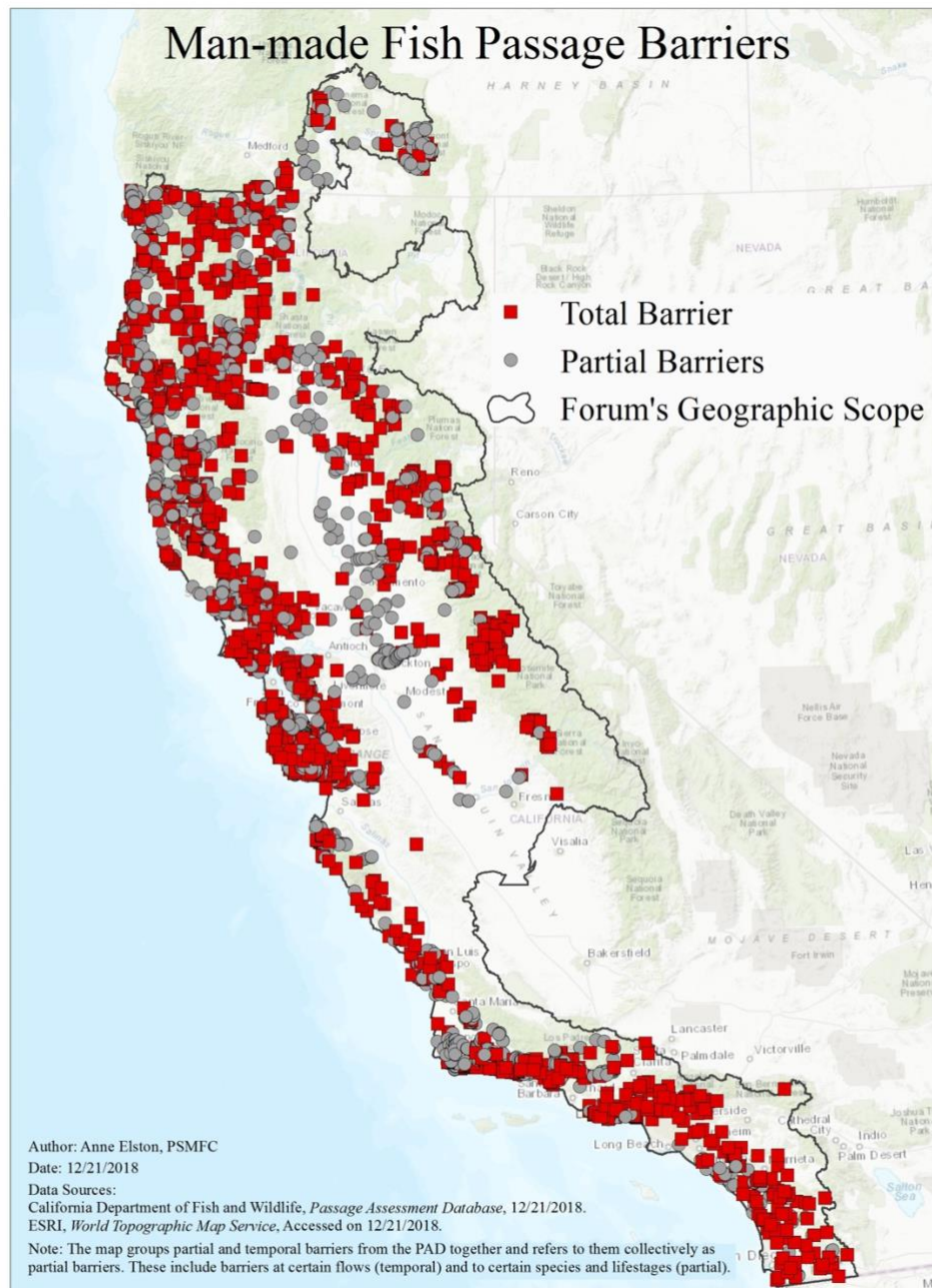


Figure 7. Man-made fish passage barriers within the Forum's geographic scope documented in the Fish Passage Assessment Database (PAD) as of December 21, 2018.

A LOOK BACK - THE LAST 5 YEARS

Forum Contributions to On-The-Ground Restoration (2012-2019)

Projects Funded	2013	2014	2015	2016	2017	2018	2019
Grape Creek							
Conner Creek							
Branciforte Creek	\$12,497						
Wilson Creek	\$27,500						
Pinole Creek		\$40,000					
Carpinteria Creek		\$11,500					
Salt River Ecosystem		\$18,600					
Sharber-Peckham		\$39,999					
Dinner Creek		\$40,000					
Kelly Gulch		\$12,899					
Memorial County			\$67,243				
Manly Gulch				\$54,765			
Central California				\$40,000			
Traction							
Pacific Lamprey PAD				\$10,000			
Project							
Juvenile Fish Passage				\$13,000			
Criteria Assessment							
Benbow Dam Removal					\$58,499		
Pennington Creek					\$40,000		
Upper Green Valley					\$30,089		
Davy Brown & Munch						\$44,538	
Creek							
Mid Klamath						\$38,680	
Neefus Gulch						\$39,513	
Cooper Mill						\$65,782	
Iron Horse Vineyards							\$20,039
Dam Removal Project							
Lamprey Passage at							\$19,500
Rowdy Creek							
4-1 Road Fish Passage							\$81,857
Improvement Project							
Mad Creek Off-Channel							\$28,856
Connection Project							
Upper Noyo River –							\$15,000
Skunk Train							
Lamprey Passage							\$41,612
Design							

10 Waters to Watch

Projects	2014	2015	2016	2017	2018
Eel River Delta	X				
Pinole Creek		X			
Carmel River			X		
Mill Creek and Deer Creek			X		
Benbow Dam Removal				X	
Big River					X

Science and Data

Projects	2013	2014	2015	2016	2017	2018
Produced report, "Optimizing Fish Passage Barrier Removal in California While Considering Climate Change Effects"		X				
FISHPass		X	X	X	X	X
Supported the NorWeST Stream Temperature Database			X			
Support PAD	X	X	X	X	X	X
Compile barrier removal effectiveness monitoring projects, and recommend tiered protocols to endorse			X			
Participation on the California LCC Science and Management Team			X	X	X	X
Engineering Working Group						
Design review flowchart – checklist of items needs to review fish passage design plans	X					
Process to summarize rationale used for exceptions that have been granted by CDFW and NMFS	X					

Outreach and Education

Projects	2013	2014	2015	2016	2017	2018
Why Fish Passage Is Important - website		X				
Convened coastal FHPs and produced/edited quarterly newsletter		X	X	X		
Added storymap to website to show project locations			X	X		
Created Forum and FISHPass logo	X					
Eel River Estuary Event		X				
Launched website	X					
Maintained website	X	X	X	X		X
Produced Forum posters	X					
Effectiveness Monitoring Case Studies						
GlennBrook Gulch				X		
Salt River Ecosystem				X		
Dunn Creek					X	
Granlees Dam					X	
Willow Creek						X
Green Gulch						X
Mill Creek Dam						X

Other

Projects	2013	2014	2015	2016
Developed form to track NFHP and USFWS partner accomplishments	X			
Completed Forum project endorsement form	X			
Forum MOU			X	
Produced electronic form for project leaders to provide updates electronically	X			
Produced committee work plans annually	X	X	X	X
Updated NFHP-funded project reporting form		X		
Strategic framework development and updates	X	X	X	X

In September of 2017, the Forum identified their strengths, challenges, and opportunities.

- **Strengths**

- Convening fish passage practitioners for education (e.g., Eel River Delta event);
- Connecting with other fish passage practitioners and scientists;
- Data and science collaboration (Passage Assessment Database);
- Distributing limited funds across multiple projects and leveraging funds, i.e., diversifying investments into a variety of projects;
- Identifying and promoting the importance of effectiveness monitoring and providing guidance on effective monitoring techniques;
- The diversity of Forum membership; and
- The timing and opportunity of funds disbursed in a different cycle than other California funds.

- **Challenges**

- Current Forum members may not have the amount of influence Forum members once had because of delegation of Forum memberships;
- The need for more engineers to be engaged and informed in fish passage efforts;
- The lack of nongovernmental diversity in Forum membership; and

- **Opportunities**

- Help people with prioritizing strategic investments in fish passage, using tools, such as FISHPass.
- Resources are limited, but the Forum can help guide how people invest.
- Monitoring, planning, and assessment are the most difficult tasks to fund, which represents a niche the Forum can fill.
- Affiliations, such as FishPACs could increase the Forum's level of potential grant funding and could create a higher NFHP ranking, improving eligibility for federal fund disbursements.
- Expand focus to instream flow barriers as a secondary priority.
- Track progress in removing barriers.
- Improving the PAD to inform more elements of passability and thus linking the PAD with future prioritizations.

- Consider forming an executive committee to engage decision makers at appropriate times/trigger points, such as updating the MOU.



FORUM CONSERVATION PRIORITIES

The Forum's conservation priorities and objectives are based on the goal of restoring and protecting healthy anadromous fish populations by restoring habitat connectivity. The following objectives and numeric targets are proposed for 2018–2023, and will be used by the Forum to measure the success of implementing this framework. These objectives and numeric targets may be modified by Forum members through the annual work planning process. Throughout the five-year period, the Forum will review its progress and update this framework.

Regular meetings and communication are the foundation for accomplishing the Forum's objectives, the Forum will convene up to four times annually to share project priorities, reviews, and treatment status reports, as well as determine priorities for Forum efforts.

The meetings also provide a venue for identifying additional anadromous habitat restoration opportunities throughout California and allow for agency cooperation during the project design, permitting, and implementation phases. The Forum will expedite implementation of on-the-ground projects by promoting and facilitating cost-sharing, technical assistance, and networking. Distribution of meeting minutes and other important documents will enhance participation by all Forum members.