



— BUREAU OF —
RECLAMATION

2020 Year in Review

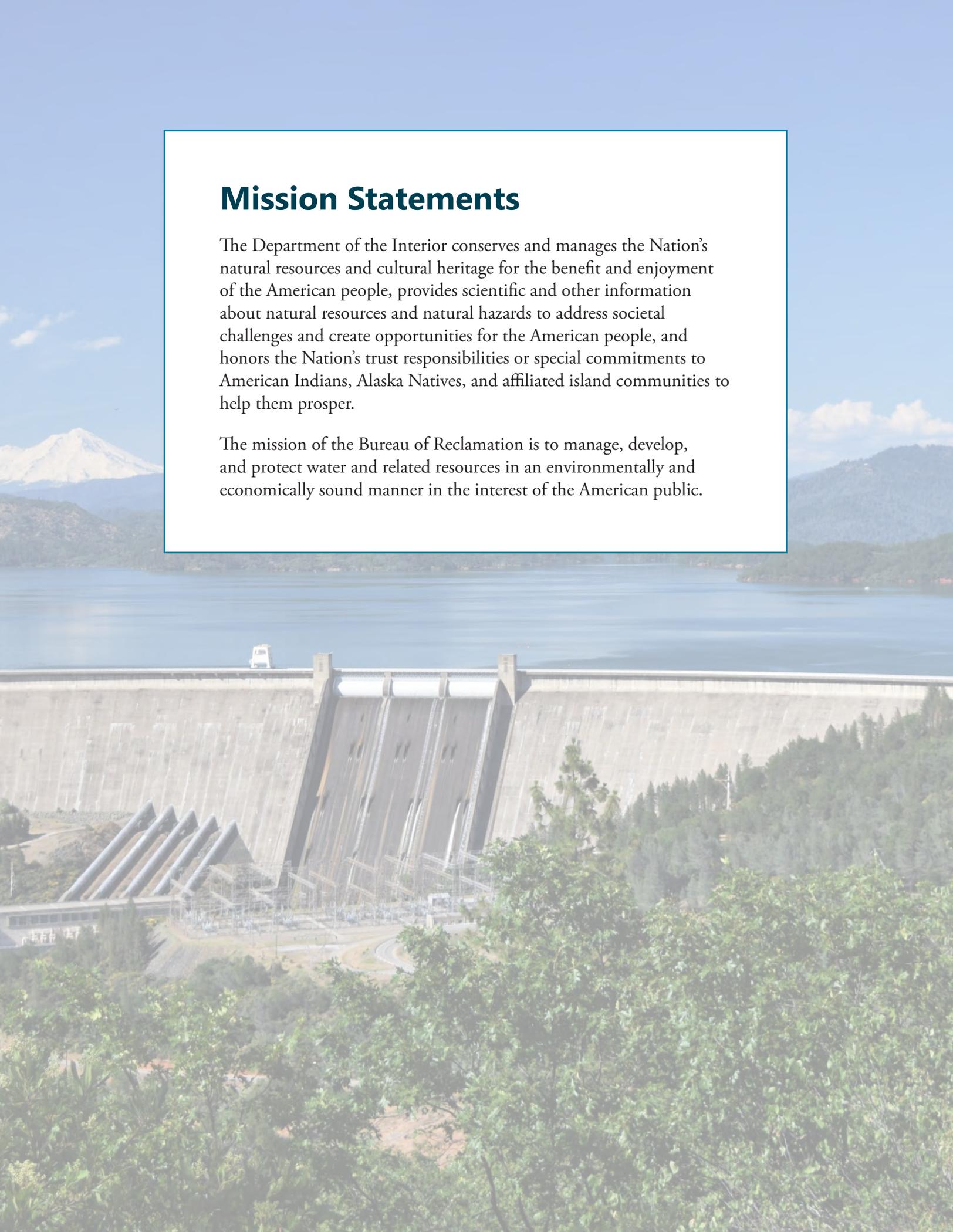
CALIFORNIA-GREAT BASIN REGION



Mission Statements

The Department of the Interior conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

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.



2020 Year in Review:

Highlights of Key Initiatives in the California-Great Basin Region



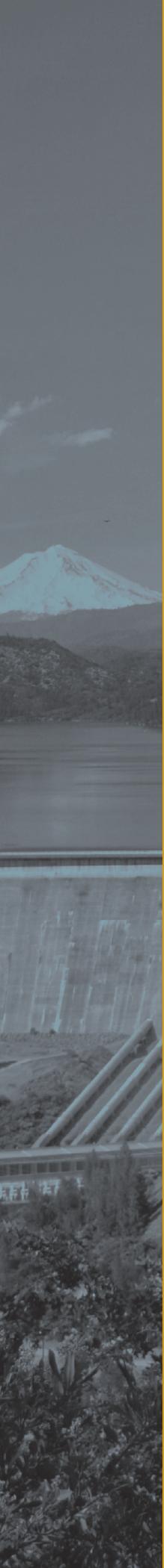
Cover Photo: The “Three Shastas:” Shasta Dam, Shasta Lake, and Mount Shasta

U.S. Department of the Interior

January 2021

Contents

Welcome from Regional Director Conant	6
Implementing New Central Valley Project Operating Plan	7
Annual Report on the Long-Term Operation of the CVP and SWP for Water Year 2020	8
Modernizing Reclamation Infrastructure	11
Friant-Kern Canal Capacity Correction.....	11
Delta-Mendota Canal Capacity Correction.....	12
B.F. Sisk Dam Modifications.....	13
Boca Dam Modifications.....	14
Derby Dam Fish Passage Improvement Project.....	15
Nimbus Dam Fish Passage Improvement Project.....	17
Advancing Water Storage Projects	18
Shasta Dam Raise and Reservoir Expansion.....	18
North-of-Delta Offstream Storage (Sites Reservoir)	19
Folsom Dam Raise	20
Los Vaqueros Reservoir Expansion Project Phase 2	21
B.F. Sisk Dam Raise and Reservoir Expansion Project.....	22
Del Puerto Canyon Reservoir Project.....	23
Bringing a Fresh Look to the Klamath Project	24
Implementing WIIN Act Contract Conversions	25
Providing Reliable Hydropower	26
Enhancing Habitat Restoration and Conservation	27
Trinity River Restoration Program.....	27
Dutch Creek Channel Rehabilitation Project.....	27
Sacramento River Watershed Restoration	28
Sacramento River Science Partnership	28
Lower Clear Creek Floodplain Restoration Project	29



San Joaquin River Restoration Program	30
Continuing to Build a Spring-Run Chinook Salmon Population	30
Completed Levee Improvements for Higher River Flows.....	31
Advanced Reach 2B Project Elements.....	31
Made Headway on Sack Dam Fish Passage Project	32
Made Achievement in Water Management Goal Activities	32
Central Valley Project Conservation Program	32
McKinney Ranch Conservation Easement Acquisition Project.....	32
Eplin Property Conservation Project.....	32
Alkali Scrub Habitat Restoration at Kern NWR.....	33
Made Producing Novel Genome-Level Resources for Vernal Pool Crustaceans of Conservation Concern in California.....	33
Central Valley Project Improvement Act Habitat Restoration Program.....	33
Caliente Property Land Protection Project.....	34
Riparian Habitat Restoration at Dos Rios Ranch	34
Made Sacramento River Riparian Habitat Restoration — Boeger Tract.....	34
Tulare Basin Endangered Species Surveys.....	34
Enriching Recreation Opportunities	35
Auburn State Recreation Area and Auburn Project Lands	35
Lake Berryessa	36
New Melones Reservoir	37
Improving Finance Practices	38
Final CVP Cost Allocation Study Completed	38

Welcome from Regional Director Conant



Regional Director Ernest Conant at Reclamation's Stampede Reservoir.

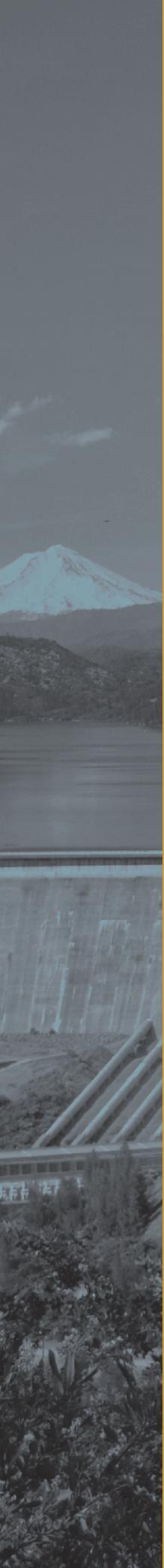
Welcome to a snapshot of Reclamation's California-Great Basin Year in Review: 2020... and what a year it has been! We started off the year with a huge achievement for our region by modernizing operating rules for the Central Valley Project—an accomplishment that our team worked on for several years along with our federal and state partners and water contractors. A month later, in March 2020, nearly 74% of our nearly 1,000-employee workforce began working from their homes full time, an unprecedented period for our agency, as well as for the nation. Despite the challenges the global pandemic brought to us this year, I could not be more proud of the way our region has risen to this challenge with flexibility, resilience, and tenacity.

During this challenging time, our region not only successfully maintained operations and continued serving Reclamation's mission, but also made significant advances on a number of key projects that are important to our agency, as well as to our customers, farmers, and communities in California, Oregon, and Nevada. We have worked diligently to meet our federal obligations and fulfill the needs of our stakeholders. This report is just a snapshot of some of the key initiatives that made substantial progress this year.

Thank you to the Reclamation team and to our water and power contractors for another successful year. We look forward to great things in 2021.

Sincerely,

Ernest A. Conant
Regional Director



Implementing New Central Valley Project Operating Plan

In 2016, Reclamation and the California Department of Water Resources (DWR) began the process to revise operations for water deliveries and power generation for California communities and farms, while improving conditions for endangered species and their habitats. Reclamation issued a Record of Decision (ROD) on February 18, 2020, completing the Reinitiation of Consultation on the Coordinated Long-Term Operation of the Central Valley Project (CVP) and State Water Project (SWP).

The decision modernizes CVP and SWP operations, based on the latest scientific information and uses real-time monitoring to improve operation decision making. This will result in a more flexible and efficient operation that balances the need to provide a safe and reliable water supply to farms, families, and communities with protections for critical species.

The new operating rules incorporate and build upon substantial new scientific information developed since the last major revision of the operational plan over 10 years ago. The decision improves operations to build and manage cold-water pools in Shasta, Folsom, and New Melones reservoirs to provide cooler water temperatures for Chinook salmon and steelhead, while incorporating opportunities for pulse flows to assist out-migrating juvenile fish in the spring. Moving forward, operations will be based on real-time conditions, with additional Delta pumping curtailments if monitoring and analysis shows Delta smelt and salmon are sensitive to the effects of exports. This will also allow for more pumping during storm flows when species are absent in areas most influenced by pumping.

In addition to operational changes, the decision broadens the suite of tools to address species needs beyond flows alone and includes habitat restoration, facility improvements, hatchery actions, and a program of scientific studies estimated to cost \$1.5 billion of federal and state funding over the next 10 years.

The February 2020 ROD is based on Reclamation's December 2019 Final Environmental Impact Statement (EIS) and biological opinions completed in October 2019 from the U.S. Fish and Wildlife Service (USFWS) and NOAA Fisheries.



February 2020 signing of the Record of Decision; left to right: USFWS Regional Director Paul Souza, former USFWS Director Aurelia Skipwith, Reclamation Regional Director Ernest Conant, former Reclamation Commissioner Brenda Burman, and former Department of the Interior Secretary David Bernhardt.

Annual Report on the Long-Term Operation of the CVP and SWP for Water Year 2020

Reclamation completed an annual report for the 2020 water year to summarize the long-term operation of the CVP and SWP. Highlights from the report include:

- Reclamation implemented Shasta Reservoir’s cold-water pool management strategies on the Sacramento River for timely allocation and improved survival of winter-run Chinook salmon eggs. During the dry conditions of 2020, Reclamation’s cold-water pool management, in coordination with NOAA Fisheries, reduced temperature dependent mortality below 7%. Reclamation additionally implemented rice decomposition smoothing actions in partnership with the Sacramento River Settlement Contractors to reduce fall-run Chinook redd dewatering, while transitioning to rebuild storage for 2021.



Photo showing Shasta Dam Temperature Control Device (TCD). The TCD allows colder water to be drawn from Shasta Reservoir and run through the generators. The water is then released into the Sacramento River to meet environmental needs for downstream fisheries.

- Old and Middle River entrainment management in the Delta focuses on proactively supporting salmonid migration with export restrictions before entrainment has occurred, rather than responding after the fact. In 2020, Reclamation coordinated with USFWS, NOAA Fisheries, DWR, and California Department of Fish and Wildlife (CDFW) to formalize new real-time operations groups and collaboratively provide weekly assessments to integrate surveys, historical status and trend information, and forecasting tools.



Aerial photo showing the Sacramento-San Joaquin Bay-Delta.

- The new operating rules include enhancement of Delta smelt summer-fall habitat to more efficiently create lower salinity zone habitat and support additional critical habitat elements. Though the action is not implemented in a dry year, Reclamation continued to partner with the USFWS Enhanced Delta Smelt Monitoring Program and the State Water Contractors to collect data that will allow a comparison between conditions with and without the action.
- Non-flow habitat and facility measures comply with the federal Endangered Species Act (ESA) in lieu of additional restrictions on reservoir releases, restrictions on exports, and bypasses on power generation. Reclamation shaped the creation of salmon and steelhead spawning and rearing habitat through oversight of a gravel restoration site downstream of Goodwin Dam on the Stanislaus River. Over 15,000 tons of gravel were placed in the area and a .25-acre side channel was created. Reclamation partnered with the USFWS, Chico State University, Sacramento River Forum, Sacramento River Settlement Contractors, Yurok Tribe, River Partners, and CDFW to complete three habitat projects along the upper Sacramento River. Approximately 5,500 meters of side channel habitat for salmon and steelhead spawning and rearing was constructed through design and implementation of a side-channel restoration site downstream of Redding on the Sacramento River.



Anderson River Park Phase 1 Project after the side channel was excavated and reconnected to the Sacramento River, creating nearly one mile of new flowing salmonid habitat.

- Reclamation continues to invest in monitoring and science for meeting the needs of species and operating the CVP and SWP for all project purposes. Reclamation biologists co-authored publications with agency and academic collaborators that help us better understand the effects of seasonal Delta water operations and aquatic habitat on Delta smelt and the native fish community. This knowledge reduces the uncertainty in Reclamation's activities and informs further seasonal and annual conservation measure planning and implementation.
- Reclamation biologists, in cooperation with CDFW and the Delta Science Program, strengthened implementation of the Salmon and Sturgeon Assessment of Indicator by Lifestage Program through coordinated acquisition of acoustic telemetry tags and receivers. This equipment went to cooperating agencies tagging juvenile salmonids and deploying receivers to provide real-time information on the movement of telemetered fishes.

Modernizing Reclamation Infrastructure

One of Reclamation's highest priorities over the last year was the investment in and modernization of our water infrastructure. In the California-Great Basin Region, many of our facilities are 50-to-over-100 years old. While our dams, canals, pumping plants, and other infrastructure are well cared for, the maintenance costs keep rising and modernizing facilities are called for. Reclamation has made considerable progress advancing infrastructure improvement projects over the past year. The following is a summary of our major initiatives.

Friant-Kern Canal Capacity Correction



Decades of groundwater overdraft near the Friant-Kern Canal have caused land subsidence that restricts the canal's ability to make full water deliveries

In the San Joaquin Valley, Reclamation is working with the Friant Water Authority to restore capacity in a 33-mile stretch of the Friant-Kern Canal. The gravity-fed, 152-mile Friant-Kern Canal plays a critical role in delivering water to one million acres of highly productive farmland and more than 250,000 people from Fresno south to Bakersfield. Since the canal's construction in 1951, more than 50% of its original capacity has been lost due to land subsidence. The diminished capacity in the canal has resulted in up to 300,000 acre-feet of reduced water deliveries in certain years. When complete, this project will restore capacity from the current 1,600 cubic-feet-per-second (cfs) to the original 4,000 cfs in the middle reach of the canal.

This project was on a fast track this past year to clear the way to begin construction as soon as possible. A Draft EIS/Environmental Impact Report (EIR) was released in April 2020, followed by the transmittal of the Final Feasibility Report to Congress in July 2020. Reclamation released the Final EIS/EIR in September 2020, and the ROD in November 2020. The ROD clears the final environmental hurdle for Reclamation to move forward on modernizing this critical infrastructure for the southern San Joaquin Valley. With \$206 million in funding as part of the fiscal year 2021 appropriations and COVID-relief package, Reclamation and Friant Water Authority are optimistic to begin construction early 2021.

Delta-Mendota Canal Capacity Correction

Similar to the Friant-Kern Canal, the Delta-Mendota Canal is also in need of repair, as it is experiencing a 30% capacity loss due to subsidence. The 117-mile long Delta-Mendota Canal begins at C.W. “Bill” Jones Pumping Plant near Tracy. The canal then follows the Coast Range south, providing irrigation water to the west side of the San Joaquin Valley along its route and terminating at Mendota Pool.



Photo showing the Delta-Mendota Canal running through the San Joaquin Valley.

Completed in 1951, the canal has experienced capacity loss due to subsidence from groundwater pumping. The reduced capacity has led to reductions in storage in San Luis Reservoir. Reclamation began an appraisal study in February 2020 to restore the canal's capacity of over 70 miles of the Delta-Mendota Canal and upgrade many canal crossings. The appraisal study was completed in October 2020. Next steps include analysis of correction alternatives, selection of final alternative leading to final design, and construction.

B.F. Sisk Dam Modifications

B.F. Sisk Dam, completed in 1967, impounds San Luis Reservoir, the nation's largest offstream reservoir, and provides supplemental irrigation water storage and municipal and industrial (M&I) water for the CVP and SWP. B.F. Sisk Dam is owned by Reclamation and operated by DWR. Storage in San Luis Reservoir is allotted 55% state and 45% federal.



The 3.5-mile long B.F. Sisk Dam impounds San Luis Reservoir, which provides water to communities, farmland, and Pacific Flyway wetlands south-of-the-Delta.

In 2006, an issue evaluation was completed for B.F. Sisk Dam that identified the need for corrective actions. Corrective action alternatives were studied, investigated, and evaluated. In 2018, Reclamation selected a preferred alternative for dam safety modifications and moved into the final design process.

In December 2019, Reclamation and DWR announced a partnership to move forward on a billion-dollar seismic upgrade with the signing of a ROD and Notice of Determination. The dam safety project, Reclamation's largest project under the 1978 Safety of Dams Act, will add stability berms and other dam safety features to the existing 3.5-mile-long earthen dam. Increasing the dam height will reduce downstream public safety concerns by reducing the likelihood of overtopping if slumping were to occur during a seismic event. Exploratory blasting at B.F. Sisk occurred during 2020 in preparation for construction on the multi-year project to begin summer 2021.

Safety of Dams Program — Reclamation started the Safety of Dams Program in 1978 to ensure Reclamation dams do not present unreasonable risk to people, property, and the environment. The program focuses on evaluating and implementing actions to resolve safety concerns at Reclamation dams.

Boca Dam Modifications

Boca Dam sits on the Little Truckee River and forms Boca Reservoir. The reservoir is used to regulate the Truckee River and provide water for irrigation, recreation, fish and wildlife benefits, power generation, and drought supplies for M&I users in the Reno-Sparks area of northern Nevada.



Photo showing completed dam modifications and reinforced road across Boca Dam.

Recent investigations indicated that Boca Dam modifications were needed to prevent potential deformation of the dam caused by liquefaction of the foundation during an earthquake. Dam deformation could lead to overtopping the embankment if the water elevation in the reservoir was high enough.

Initial construction began in the spring of 2019 and was completed in October 2020. Modifications to the 81-year-old dam included adding a stability berm, widening the crest by 25 feet and reinforcing the road over the dam for security purposes. The spillway at the dam was previously reinforced and updated for seismic issues in October 2019.

Derby Dam Fish Passage Improvement Project

Derby Dam is located on the Truckee River about 20 miles east of Reno, Nevada. The construction of Derby Dam, completed in 1905, was one of the first projects of the newly formed U.S. Reclamation Service, now Bureau of Reclamation. The dam diverts water from the Truckee River into the Truckee Canal, where it is used for irrigation downstream; it also blocks passage for the threatened Lahontan cutthroat trout.



Installation of the new fish screen at Derby Dam is the nation's largest horizontal fish screen to date.

For the last two decades, Reclamation has worked with USFWS and Pyramid Lake Paiute Tribe to restore connectivity for the Lahontan cutthroat trout. In April 2019, Reclamation entered into a cooperative agreement with Farmers Conservation Alliance to design, construct, and commission a horizontal fish screen. The fish screen, completed in September 2020, is the largest horizontal screen installation in the nation. The screen is the last project component, which includes a fishway to allow movement above the dam and modification of two gates on the dam to regulate water flows. This complex allows fish to safely pass around Derby Dam and access their historic habitat along much of the Truckee River. The Lahontan cutthroat trout, once thought to be extinct, can now successfully move from Pyramid Lake, past Derby Dam, to its native spawning habitat for the first time since 1905.

The \$34-million fish passage infrastructure project modernized Derby Dam and provided new efficiencies for dam operations and deliveries with an automated supervisory control and data acquisition control system to make flow adjustments remotely. The project also provides benefits to agriculture, fishing, and recreation in western Nevada.



Derby Dam Fish Screen Ribbon Cutting Ceremony. Left to right: Regional Director Ernest Conant, USFWS Regional Director Paul Souza, Farmers Conservation Alliance CEO Julie O'Shea, Pyramid Lake Paiute Chairman Anthony Sampson, and former Reclamation Commissioner Brenda Burman

Nimbus Dam Fish Passage Improvement Project

Nimbus Dam is situated on the American River, seven miles downstream of Folsom Dam. Completed in 1955, the dam serves as an afterbay structure for Folsom Dam and re-regulates American River flows. The Fish Passage Project at Nimbus Dam has been in development for over 10 years. This year's completed construction phase includes a new fishway consisting of a concrete flume, pool, fish ladder, and rock-lined natural-looking channel located on the lower American River, immediately downstream of Nimbus Dam. The project will replace a weir, picket system, and fish ladder that were built over 50 years ago as mitigation for Chinook salmon and Central Valley steelhead trout spawning areas blocked by Nimbus Dam construction.

Upon completion of the \$12.2-million fish passage project, salmon will have access to the Nimbus Basin salmonid spawning and rearing habitat improvement area for holding and in-river spawning. This feature's operation will also provide improved genetic diversity by expanding the hatchery's spawning season that was historically limited by potential river-flood flows that required Reclamation to remove the pickets earlier than the end of the salmon run. Initial testing of the fish passage project occurred fall 2020. The project will be fully operational in 2022.



Aerial photo showing the new Nimbus Dam Fish Passage Project underway.

Advancing Water Storage Projects

Reclamation has been studying and pursuing new water storage opportunities for decades. Even as the state's population has nearly doubled, no major federal water storage infrastructure has been built since 1979. In 2020, however, Reclamation made huge strides to change this. From Northern California to the San Joaquin Valley, Reclamation has provided the foundation to make new water-storage plans become a reality. The following are some of the region's highlights from 2020.

Shasta Dam Raise and Reservoir Expansion

Shasta Dam and Reservoir sit at the head of California's water system and are cornerstone to the CVP. Completed in 1945, Shasta Reservoir has a current water storage capacity of 4.5 million acre-feet and is the state's largest reservoir. Investigations in the 1980s analyzed a 200-foot raise of Shasta Dam. Today, Reclamation is pursuing a modest raise of 18.5 feet that would provide an additional 630,000 acre-feet of water storage—enough water to sustain two million people annually. The project would improve water supply reliability for agricultural, M&I, and environmental uses. It would also reduce flood-damage risk and improve Sacramento River temperatures and water quality below the dam to benefit fisheries.

Since the Final EIS was released in 2015, Reclamation identified several key areas that required updating. A Draft Supplemental EIS was released to the public in August 2020. Since a public meeting was infeasible due to COVID-19, a virtual open house provided additional information and the comment period was extended from 45-to-60 days. The Final Supplemental EIS, which considered over 6,300 comment letters, was released in November 2020, marking a major project milestone. The Final Supplemental EIS was transmitted to Congress on January 12, 2021.



Shasta Dam shown above releasing 50,000 cfs of water.

North-of-Delta Offstream Storage (Sites Reservoir)

As part of a continuing effort to increase storage capability throughout California, Reclamation and the Sites Project Authority worked together to evaluate new offstream surface water storage north of the Sacramento-San Joaquin Delta. Located 10 miles west of the town of Maxwell in rural Glenn and Colusa counties, Sites Reservoir would store water that is diverted from the Sacramento River for later release by beneficiaries throughout the state of California. The Sites Reservoir would store up to 1.5 million acre-feet of water and has the potential to increase California's water storage by 15%.



Photo showing the proposed location of Sites Reservoir in Northern California.

Reclamation, in coordination with Sites Project Authority, developed a Final Feasibility Report for the project, which was transmitted to Congress in December 2020. Sites Reservoir remains eligible for \$816 million in state funds to advance under Proposition 1 Water Storage Investment Program, the largest award given to any project requesting funding. It has received significant federal investment including over \$10 million in Water Infrastructure Improvements for the Nation (WIIN) Act funding and is tentatively eligible for a \$449 million loan from the U.S. Department of Agriculture's Rural Development Program. As the project advances, it will be optimized for current conditions and affordability of all participants, while maintaining flexibility to adapt to changing conditions.

Folsom Dam Raise

Beginning in January 2020, Reclamation and partner, U.S. Army Corps of Engineers (Corps), broke ground on the Folsom Dam Raise Project. The project is part of a continuing effort to increase storage capability throughout California. The Folsom Dam Raise Project will increase flood-risk-management by using the reservoir's extra storage space to maximize both flood-storage capacity and flood protection to downstream American River communities.



Photo illustrating Folsom Dam improvements and new auxiliary spillway.

In June 2020, the Corps completed Phase 1 of the Folsom Dam Raise Project, which included an upgrade to Folsom Reservoir's Dike 8. The Corps is currently working on plans to award Dikes 1-7 and Mormon Island Auxiliary Dam in fiscal year 2021. With Reclamation's unique knowledge of Folsom Dam and operations, Reclamation has provided the Corps with continued support to the Folsom Dam Raise design development.

Los Vaqueros Reservoir Expansion Project Phase 2

Los Vaqueros Reservoir is an existing offstream storage facility operated by Contra Costa Water District (CCWD), located in northeastern Contra Costa County. The Los Vaqueros Reservoir Expansion (LVE) is a joint investigation between Reclamation and CCWD, authorized by Congress in 2003.



Phase 2 of the Los Vaqueros Project would increase storage capacity from 160,000 acre-feet up to 275,000 acre-feet and add new conveyance facilities.

The original Los Vaqueros Reservoir was completed in 1997, with a capacity of 100,000 acre-feet and built to improve CCWD's ability to deliver good water quality year-round and to provide emergency storage for their customers. Phase 2 is a collaborative effort that evaluated the feasibility of expanding Los Vaqueros Reservoir from the recently expanded size of 160,000 acre-feet to a total capacity of 275,000 acre-feet. This expansion would provide increased water supply reliability and operational flexibility to the CVP. In addition, the expansion would deliver water supplies to various Bay Area M&I water providers, as well as federally recognized wildlife refuge areas and irrigation districts in the San Joaquin Valley.

Reclamation and CCWD reached significant milestones in the second phase of the LVE Project this year. In February 2020, final environmental documents were published, followed by the transmittal of the Final Feasibility Report to Congress in August 2020.

B.F. Sisk Dam Raise and Reservoir Expansion Project

B.F. Sisk Dam is a 382-foot high earthfill embankment located on the west side of the Central Valley, about 12 miles west of Los Banos. The dam is about 3.5-miles long and impounds San Luis Reservoir, the nation's largest offstream reservoir, which has a total capacity of over two million acre-feet of water. The reservoir provides supplemental irrigation water storage for the federal CVP and M&I water for the SWP. The dam and reservoir are owned by Reclamation and operated by DWR. San Luis Reservoir storage is allotted 55% state and 45% federal.



At San Luis Reservoir, pictured above, an opportunity exists to meet two objectives at the same time: implement dam safety modifications and increase water storage.

While implementing Safety of Dam Program modifications at B.F. Sisk Dam, Reclamation is partnering with San Luis & Delta-Mendota Water Authority to investigate raising the dam 10 feet to create an extra 130,000 acre-feet of storage in San Luis Reservoir. The additional space would be used to store water that could be delivered to south-of-Delta water contractors and wildlife refuges. This water would meet existing contractual obligations and not serve any new demands.

During 2020, Reclamation and the San Luis & Delta-Mendota made monumental progress to advance this project. A Draft Supplemental EIS and Draft EIR were released to the public in August, followed by final environmental documents in December. A Final Feasibility Report was also transmitted to Congress in December with a finding of feasibility. Reclamation anticipates signing a ROD for the project in 2021 after completing other environmental-compliance requirements.

Del Puerto Canyon Reservoir Project

Reclamation is working with Del Puerto Water District and the San Joaquin River Exchange Contractors Authority on a proposal to construct a new offstream reservoir to develop additional water storage south-of-the-Delta. The reservoir would be located on Del Puerto Creek in the Coastal Range, west of Patterson and Interstate 5. With a pipeline connection to the Delta-Mendota Canal, the reservoir would provide up to 82,000 acre-feet of water storage for nearby highly productive farmlands, in addition to benefits for refuge water supply and flood protection. The project sponsors have completed a Final Feasibility Report for the project.



An artist's rendering depicts the proposed Delta Canyon Reservoir.

Bringing a Fresh Look to the Klamath Project

The Klamath Project supplies water to more than 230,000 acres of irrigated farmland along the California and Oregon border and to the Tule Lake and Lower Klamath National Wildlife Refuges. Operation of the Klamath Project was challenged in 2020 by the second-driest year on record, water-supply forecasts that continued to worsen through the spring, litigation that required the re-initiation of Endangered Species Act consultation, and an avian botulism outbreak that led to historic water fowl mortality in the project's wildlife refuges.

These extreme conditions attracted the attention of former Secretary of the Interior David Bernhardt, who visited the Klamath Basin in July 2020 with former Reclamation Commissioner Brenda Burman. While in the basin, the former Secretary and Commissioner met with Klamath Basin ranchers, farmers, tribes, and community officials to hear first-hand from the community on the best path forward to address longstanding water challenges.



Photo above showing Bob Gasser, Klamath Water User Association Board Member; Senator Greg Walden; former Interior of the Secretary David Bernhardt; Congressman Doug LaMalfa; and former Reclamation Commissioner Brenda Burman meeting with Klamath Basin water users in July 2020.

The Department of the Interior and Reclamation responded quickly with a plan to launch a fresh approach to improve water supply forecasting, operations planning, and modeling. Reclamation is currently implementing an initial \$1.2 million investment in applied science projects. These projects will improve our understanding of the Klamath Basin's natural stream flows and the relationship between project operations and aquatic ecosystems.

Implementing WIIN Act Contract Conversions

Section 4011 of the WIIN Act directs the Secretary of the Interior to convert agricultural and municipal water service contracts to repayment contracts at the contractor's request. This provision allows for prepayment of allocable construction costs that otherwise would have been repaid to Reclamation over extended terms. The section authorizes prepayment of outstanding construction cost obligations through a lump sum or in installments. It allows repayment contractors to pay, upon request, their remaining construction repayment obligations, either in a single lump sum or over three years in three equal payments.



Photo of the signing ceremony celebrating Reclamation's first completed group of congressionally mandated CVP contract conversions with American River contractors.

In 2019, the Region began CVP-wide contract negotiations to implement the WIIN Act, which allows for early CVP repayment and for a portion of the funds to go into a storage account. As of December 2020, around 90 contractors have requested to convert to repayment contracts. Contract negotiations were publicly noticed and negotiated. As of the end of 2020, 60 contract conversions have been executed.

Providing Reliable Hydropower

Reclamation's California Great-Basin Power Program continues to provide tremendous value to its customers. In fiscal year 2020, the CVP generated 4,512,420 megawatt-hours with 3,039,753 megawatt-hours delivered to the customer Base Resource (BR). The generation delivered to the BR was shaped to optimize value and resulted in a delivered value over \$111 million, which is equivalent to approximately \$36.78 per megawatt-hour. The shaped value is what the customers would have paid without CVP generation. Instead, the total cost of CVP power was equivalent to \$27.82 per megawatt-hour, a savings of over \$27 million, which includes the full Reclamation and Western Area Power Administration Funding Plans and the CVP Restoration Fund.



Photo showing turbine runner being installed at the Trinity Powerplant, which will increase the power-generation efficiency.

Attempts to improve customer confidence have been made through a reformed relationship with power customers. Reclamation shared information and sought input through Reclamation's CVP Power Initiative and other efforts, including the Central Valley Project Improvement Act (CVPIA) Business Practices Guidelines, powerplant bypass, and Reconsultation on the Long-Term Operation of the CVP and SWP. Updates were provided to the customers regularly throughout the year with revisions posted on the regional hydropower website.

Enhancing Habitat Restoration and Conservation

Trinity River Restoration Program

The Trinity River Restoration Program (TRRP) is a multi-agency program with eight partners and numerous collaborators. The TRRP implements the 2000 ROD, which directs the Department of the Interior to restore the fisheries of the Trinity River impacted by dam construction and related diversion of the Trinity River Division of the CVP. In 2020, the TRRP constructed the Dutch Creek channel rehabilitation project on the Trinity River, implemented the 2000 ROD restoration flows from Lewiston Dam for the Critically Dry 2020 Water Year, and continued science monitoring to assess Trinity River natural-origin salmonid recovery goals.

Dutch Creek Channel Rehabilitation Project

The collaborative Dutch Creek Project, located about 25 miles downstream from Lewiston Dam, was constructed to recover dynamic river processes that will create and sustain salmon and steelhead habitat on the Trinity River. This is the first channel rehabilitation project that the TRRP constructed partially on U.S. Forest Service lands and is a testament to years of close cooperation with partners. Habitat benefits for fish and wildlife from this work will sustain over time as the river evolves with the constructed features and new terrain.



A new meander was excavated at the Dutch Creek Project to the appropriate depth; construction crews then slowly removed turbidity mitigation barriers to connect the meander to the mainstem channel.

These channel rehabilitation projects are monitored to assess the total change and optimal habitat across a range of flows before and after construction. Similar projects have shown significant improvements in the total available habitat, particularly for juvenile salmonids, which could be attributed to the increased number of smolts that survive per spawning adult.

Sacramento River Watershed Restoration

Sacramento River Science Partnership

In August 2020, Reclamation and partners signed on to the Sacramento River Science Partnership. The partners include USFWS, NOAA Fisheries, Sacramento River Settlement Contractors, DWR, and CDFW. The partnership members are co-producing a science plan for the mainstem of the Sacramento River from Shasta Reservoir to Verona, at the confluence of the Feather River. The plan provides a science and research forum centered on prediction, detection, and understanding of the effects of management actions designed to support all four runs of Sacramento River Chinook salmon.



Aerial photo shows salmon redds in the Sacramento River.

Lower Clear Creek Floodplain Restoration Project

Reclamation, in partnership with USFWS, completed the construction of the Lower Clear Creek Floodplain Restoration Project – Phase 3C. Phase 3C marks the final major phase of this ambitious project, started in 1999, and represents a culmination of work to restore more than two miles of highly degraded stream channel in Clear Creek. The project was funded by collections under the CVPIA and was guided by technical input from the Clear Creek Technical Team, a group of federal, state, and tribal agencies, and local stakeholders. The Yurok Tribe helped develop the site's design and completed all of Phase 3C Project's construction.



Aerial view of Clear Creek flowing through the Phase 3C Project area. This project greatly improved the area's ecological function and increased habitat for the benefit of salmon, steelhead, and diversity of other flora and fauna.

One of the major goals of Phase 3C was to return Clear Creek to its historic channel alignment. In its pre-construction condition, this section of Clear Creek ran through a man-made ditch that was built to divert the stream around a gravel deposit in the 1950s. Clear Creek has since been “trapped” within this ditch. Phase 3C addressed this problem by placing a large earthen plug at the top end of the ditch, allowing the stream to flow through its original channel location. The remaining ditch portion was transformed into a series of step pools, separated by beaver dam analogs, that provide additional fish habitat and hopefully attracts a beaver colony. The newly created channel has a variety of fish-friendly habitat features such as side channels, alcoves, wood jam, and more. The Phase 3C Project dramatically increased the amount of spawning-and-rearing habitat for the wild salmon and steelhead that occupy Clear Creek.

San Joaquin River Restoration Program

The San Joaquin River Restoration Program is the direct result of the San Joaquin River Restoration Settlement reached in September 2006 by the U.S. Departments of the Interior and Commerce, the Natural Resources Defense Council, and the Friant Water Authority. The settlement, which followed an 18-year lawsuit, received federal-court approval in October 2006. Federal legislation, the San Joaquin River Restoration Settlement Act, was passed in March 2009, authorizing federal agencies to implement the settlement. The settlement is based on two goals:

Restoration: To restore and maintain fish populations in “good condition” in the main stem of the San Joaquin River below Friant Dam to the confluence of the Merced River, including naturally reproducing and self-sustaining populations of salmon and other fish.

Water Management: To reduce or avoid adverse water-supply impacts to all of the Friant Division long-term contractors that may result from the settlement’s interim flows and restoration flows.

Key 2020 accomplishments for the program include:

Continuing to Build a Spring-Run Chinook Salmon Population

For the second year running and only the third time in over 60 years, spring-run Chinook salmon returned to the San Joaquin River. In 2020, over 300 adult salmon again spawned in the upper river reach near Friant Dam, bringing forth the next generation of naturally hatched spring-run Chinook salmon. The returns are directly due to the efforts of the San Joaquin River Restoration Program, including Reclamation and other partnering agencies: NOAA Fisheries, USFWS, CDFW, and DWR. Having a self-sustaining, naturally reproducing population of Chinook salmon in the San Joaquin River is a key goal of the San Joaquin River Restoration Settlement and having fish return to the river to complete their lifecycle is a major milestone in meeting this goal.



Photo shows a field crew releasing a 2020 spring-run Chinook salmon into Reach 1 of the San Joaquin River.

Completed Levee Improvements for Higher River Flows

In 2020, one of the program's implementing agency partners, DWR, completed over two miles of levee improvements that will allow high restoration flows for sections of the Eastside Bypass. These flows are imperative to providing the conditions needed to ensure a successful return of spring-run Chinook salmon to the San Joaquin River. Through the project, seepage cutoff walls were poured, and six culverts replaced to allow higher restoration flows and improve seepage and stability requirements in this bypass section.

Advanced Reach 2B Project Elements

The program and its partner, the City of Mendota, began new bridge construction that will serve as an access point for the Program's Reach 2B Project, as well as support for the city's water line. The project will remove an existing condemned bridge and construct a new, concrete pre-formed bridge across the Fresno Slough near the Mendota Pool. In addition to providing operations and maintenance access for the Mendota Pool Control Structure and Fish Screen, the project also provides the economically-disadvantaged city a stable structure to hang their water line—the sole source of the community's water. The program also reached a 30% design for the Reach 2B Project, which will include two control structures, a fish screen and a .75-mile artificial river channel to allow for unimpeded passage of salmonids and other native fish species around the Mendota Pool.

Made Headway on Sack Dam Fish Passage Project

In 2020, the Sack Dam Fish Passage Project took significant steps forward with completion of a 10% design. Additionally, the program received an east-side of the dam's landowner donation, which will allow the program to pursue the preferred nature-like fishway alternative to allow unimpeded fish passage around Sack Dam for salmonids and other native fish species.

Made Achievement in Water Management Goal Activities

The program's Water Management Goal also had a string of accomplishments in 2020. The Friant-Kern Canal Middle Reach Capacity Correction Project was successfully ushered through the environmental and planning phases and were completed at the end of the year. In addition, the goal saw accomplishments with major revisions to the program's Restoration Flow Guidelines, which guide its flow releases, as well as generating \$10.3 million from the sale of unreleased restoration flows, which will be used to fund program needs.

Central Valley Project Conservation Program

The Central Valley Project Conservation Program (CVPCP) was developed by Reclamation and the USFWS during the Reinitiation of Consultation on the Long-Term Operation of the CVP and SWP. The program goal is to ensure that the existing CVP operation and renewal of CVP water-service contracts do not jeopardize listed or proposed species or adversely affect designated or proposed critical habitat. Accordingly, the CVPCP implements actions that protect, restore, and enhance special-status species and their habitats affected by the CVP. The program provides funds through grants and agreements to nonprofit organizations, state and local agencies, universities, and others to acquire and conserve lands, restore habitats, and conduct research leading to the conservation and restoration of lands to help recover federally listed species whose populations have been impacted by the CVP. In 2020, CVPCP funds went toward the following efforts:

McKinney Ranch Conservation Easement Acquisition Project

Funds were provided a conservation easement purchase to permanently conserve 3,602 acres of vernal pool and grassland habitats in Madera County. Its conservation will benefit numerous endangered and threatened species, including California tiger salamander, vernal pool fairy shrimp, hairy orcutt grass, succulent owl's clover, and other CVP-impacted species of concern. The easement will be managed by the Sierra Foothills Conservancy.

Eplin Property Conservation Project

Funds were provided for purchase of the 111-acre property adjacent to the San Joaquin River in Stanislaus County for inclusion in the USFWS's San Joaquin River National Wildlife Refuge (NWR). The project focus is to conserve habitat for the federally endangered riparian brush rabbit; other sensitive wildlife species' populations will also benefit through its protection.

Alkali Scrub Habitat Restoration at Kern NWR

Funds were provided for the first phase of an effort to restore 5,000 acres of alkali-scrub habitat at Kern and Pixley NWRs to benefit endangered San Joaquin kit fox, Tipton kangaroo rat, and blunt-nosed leopard lizard. The restoration will assist Reclamation in meeting its requirement with the State Water Resources Control Board for the CVP Consolidated Place of Use.

Made Producing Novel Genome-Level Resources for Vernal Pool Crustaceans of Conservation Concern in California

Funds were provided to the University of California Davis to conduct research to provide genetic information to be used to assist with the conservation and recovery of the federally threatened vernal pool fairy shrimp and endangered vernal pool tadpole shrimp.



Photo shows vernal pool-and-grassland habitats at the McKinney Ranch, protected through a conservation easement to conserve populations of federally listed vernal pool species.

Central Valley Project Improvement Act Habitat Restoration Program

The CVPIA Habitat Restoration Program (HRP), managed by Reclamation and USFWS, was established under Title XXXIV, Section 3406 (b)(1) “other” of the CVPIA under the Fish and Wildlife Restoration Activities’ section. The HRP implements actions to protect, restore, and enhance special-status species and their habitats affected by the CVP. Its purposes, processes, species and habitat priorities, and implementation are identical to that of the CVPCP, and the programs are jointly managed. In 2020, HRP funds went toward the following below efforts:

Caliente Property Land Protection Project

Funds were provided for the purchase and conservation of 71 acres of the Sand Ridge in Kern County, east of Bakersfield. The property contains rare sand-dune-alkali scrub habitat, supporting one of the largest populations of endangered Bakersfield cactus. Sand Ridge supports the only known population of the San Joaquin Valley giant flower-loving fly, a species being evaluated for potential listing as endangered by USFWS. The property will become part of the Center for Natural Lands Management's Sand Ridge Preserve.

Riparian Habitat Restoration at Dos Rios Ranch

Funds were provided to River Partners for restoration of 159 acres of San Joaquin River floodplain in Stanislaus County to riparian habitat to benefit riparian brush rabbit, riparian woodrat, least Bell's vireo, and other federal-and state-listed species and species of concern.

Made Sacramento River Riparian Habitat Restoration — Boeger Tract

Funds were provided for the first phase of the restoration of 51 acres of riparian habitat at The Nature Conservancy's Boeger Tract on the Sacramento River in Colusa County. Once fully restored, the property will provide habitat for federally listed western yellow-billed cuckoo and least Bell's vireo.

Tulare Basin Endangered Species Surveys

Funds were provided to California State University Stanislaus' Endangered Species Recovery Program to survey and evaluate the potential for presence of federally listed species at Kern and Pixley NWRs in Tulare County. The surveys are part of the first phase of an effort to restore 5,000 acres of alkali-scrub habitat to assist Reclamation in meeting its habitat mitigation requirement with the State Water Resources Control Board for the CVP Consolidated Place of Use.



Riparian habitat restoration shown at Dos Rios Ranch will provide habitat for federally listed riparian species.

Enriching Recreation Opportunities

Auburn State Recreation Area and Auburn Project Lands

Working closely with the California Department of Parks and Recreation (State Parks), Reclamation met major milestones in 2020 on the Auburn State Recreation Area (SRA) General Plan/Resource Management Plan (GP/RMP). In August 2020, Reclamation signed a ROD that will guide the future development and management of Auburn SRA and Auburn Project Lands, ensuring the best possible stewardship for the benefit of all visitors.



Photo shows American River running through the Auburn SRA.

The GP/RMP is a programmatic document that outlines broad goals and guidelines for management of Auburn SRA, including resource protection and land use strategies that will serve the communities and recreating public in the long term. These actions include addressing fire prevention strategies and wildfire risk prior to new development; improving infrastructure, traffic circulation and parking issues; increasing natural and cultural resources management; and strengthening the mechanism for communicating river hazard risks to the public.

Situated in the Sierra Nevada foothills northeast of Sacramento, Auburn SRA/Auburn Project Lands include about 30,000 acres of public land set along the North and Middle forks of the

American River and welcomes nearly one million visitors annually. Recreational opportunities include hiking, swimming, boating, fishing, camping, mountain biking, gold panning, and off-highway motorcycle riding. State Parks currently manages the Auburn SRA through a managing partner agreement with Reclamation.

Reclamation also developed a preliminary five-year plan for fuel reduction management projects on Auburn Project Lands. To help reduce the threat of potential wildfire, Reclamation worked with the Auburn Area Recreation and Park District (ARD) on a goat grazing project in May 2020. The ARD Grazing Project sought to decrease fuel-or vegetation-loads on lands near Maidu Drive in Auburn, where homes meet the forest or in the urban interface. The goal was to thin lower-vegetation layers and lessen the chance for wildfire to spread into surrounding shrubs and trees. This project is also within the existing Shaded Fuel Break—a 10-year collaborative project between Reclamation, State Parks, and CalFire.

Lake Berryessa



Former Reclamation Commissioner Brenda Burman meets with Lake Berryessa employees post LNU Lightning Complex Fire.

In 2020, Reclamation finalized negotiations and coordinated the signing of a 55-year managing partner agreement with Napa County for Lake Berryessa's recreation sites. The agreement was approved in March and executed in June, with Napa County taking on management of three areas at Lake Berryessa with options to expand the area of effect over time, beginning in November 2020. The Lake Berryessa Field Office team also worked with Napa County to manage the roadside parking hazard on Knoxville Berryessa Road to improve

public safety; and a path forward was developed and is in progress. The team successfully solicited a bid for the Putah Canyon Concession Area and awarded a long-term 10-year contract to Royal Elk Resort.

In August 2020, the Lake Berryessa area was devastated by the LNU Lightning Complex Fire. The Lake Berryessa team safely evacuated all staff, day-use area visitors, concession staff, and visitors at Putah Canyon and Spanish Flat concession areas, notified Berryessa Boat Rental partner as to status, and closed and secured the field office. The Lake Berryessa Field Office maintenance and Park Ranger divisions diligently implemented defensible space protocols throughout the administrative complex and day-use areas. This attention to safety and fire prevention was largely responsible for the minimal damage the Reclamation facilities sustained from the LNU Lightning Complex fire.

New Melones Reservoir

In 2020, the New Melones Field Office created a fire management plan to include prescribed fires to reduce fuel hazards and the impact of non-native plant species on the native ecosystem. The prescribed fire was successfully completed in June, with the overall burn plan still in progress. The New Melones team also worked with Calaveras County to install “No Parking” signs on Parrots Ferry Road at Natural Bridges to ensure public safety for the visitors and its nearby residents. New Melones began using mussel-sniffing dogs in May to inspect boats on the weekends for the summer to help protect New Melones Lake from invasive-aquatic species, such as quagga or zebra mussels. The staff also provided training to boat owners on conducting their own boat inspections.



New Melones park ranger inspects boats for invasive mussels during summer 2020.

Improving Finance Practices

Final CVP Cost Allocation Study Completed

On January 14, 2020, Reclamation released the CVP Final Cost Allocation Study, marking a major regional achievement, decades in the making. The study determines how to distribute costs of the multipurpose CVP facilities to project beneficiaries. Reclamation began the process to develop a new cost allocation for the CVP in 2010, in conjunction with Western Area Power Administration, holding over 30 meetings through a fully transparent process. The final study reflects years of diligent effort and collaboration with our partner agencies, organizations and stakeholders, bringing financial certainty to water and power pricing. The CVP provides water to irrigate approximately 33% of California's agricultural land. In economic terms, the benefits of water supplies, hydropower production, flood control, and water quality generated from the CVP are valued at more than two billion annually.

The CVP creates benefits for water supply, flood control, navigation, power, fish and wildlife, recreation, and water quality needs. Like other Reclamation projects, the infrastructure investment made by Congress to build the CVP is to be repaid by the project beneficiaries. The CVP's interim cost allocation was completed in 1970, with a minor update in 1975. Reclamation was directed by Congress to complete this final cost allocation study in 1986, but had been unable to reach decisions on several key issues.

This CVP Final Cost Allocation Study will replace the 1975 interim allocation to reflect additional project construction, as well as regulatory, operational, legal, and ecological changes that have taken place over the last half century. Other federal agencies, including the Corps and USFWS, participated in the study through coordination on key issues and analyses. The final Cost Allocation Study will be reflected in rates for 2021 so that irrigation contractors, M&I contractors, and commercial power contractors have time to plan construction repayment costs due no later than the legislatively mandated deadline of 2030.



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