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RECLAMATION

2022 Long-Term Operations Habitat Restoration Report

Central Valley Project, California

California-Great Basin Region



Mission Statements

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The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

2022 Long-Term Operations Habitat Restoration Report

Central Valley Project, California

California-Great Basin Region

prepared by

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Cover Photo: The completed Nimbus Basin salmon spawning and rearing habitat restoration project on the American River, looking upstream with a good view of the newly constructed spawning riffle and side channel rearing habitat. (Reclamation/John Hannon)

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Purpose

The 2023 Long-Term Operations Seasonal Habitat Restoration Report summarizes the habitat restoration work that was implemented in water year (WY) 2023 and planned work for WY 2024 that contributes toward the conservation measures outlined in the 2020 ROD and associated National Marine Fisheries Service's (NMFS) and U.S. Fish and Wildlife Service's (USFWS) respective biological opinions for the Long-Term Operations of the Central Valley Project (CVP) and State Water Project (SWP). As part of the 2020 ROD, the U.S. Bureau of Reclamation (Reclamation) and the California Department of Water Resources (DWR) proposed conservation measures to avoid and minimize or compensate for CVP and SWP long-term operation effects on listed species. These conservation measures include non-flow, habitat restoration actions to improve spawning and rearing habitat and improve food web conditions.

Background

The CVP, which runs approximately 400 miles from the southern end of the Cascade Mountains in the north to the Tehachapi Mountains in the south, allows Reclamation to deliver about seven million acre-feet of water annually for agricultural, urban, and wildlife uses. The 2020 Record of Decision implementing the coordinated Long-Term Operation of the CVP and SWP included non-flow, habitat restoration actions to increase and maintain spawning and rearing habitat, including creation, expansion, and grading of floodplains and side channels; adding spawning and large cobble; adding large, woody materials for salmonids; and increasing food web support for tidal habitat for Delta smelt. In 2013, responding to Listen to the River, and Independent Review of the Anadromous Fish Programs, Reclamation and the USFWS began a structured decision-making process to improve the scientific basis for restoration projects for salmonids. A Science Integration Team (SIT) comprised of local, state, and federal agencies and interested parties develop and maintain a decision support model to inform restoration needs.

This report includes calculations of the number of fry and redds able to utilize the amount of habitat created and maintained for the habitat actions completed in the American River and Sacramento River in WY 2023. These calculations are based on territory requirement values developed by the SIT. The SIT based their estimate for fry territory requirement (roughly 0.054 square meters) on the Grant & Kramer equation for territory size (m²) as a function of fork length (cm); ($\log_{10} \text{territory size} = 2.61 \log_{10} \text{fork length} - 2.83$, $r^2 = 0.87$, $n = 23$). (James W. A. Grant and Donald L. Kramer. Territory Size as a Predictor of the Upper Limit to Population Density of Juvenile Salmonids in Streams. *Canadian Journal of Fisheries and Aquatic Sciences*. 47(9): 1724-1737. <https://doi.org/10.1139/f90-197>). The SIT as a whole now uses roughly 9.29 square meters for redd size based on studies originating in the north portion of the Sacramento Valley. These calculations of fry and redds are static estimates of the number of fish able to use the available habitat. They are based solely on the amount of available territory and are not intended as an estimate of the number of fish that will be present in the restored area.

The 2020 ROD includes a mix of standard consultation (which includes an Incidental Take Statement [ITS]) and programmatic consultation (for which an ITS is not required at the

programmatic stage). This report includes discussion of permitting and consultation for each completed project that was addressed programmatically.

Summary of Habitat Restoration Projects

The listed projects all contribute toward the habitat restoration conservation measures identified in the 2020 ROD. The sections below summarize the habitat restoration work implemented in WY 2022 and planned for WY 2023.

Upper Sacramento River (Shasta and Sacramento Divisions)

Battle Creek Salmon and Steelhead Restoration Project and Battle Creek Reintroduction Plan

Battle Creek - Habitat Restoration Conservation Measures

Conservation measures for Battle Creek (PA page 4-41, Section 4.10.1.5.2) are as follows:

Reclamation will provide funding for ten years, subject to available appropriations, toward reintroduction of Winter-run Chinook Salmon to Battle Creek. Reclamation will accelerate implementation of the Battle Creek Salmon and Steelhead Restoration Project, which is intended to reestablish approximately 42 miles of prime salmon and Steelhead habitat on Battle Creek, and an additional 6 miles on its tributaries. The Battle Creek Restoration Project is a collaborative effort among several federal and state agencies and Pacific Gas & Electric Company. The partnership provides a framework for expanding Winter-Run Chinook Salmon spawning to cold water habitat not in the Sacramento River.

Battle Creek - Implemented in WY 2022

Battle Creek Restoration Project Status

Phase 1 – This phase consists of removal of Wildcat Diversion Dam and Wildcat Canal; construction of fish screens and fish ladders on North Battle Creek Feeder and Eagle Canyon Diversion Dams; and, construction of a fish barrier weir on Baldwin Creek (that maintains 5 cfs of flow in Baldwin Creek for suitable salmon and steelhead habitat, and protects the upstream Darrah Springs State Trout Hatchery from being infected with diseases that anadromous fish could carry).

Phase 2 – This phase consists of removal of South Diversion Dam, South Canal, Soap Creek Feeder Diversion Dam, Lower Ripley Creek Feeder Diversion Dam, and Coleman Diversion Dam; construction of a South Powerhouse tailrace tunnel connector to Inskip Canal; and construction of a fish screen and fish ladder on Inskip Diversion Dam.

- South Dam and Canal Removal (+) Contract:
 - Removal of South Diversion Dam, South Canal, Soap Creek Feeder Diversion Dam and Lower Ripley Creek Feeder Diversion Dam

- Final design was completed in 2018 and was updated in October 2020 to include Lower Ripley Creek Diversion Dam; contract award is planned for September 2024; and construction completion is planned for October 2026.
- Coleman Dam Removal Contract:
 - Removal of Coleman Diversion Dam and Coleman Canal Diversion Closure
 - Final design is planned to be completed in 2023; contract award is planned for 2025; and construction completion is planned for 2026.
- Hydropower Facilities Modifications (HFM) - Stage 2, Part 1 Contract:
 - Construction of a South Powerhouse tailrace connector tunnel to Inskip Canal (including a mechanically stabilized earth dike), and an access road to Inskip Diversion Dam
 - Final design was completed in 2018; and contract award is on hold.
- HFM - Stage 2, Part 2 Contract:
 - Construction of fish screen and fish ladder on Inskip Diversion Dam
 - Draft design was completed in 2018 and updated in October 2020; final design is on hold; and contract award is on hold. Note: Due to ongoing erosion issues, PG&E now plans to remove Inskip Diversion Dam around 2023.

PG&E's Intent to Not Renew FERC License in 2026: In late July 2018, PG&E informed the Restoration Project Partners that they do not intend to renew their Battle Creek Hydroelectric Project FERC License in 2026. On April 2, 2019, PG&E withdrew its 2015 Phase 2 license amendment application.

In March 2021, PG&E completed a draft new Phase 2 FERC license amendment application for removal work only. This draft went through an agency review and PG&E currently plans to submit the application to FERC. A new Phase 2 license amendment application triggers the need for a new Phase 2 Water Quality Certification and a new Phase 2 Biological Opinion. The Phase 2 contract to remove South Diversion Dam, South Canal, Soap Creek Feeder Diversion Dam and Lower Ripley Creek Feeder Diversion Dam is currently planned to be awarded in September 2024. Reclamation continued funding the USFWS Red Bluff office for reintroduction monitoring activities as follows:

- Adult Winter-run Chinook Salmon stream surveys
- Adult winter-run Chinook telemetry
- Juvenile winter-run Chinook Salmon acoustic telemetry
- Eagle Canyon Diversion Dam Canal Gate Monitoring
- Evaluation of genetic diversity and life-history strategies in upper Sacramento River and tributary Chinook Salmon and Central Valley steelhead

The deliverables from these activities include an annual report detailing each activity and the results along with useable data files of all raw data collected including analyses used in preparation of the report. The due date for each annual report is September 30 of the year following the sample year and the due date for task 5 is 9/30/2024.

Battle Creek - Planned for 2023

- The winter-run Chinook salmon reintroduction will continue in 2023 utilizing offspring of the captive broodstock and adult returns to Battle Creek from prior year winter-run releases. Spawning and incubation will occur at LSNFH, and juvenile rearing will likely occur at a private facility in the Battle Creek watershed.
- A natural barrier blocks fish passage in the north fork below Eagle Canyon Dam and a contract is in place to remove the barrier. Entities are working to obtain landowner permission to access the barrier for the project so that work can occur in 2023.
- The Eagle Canyon Dam Fish Ladder operation is pending acceptance of the project by PG&E due to uncertainty over fish being diverted into the water diversion when the ladder operates. The agencies will continue to devise a solution there.
- The monitoring funded in 2021 will continue in 2023.
- Reclamation is programming to fund the entire cost of the Battle Creek Restoration Project, \$165.35 million.

Sacramento River Spawning and Rearing Habitat Restoration

Sacramento River - Habitat Restoration Conservation Measures

Reclamation, in coordination with the Sacramento River Settlement Contractors proposes to create 40–60 acres of side channel and floodplain habitat at 10 sites in the Sacramento River by 2030. The potential sites include Salt Creek, Turtle Bay Island, Kutras Lake Rearing Structures, Painter’s Riffle maintenance, North Cypress maintenance, Cypress South maintenance, North Tobiasson Rearing Structures maintenance, Tobiasson Side Channel, Shea Side Channel, Kapusta Side Channel, Kapusta 1-A Side Channel maintenance, Kapusta 1-B Side Channel, Anderson River Park Side Channels maintenance, Cow Creek Side Channel, I-5 Side Channel, China Gardens, Rancheria Island Side Channel maintenance, Rancho Breisgau, Lake California Side Channel maintenance, Rio Vista Side Channel maintenance, East Sand Slough Side Channel, La Barranca Side Channel, Woodson Bridge Bank Rearing Improvement, Jellys Ferry, Dog Island, Altube Island, Blackberry Island, Oklahoma Avenue, Mooney Island, McClure Creek, Blethen Island, Wilsons Landing, McIntosh Island, Shaw, Larkins, Reilly Island, Hanson Island, and Broderick.

Sacramento River - Implemented in WY 2022

In WY 2022, in accordance with the charter for LTO Implementation of the Sacramento River Spawning and Rearing Habitat, rearing habitat restoration was completed at East Sand Slough, and construction began at Kapusta 1-B. These habitat restoration activities on the Sacramento River created roughly 18 acres of rearing habitat, which has the potential to support roughly

73,000 juvenile Chinook at a density of one fish per square meter. Additional details about each habitat restoration project completed in WY 2022 on the Sacramento River are discussed below.

In WY 2022, 20,000 tons of gravel were deposited into the Sacramento River at Keswick Dam. Additional details about this gravel augmentation are discussed below.

East Sand Slough Side Channel In WY 2022, rearing habitat restoration was completed at East Sand Slough Side Channel (Figure 1). The project created four acres of perennial rearing habitat and eight acres of more frequently inundated floodplain rearing habitat by excavating a low flow channel through the former inundation area of Red Bluff Diversion Dam. The project added over 200 clusters of large wood for cover and filled one acre of predator hot spot. The 12 acres of rearing habitat created through this project will have the potential to support roughly 49,000 juveniles.

Site specific ESA consultation for this project through USFWS was completed on April 20, 2020, in the USFWS concurrence letter (ID #: 08FBDT00-2020-I-0126) related to East Sand Slough. The USFWS concurrence letter was amended on June 16, 2020 and concluded USFWS ESA Section 7 consultation (ID #: 08FBDT00-2020-I-0126-R001). Site specific ESA consultation for this project through NMFS was completed on April 2020 through the NMFS NOAA Restoration Center's (RC's) Central Valley Office Programmatic Approach Biological Opinion.



Figure 1. An aerial image looking upstream towards the Highway 36 bridge across the East Sand Slough side channel in Red Bluff.

Kapusta 1-B In December of 2022 construction will be complete on the Kapusta 1B Salmon Habitat Restoration Project (Figure 2). When complete Kapusta 1B will create five acres of rearing and spawning habitat. This project includes the excavation of a new side channel to create rearing habitat for juvenile salmonids at different flow regimes, particularly at low flows, on the Sacramento River. Suitable gravel obtained from channel excavation will be placed in the Sacramento River to provide spawning habitat for adult salmon. Riparian vegetation will be planted for cover and other ecosystem benefits. The 5 acres of rearing habitat created by this

project have the potential to support roughly 20,000 juveniles and the 0.25 acres of spawning habitat added have the potential to support roughly 110 redds.

Kapusta 1B is just down river from Kapusta 1A whose entrance and exit elevations were recently surveyed and are very close to as-built conditions. A second project, Kapusta Island, is slated to be installed in 2023. The southern end of Kapusta Island is near adjacent to Kapusta 1A's proposed inlet.

Site specific ESA consultation with USFWS was completed on June 15, 2016, in the Upper Sacramento River Anadromous Fish Programmatic USFWS Concurrence Letter (ID #: 08FBDT00-2016-I-0166). Site specific ESA consultation with NMFS for this project was completed on October 2015 in the Upper Sacramento River Anadromous Fish Habitat Restoration Project NMFS Biological Opinion.



Figure 2. An aerial image looking downstream at the Kapusta 1-B Salmon Habitat Restoration Project immediately after opening the channel to flow.

Gravel Augmentation at Keswick Dam In WY 2022, 20,000 tons of gravel were deposited into the Sacramento River at Keswick Dam (Figure 3).

Site specific ESA consultation with USFWS for this project was completed on June 15, 2016, in the Upper Sacramento River Anadromous Fish Programmatic USFWS Concurrence Letter (ID #:

08FBDT00-2016-I-0166). Site specific ESA consultation with NMFS for this project was completed on October 2015 in the Upper Sacramento River Anadromous Fish Habitat Restoration Project NMFS Biological Opinion.



Figure 3. A photograph of gravel augmentation at Keswick Dam in 2022.

Sacramento River - Planned for 2023

Gravel Augmentation In WY 2023, approximately 12,000 tons of gravel is anticipated to be injected into the Sacramento River, at the Market Street site. Sites for injection are currently under review.

Site specific ESA consultation with USFWS for this project was completed on June 15, 2016, in the Upper Sacramento River Anadromous Fish Programmatic USFWS Concurrence Letter (ID #: 08FBDT00-2016-I-0166). Site specific ESA consultation with USFWS for this project was completed in October 2015 in the Upper Sacramento River Anadromous Fish Habitat Restoration Project NMFS Biological Opinion.

Tobiasson Island This project would create juvenile rearing habitat and spawning habitat and re-open existing side channel habitat to perennial flow at Tobiasson Island, just downstream of Bonnyview Bridge in Redding. Kapusta Island. This project would reduce stranding pools and create additional side channel rearing habitat on Kapusta Island (river mile 288).

Rockwad Rearing Structures This project would add 20 new juvenile rearing habitat rockwad structures at the Bonnyview Bridge in Redding. The project expands on the initial project of rockwad structures added in the same area in 2017.

Trinity

Clear Creek - Channel Maintenance

Clear Creek - Implemented in WY 2023

In WY 2022 there were no habitat restoration activities on Clear Creek. This includes the placement of gravel.

Clear Creek - Planned for WY 2024

Currently there are no habitat restoration projects planned in Clear Creek for WY2023.

American River Division

American River - Implemented in 2022

Lower Sailor Bar

In WY 2022, in accordance with the charter for LTO implementation of American River Spawning and Rearing Habitat, spawning and rearing habitat was restored at Lower Sailor Bar (Figure 4). Mobilization of construction equipment for the Lower Sailor Bar Restoration Project started on August 1, 2022. The construction was completed on September 30, 2022. Once completed the Lower Sailor Bar Restoration created three spawning riffles (13.5 acres); sorted and placed 37,000 cubic yards of spawning gravel; excavated a 2,500 foot in length side channel (4.9 acres); placed roughly 80 woody habitat structures; and vegetated the bank by planting willow trees and native grasses. The 4.9 acres of rearing habitat created through this project has the potential to support about 20,000 juvenile Chinook, and the 13.5 acres of spawning habitat created has the potential to support roughly 2,700 redds at 200 redds per acre.

Site specific ESA consultation with USFWS for this project was completed on August 29, 2016, in the Lower American River Anadromous Fish Habitat Restoration Project USFWS concurrence letter (ID #: 08FBDT00-2016-I-0198). The concurrence letter was amended on September 22, 2020 and concluded USFWS ESA Section 7 Consultation (ID #: 08FBDT00-2016-I-0198-R001). Site specific ESA consultation with NMFS for this project through NMFS was completed on July 2015 in the Lower American River Anadromous Fish Habitat Restoration Project NMFS Biological Opinion.



Figure 4. An aerial photograph of Lower Sailor Bar showing the gravel placements and side channel. The gravel placements are the three lighter shaded areas extending across the river and the two side channels are along the bottom (south) side of the image.

Nimbus Basin

In WY 2022, in accordance with the of the charter for LTO implementation of American River Spawning and Rearing Habitat, spawning and rearing habitat was restored at Nimbus Basin (Figure 5). Mobilization of construction equipment for the Nimbus Basin Restoration Project started on September 6, 2022. The construction was completed on October 7, 2022. Once completed the Nimbus Basin Restoration Project created one spawning riffle (3.7 acres); sorted and placed 4,200 cubic yards of spawning gravel; excavated 800 feet of side channels and floodplain grading (2.5 acres); placed 30 repurposed woody habitat structures; and vegetated the bank by planting willow trees and native grasses. The 2.5 acres of rearing habitat created through this project has the potential to support 10,000 juvenile Chinook, and the 3.7 acres of spawning habitat created has the potential to support roughly 740 redds.

Site specific ESA consultation with USFWS for this project was completed on August 29, 2016, in the Lower American River Anadromous Fish Habitat Restoration Project USFWS concurrence letter (ID #: 08FBDT00-2016-I-0198). The concurrence letter was amended on September 22, 2020, and concluded USFWS ESA Section 7 Consultation (ID #: 08FBDT00-2016-I-0198-R001). Site specific ESA consultation with NMFS for this project was completed on July 2015 in the Lower American River Anadromous Fish Habitat Restoration Project NMFS Biological Opinion.



Figure 5. An aerial image of the completed project at Nimbus Basin, October 22, 2022. Salmon can be seen holding along the upstream part of the riffle (small black areas).

American River - Planned for WY 2023

Upper River Bend

In WY 2023, in accordance with the charter for LTO implementation of American River Spawning and Rearing Habitat, spawning and rearing habitat will be created at Upper River Bend as part of Phase 1 restoration at this site (Figure 6). Phase 1 of the Upper River Bend project is anticipated to create five acres of spawning habitat, and nine acres of rearing habitat (4.2 acres of perennial rearing habitat, 1.6 acres of floodplain rearing habitat), as well as add clusters of large wood for cover (figure xx). The nine acres of rearing habitat created through this project has the potential to support 36,000 juvenile Chinook, and the five acres of spawning habitat created has the potential to support roughly 1,000 Redds.

Site specific ESA consultation with USFWS for this project was completed on August 29, 2016, in the Lower American River Anadromous Fish Habitat Restoration Project USFWS concurrence letter (ID #: 08FBDT00-2016-I-0198). The concurrence letter was amended on September 22, 2020, and concluded USFWS ESA Section 7 Consultation (ID #: 08FBDT00-2016-I-0198-R001). Site specific ESA consultation with NMFS for this project was completed on July 2015 in the Lower American River Anadromous Fish Habitat Restoration Project NMFS Biological Opinion.

Stanislaus River (East Side Division)

Stanislaus River – Spawning and Rearing Habitat Restoration

In WY 2022 there were no habitat restoration activities on the Stanislaus River. This includes the placement of gravel.

Stanislaus River – Planned for WY2023

Several additional spawning and rearing projects have been identified in the Stanislaus River. However, none of these projects are anticipating groundbreaking in WY2023.

Gravel injections to create spawning habitat on the Stanislaus River are ahead of schedule, therefore, no spawning habitat restoration projects are anticipated for WY 2023. Reclamation is coordinating with other agencies to determine priority locations for future gravel injections.

San Joaquin River (Friant Division)

San Joaquin River - Implemented in 2022

In accordance with the charter for LTO Implementation for Lower San Joaquin River Habitat Restoration, no on-the-ground habitat restoration projects were implemented in WY 2022.

San Joaquin River - Planned for WY 2023

In accordance with the charter for LTO Implementation for Lower San Joaquin River Habitat Restoration, the on-the-ground implementation of habitat restoration projects is not currently planned for WY 2023.

Delta Division

Delta – Tidal Habitat Restoration

Delta Tidal Habitat - Implemented in WY 2022

As of 2022, DWR has constructed eight projects totaling approximately 3,700 acres of tidal habitat that could contribute toward the PA after final credits are provided by USFWS (Table 1).

In a letter signed September 26, 2022, USFWS determined that the request for 1713.2 credit acres for Lower Yolo Ranch were accepted, pending receipt of all necessary administrative documentation. Therefore, the Lower Yolo Ranch project is the only project to be issued credits towards the 8,000-acre commitment.

Tidal Habitat Crediting The 2011 Memorandum of Agreement titled The Early Implementation of Habitat Projects for the Central Valley Project and State Water Project Coordinated Operations and Bay Delta Conservation Plan established the FAST. The FAST is a review team composed of technical level representatives from each Fishery Agency and Reclamation that works with DWR to review and assist in planning habitat restoration projects

and provide guidance to the Water Agency on the expected benefits of proposed habitat projects in meeting the Restoration Objectives. The FAST is tasked with reviewing the prospectus of proposed habitat projects. The prospectus is information on a proposed habitat project provided to the FAST for the purposes of defining the type and amount of credit the habitat project would yield if implemented as planned. Credits are the acreage and linear mileage contributions of habitat projects toward meeting the 8,000-acre requirement of the 2008 USFWS and 2009 NMFS biological opinions and 2019 PA. One credit is equivalent to one acre in meeting the required acreage.

All Projects described below are eligible for FAST Crediting. The only project to have been credited at this point is Lower Yolo Ranch. Lower Yolo Ranch was credited with 1,713.2 acres in WY2022, pending USFWS’ receipt of necessary administrative documentation. DWR plans to formally request credits for the seven remaining projects in 2023.

Table 1. Delta Tidal Projects that have been completed or groundbreaking occurred in WY 2022.

Project	Year Completed	Potential Creditable Acres	Location in Delta	Credited Acres
Winter Island	2019	544	Lower Sacramento/ Confluence	TBD
Tule Red	2019	610	Suisun Marsh	TBD
Lower Yolo Ranch	2020	1,713.12	Cache Slough Region	1713.2 acres
Wings Landing	2020	244	Suisun Marsh	TBD
Arnold Slough	2021	141	Suisun Marsh	TBD
Bradmoor Island	2022	490	Suisun Marsh	TBD
Lookout Slough	On-going	3,000	Cache Slough	TBD

Delta Tidal Habitat - Completed or Began Construction WY 2022

Cache Slough Region

Lookout Slough Tidal Habitat Restoration and Flood Improvement Project Groundbreaking for the Lookout Slough Tidal Habitat Restoration and Flood Improvement Project occurred in April 2022. Construction is anticipated to last two calendar years. DWR and Reclamation estimate the Lookout Slough Tidal Habitat Restoration and Flood Improvement Project will result in 3,000 creditable acres of Delta Smelt Habitat to count against the 8,000 required by the PA. Once completed, Lookout Slough will be the Delta’s largest single tidal habitat restoration project to date. Furthermore, Lookout Slough is adjacent to additional tidal habitat restoration efforts, including Yolo Flyway Farms and Lower Yolo Ranch, which when completed will create a contiguous tidal wetland restoration complex spanning 16,000 acres (Figure 7).

The Project is designed to be a multi-benefit project to restore approximately 3,100 acres of tidal marsh, increase flood storage and conveyance in the Yolo Bypass, increase levee resilience, and decrease flood risk. Ecological Project goals include creating and maintain a diverse landscape of intertidal and associated subtidal habitat that supports habitat elements for native species and improved food productivity within the Project Area. Flood conveyance goals include providing additional flood storage and conveyance within the Yolo Bypass to reduce the chance of catastrophic flooding and protect existing nearby infrastructure.

Habitat restoration and flood improvement goals would be attained by excavating a network of tidal channels, constructing a new setback levee along Duck Slough, breaching and degrading the Shag Slough (Yolo Bypass West) Levee; breaching the Vogel Levee, and improving the Cache/Hass Slough Levee. Site specific ESA consultation was completed with USFWS (#08FBDT00-2020-F-0181).



Figure 6. A map showing the location in the Delta, of the Lookout Slough Tidal Restoration Project.

Suisun Marsh Region

Bradmoor Island Completed in WY 2022, the Bradmoor Island Project restored or enhanced approximately 744 acres of tidal habitat, with 490 creditable acres of Delta Smelt Habitat to

count against the 8,000 required by the PA. The goal of the Bradmoor Island Project was to restore tidal wetlands in an area where tidal restoration has a high potential to directly benefit listed fish species by creating rearing habitat and increasing food production and availability in Suisun Marsh.

Bradmoor Island is located within Solano County in the Nurse-Denverton Slough Complex of Suisun Marsh. Bradmoor Island restoration consisted of removing water control structures, creating five exterior levee breaches and two interior levee breaches, and grading down an interior berm. At each exterior breach, fill was placed in ditches adjacent to existing levees to marsh plain elevation to create a total of 13 ditch blocks. Remnants of a tidal slough will also be reconnected. Site specific ESA consultation was completed with USFWS (#08FBBDT00-2020-F-0211).

Delta Tidal Habitat- Planned for WY 2023

Cache Slough Region

Lookout Slough Tidal Habitat Restoration and Flood Improvement Project The continued construction the Lookout Slough Tidal Habitat Restoration and Flood Improvement Project will continue through WY 2023 and into WY2024. DWR and Reclamation estimate the Lookout Slough Tidal Habitat Restoration and Flood Improvement Project will result in 3,000 creditable acres of Delta Smelt Habitat to count against the 8,000 required by the PA.

Delta – Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project

Yolo Bypass – Habitat Restoration Conservation Measures

The Yolo Bypass Salmonid Habitat Restoration and Fish Passage project will allow increased flow from the Sacramento River to enter the Yolo Bypass through a gated notch on the east side of Fremont Weir (Figure 8). The Record of Decision for this project was signed in September 2019. The site preparation construction contract was completed in November 2021 and final design for the project was completed in December 2021. Current construction activities began in July 2022 and includes the intake channel, headworks, control building, transport channel and pedestrian bridge (Figure xx). The Project will be built over multiple construction seasons (i.e., not in a single season). DWR and Reclamation are considering strategies for accelerating construction. It is anticipated that the project will be completed in 2024. Substantial earthwork work for the intake channel and transport channel are anticipated to be completed in 2022, including rock slope protection placement. Concrete work for the headworks began in November 2022 and is planned to continue into summer 2023, at which time all mechanical and electrical components can be installed. Final operational, outreach, and adaptive management plans are planned to be available by the fall of 2023.



Figure 7. An aerial view of the progress made on the Fremont Weir gated notch in WY2022.

Yolo Bypass – Wallace Weir Fish Rescue Facility Status Update

The original Wallace Weir consisted of an earthen berm with a series of culverts to control irrigation and drainage flows from the Colusa Basin Drain. The earthen berm would wash out during high flow events, allowing State- and federally-listed salmonids and sturgeon unimpeded access to the Colusa Basin Drain without the possibility of reentering the Sacramento River. The new facility includes a permanent fish barrier structure and a fish rescue facility where CDFW biologists can safely collect salmonids to be transported back to the Sacramento River. All drainage and irrigation functionality has been retained through a series of operable gates. To date, thousands of salmon have been captured and safely transported to the river.

Minor efficiency and safety improvements are ongoing at the facility with work expected to be completed by the fall of 2023. Improvements include updating the electrical system, installing a larger water pump and a dedicated air compressor for the livewell aeration system, and installing lights and cameras to improve staff safety and reduce the risk of vandalism.

Yolo Bypass – Agricultural Road Crossing #4 Status Update

The Agricultural Road Crossing #4 Project (ARC4) addresses the final fish passage barrier in the Yolo Bypass that would prevent migrating fish from accessing the Big Notch, the Wallace Weir Fish Rescue Facility, or the Fremont Weir Adult Fish Passage Project. Currently in the 95% design phase, this project replaces an earthen road crossing with a new, open-channel bridge to maximize fish passage. DWR staff have begun submitting environmental permit applications and are finalizing a settlement agreement with the landowner. ARC4 is scheduled to be constructed in the summer of 2024.