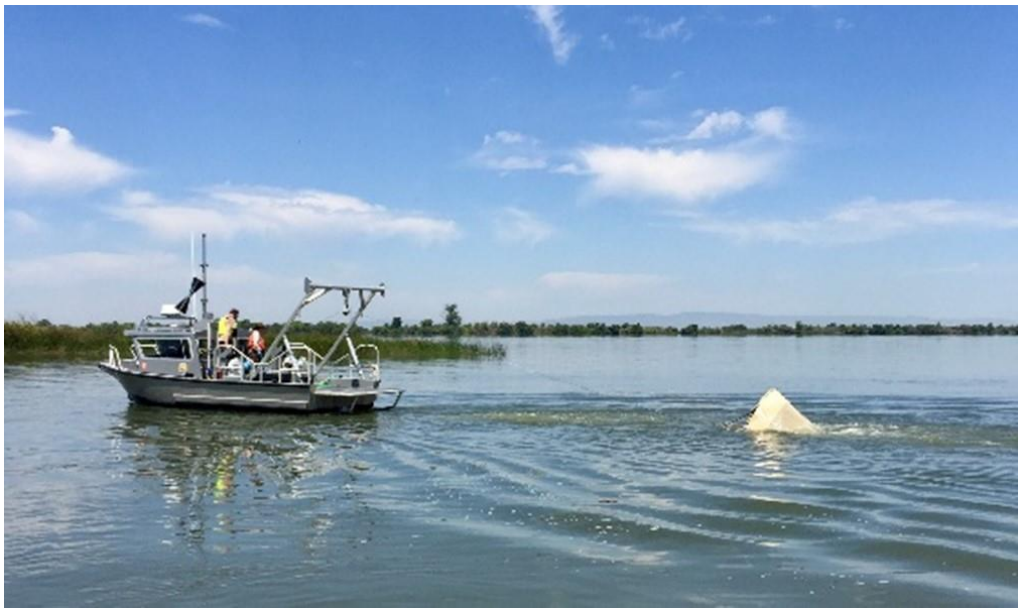
Interagency Ecological Program
2025 Annual Work Plan



Enhanced Delta Smelt Monitoring crew from USFWS collecting data.
Photo Credit: USFWS

Interagency
Ecological Program

Cooperative Ecological
Investigations Since 1970

February 6, 2025

Information from the IEP Management Committee

This Work Plan does not necessarily represent compliance with regulatory, permit, or other requirements and each agency remains individually responsible for ensuring compliance with its requirements.

Acronym Definitions

CDFW- California Department of Fish and Wildlife

CVP- Central Valley Project

DJFMP- Delta Juvenile Fish Monitoring Program

DSC/DSP- Delta Stewardship Council/Delta Science Program

DSLCM- Delta Smelt Life Cycle Model

DWR- Department of Water Resources

EBMUD- East Bay Municipal Utility District

EDSM- Enhanced Delta Smelt Monitoring

FMWT- Fall Midwater Trawl Survey

NASA- National Aeronautics and Space Administration

NMFS- National Marine Fisheries Service

NOAA- National Oceanic and Atmospheric Administration

PESP- Phytoplankton Enumeration Synthesis Project

SDFPF- Skinner Delta Fish Protective Facility

SFEI- San Francisco Estuary Institute

SLS- Smelt Larva Survey

SMSCG- Suisun Marsh Salinity Control Gate

STN- Summer Townet Survey

SWRCB- State Water Resources Control Board

TFCF- Tracy Fish Collection Facility

USACE- United States Army Corps of Engineers

USBR- United States Bureau of Reclamation

USEPA- United States Environmental Protection Agency

USFWS- United States Fish & Wildlife Service

USGS- United States Geological Survey

YBFMP- Yolo Bypass Fish Monitoring Program

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2025 Project Element Details

2025-003 Fall Midwater Trawl Survey (FMWT)

PI: Steve Slater (CDFW)

The Fall Midwater Trawl Survey was initiated by the California Department of Fish and Wildlife (CDFW) to determine the relative abundance and distribution of age-0 Striped Bass (*Morone saxatilis*) in the San Francisco Bay/Sacramento-San Joaquin estuary. Sampling has been conducted annually since the project's inception in 1967, with the exceptions of 1974 and 1979. While initiated for the purpose of sampling Striped Bass, the survey is designed to sample pelagic species and the data has been routinely used for other upper estuary pelagic species, including Delta Smelt (*Hypomesus transpacificus*), Longfin Smelt (*Spirinchus thaleichthys*), American Shad (*Alosa sapidissima*), and Threadfin Shad (*Dorosoma petenense*). These species, along with Striped Bass, are considered important indicators of estuary health and all have suffered substantial population declines in recent decades. The Delta Smelt and Longfin Smelt are of particular importance because the former is listed and managed under both the United States and California Endangered Species Acts (ESA), while the latter is listed and managed by the state of California ESA. As a result, continuation of the FMWT survey is mandated by a federal Delta Smelt Biological Opinion for the coordinated operation of the Central Valley Project and the State Water Project. FMWT survey data are used to determine the allowable number of Delta Smelt (i.e., take of Delta Smelt) that can be entrained in the state and federal export facilities in the southern Sacramento-San Joaquin Delta.

Funding Agency	Amount in thousands of dollars
DWR	$424
USBR	$438
Total	$862

2025-007 Summer Townet Survey (STN)

PI: Steve Slater (CDFW)

Summer Townet Survey (STN) is a long-term effort to monitor young pelagic fishes in the upper San Francisco Estuary. Since 1959, STN has sampled locations from eastern San Pablo Bay to Rio Vista on the Sacramento River, and to Stockton on the San Joaquin River, and a single station in the lower Napa River. The study area was expanded in 2011 to include the Sacramento Deep Water Ship Chanel and Cache Slough. Currently, 40 stations are sampled every other week June through August using a conical, fixed-frame net, which is pulled obliquely through the water column 2 to 3 times at each station. Data collected at 31 stations are used to calculate annual relative abundance indices for age-0 Striped Bass (*Morone saxatilis*) and Delta Smelt (*Hypomesus transpacificus*). The remaining 8 stations are sampled to increase our understanding of juvenile fish abundance and distribution in the lower Napa River and the north Delta. In 2005, STN added a zooplankton net to assess fish food resources at

each station and a subset of the fish collected are retained for diet analysis by CDFW researchers (see element # 062). The STN also measures water temperature, water clarity, specific conductivity and ranks station conditions (i.e., weather, wave height, etc.) and Microcystis spp. presence. Managers and researchers use the data collected by STN to inform water project operations and flow actions to manage the health of the upper San Francisco Estuary.

Funding Agency	Amount in thousands of dollars
DWR	$424
USBR	$438
Total	$862

2025-011 Estuary and Marine Fish and Crab Abundance and Distribution Survey (Bay Study)

PI: Kathy Hieb (CDFW)

The San Francisco Bay Study (Bay Study) is conducted by CDFW and was implemented in 1980 to determine the requirements of fish, crabs, and shrimp downstream of the delta, as related to the Bay-Delta Water Quality Standards. The Bay Study currently samples 52 stations monthly from South San Francisco Bay to the lower Sacramento and San Joaquin rivers with an otter trawl and midwater trawl, which are towed from a research vessel. The study is designed to sample young (age-0) fishes and crabs and juvenile and adult shrimp from open water, soft bottom habitats deeper than 3 meters. Note that shrimp are the focus of the companion program element "Shrimp Abundance and Distribution Survey". For the fish and crab program element, the Bay Study calculates and reports annual abundance indices and abundance trends for 30+ species of fish and 5 species of crabs. We also track and reports seasonal abundance patterns and annual and seasonal distributional patterns for these species. Ultimately, the abundance trends and distributional patterns are related to physical factors - primarily freshwater outflow, but also ocean and estuarine water temperature, ocean upwelling, and ocean climate indices, such as the Pacific Decadal Oscillation and North Pacific Gyre Oscillation. The goal is to determine what factors may control recruitment and distribution of important estuarine and marine fishes and crabs that rear and reside in the San Francisco Estuary.

Funding Agency	Amount in thousands of dollars
DWR	$582
USBR	$582
Total	$1,164

2025-012 Bay Shrimp Abundance and Distribution Survey (Bay Study)

PI: Kathy Hieb (CDFW)

The San Francisco Bay Study (Bay Study) is conducted by CDFW and was implemented in 1980 to determine the requirements of fish, crabs, and shrimp downstream of the delta, as related to the Bay-Delta Water Quality Standards. The

shrimp program element is a companion to the "Estuarine and Marine Fishes and Crabs Abundance and Distribution Survey" element. The Bay Study currently samples 52 stations monthly from South San Francisco Bay to the Sacramento and San Joaquin rivers with an otter trawl and midwater trawl, which are towed from a research vessel. The study is designed to sample young (age-0) fishes and crabs and juvenile and adult shrimp from open water, soft bottom habitats deeper than 3 meters. For the shrimp program element, the Bay Study calculates and reports annual abundance indices and abundance trends for 6 common species of shrimp. We also track and report seasonal abundance patterns and annual and seasonal distributional patterns for these species. Ultimately, the abundance trends and distributional patterns are related to physical factors - primarily freshwater outflow, but also ocean and estuarine water temperature, ocean upwelling, and ocean climate indices, such as the Pacific Decadal Oscillation and North Pacific Gyre Oscillation. The goal is to determine what factors may control recruitment and distribution of the most important estuarine and marine shrimp that rear and reside in the San Francisco Estuary.

Funding Agency	Amount in thousands of dollars
DWR	$125
USBR	$125
Total	$250

2025-029 San Fracisco Bay Salinity and Temperature Monitoring

PI: David Hart (USGS)

The USGS collects specific conductance (related to salinity) and water temperature data on a 15-minute interval at six continuous monitoring stations in San Francisco Bay – San Francisco Bay at Dumbarton Bridge, San Francisco Bay at San Mateo Bridge near Foster City, San Francisco Bay at Alcatraz, San Francisco Bay at Richmond Bridge, Carquinez Strait at Carquinez Bridge, and Suisun Bay at Benicia Bridge.

The stations are currently installed, and regular maintenance includes approximately monthly visits to the sites for sensor calibration and cleaning, along with other routine maintenance of the water-quality sondes and infrastructure. All stations except Alcatraz include instruments located at two depths, typically one each in the lower and upper half of the water column. The Alcatraz station has a single instrument located roughly at mid-depth. All equipment, travel expenses, supplies, and labor are provided by the USGS. This project does not include data interpretation.

Funding Agency	Amount in thousands of dollars
DWR	$367
USGS	$27
Total	$394

2025-030 Delta Flows Network

PI: Catherine Ruhl (USGS)

The US Geological Survey, Bay Delta Hydrodynamics Program has been collecting water level, velocity, and flow data in the Sacramento-San Joaquin Delta since 1978. Today, the flow network includes 35 stations throughout the Delta and in some cases have expanded to include water quality data collection as well. The data collected at these stations are critical for understanding the circulation and mixing patterns in the complex and interconnected channels that comprise the Delta region. Understanding Delta hydrodynamics is imperative to documenting current conditions and to understanding the impacts of proposed major infrastructure projects and regulatory actions being taken to protect threatened and endangered species in the Delta.

Funding Agency	Amount in thousands of dollars
DWR	$861
USGS	$103
Total	$964

2025-033 20-mm Delta Smelt Survey (20-mm)

PI: Colin Brennan (CDFW)

The 20-mm Survey samples the upper San Francisco Estuary every other week from March through July at 61 fixed stations to determine the distribution and abundance of juvenile Delta and Longfin Smelts. Results from this survey are provided in near-real time to assess the entrainment risk of these species.

Funding Agency	Amount in thousands of dollars
DWR	$600
USBR	$568
Total	$1,168

2025-043 Estimation of Pelagic Fish Population Sizes

PI: Lara Mitchell (USFWS)

Estimates of fish abundance, and corresponding measures of uncertainty, are critical for assessing the status of the population, estimating vital rates such as survival and reproduction, and developing management actions aimed at population recovery and sustainability. This work focuses on advancing abundance estimation methods for multiple life stages of Delta Smelt based on a variety of sampling surveys, including the 20-mm Survey, Summer Townet Survey, Fall Midwater Trawl Survey, Spring Kodiak Trawl Survey, and the Enhanced Delta Smelt Monitoring program. Such abundance estimates serve as input data for models linking environmental covariates and management actions to population dynamics. This work also extends methods that were developed for Delta Smelt to Longfin Smelt, which is another species of management concern. Work on Longfin Smelt abundance estimates will continue to build on exiting models for Longfin Smelt population dynamics and growth. Abundance modeling for Longfin Smelt will differ from models for Delta Smelt because of their longer life span and different geographic patterns throughout the life cycle.

Funding Agency	Amount in Thousands of Dollars
DWR to USFWS	In-kind Contribution approximately $73
USBR to USFWS	In-kind Contribution approximately $73

2025-047 Yolo Bypass Fish Monitoring Program (YBFMP)

PI: Nicole Kwan (DWR)

The objectives of this interdisciplinary monitoring effort are to collect baseline data on juvenile and adult fish, lower trophic levels (phytoplankton, zooplankton, and aquatic insects), and water quality. Understanding the specific environmental conditions that trigger migrations and enhanced survival and growth of native fishes (esp. salmon and smelt) are of critical importance for restoration efforts, and the Yolo Bypass is a critical linkage in the health of fish populations and the entire bay delta ecosystem. Furthermore, the mechanisms through which lower trophic organisms reach higher abundance in the Yolo Bypass are not well understood. The YBFMP will serve to fill in these information gaps. The Yolo Bypass has been identified as a high restoration priority by the National Marine Fisheries Service and US Fish and Wildlife Service Biological Opinions for Delta Smelt, winter & spring-run Chinook Salmon. The YBFMP informs the restoration actions that are mandated or recommended in these plans, provides valuable response data for adaptively managing bypass weirs, and provides critical baseline data on floodplain ecology.

Funding Agency	Amount in thousands of dollars
DWR	$1,250
Total	$1,250

2025-053 Juvenile Salmon Monitoring (DJFMP)

PI: Adam Nanninga (USFWS)

The Delta Juvenile Fish Monitoring Program conducts weekly beach seining (year-round) within the lower Sacramento River and Delta and the lower San Joaquin River, and bi-weekly seining (year-round) in San Francisco Bay and San Pablo Bay to monitor the relative abundance and distribution of juvenile Chinook Salmon and other juvenile fishes in unobstructed near-shore habitats. Year-round surface trawling is conducted in the Sacramento River near Sacramento and in the San Joaquin River near Mossdale to monitor juvenile Chinook Salmon entering the Delta. In addition, year-round surface trawling at Chipps Island monitors juvenile Chinook Salmon exiting the Delta. Surface trawling at Mossdale is conducted in cooperation with the California Department of Fish and Wildlife.

Funding Agency	Amount in thousands of dollars
DWR	$2,785
USBR	$1,671
Total	$4,456

2025-059 Coleman National Fish Hatchery Late-Fall Run Production Tagging

PI: Kevin Niemela (USFWS)

This element consists of coded-wire tagging of all Coleman National Fish Hatchery late fall-run production to ensure proper race identification during subsequent recovery of fish at Delta export facilities, and in juvenile and adult sampling programs. The Late Fall Chinook Salmon Tagging effort is broken into two tasks within the US Fish and Wildlife Service's Delta Juvenile Fish and Monitoring Program. Task 5 is the sub-contracting and equipment costs for marking and tagging operations. Task 6 is the USFWS personnel costs for tagging coordination and tag recovery. The coded wire tags are purchased separately by USBR. DWR contract costs are for the tagging of fish. Operation costs include operational oversight and recovery of tags from adults at the hatchery.

Funding Agency	Amount in thousands of dollars
DWR	$194
USBR	$114
Total	$308

2025-062 Quantitative Analysis of Stomach Contents and Body Weight for Pelagic Fishes

PI: Steve Slater (CDFW)

The Diet and Condition Study has provided information on the food habits of pelagic fishes in the estuary since 2005. We focus on the temporal and spatial differences in diet composition and feeding success of Delta Smelt, Striped Bass, Threadfin Shad, Longfin Smelt, Mississippi Silversides, and American Shad. This study was created to address questions of food limitation in young fish by understanding the types and amount of prey eaten among seasons and regions of the upper estuary. Food limitation can be an important factor to the annual recruitment success of young fishes. Stomach contents are identified to describe fish diets and stomach fullness. This study is a collaboration with IEP monitoring surveys with samples provided by STN (2024-007), FMWT (2025-003), 20-mm (2025-033), Smelt Larva Survey (2025-096), Bay Study (2025-011), SKT (2025-088), and USFWS EDSM (2025-325).

Funding Agency	Amount in Thousands of Dollars
DWR	$127
USBR	$127
Total	$254

2025-071 Mossdale Trawl (Mossdale)

PIs: Erik Huber (USFWS) and Steve Tsao (CDFW)

The Mossdale Trawl monitors timing and production (indices and estimates) for the out-migrating fall-run Chinook salmon smolts at this location since 1987 by then the California Department of Fish and Game and now California Department of Fish and Wildlife. The Mossdale Trawl is the key juvenile salmonid monitoring activity in San

Joaquin Basin passing into the South Delta. Sampling is coordinated year-round between CDFW and USFWS DJFMP staff. The data collected is provided to all interested stakeholders including CDFW, NOAA, NMFS, USFWS, USBR, SWRCB, DWR, local water districts and NGOs weekly.

Funding Agency	Amount in thousands of dollars
DWR	$300
CDFW	$45
Total	$345

2025-072 Environmental Monitoring Program

PI: Theodore Flynn (DWR)

The Environmental Monitoring Program's (EMP) monitoring and reporting mandates are described in Water Right Decision D-1641. Under this decision, the permit holders (DWR and USBR) must conduct a comprehensive environmental monitoring program to determine compliance with the stated water quality standards. The EMP is also mandated in the Incidental Take Permit for operation of the State Water Project. The EMP collects monthly samples of discrete water quality, nutrients, phytoplankton, zooplankton and benthic samples and continuous water quality data throughout the San Francisco Bay-Delta estuary. The program objectives are as follows:

1) document compliance with Bay-Delta water quality objectives

2) maintain a long-term baseline record and provide a record of trends

3) develop and improve predictive tools to assess changes within the Bay-Delta

4) provide accurate and validated water quality information on a timely basis in a format appropriate for a variety of users

5) respond to the findings of ongoing monitoring, changing conditions within the Bay-Delta, and the needs of management with special studies.

Funding Agency	Amount in thousands of dollars
DWR	$2,976
USBR	$2,860
Total	$5,836

2025-073 San Joaquin River Dissolved Oxygen Monitoring

PI: Julianna Manning (DWR)

EMP monitors dissolved oxygen (DO) levels in the Stockton Ship Channel to ensure that water quality objectives established by the Central Valley Regional Water Quality Control Board and State Water Resources Control Board are being met as well as to document long term trends in water quality in the area. EMP's continuous water quality station near Rough and Ready Island (RRI) records DO measurements at 15 minutes intervals at three separate depths. If daily average DO values remain below minimum

thresholds for three consecutive days, additional discrete monitoring is triggered to measure DO values at fixed stations upstream and downstream of RRI.

Funding Agency	Amount in thousands of dollars
DWR	$51
Total	$51

2025-074 Central Valley Juvenile Salmon and Steelhead Monitoring (Knights Landing)

PI: Nick Bauer (CDFW)

The project at Knights Landing (rkm 144) consists of paired, 8-ft rotary screw traps secured to one another and anchored in-river. Juvenile salmonid emigration data collected at this site provides an early warning of fish emigrating toward the Delta and allows for near real-time adaptive management of CVP and SWP water operations.

Monitoring begins when water temperatures begin to decrease in August/September and salmonids can be handled more safely, then ceases when temperatures rise in May/June and handling of juvenile salmonids becomes detrimental to their health. At each trap check, fish are enumerated, identified to species, length measured, and weighed. Salmon are assigned to a run based on length-at-date criteria. To assess emigration rates of fish released upstream, a sub-sample of adipose fin-clipped (hatchery origin) Chinook salmon are held and euthanized for coded wire tag extraction and reading. Natural origin fall-run Chinook salmon as well as Chinook released from Coleman National Fish Hatchery are utilized for assessing trap capture efficiency through mark and recapture trials. Trap capture efficiency data are then used in calculating passage estimates. Daily catch and environmental conditions are summarized and made publicly available on the CalFish website.

Funding Agency	Amount in thousands of dollars
DWR	$265
USBR	$312
Total	$577

2025-077 Upper Estuary Zooplankton Sampling

PI: Kathy Hieb (CDFW)

The Zooplankton Study has estimated the abundance of zooplankton taxa in the upper San Francisco Estuary since 1972, as a means of assessing trends in fish food resources and is part of a D-1641 mandate to monitor water quality and related parameters. Sampling with three gear types occurs monthly at 23 stations located from upper San Pablo Bay through the delta, including Suisun Marsh.

Funding Agency	Amount in thousands of dollars
DWR	$175
USBR	$175

Total	$350

2025-093 UCD Suisun Marsh Fish Monitoring

PI: Teejay O'Rear, UC Davis (UCD)

The Suisun Marsh Fish Study, a collaboration among UC Davis, DWR, and volunteers that began in 1980, monitors the aquatic ecosystem monthly throughout Suisun Marsh, primarily with otter trawls and beach seines. The main purpose of the study has been to understand environmental and anthropogenic factors affecting the aquatic community, in part by providing baseline data and methods for finer-scale ancillary studies focused on elucidating mechanisms. Aside from papers in peer-reviewed publications and presentations at conferences such as the Bay-Delta Science Conference, the primary conduit of the study's information is the annual report, which is completed each April and is available on either DWR's or UC Davis's websites. Information collected by the study is crucial for delineating long-term trends, documenting and understanding new species invasions, and gauging restoration and management actions.

Funding Agency	Amount in thousands of dollars
DWR	$300
Total	$300

2025-096 Smelt Larva Survey (SLS)

PI: Colin Brennan (CDFW)

SLS survey samples the upper San Francisco Estuary every other week from December through March at 44 fixed stations to determine the distribution and relative abundance of larval Longfin Smelt. Results from this survey are provided in near-real time to assess the risk of entrainment.

Funding Agency	Amount in thousands of dollars
DWR	$267
USBR	$255
Total	$522

2025-104 Operation of Thermographic Stations

PI: Travis Hiett (USGS)

The Water-quality work at these sites, 11389500 and 11303500 consists of continuous monitoring of water temperature. Measurements are recorded at fifteen-minute intervals during the entire water year. Sediment sampling conducted at site 11303500. Samples are normally collected once each day by the observer along with recording the water temperature and gage height. Additional sampling is conducted by USGS crews on a regular basis as part of the sampling protocols.

Water-quality work at these sites consists of continuous monitoring of water temperature at sites 11303500, San Joaquin River at Vernalis, CA and 11389500, Sacramento River

below Wilkins Slough near Grimes, CA. Measurements are recorded at fifteen-minute intervals during the entire water year. Sediment sampling is conducted at site 11303500 (San Joaquin River at Vernalis, CA). Samples are normally collected once each day by the observer along with recording the water temperature and gage height. Additional sampling is conducted by USGS crews on a regular basis as part of the sampling protocols.

Funding Agency	Amount in thousands of dollars
DWR	$60
USGS	$6
Total	$66

2025-208 Statistical Support (DJFMP) Delta Smelt Life Cycle Model

PI: Lara Mitchell (USFWS)

The DSLCM is a state-space model for Delta Smelt population dynamics that is fit using long-term fish survey data sets from multiple surveys corresponding to different life stages (e.g., post-larvae, juveniles, sub-adults, and adults). The model is designed to estimate survival rates between life stages and recruitment rates between year-classes, and to establish a quantitative link between these rates and management actions and environmental conditions. The goal of the modeling effort is to provide guidance on effective management actions that would both prevent extinction and lead to a rebuilding of the population contingent on environmental conditions beyond the control of USFWS.

Funding Agency	Amount in Thousands of Dollars
DWR to USFWS	Staffing Contribution approximately $65
USBR to USFWS	Staffing Contribution approximately $65

2025-249 Gear Efficiency Evaluations in Support of Modeling Efforts for Delta Smelt

PI: Lara Mitchell (USFWS)

Gear selectivity evaluations are needed to integrate catch data from multiple trawl surveys to estimate abundance and ultimately to model population dynamics for Delta Smelt and other species of management concern. Data from simultaneous, adjacent deployment of IEP survey gears has permitted the estimation of selectivity curves relating the relative capture probability of Delta Smelt and can be used for other species of a given size across gears. These selection curves have been used to calculate estimates of Delta Smelt abundance which were then used as input data in a hierarchical state-space life cycle model. As an extension of this work comparing and integrating data from multiple survey programs, we plan to investigate whether any bias can be detected in data from fixed site surveys such as the Spring Kodiak Trawl, Fall Midwater Trawl, and 20-mm when compared with data from random site surveys such as the Enhanced Delta Smelt Monitoring program. This analysis will be relevant to the

sample design development of current and future monitoring programs in the San Francisco Estuary. It may also provide insight on how to integrate CDFW and USFWS survey data to inform population trends.

Funding Agency	Amount in Thousands of Dollars
USBR to USFWS	Staffing Contribution approximately $25

2025-281 North Delta Flow Action: Role of Improved Yolo Bypass Flows on Delta Food Web Dynamics

PI: Eric Holmes (DWR)

In a collaborative effort between CA Department of Water Resources, US Bureau of Reclamation, CA Department of Fish and Wildlife, US Fish and Wildlife Service, United States Geological Survey and San Francisco State University, this project monitors and evaluates the effects of augmented summer and fall flows in the Yolo Bypass and North Delta on net flow to downstream areas and lower trophic food web dynamics. Using both continuous and discrete sampling approaches, this study will relate hydrologic patterns to chlorophyll-a, nutrients and primary productivity, plankton densities and composition (phytoplankton and zooplankton), contaminant concentrations, as well as water quality parameters such as electrical conductivity, turbidity, and dissolved oxygen.

Funding Agency	Amount in Thousands of Dollars
DWR	$616
Total	$616

2025-296 Investigation of the Distribution and Abundance of Longfin Smelt in the SFE

PI: Levi Lewis (UCD)

Longfin Smelt populations have declined rapidly in the SFE, and little remains known about their distributions in wetland habitats of the lower SFE. The need for understanding their distribution, habitat use, and reproductive biology is outlined in the IEP Longfin Smelt Science Plan (LFSSP). Here, Longfin Smelt are sampled in wetlands of the lower estuary to address data needs identified in the LFSSP including expanded monitoring and development of a captive culture program for Longfin Smelt. Water quality data will be paired with data on fish abundance, size structure, and maturity to provide additional information on the geographic distribution of Longfin Smelt, critical habitats, associations with environmental conditions; and to provide broodstock for the Longfin Smelt captive culture program.

Funding Agency	Amount in thousands of dollars
DWR	$400
San Jose City	$75

2025-301 Juvenile Salmon Emigration Real Time Monitoring (DJFMP)

PI: Adam Nanninga (USFWS)

Beach seining is conducted 3 days/week from October 1st to January 31st near Sacramento to detect the arrival of older juvenile Chinook Salmon entering the Delta. Monitoring data is used to inform Delta Cross Channel Gate closure decisions from October 1st to December 15th in order to minimize the diversion and mortality of emigrating juvenile winter-run sized Chinook Salmon. These data also were and will continue to be used to inform biological opinions, and drought operations planning decisions. (Note: This is part of the US Fish and Wildlife Service Delta Juvenile Fish Monitoring Program.)

Funding Agency	Amount in thousands of dollars
DWR	$91
USBR	$156
Total	$247

2025-311 Tidal Wetland Monitoring Study (New Methods)

PI: Christy Bowles (CDFW)

The CDFW Fish Restoration Program will collect fish, invertebrate, and water quality data near existing and planned tidal wetlands. These data will provide information on how fish and invertebrate communities change pre-/post-restoration. A suite of sampling gears will be deployed to capture fish and invertebrates throughout the year to characterize their use, relative abundance, and community composition in tidal wetlands. Over time, the Fish Restoration Program will assess the effectiveness tidal wetland restoration as it relates to providing food sources and habitat refuge for at-risk native fishes.

Funding Agency	Amount in thousands of dollars
DWR	$2,177
Total	$2,177

2025-322 Estimating Abundance of Juvenile Winter-run Chinook Salmon Entering and Exiting the Delta (SAIL)

PI: Bryan Matthias (USFWS)

This is a long-term continuation of a five-year project funded by CDWR and CDFW and the Central Valley Project Improvement Act in 2017. The objective of the project is to improve estimates of population abundances for fall, winter and spring run juvenile Chinook Salmon at Sacramento and Chipps Island by improving trawl efficiency estimates using data from releases of coded wire tags (CWT), acoustic tags (AT), and by genetically sampling the trawl catch in 2023 and 2024. The project will (1) develop statistical models for estimating trawl efficiencies using 2016-2023 data for paired AT-CWT releases of winter run and fall-run Chinook Salmon; (2) use 2016-2023 genetic sampling of trawl catch in combination with efficiency estimates to estimate population abundances of fall, spring and winter run at Sacramento and Chipps Island for 2016-2023; (3) implement trawl efficiency studies for multiple salmon runs in 2023-2024

informed by the prior results and in coordination with hatcheries for inclusion of AT fish with existing CWT releases; and (4) combine trawl efficiencies with genetic samples of trawl catch to provide estimates of fall, spring and winter-run salmon abundance (with estimated precision) entering and exiting the Delta in 2016-2023.

Funding Agency	Amount in Thousands of Dollars
DWR	$600
USBR (CVPIA)	$600
Total	$1,200

2025-325 Enhanced Delta Smelt Monitoring (EDSM)

PI: Denise Goodman (USFWS)

The primary objective of the Enhanced Delta Smelt Monitoring program (EDSM) conducted by the U.S. Fish and Wildlife Service is to enhance the data available for calculating life stage-specific estimates of abundance and distribution for Delta Smelt at management-relevant time scales. The EDSM program employs a stratified random sampling design that includes multiple crews trawling concurrently at multiple sites in pre-defined strata in the San Francisco Estuary. EDSM sampling occurs year-round via Kodiak trawls and 20 mm gear. Daily catch summaries and weekly abundance reports are distributed to managers and stakeholders. Catch data on smelt and salmonids are also made available to the Smelt Monitoring Team and Salmon Monitoring Team as part of their risk assessment processes.

Funding Agency	Amount in Thousands of Dollars
DWR	$127
USBR	$127
Total	$254

2025-329 Extracting Better Information from Long-Term Monitoring Data: Estimating Occupancy and Abundance of Near Shore Fishes in the Sacramento-San Joaquin River Delta

PI: Adam Nanninga (USFWS)

The purpose of this study is to expand IEP monitoring and inference to other dominant near-shore, littoral habitats not sampled by beach seines through the use of boat electrofishing. To accomplish this, we will sample key littoral fish species across various near-shore habitats in order to determine how best to estimate abundance, occupancy, capture probabilities, and related environmental drivers.

Funding Agency	Amount in Thousands of Dollars
DWR	$389
USBR	$303
Total	$692

2025-330 Aquatic Habitat Sampling Platform: Platform Utility and Delta Implementation Studies

PI: Joe Merz, Cramer Fish Sciences (CFS)

The purpose of this study is to quantify and characterize fish response to engineered levee slope attributes near setback levees with waterside habitat and to measure the fish community response to large scale tidal restoration at Dutch Slough Tidal Restoration Project. Analyzing environmental DNA (eDNA) coupled with observations by the Aquatic Habitat Sampling Platform (Sampling Platform) at sites in the Delta and Dutch Slough channels will provide an unprecedented assessment of fish community response to altered and restored environments.

The Sampling Platform is a 26-ft boat, with adjustable concentrator net and smaller drift net attached to an adjustable sample chamber, containing cameras, water sampling equipment, and water quality sensors integrated with fish finder, GPS, and other data recording equipment. The Sampling Platform is an integrated aquatic species and habitat sampling system that can effectively sample fish and invertebrates and reveal habitat associations while having minimal or no "take" of sensitive species. The sampling apparatus is suspended by hydraulic arms allowing fine-scale adjustments to sampling depth during operation. Wheels attached to the bottom of the net frame allow the frame to roll over obstacles, reducing impact and facilitating continued sampling across variable habitats. Additionally, collection of water during transects for the detection of environmental DNA (eDNA), the data collected by the AHSP gives an unprecedented view of fish use of various habitats. Deployment of this versatile sampling system expands data collection to shallow and off-channel habitat, while offering the capability to transition to deeper and open water habitats, providing for reliable estimates of sampling efficiency and "catch" per unit effort and improving our knowledge about populations, habitat associations and major stressors of key organisms.

Funding Agency	Amount in Thousands of Dollars
DWR	$627
Total	$627

2025-333 Enhanced Acoustic Tagging, Analysis, and Real-Time Monitoring

PI: Cyril Michel, U. C. Santa Cruz (UCSC) / (NMFS-SWFSC)

Understanding the movement and survival rates of outmigrating salmonids in real-time is critical for resource managers to make informed decisions. Through the development of the CalFish Track website and deployment of real-time acoustic receivers, detections of acoustically tagged fish can be displayed in real-time at multiple locations in the Sacramento River, Delta and SF Bay. Movement and survival rates are estimated between receiver sites and route selection is predicted at critical junctions in the Delta. ESA listed salmonids will be acoustic tagged and released at different locations during

the winter and spring to track movement and survival rates in different regions, and relate survival to environmental factors such as flow, temperature and turbidity.

Funding Agency	Amount in Thousands of Dollars
USBR	$1,000
Total	$1,000

2025-335 Suisun Marsh Salinity Control Gate Action

PI: Rosemary Hartman (DWR)

The Suisun Marsh Salinity Control Gate (SMSCG) has been identified as a management tool to improve habitat conditions for Delta Smelt in summer-fall. The proposed effort is the scientific evaluation of the project. Much of the evaluation will be based on existing IEP surveys and instrumentation (e.g., Environmental Monitoring Program, Summer Townet Survey, Fall Midwater Trawl, Enhanced Delta Smelt Monitoring), but we will include some additional evaluation tools such as the deployment of hatchery Delta Smelt in custom cages at strategic locations during the SMSCG action.

Funding Agency	Amount in Thousands of Dollars
DWR	$300
Total	$300

2025-342 Spatio-Temporal Community Patterns for Early Life Stages of Fishes and their Associations with Zooplankton in the Upper San Francisco Estuary

PI: Gonzalo Castillo (USFWS)

The purpose of the element is to advance the ecological knowledge on spatial and temporal community patterns for the larval-juvenile fishes and zooplankton in the upper San Francisco Estuary. Two major tasks are considered in this plan:

1) Utilize Delta outflow and X2 to evaluate the hydrodynamic influence on dominant species of fish and listed fish species. Changes in upstream fish distribution will be based on the river kilometer index (weighted by species relative abundance across stations). We will also evaluate the hydrodynamic influence on the salinity habitat component for Delta Smelt and other pelagic fish species throughout most of the study period.

2) Evaluate whether survival of Delta Smelt and Longfin Smelt are associated to zooplankton abundance, we will examine the coupling between relative abundance of fish (larval and juvenile stages) and potential zooplankton prey. Anticipated products include two IEP workshop presentations and two manuscripts. Agencies involved include USFWS, CDFW, USBR. IEP management could use the generated information to further inform three IEP science strategy areas (non-native species, food webs and climate change).

Funding Agency	Amount in Thousands of Dollars

USBR	$60
Total	$60

2025-346 Using Delta Smelt Enclosures to Support Species Recovery

PIs: Melinda Baerwald, Brian Schreier, and Trishelle Tempel (DWR)

With the wild Delta Smelt population's continued decline, cultured Delta Smelt are being used to evaluate management actions and support species recovery through future population supplementation. In the summer of 2025, we propose to deploy enclosures to assist in collecting effectiveness data in association with the Suisun Marsh Salinity Control Gate (SMSCG) action. We will assess fish health, growth, diet, and survival over a 4–6-week period during the SMSCG action, if one occurs. In addition, we propose to deploy a larval enclosure in the North Delta Arc in the spring of 2025. This deployment will assess the survival of larval Delta Smelt in enclosures in a naturalized environment.

Funding Agency	Amount in Thousands of Dollars
DWR	$400
Total	$400

2025-352 Larval Smelt Entrainment Monitoring

PI: Morgan Gilbert and Tim Malinich (CDFW)

Delta Smelt and Longfin Smelt are protected under the Endangered Species Act. Water exports at the State Water Project entrain fish and are a source of mortality, so take is authorized by the 2020 Incidental Take Permit for the Long-Term Operation of the SWP in the Sacramento-San Joaquin Delta. Entrainment results in "loss" of fish from the population. Only juvenile and adult smelt (>20 mm) loss has been quantified, but given continued declines, larval loss is also a concern. No quantitative larval smelt monitoring currently occurs at the salvage facilities, and existing larval smelt monitoring is only appropriate for detecting presence. This project's primary purpose fulfills the 2020 ITP Condition of Approval 7.6.2; "Permittee shall fund and implement a new Smelt Larval Entrainment Program to quantify larval DS and LFS entrainment into Clifton Court Forebay." In 2025, the pilot efforts of the Larval Entrainment project will continue annual monitoring of larval fishes as well as special studies to examine gear efficiency and impacts of night-day bias in Smelt catch.

Funding Agency	Amount in Thousands of Dollars
DWR	$447
Total	$447

2024-353 Fish Facilities Monitoring

PI: Virginia Afentoulis (CDFW)

The State Water Project (SWP), operated by the California Department of Water Resources (DWR), and the Central Valley Project (CVP), operated by the U.S. Bureau of Reclamation (USBR), export water out of the San Francisco Bay Delta for urban and

agricultural use in California. When water is exported, fish become entrained into the diversion. Since 1957, the USBR has salvaged fish at the Tracy Fish Collection Facility (TFCF). CDFW's Fish Facilities Unit, in cooperation with DWR, began salvaging fish at the Skinner Delta Fish Protective Facility (SDFPF) in 1968. The salvaged fish are trucked daily and released at several sites in the western Delta. The schedule of fish hauling is dependent on salvage rates, debris loading, and special-status-species procedures. Salvage of fish at both facilities is conducted 24 hours a day, seven days a week at regular intervals. Sampling of entrained fish at the SDFPF and TFCF is the source for CDFW's daily salvage and loss estimates for the monitoring of incidental take of listed fish species.

Fish salvage and loss information at the SDFPF and TFCF is used extensively in water project monitoring and planning. The Fish Facilities Monitoring Project manages the data collected on fish entrained and salvaged at the SDFPF and TFCF. Directed by cooperative agreements and funded by USBR and DWR, project staff are responsible for key entry, quality assurance, data processing, data reporting, and other database management activities for these facilities. Staff participates, gives input, and feedback in multiagency SWP and CVP project work teams meetings (the Tracy Technical Advisory Team and Central Valley Fish Facilities Review Team, and Salvage Biology Meetings) where fish facility and water project report documents, SOPs, permit document changes, and project work plans are presented.

This project maintains one of the largest historical databases on Delta species available and has been used in assessing the effects of new facilities and programs, water project operations proposals, and evaluation of proposed CALFED alternatives.

Funding Agency	Amount in thousands of dollars
DWR	$600
USBR	$400
Total	$1,000

2025-354 Physical and Biological Drivers of Fish Distribution in Suisun Bay

PI: Matthew Young (USGS)

Species distributions in San Francisco Estuary are controlled by factors acting at multiple spatiotemporal scales, including physical habitat (e.g., channels, shoals, wetlands), water quality conditions (e.g., salinity, turbidity), hydrodynamics (tidal velocities), and species-specific behavioral responses to these factors in time and space. Multiple tools can be used to assess the distribution of fish with respect to these factors, but extensive work is needed to determine if trends observed with techniques other than net-based sampling can provide insight to inform specific management actions. Vertical and lateral distribution studies will be conducted at various locations in the central San Francisco Estuary, using a combination of net-based and hydroacoustic sampling methods.

Funding Agency	Amount in Thousands of Dollars

USACE	$157
Total	$157

2025-355 Phytoplankton Enumeration Synthesis Project

PI: Sarah Perry (DWR)

Phytoplankton community composition is an important driver of zooplankton productivity and food supply for higher trophic levels. However, research involving the organisms has been hindered by lack of access to existing phytoplankton datasets and a lack of a standardized way to combine and analyze them. Having a synthesized dataset will facilitate further research into productivity in the estuary.

Funding Agency	Amount in Thousands of Dollars
DWR	Staffing Contribution approximately $11
USBR	Staffing Contribution approximately $11
DWR to CDFW	Minimal Staffing Contribution

2025-357 Submersed Aquatic Vegetation in the Delta: Composition, Niche Occupancy and Response to Climatic Factors

PI: Shruti Khanna (IEP at CDFW)

This project will focus on Submersed Aquatic Vegetation (SAV) with an IEP Synthesis effort that will integrate a historical and an ongoing dataset of Delta SAV coverage since 2004 with existing hydrodynamic model outputs such as water speed, salinity, and depth, turbidity derived from remote sensing imagery, and temperature and outflow observations to build a realized niche occupancy model for SAV. This study will also analyze field SAV data collected since 2004 to determine characteristics of different SAV species to grow as monocultures or form community assemblages and determine how the SAV community has changed from 2004 to present. We anticipate that the integration and assessment of these field data in conjunction with the niche occupancy model will allow us to define species-specific niche space within the SAV community and evaluate whether the invasive SAV niche space differs from the native niches. Finally, we will combine our niche model with climate change projections of temperature, solar radiation, inflow and outflow scenarios during drought and wet years to predict whether and, if so, how SAV niche space and cover may change or expand as we move toward an increasingly altered Delta ecosystem.

Funding Agency	Amount in Thousands of Dollars
DWR to CDFW	Staffing Contribution $20

2025-358 Zooplankton Monitoring Design Review: Gaps, Strength, and Redundancies (Closing in 2025)

PI: Daniel Ellis (IEP at CDFW)

Zooplankton are critical components of estuarine ecosystems because they link primary producers with upper levels of the food web. To conserve the San Francisco Estuary

(SFE), its listed fish, and the flora and fauna it supports, we need to develop better models that integrate zooplankton into our understanding of the food web. SFE monitoring focused primarily on fishes before the importance of zooplankton as prey was recognized. This recognition led to the addition of zooplankton surveys to monitor status and trends in, and the effects of, water operations on environmental conditions and fish prey resources. Since the Environmental Monitoring Program began monitoring zooplankton in the SFE in 1972, additional long-term zooplankton surveys have been added, typically to pre-existing or new fish surveys. When synthesized, these datasets cover a broad area of the SFE but vary in spatial and temporal coverage through time. Despite a sizable dataset, we do not know its limitations in answering important ecological and management questions. In this study, we seek to evaluate the gaps, strengths, and redundancies of the zooplankton monitoring program to characterize the status and trends of the community. The ultimate goal of this project is to inform an improved zooplankton monitoring design that will allow scientists and managers to document and understand changes in community and population dynamics over time and space and in response to potential drivers such as flow, temperature, or salinity. This project will use existing datasets and modelling approaches to evaluate zooplankton monitoring design.

Funding Agency	Amount in Thousands of Dollars
USBR to CDFW	Staffing Contribution $76
USBR to USFWS	Staffing Contribution $30
USBR	Staffing Contribution $5

2025-360 Genetic Analysis and Storage of listed species to Inform Multiple Studies for State Water Project Operations

PI: Melinda Baerwald (DWR) and Daphne Gille (DWR)

The Department of Water Resources Genetic Monitoring (GeM) program focuses on using genetic approaches to inform continued operation of the State Water Project. For all studies, the work directly supports fulfillment of Incidental Take Permit (ITP) mandates. Overview information for each directed study currently in progress is outlined below. These studies align with current IEP science priorities including accurate salmon run identification (including those at salvage facilities) and improvement of existing monitoring surveys for smelt species.

The three studies are the Rapid Genetics of Chinook Salmon Runs at SWP and CVP Salvage Facilities (pilot study), Run Identification for Spring-run Chinook Salmon Juvenile Production Estimate (JPE), and the Larval Smelt Entrainment Monitoring (Near Clifton Court Forebay and Barker Slough Pumping Plant).

Funding Agency	Amount in Thousands of Dollars
DWR	$1,765
Total	$1,765

2025-361 Evaluation of morphological characteristics used in identification of larval Delta Smelt *Hypomesus transpacificus* in the San Francisco Estuary

PI: Denise Goodman (USFWS) and Evan Carson (USFWS)

This collaborative study is an initial step towards improving reliable identification of larval SFE *Osmeridae* (Delta Smelt, Longfin Smelt, and Wakasagi) to species by establishing a baseline of key morphological and phenotypic attributes of cultured larval Delta Smelt. We will evaluate morphological and phenotypic variation in relation to age and size of 600 cultured larval Delta Smelt from the UC Davis Fish Conservation and Culture Laboratory to establish a baseline of key attributes in fish born and reared in a controlled (hatchery) environment. Through coordinated methods development between USFWS and CDFW staff we also hope to improve standardization of larval *Osmeridae* identification methods and account for effects of different preservative-formulations used between the programs. The first phase (approximately November 2023 through early 2024) we will further develop study methods including an attribute table of phenotypic characteristics of larval *Osmeridae* used during fish identification and a standardized protocol for taking images of each larva. USFWS and CDFW will photograph and analyze phenotypic attributes of larval fish as they are received and as time allows for the first half of 2024. Between approximately August through October 2024, we will analyze variation in attributes identified in the morphology-phenotype attribute table and potentially conduct a morphometric analysis on photos. If needed, the morphometric analysis will be pushed back to 2025.

Funding Agency	Amount in Thousands of Dollars
USBR to USFWS	Staffing Contribution $15
USBR to CDFW	Staffing Contribution $15
DWR to USFWS	Staffing Contribution $15
DWR to CDFW	Staffing Contribution $15

Technical Teams

2025-T20 IEP Data Utilization Work Group (DUWG)

Chairs: David Bosworth (DWR) and Sam Bashevkin (SWRCB)

The Data Utilization Work Group (DUWG) is a multi-agency technical team established to address the IEP's data management needs by setting internal procedures and guidelines, defining and implementing shared data standards across member agencies, facilitating data sharing in a timely manner, and coordinating with other data management teams in the Delta science community. Studies that are included in the IEP Work Plan would follow any guidelines set up by DUWG; studies conducted by IEP partners could use these guidelines as they see fit. The DUWG's activities include (1) developing data standards and best practices, including minimum standards for data descriptions, definitions, and documentation, (2) increasing efficiency and openness of data sharing and interoperability among datasets, and (3) providing support for IEP

member agencies. Membership in the DUWG is limited to individuals representing IEP member agencies and affiliated groups.

Organizations Involved: CDFW, DSC/DSP, DWR, USBR, USFWS, USGS, Water Boards

2025-T21 Central Valley Fish Facilities Review Team

Chairs: John Carl (Carl) Dealy (USBR) and Javier Miranda (DWR)

The main objective of the Central Valley Fish Facilities Review Team is to review, coordinate activities, and provide oversight for Central Valley fish screen and fish passage projects. The team is comprised of scientists and engineers who generally meet two to three times per year but will meet more frequently if necessary. Meetings are used to introduce and provide guidance for new fish screen related study programs, provide updates for ongoing programs, and disseminate information on new fish screen technologies.

Organizations Involved: CDFW, DWR, Innovasea, Intake Screens Inc. NOAA, ProTroll, USBR, USFWS

2025-T28 Longfin Smelt Technical Team

Chair: Michael Eakin (CDFW) and Brian Schreier (DWR)

On March 31, 2020, CDFW issued an Incidental Take Permit (ITP) to the California Department of Water Resources (DWR) for the long-term operations of the State Water Project (SWP) in the Sacramento-San Joaquin Delta (ITP No. 2081-2019-066-00). As part of the Conditions of Approval for the ITP, DWR is required to implement a Longfin Smelt Science Program and develop a Longfin Smelt Science Plan (LFSSP) for the term of the ITP. The LFSSP is expected to inform scientific priorities identified within Condition of Approval 7.6.3 of the ITP. The LFSSP was approved in writing by the California Department of Fish and Wildlife (CDFW) on December 8, 2020, and contains seven Priority Areas to address the science priorities identified in the ITP. The Longfin Smelt Technical Team (LFSTT) was established to coordinate implementation of the LFSSP through a collaborative forum between DWR, CDFW, the United States Fish and Wildlife Service (USFWS), United States Bureau of Reclamation (Reclamation), and the State Water Contractors (SWC). This process is expected to ensure advancement in Longfin Smelt scientific understanding over the term of the ITP (10 years). Because the LFSSP is part of the re-consultation on the Long-Term Operations of the SWP, we anticipate the description of the LFSTT to be modified upon issuance of a new ITP in the fall of 2024. Such changes will be reflected in the 2026 IEP Work Plan.

Organizations Involved: CDFW, DSC/DSP, DWR, Metropolitan Water District of Southern California, State Water Contractors, USBR, USFWS

Project Work Teams

2025-T03 Sturgeon PWT

Chairs: John Kelly (CDFW) and Alicia Seesholtz (DWR)

The Sturgeon Project Work Team encourages, facilitates, and coordinates sturgeon monitoring, research, and information dissemination, and provides a technical forum for Central Valley sturgeon issues. The objectives of the Sturgeon Project Work Team are to 1) Encourage, facilitate, and assist development of research on life history, distribution, population dynamics, abundance, and ecology of Central Valley sturgeon, 2) Encourage, facilitate, and assist development of monitoring and research to evaluate the effects of water development/management and other stressors on Central Valley sturgeon, 3) Identify research questions and data gaps, 4) Provide technical review of sturgeon research, monitoring, and restoration proposals and recommendations on technical issues related to the protection, restoration, and management of sturgeon, 5) Promote dissemination of project updates, research results, and current literature among scientists, resource managers, restoration specialists, and constituent organizations, and 6) Promote sustainable management of California's sturgeon species. The Sturgeon PWT meets twice a year, with occasional special sessions or subcommittee meetings, as needed.

Organizations Involved: CDFW, Cornell University, Cramer Fish Sciences, DSC/DSP, DWR, Enterprise Rancheria, ICF, Kern County Water Agency, Metropolitan Water District of Southern California, NOAA, Oregon State University, Pacific States Marine Fisheries Commission, River Run Consulting, Robinson Rancheria, UC Davis, USACE, USBR, USEPA, USFWS, USGS, Yurok Tribe

2025-T04 Estuarine Ecology Team (EET) PWT

Chair: Rosemary Hartman (DWR)

The Estuarine Ecology Team (EET) is an interdisciplinary forum to improve understanding of the Bay-Delta ecosystem, by fostering communication and collaboration among scientists. The purpose of the group is to provide a forum for emerging scientific ideas and problems and improve scientific communication. There are many other project work teams in the IEP landscape, generally focused on specific species, habitats, or management actions. The EET is a place to take on broader ecological issues with an interdisciplinary group. Some characteristics that make EET unique are that it explicitly makes connections with ecosystems upstream and downstream of the Delta, considers linkages and interactions between species across trophic levels, and fosters interdisciplinary partnerships.

Organizations Involved: Anchor QEA, Cal Maritime, CDFW, Contra Costa Water District, Cramer Fish Sciences, DSC/DSP, DWR, FISHBIO, Hanson Environmental, ICF, Lawrence Berkeley National Labs, Metropolitan Water District of Southern California, NOAA, RMA, San Francisco Bay Keeper, San Francisco State University, State Water

Contractors, UC Davis, USBR, USFWS, Valley Water, Vollmar Consulting, Water Boards, Westlands Water District

2025-T05 Biotelemetry PWT

Chairs: Curtis Yip (DWR) and John Kelly (CDFW)

The mission of the IEP Biotelemetry PWT is to provide a conduit for communication and coordination among scientists engaged in biotelemetry activities in the Central Valley, Delta, Estuary and near shore Pacific Ocean. This communication entails regular meetings, identification and discussion of current and future projects, and proposal review as solicited to facilitate collaboration, standardization of methods and technologies where possible and the leveraging of resources. The purpose of the Biotelemetry PWT is to coordinate Biotelemetry Projects taking place in the Central Valley and provide a forum for collaboration between Biotelemetry projects within the Central Valley (sharing equipment, tagged fish, etc.). The Biotelemetry PWT meets twice per year.

Organizations Involved: CDFW, Cramer Fish Sciences, DSC/DSP, DWR, EBMUD, FISHBIO, H. T. Harvey & Associates, ICF, Innovasea, Lotek, Metropolitan Water District of Southern California, NOAA, Sonoma County Water Agency, Thomas Gast & Associates Environmental Consultants, UC Davis, USACE, USBR, USFWS, USGS, Water Boards

2025-T06 Spring Run Salmon PWT

Chairs: Flora Cordoleani (NOAA) and Ryan Revnak (CDFW)

Since 1999 Central Valley spring-run Chinook (CVSC) salmon ESU is state and federally listed as a threatened species and is currently faced with three primary threats: (1) loss of most historic spawning habitat; (2) degradation of the remaining rearing and migration habitats; and (3) genetic introgression with the Feather River Fish Hatchery spring-run Chinook salmon strays (NMFS 2014). While a large amount of monitoring occurs in the Central Valley, the understanding of CVSC dynamics is still very data limited, and the existing CVSC salmon monitoring programs seem to be fragmented and lack a common thread. Therefore, the goal of the IEP spring-run Chinook salmon PWT is to provide a venue for scientists from diverse agencies/groups to coordinate and synthetize findings, which will in turn inform research and monitoring needs in the future. Key roles and activities include: 1) coordination on in-season status and trend monitoring updates, 2) technical guidance to IEP Lead Scientist, Coordinators and Directors on science priorities, 3) development, coordination, and technical review of management-relevant research and studies for IEP and other partners (e.g., modeling, manipulation, and monitoring). The PWT meet twice a year, in the spring and the fall of each year. Sub-teams that will potentially be created to tackle a specific PWT question will meet on a more regular basis (not determined yet) and report their conclusions to the PWT during the bi-annual meeting.

Organizations Involved: CDFW, Cramer Fish Sciences, DSC/DSP, DWR, Environmental Science Associates, FISHBIO, McBain Associates, Metropolitan Water District of Southern California, NOAA, Trout Unlimited, UC Davis, USBR, USFWS, USGS, Valley Water

2025-T07 Resident Fishes PWT

Chairs: Nicole Kwan (DWR) and Adam Nanninga (USFWS)

The IEP Resident Fishes Project Work Team (PWT) is a forum for information exchange, discussion, synthesis, and exploring and recommending next steps in research and monitoring activities related to populations of resident fishes in the San Francisco Estuary. Resident fishes are defined rather loosely to include fishes spending all or part of their life cycle as residents in the San Francisco Estuary. This definition will exclude salmonids and sturgeons because PWTs dedicated to these taxa already exist; however, we encourage members of the salmonid and sturgeon PWTs to share their information with the Resident Fishes PWT as certain topics are likely to be of interest to both groups. Currently, members of the Resident Fishes PWT are working on an update to the Stompe et. al. 2020 Table 2, which describes how well each of the 14 fish monitoring programs in the San Francisco Estuary capture the 36 most prevalent fish species. Two new tables will be created from the project, one for adults and the other for juveniles. There are also two synthesis studies underway: one looking at 3 native and 3 non-native cypriniforms in the San Francisco Estuary and the other focused on catfish trends seen across various monitoring programs. Members can also choose to participate in sub teams which are focused on exploring key topics in further detail. The Resident Fishes PWT will serve as an avenue for feedback and information/data exchange for these studies and sub teams. The Resident Fishes PWT will also continue to highlight any important or management-relevant work on resident fish species that are not covered by the IEP workshop or other PWTs. This PWT meets every two months, year-round.

Organizations Involved: California State University Los Angeles, CDFW, Cramer Fish Sciences, DSC/DSP, DWR, FISHBIO, GEI Consultants, Metropolitan Water District of Southern California, UC Davis, USACE, USBR, USFWS, NOAA, Valley Water, Water Boards

2025-T09 Tidal Wetland Monitoring PWT

Chair: Stacy Sherman (CDFW)

The IEP Tidal Wetland Monitoring Project Work Team (TWM PWT) facilitates collaboration in the design of monitoring and research programs to evaluate the effectiveness of tidal wetland restoration in providing habitat and food web resources to native fishes, particularly Delta Smelt and juvenile Chinook Salmon. The geographic focus of the team’s work is the Sacramento-San Joaquin Delta and Suisun Marsh, but we strive to coordinate and collaborate with scientists who work in other areas of the estuary or watershed and with those who focus on non-fish aspects of wetland ecology.

TWM PWT membership is open to all and currently includes experts in a wide variety of wetland-related disciplines as well as representatives of many agencies, universities, non-profits, and private interests. The team acts as a forum for the discussion of monitoring and research proposals and for presentation of preliminary results. The team currently meets on an ad-hoc basis according to need, typically semi-annually.

Organizations Involved: CDFW, DSC/DSP, DWR, Environmental Science Associates, NMFS, Oregon State University, Regional San, RMA, Sacramento-San Joaquin Delta Conservancy, San Francisco Bay National Estuary Research Reserve, SFEI, State Water Contractors, UC Davis USFWS, USGS

2025-T11 Winter-Run Salmon PWT

Chair: Tracy Grimes (CDFW)

The Winter-run Project Work Team coordinates research, monitoring and management activities for the state and federally listed endangered Sacramento River winter-run Chinook salmon. The team facilitates communication and information exchange on technical issues among the agencies and stakeholders. The team also provides advice, peer review, and recommendations on technical issues related to the protection, restoration, and management of winter-run Chinook. Each year the PWT submits a recommendation letter to the National Marine Fisheries Service for the calculation of the Winter Run Juvenile Production and Central Valley Project and State Water Project Take Estimates.

Team members currently include staff from the California Departments of Fish and Wildlife and Water Resources, The Metropolitan Water District of Southern California, National Marine Fisheries Service, Bureau of Reclamation, the U.S. Fish and Wildlife Service and other Stakeholders. The team meets bi-monthly or as needed.

Organizations Involved: CDFW, Cramer Fish Sciences, DSC/DSP, DWR, FISHBIO, HDR, ICF, Kearns & West, Metropolitan Water District of Southern California, NOAA, Pacific States Marine Fisheries Commission, QEDA Consulting, UC Berkeley, UC Davis, University of Washington, USBR, USFWS, USGS, Water Boards

2025-T12 Juvenile Monitoring PWT (Dormant)

Chair: Bill Poytress (USFWS)

The Juvenile Monitoring Project Work Team (JMPWT) is a satellite team of the Central Valley Salmonid Project Work Team. The goal of the JMPWT is to bring together biologists to collaborate in a manner that will benefit juvenile monitoring activities in the Central Valley. The specific objectives of the group include, but are not limited to, increase the quality and utility of juvenile monitoring data, standardize sampling techniques (where applicable), improve methods for analyzing and presenting monitoring data, identify research questions and data gaps, provide expert recommendation and/or review of issues affecting juvenile salmonids, and collaborate on data compilation projects in an effort to expand the knowledge of fisheries biology

within the Central Valley of California. Team members currently include staff from the California Department of Fish and Wildlife and Water Resources, East Bay Municipal Utility District, United States Fish and Wildlife Service and Bureau of Reclamation, and various private consulting groups. Team meetings are held quarterly throughout the year. This project work team is currently dormant.

2025-T13 Central Valley Salmonid Hatchery PWT (Dormant)

Chairs: Jon Nelson (CDFW)

The Central Valley Hatchery Project Work team, a satellite team of the Central Valley Salmonid Project Work Team, facilitates communication and information exchange related to the propagation, marking and tagging, distribution, research, and monitoring of Chinook salmon and steelhead from Central Valley Hatcheries, including Livingston Stone National Fish Hatchery, Coleman National Fish Hatchery, Feather River Hatchery, Nimbus Fish Hatchery, Mokelumne River Hatchery, Merced River Hatchery, and the San Joaquin Conservation Hatchery. The team provides a forum for interagency coordination among hatchery managers and supervisors, and between hatchery managers and agency and stakeholder biologists involved in the management of Central Valley fisheries and recovery of listed stocks. The team will review issues related to Central valley hatchery production and discuss recommendations for improved hatchery management. This project work team is currently dormant.

2025-T14 Aquatic Vegetation PWT

Chairs: Shruti Khanna (IEP at CDFW) and Nick Rasmussen (DWR)

The IEP Project Work Team (PWT) for Aquatic Vegetation formed to address a gap within the IEP science program for coordination of science efforts related to aquatic vegetation, and the lack of a consistent monitoring program for aquatic vegetation coverage. The goals of the PWT are to provide a forum for research and monitoring activities, help guide and evaluate management efforts and support development of work plans for new studies. In 2023-24, key activities will include (1) continued development of an integrated SAV dataset updating the current version published on EDI; (2) producing draft technical reports or manuscripts that synthesize current knowledge of aquatic vegetation ecology in the Delta and advancing knowledge of treatment efficacy of floating and submerged invasive species; (3) provide feedback for ongoing research activities in the Delta, including support of the Water Primrose Ecoengineering project spearheaded by Dr. Erin Hestir, the Delta Invasive Species Mapping project led by Dr. Susan Ustin, and any other ongoing aquatic vegetation studies; (4) continued development of aquatic plant identification resources. The Aquatic Vegetation PWT meets on a quarterly basis, with subcommittee meetings occurring more frequently.

Organizations Involved: CDFA, CDFW, Central Valley Flood Protection Board, Cramer Fish Sciences, CROWE, DSC/DSP, DWR, Metropolitan Water District of Southern California, NASA, NOAA, Regional San, Sacramento-San Joaquin Delta Conservancy,

San Francisco State University, SEPRO, State Parks, Suisun RCD, UC Berkely, UC Davis, UC Merced, USBR, USDA, USFWS, USGS

2025-T15 Steelhead PWT

Chair: Erin Ferguson (CDFW)

The primary goal of the Steelhead PWT is to serve as an open forum for information exchange, discussion, synthesis, and exploring and recommending next steps in research and monitoring activities related to coastal rainbow trout/steelhead populations in the Central Valley. Specific objectives include identifying research questions and data gaps, standardizing sampling techniques and data collection, serving as technical advisory group to IEP, CVPIA, and other enhancement programs, collaborating on data compilation projects in an effort to expand the knowledge of fisheries biology within the Central Valley of California. Team members currently include staff from the California Department of Fish and Wildlife and Water Resources, East Bay Municipal Utility District, United States Fish and Wildlife Service, and Bureau of Reclamation, and various private consulting groups and partners.

Organizations Involved: Anchor QEA, CDFW, Cramer Fish Sciences, DSC/DSP, DWR, EBMUD, FISHBIO, Metropolitan Water District of Southern California, NOAA, Oregon State University, UC Santa Cruz, USBR, USDA, USEPA, USFWS

2025-T16 Upper Sacramento River Salmon PWT (Dormant)

Chair: Kevin Niemela (USFWS)

The Upper Sacramento River Monitoring Project Work Team mission statement is "to meet on an annual basis to facilitate communication and information exchange among the agencies monitoring Chinook salmon and steelhead in the Upper Sacramento River Basin." Since its formation, we have extended data sharing to include Green Sturgeon studies and ecological monitoring in the Upper River. The team traditionally meets in March to coordinate exchange of study plans prior to the upcoming field season. In more recent years, at least half of the annual meeting has focused on informal oral presentations of the results of the monitoring activities from previous years. The annual meeting chair rotates each year among US Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife, National Marine Fishery Service, US Bureau of Reclamation, and the California Department of Water Resources. The year-to-year primary contact for the PWT is Matt Brown - USFWS, Red Bluff Fish and Wildlife Office. This project work team is currently dormant.

2025-T17 Contaminants PWT

Chair: Vacant

The Contaminants PWT (CWT) was originally formed to investigate the role of contaminants in the Pelagic Organism Decline; however, more recently, it has evolved to primarily be a forum for sharing information on current contaminant research and contaminant management practices. The group continues to be a place for dialogue on

emerging contaminants of interest to the Bay-Delta ecosystem, vetting ideas for research needs, and sharing study results. The CWT has also served in an advisory role to Bay-Delta contaminants-related research projects and structured decision-making processes. The CWT strives to work across PWTs to promote more widespread adoption of contaminant considerations in IEP work.

Organizations Involved: AECOM, CalRice, Cal Maritime, CDFW, CDPR, Central Valley Clean Water Association, DSC/DSP, DWR, Environmental Solutions Group LLC, G. Fred Lee, Larry Walker Associates, Metropolitan Water District of Southern California, MLJ Environmental, NOAA, Oregon State University, Regional San, Robertson-Bryan, San Francisco State University, Sacramento County, Sacramento-San Joaquin Delta Conservancy, SFEI, Southern Illinois University, UC Berkeley, UC Davis, U Mass Boston, USFWS, USGS, Valley Water, Western Washinton University, Water Boards, Zone 7 Water Agency

2025-T18 Flow Alteration PWT (Dormant)

Chairs: Rosemary Hartman (DWR) and Marissa Wulf (USGS)

The Flow Alteration (FLOAT) Project Work Team is on hold indefinitely. The FLOAT PWT was a forum for communication and engagement on flow alterations being considered by management agencies to improve conditions for Delta Smelt. It provided opportunities for engagement with work being done by the Delta Coordination Group on the Summer-Fall Habitat Action, including Suisun Marsh Salinity Control Gates, Fall X2, and the North Delta Flow Action.

Organizations Involved: AnchorQEA, CDFW, Contra Costa Water District, Cramer Fish Sciences, DSC/DSP, DWR, ESSEX Partnership, Glenn-Colusa Irrigation District, Hamilton Resources, ICF, Kern County Water Agency, Metropolitan Water District of Southern California, NASA, Regional San, San Francisco State University, State Water Contractors, University of New Orleans, USBR, USFWS, USGS, Valley Water, Water Boards

2025-T22 Predation PWT

Chairs: Tyler Pilger (FISHBIO) and Geoffrey Steinhart (USFWS)

The Predation Project Work Team provides a forum to examine impacts of predators in the Delta and its tributaries. The Project Work Team can provide guidance on collaboration and coordination of predation studies, so existing work can become more productive and can better inform resource management. Specific functions of the team include the following: 1) provide a forum for discussion of current or planned projects related to predation upon fishes, 2) provide guidance on the development of work plans and studies, and 3) foster collaboration among different organizations currently working on predation studies.

Organizations Involved: Cal Trout, CDFW, Cramer Fish Sciences, DSC/DSP, DWR, EBMUD, Environmental Science Associates, Farallon Institute, FISHBIO, Humboldt

State University, Innovasea, Metropolitan Water District of Southern California, Pacific State Marine Fisheries Commission, Regional San, San Francisco State University, UC Davis, UC Santa Cruz, Water Boards

2025-T23 Water Quality and Phytoplankton PWT

Chairs: Silvia Angles (DWR), Ellen Preece (DWR, Keith Bouma-Gregson (USGS), and Janis Cooke, Central Valley Water Board (CVWB)

The IEP Water Quality and Nutrients PWT will provide a venue for scientists from diverse agencies and groups to coordinate and synthesize data and information that will inform IEP research and monitoring needs for water quality and phytoplankton in the future. A small workgroup within the PWT is working on a Phytoplankton Enumeration Synthesis Project, which will create a standardized and integrated phytoplankton dataset for use by Delta researchers.

Organizations Involved: CDFW, DSC/DSP, DWR, ICF, Metropolitan Water District of Southern California, Peggy Lehman Consulting, Regional San, Sacramento-San Joaquin Delta Conservancy, San Francisco Estuary Institute, San Francisco State University, UC Berkeley, USBR, USGS, Water Boards

2025-T24 Genetics PWT

Chairs: Bryan Barney (CDFW), Evan Carson (USFWS), Daphne Gille (DWR) and Jeff Rodzen (CDFW)

The Genetics PWT will provide a venue to communicate and coordinate current and proposed genetic activities in the SFE. Previously, a salmonid genetics PWT met to focus on coordinating research and monitoring of Central Valley salmon and steelhead genetics. Herein we propose to redirect and broaden the scope of the Salmon Genetics PWT to include genetic research and monitoring for any species found, at any point in its life cycle, in the San Francisco Estuary (SFE). Genetic analysis is a powerful and well-established tool that can be used to enhance the information content provided by existing monitoring programs and directly inform managers of biological effects from proposed and existing activities, such as restoration actions and modifications to water operations.

Organizations Involved: California State University Los Angeles, CDFW, Cramer Fish Sciences, DSC/DSP, DWR, FISHBIO, Metropolitan Water District of Southern California, Michigan State University, NOAA, Oregon State University, Regional San, Southern California Coastal Water Research Program, UC Davis, UCLA, USBR, USFWS

2025-T25 Data Science PWT

Chairs: Rosemary Hartman (DWR) and Travis Hinkelman, Environmental Science Associates (ESA)

The Data Science PWT is a forum for IEP Scientists and their partners to share resources and skills for dealing with complex data sets. The PWT provides opportunities

to teach advanced data science skills to new users, connect data scientists with subject-matter experts, provides a forum for feedback on draft analyses, and hosts a repository for resources. The team has quarterly meetings with a variety of presentations covering any aspect of statistics, data science, data analysis, and computer science, and also facilitates training in data science skills.

Organizations Involved: 34North, Balance Hydrodynamics, CDFW, CHWM Hill, Cramer Fish Sciences, City of San Diego, Contra Costa Water District, DSC/DSP, DWR, FlowWest, Metropolitan Water District of Southern California, NOAA, Oregon State University, San Francisco Estuary Institute, Stanford University, UC Berkeley, UC Davis, USBR, USEPA, USFWS, USGS, University of Washington, Valley Water, Water Boards

2025-T26 Climate Change PWT

Chairs: Celeste Dodge (CDFW) and Denise Colombano (DSP)

The primary purpose of the CC PWT is to provide a forum and framework for addressing climate change issues within the upper SFE. More specific, technical issues will be addressed by a CC MAST (Management, Analysis, and Synthesis Team) that will include selected PWT members and outside experts who can commit to substantive work for the team.

Organizations Involved: CDFW, DSC/DSP, DWR, FISHBIO, Metropolitan Water District of Southern California, NASA, Regional San, UC Berkeley, UC Davis, USBR, USFWS, USGS, Westlands Water District

2025-T29 Zooplankton PWT

Chair: Christina Burdi (DWR)

The 2020-2024 IEP science strategy (Interagency Ecological Program 2019) recommends improved zooplankton monitoring as well as increased research into the growth, production, abundance, and biomass of zooplankton to restore food webs. The Zooplankton PWT is a forum for discussion and collaboration around issues of concern for zooplankton monitoring and research in the upper SFE. In addition to regular meetings, the Zooplankton PWT also holds yearly symposiums based on identification, ecology, and utilization of emerging data.

Organizations Involved: CDFW, Cramer Fish Sciences, DSC/DSP, DWR, ICF, Metropolitan Water District of Southern California, San Francisco State University, UC Berkeley, UC Davis, USBR, USFWS, Water Boards