

RECLAMATION

Managing Water in the West

Mid-Pacific Region

2011 Report of Accomplishments



U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region

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THE MID-PACIFIC REGION

Foreword

Water supply and management present serious challenges for the water and power contractors, and other stakeholders, in the Bureau of Reclamation's Mid-Pacific Region. Much of the water supply in California and the bordering areas of Oregon and Nevada is no longer reliable. Some water systems are environmentally unsustainable. Long-term solutions are essential to the health of the state and local economies and the environmental well-being of associated natural resources. Reclamation is committed to working with our partners on long-term water supply improvements and environmental restoration in the Region.

The Mission

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.

During Fiscal Year 2011 (October 1, 2010 to September 30, 2011), the Region continued to implement strategies to improve organizational efficiency and effectiveness to deal with diverse and complex issues in a world of both changing climate and public values. The improvements were coupled with the focus on priorities of protecting human health and safety; and developing and maintaining relationships essential to accomplishing the Region's mission. Regional Director Don Glaser led the Regional Management Team's efforts at improving workload management and acquisition efforts, as well as to prepare for future needs.

The Region's newly created Program Coordination Office prioritized programs across the Region, and the newly formed Bay-Delta Office addressed issues involving the Sacramento-San Joaquin Delta. The Delta is a central focus in water supply reliability and environmental restoration for the Central Valley Project and California's State Water Project.

Through improved organizational efficiency and effectiveness, the Region successfully obligated the FY 2011 program of \$325 million. Funding was designated for maintaining water supplies; repairing water and power infrastructure; addressing environmental needs associated with project operations; and improving water efficiency, reuse and recycling.

Advances in projects and ongoing programs in FY 2011 and early FY 2012 are highlighted in this report.

Regional Director's Report on 2011: A Year of Accomplishments

Overview

The Mid-Pacific Region achieved milestones on essential projects and programs while accelerating progress toward important goals and objectives during a pivotal time in a dynamic region. Employing strategies such as proactive problem solving, innovative processes and teamwork through new partnerships, the Region demonstrated dedication to its responsibilities and commitment to short-term and long-term water supply reliability and environmental restoration.

During Fiscal Year 2011, the Region continued to address significant water challenges on multiple fronts. We have advanced major projects, funded by the 2009 American Recovery and Reinvestment Act (ARRA),

including the Red Bluff Fish Passage Improvement Project, the Battle Creek Salmon and Steelhead Restoration Project, and the Delta-Mendota Canal and California Aqueduct Intertie Project.

Through the WaterSMART program, the Region contributed millions of dollars to dozens of local water-saving projects, including water recycling and reuse efforts. We have strengthened reliability and sustainability in water management by concentrating our work on a number of river restoration activities.

In addition, through river restoration projects such as those on the San Joaquin and Trinity rivers, the Region also assumed a major role in the Secretary of the Interior's "America's Great Outdoors" initiative.

The Region's numerous 2011 accomplishments include taking steps to address climate change,



Mid-Pacific Regional Director Donald Glaser speaking at a 2011 ceremony.

advancing the restoration and mitigation goals of the Central Valley Project Improvement Act (CVPIA) and Interim Federal Action Plan (IFAP) for the San Francisco Bay/Sacramento-San Joaquin River Delta (Bay-Delta) with projects such as installation of new fish screens over intakes for water districts, and partnering to increase water storage through the Los Vaqueros Reservoir Expansion Project and Madera Ranch groundwater banking project.

2011: A Wet Year

In an above-average precipitation year, the Region worked to optimize use of water available in its 11 projects, including California's Central Valley Project..

Precipitation at eight key stations in Northern California was about 145 percent of the historic seasonal average. For the Friant Division, in the San Joaquin Valley, the precipitation total for the Huntington Lake

station was 151 percent of the historic seasonal average.

The improved hydrology and opportunities to exercise CVP operational flexibility influenced water supply availability, allowing a 100 percent allocation for all CVP water contractors, except for the South-of-Delta agricultural water service contractors (80 percent) and Friant Division Class 2 contractors (20

percent). (See page 16 for more information.)

Going into the current 2012 Water Year, WY 2011 carryover CVP storage was 9.3 million acre-feet, the third highest carryover storage on record, with six key reservoirs at 78 percent of capacity--20 percentage points above the 15-year carryover average of 58 percent and significantly higher than the WY 2010 carryover.

Infrastructure Projects for Varying Needs

The Region's achievements in managing and improving water resources for agriculture, for municipal and industrial use, and for fish and wildlife included completion of projects in the Bay-Delta -- the hub of the CVP and California's water supply system. The Region and its partners completed two fish screen intake projects and participated in a ceremony to begin construction of a groundwater bank. Reclamation provided funds for the projects, which advanced priorities identified in the IFAP and the CVPIA. The fish screens were installed at intakes for the Contra Costa Water District in the Delta and the Patterson Irrigation District, south of the Delta in the San Joaquin Valley. The Madera Irrigation District's groundwater bank is also in the San Joaquin Valley.

Reclamation continued working toward completion of a project that links two major federal and state canals in the Central Valley to improve operational flexibility and more efficiently deliver water south of the

Delta. Reclamation provided nearly \$16 million in ARRA funds, which combined with other funding sources, made it possible to break ground in October 2010 for the \$28 million project to construct an intertie between the federal Delta-Mendota Canal (DMC) and the state California Aqueduct. The project, located in Alameda County, west of Tracy, will potentially increase average annual deliveries to the CVP by as much as 35,000 acre-feet by addressing conveyance conditions in the DMC that restrict use of the nearby C. W. "Bill" Jones Pumping Plant to less than its design capacity.

The Region advanced two major fish passage projects, including the Red Bluff Fish Passage Improvement Project in northern California, a \$190 million pumping plant project that includes about \$115.5 million in funds from ARRA. The pumping plant, screened to protect fish, will convey water from the Sacramento River to the Tehama-Colusa and Corning canals. The pumping plant replaces the existing Red Bluff

Diversion Dam that creates a barrier to migrating fish, some of which are listed under the Endangered Species Act. The diversion dam gates will be placed in the open position for unimpeded migration of fish. The new pumping plant will ensure continued water deliveries to farmlands.

Reclamation advanced another major fish passage project, the Battle Creek Salmon and Steelhead Restoration Project in Northern California near Manton. The project is among the largest cold-water anadromous fish restoration efforts in North America. Facility improvements, and habitat restoration and enhancement will enable safe passage, growth and recovery for threatened and endangered Chinook salmon and Central Valley steelhead. Restoration along 48 miles of Battle Creek and its tributaries, which is on schedule for completion in 2014, includes removal of five hydropower diversion dams and construction of fish screens and ladders on three hydropower diversion dams.



Construction continued on an intertie between two major canals in California's Central Valley (pages 30-31).

**WaterSMART Programs/
Addressing Climate
Change**

Reclamation plays a key role in the WaterSMART Program as the Department of the Interior’s main water management agency. Focused on improving water conservation and helping water and resource managers make wise decisions about water use, Reclamation’s portion of the WaterSMART program is achieved through administration of grants, scientific studies, technical assistance and scientific expertise.

In 2011, the Region awarded 36 water conservation and efficiency grants through WaterSMART and other programs that totaled more than

\$13 million. Including local cost-share contributions, more than \$205 million in water management improvement projects will be implemented in the next 24 months. The projects will result in conservation or better management of an estimated 236,500 acre-feet annually.

The Region also entered into 16 new financial assistance agreements to provide more than \$5.5 million in federal cost-sharing funds for the planning of projects to reclaim and reuse wastewater. The local sponsors will provide at least 50 percent of the funding. The Region modified two existing agreements to provide about \$2.3 million for

the construction of three water reuse projects. The sponsors will provide at least 75 percent of construction costs. Of the more than \$7.8 million total awarded by the Region in 2011, nearly \$4 million came from the WaterSMART Program.

A new program to address the effects of climate change intersects with the WaterSMART program, enabling grants for studies that will benefit the Region’s climate change assessment and adaptation strategy planning capabilities. Studies also are underway to analyze options for meeting future demands within three areas of the Region: the Truckee, Klamath and Sacramento-San Joaquin Basins.

Restoration Programs

The Region and its partners advanced the San Joaquin River Restoration Program, a comprehensive, long-term effort in central California to restore more than 150 miles of the San Joaquin River below Friant Dam to create a self-sustaining Chinook salmon fishery in the river while reducing or avoiding adverse water supply

impacts from restoration flows. A second year of interim flows concluded in September 2011. Interim flow releases first began in October 2009 and the river was reconnected to the Delta in March 2010, a stretch of roughly 330 miles -- an event that had not occurred in more than 60 years without flood flow releases.

Other restoration efforts included making advancements in comprehensive, long-term projects such as the Trinity River Restoration Program in Northern California and the Habitat Management, Preservation and Restoration Plan for the Suisun Marsh near the San Francisco Bay.



Construction advanced on a major fish passage improvement project near Red Bluff (pages 26-27).

Central Valley Project Improvement Act Program

The Central Valley Project Improvement Act of 1992 amended previous authorizations of the CVP to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic uses; and fish and wildlife enhancement.

From 1993 through 2011, Reclamation and its partners have completed numerous major projects. Currently, the Region's response to the CVPIA is comprised of 23 programs that fall into broad categories that include fisheries, wildlife refuges and wildlife habitat restoration. During 2011, numerous actions across the Region assisted the natural production of anadromous fish on a sustainable basis, including placement of thousands of tons of gravel in rivers across the Region; significant allocations of water to wildlife refuges; and protection of thousands of acres of wildland habitat through conservation easements.



Secretary of the Interior Ken Salazar at an America's Great Outdoors event in Fresno (pages 70-73).

Safety of Dams Program/Joint Federal Project

Reclamation's major Safety of Dams efforts continue to be focused on modifications to Folsom Dam in our Region. In 2011, the Region and its partners, including the Army Corps of Engineers, announced the completion of the second phase of the Joint Federal Project. The JFP is the cornerstone for more than \$1 billion in dam safety and flood damage reduction improvements to further protect more than a million residents in communities downstream from Folsom Dam, which is on the American River, about 25 miles northeast of Sacramento, California.



Secretary of the Interior Ken Salazar and San Joaquin River Restoration Program Manager Alicia Forsythe in Washington, D.C. (pages 32-35).

America's Great Outdoors

Secretary of the Interior Ken Salazar and Bureau of Reclamation Commissioner Michael Connor visited two of the events that were among the many held by the Region and its partners to advance the America's Great Outdoors initiative. Secretary Salazar participated in an AGO event in Fresno, California, which focused on restoration efforts along the San Joaquin River. Commissioner Connor visited a major AGO exhibit at the California State Fair in Sacramento, California.



Reclamation Commissioner Michael Connor speaking at a ceremony in Contra Costa County (pages 38-39).

The Future: Dedication and Dedications

Looking to the rest of 2012 and beyond, the Region remains dedicated to working toward completion of other important projects and objectives as it strives to proactively meet the varying challenges of this critical era for water management.

With the momentum of 2011 continuing into 2012, the Region is expecting to dedicate three major projects. Reclamation and its partners are scheduled to hold completion ceremonies for the Delta-Mendota Canal/California Aqueduct Intertie Project, the Red Bluff Fish Passage Improvement Project, and the Los Vaqueros Reservoir Expansion Project, which increases water storage by enlarging a water district's reservoir that is used to supply municipal and industrial water to part of the San Francisco Bay Area.



Patterson Irrigation District General Manager Peter Rietkerk and Regional Director Don Glaser during a ceremony in Patterson, California (pages 40-41).

MID-PACIFIC REGION ORGANIZATION

Bureau of Reclamation

President Theodore Roosevelt signed the Reclamation Act in 1902, creating the agency that would become the Bureau of Reclamation. The agency’s initial mission: Develop and provide water for the 17 semi-arid western states. Reclamation has built 475 major structures, including Hoover Dam on the Colorado River and Shasta Dam on the Sacramento River.

Mid-Pacific Region

The Mid-Pacific Region, one of five Reclamation regions, covers the northern two-thirds of California, most of western Nevada and part of southern Oregon. The Region places great importance on fulfilling its obligations for water delivery, water conservation, water recycling and reuse, power generation, and protecting natural and cultural resources. The Region develops partnerships with customers, states, and Native American Tribes; and brings together a variety of interests to address competing needs for limited water resources.

Mid-Pacific Region Headquarters Office

The Regional Director’s Office in Sacramento is the lead office for the Mid-Pacific Region. The office includes the Regional Director and Deputy Regional Director, as well as the Assistant Regional Director for Business Services and the Assistant Regional Director of Technical Services.

Regional Headquarters Offices	
• <i>Acquisition Services</i>	• <i>Information Technology</i>
• <i>Administrative Services</i>	• <i>Planning</i>
• <i>Design and Construction</i>	• <i>Program Coordination Office</i>
• <i>Environmental Affairs</i>	• <i>Public Affairs</i>
• <i>Equal Employment Opportunity</i>	• <i>Resources Management</i>
• <i>Financial Management</i>	• <i>Safety, Health, and Security</i>
• <i>Human Resources</i>	• <i>San Joaquin River Restoration Program</i>



The Mid-Pacific Region



Mid-Pacific Region Areas and Offices

Area Offices



Klamath Basin Area Office

The office, in Klamath Falls, Oregon, operates the Klamath Project on the Oregon-California border in Oregon's Klamath County and California's Siskiyou and Modoc counties. The Klamath Project provides irrigation for more than 200,000 acres of cropland and nearly 35,000 acres of wetlands. Two main sources supply water for the project: The Upper Klamath Lake and Klamath River; and Clear Lake Reservoir, Gerber Reservoir, and Lost River, which are in a closed basin.

Northern California Area Office

The office, at Shasta Dam, north of Redding, administers Reclamation lands, water service, and water contracts from north of Sacramento to near the California-Oregon border. The office manages the Central Valley Project's Shasta-Trinity and Sacramento River divisions, which include Shasta Dam, powerplant and reservoir.

Central California Area Office

The office, at Folsom Dam, about 25 miles east of Sacramento, manages water and land resources in 12 counties, including facilities of the CVP's American River and East Side divisions, the Auburn Folsom South Unit and the Solano Project's Lake Berryessa. The office's area of responsibility encompasses Folsom Lake and New Melones Reservoir.



South-Central California Area Office

The office, headquartered in Fresno, manages Reclamation activities from the Sacramento-San Joaquin Delta, south to the Tehachapi Mountains and the southern coastal counties of Santa Barbara and Ventura, including the CVP's Delta, San Felipe and Friant divisions and the San Luis Unit. The office has jurisdiction over 2.5 million acres of irrigated land, accounting for 25 percent of Reclamation's total irrigated acreage.

Lahontan Basin Area Office

The office, in Carson City, Nevada, is responsible for the western Great Basin, with a focus on about 80,000 square miles in northern Nevada and eastern California. The area extends from the Truckee, Carson, and Walker River drainages on the eastern slope of the Sierra Nevada Mountains and covers much of northern and central Nevada. The office operates the Newlands, Washoe, Humboldt and Truckee River Storage projects.

More information on Area Offices and accomplishments:
http://www.usbr.gov/mp/area_offices.html

Specialized Offices

Central Valley Operations Office

The office, together with the California Department of Water Resources, manages the daily operations of the CVP and the State Water Project from a joint operations center in Sacramento. The center coordinates releases and Sacramento-San Joaquin Delta exports to ensure that each project achieves its share of benefit from shared water supplies and bears its share of joint obligations to protect beneficial uses.

Mid-Pacific Construction Office

The office in Willows, California, manages construction programs and performs preconstruction work, onsite construction management, and construction contract administration throughout the Mid-Pacific Region.

Bay-Delta Office

The office, created in 2010, focuses on the many issues associated with the San Francisco Bay/Sacramento-San Joaquin Delta. The Bay-Delta Office centralizes program management and staff expertise to help ensure that Reclamation effectively responds to the emerging needs of the Bay-Delta (see pages 36-37).

More information on Specialized Offices:
http://www.usbr.gov/mp/area_offices.html



The Sacramento-San Joaquin River Delta is a key element in California's water supply.

Mid-Pacific Region At a Glance

Headquarters: Sacramento, CA

Location: Northern two-thirds of CA, most of western NV, part of OR

Area Offices

- Northern, CA (Redding)
- Central, CA (Folsom)
- South-Central, CA (Fresno)
- Lahontan Basin, NV-CA (Carson City, NV)
- Klamath Basin, OR-CA (Klamath Falls, OR)

Supporting Offices

- Central Valley Operations, CA (Sacramento)
- Construction, CA (Willows)
- Bay-Delta, CA (Sacramento)

Water Projects

- CA: Central Valley, Cachuma, Orland, Santa Maria, Solano, Ventura River
- OR: Klamath
- NV: Newlands, Humboldt, Washoe, Truckee River Storage

Benefits

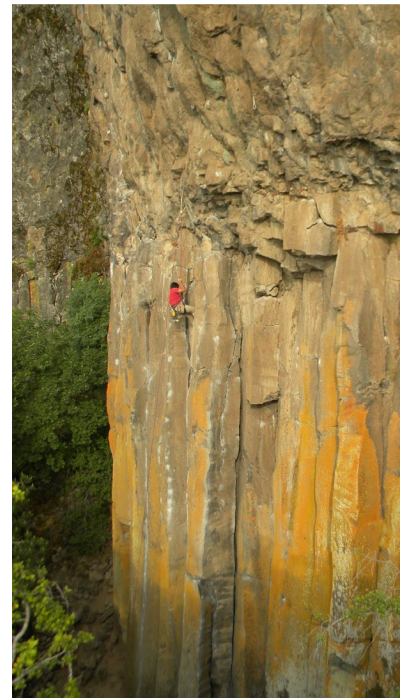
- Water for farms, municipal and industrial use; fish and wildlife
- Hydroelectricity production
- Flood control
- Recreational opportunities

Employee Photo Contest

Each year, the Region conducts an employee photo contest that draws numerous entries. Photos are submitted in four categories: Facilities, landscape, people and wildlife. Winning photos are shown on this page.



Best of Show: "Fog Creeping Over Shasta Dam," Tami Corn.



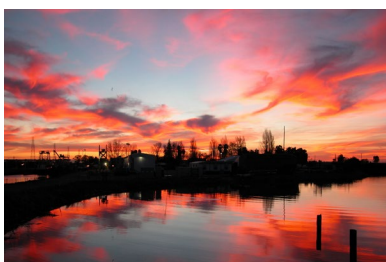
People: "Climbing," Casey Batchelder.



Honorable Mention: "Tarantula Hawk," Tracy Neal.



Above: Wildlife: "Juvenile Owl at Friant Dam," John Bohrman; Below: Facilities: "Sunrise at Tracy Fish Collection Facility," Rene C. Reyes.

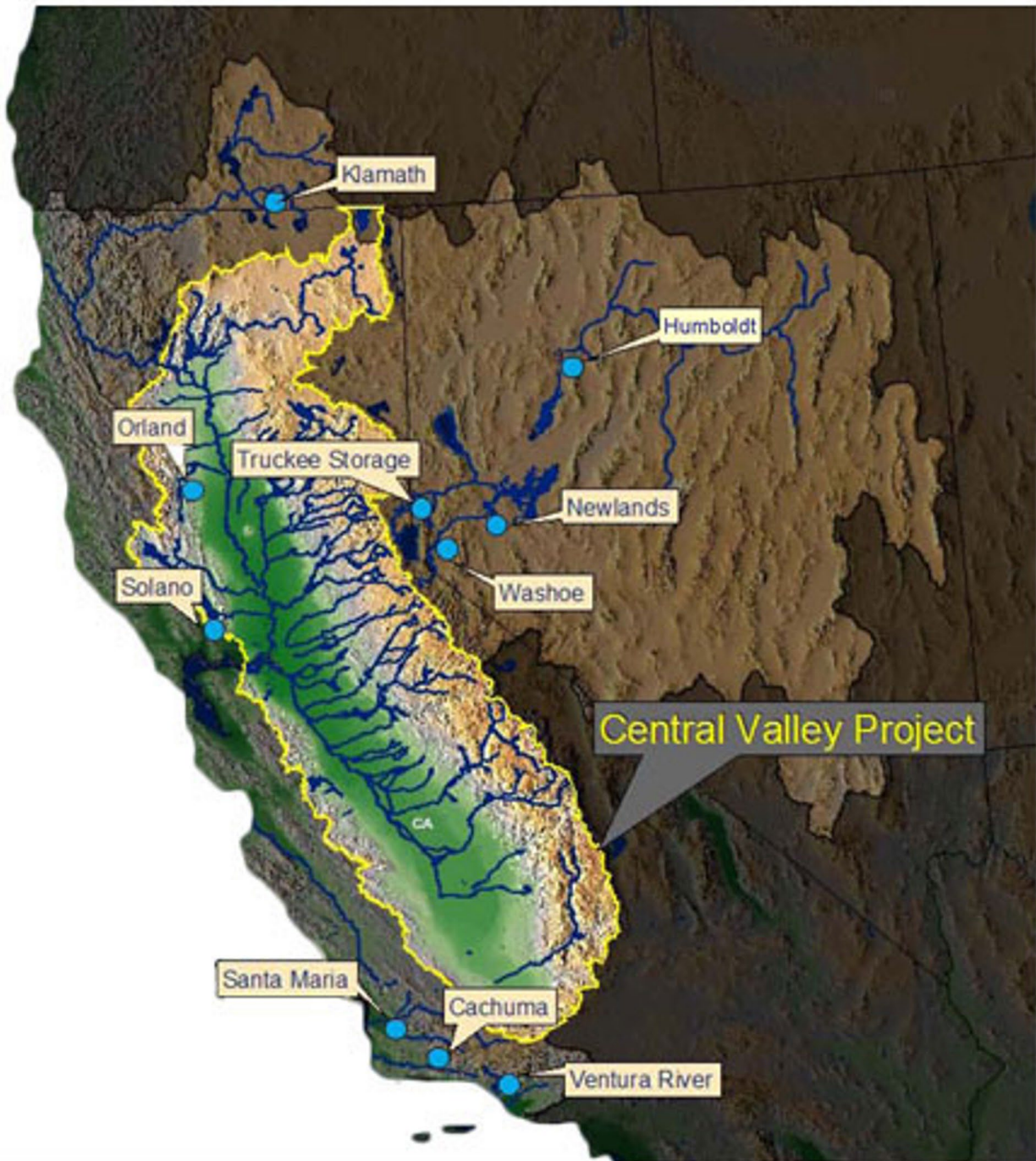


Above: Landscape: "A Colorful Reminder--Rainbow Over Lake Berryessa," Darcy Ayotte; Below left: Honorable Mention, "Keswick," John Fogerty; Below right: Honorable Mention, "Lake Berryessa Today," Mary Ellingsworth.



MID-PACIFIC REGION HIGHLIGHTS

Introduction/Overview



Mid-Pacific Region Water Projects

Eleven Water Projects Serve a Diverse Region

The Mid-Pacific Region stands out for many reasons. It includes parts of southern Oregon, western Nevada and California – a major food producer for the world, the most populous state in the nation, and a place with treasured natural resources.

With a complex system of 11 projects, the Region provides water for agricultural, municipal, industrial and environmental purposes. It is a complex process, driven by numerous factors, including hydrology, regulations, court decisions, environmental considerations, operational limits, input from other agencies and organizations, and a changing climate.

The Region's multi-purpose network of dams, reservoirs, canals, hydroelectric powerplants and other facilities include the Central Valley Project, one of the world's largest and best-known systems for storing and delivering water. Reclamation's Shasta Dam forms the CVP's largest reservoir, near Mount Shasta in Northern California.



Mount Shasta in Northern California as shown in an employee photo contest picture taken by Sheri Harral.



Shasta Dam and Reservoir in Northern California are essential to the Central Valley Project.

The Central Valley Project

Overview

The Central Valley Project extends 400 miles from the Cascade Range in the north to the Tehachapi Mountains near Bakersfield in the south. The CVP's complex, multi-purpose network of dams, reservoirs, canals, hydroelectric powerplants and other facilities across northern and central California serve agriculture, municipal and industrial needs, and fish and wildlife in the semi-arid Central Valley.

The project is a major asset to California's economy, providing water for most of the top agricultural producing counties in the nation's leading farm state. The California Department of Food and Agriculture reported in its latest California Agricultural Highlights publication that farm production in the state totals more than \$36 billion annually. Approximately a third of that production, or about \$12 billion, came from the Central Valley.



Shasta Dam and Reservoir



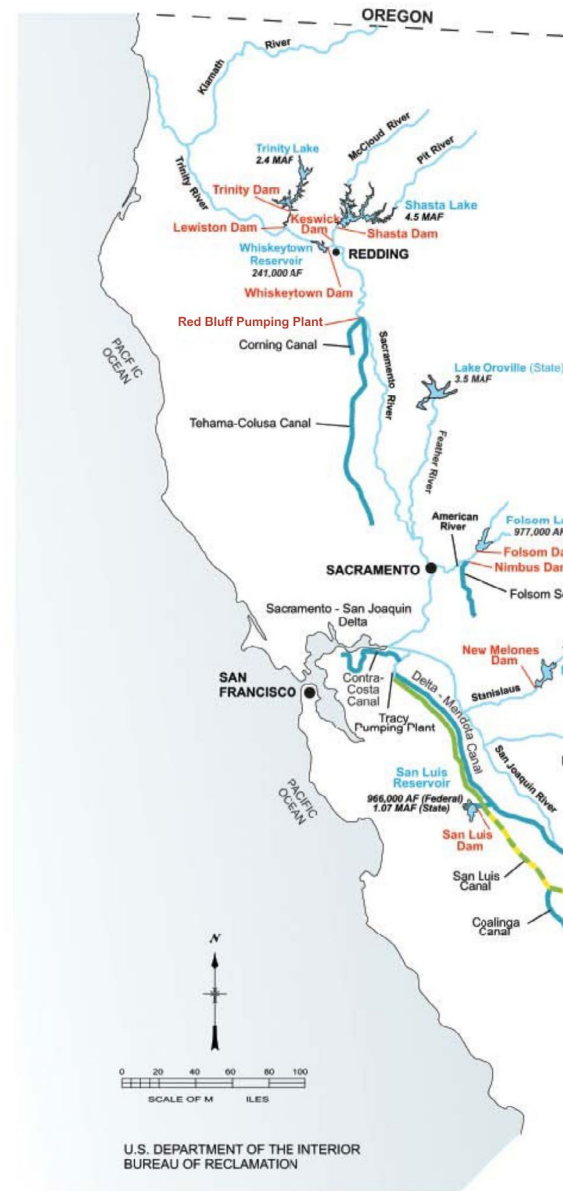
San Luis Dam and Reservoir



New Melones Dam and Reservoir



Trinity Dam and Reservoir



California's Central Valley Project

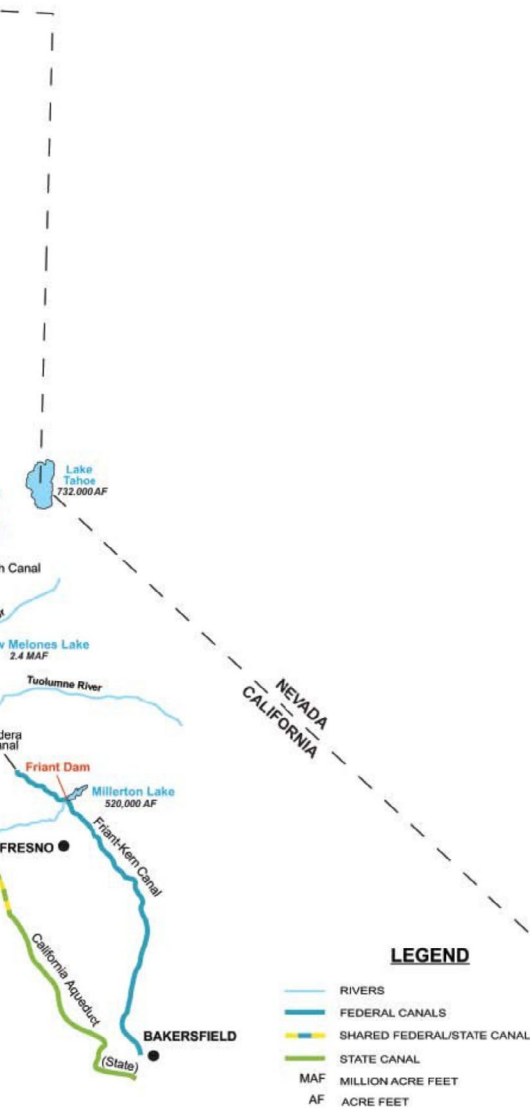


Folsom Dam and Reservoir

The project provides flood protection for the Central Valley and supplies domestic and industrial water in the valley, as well as to major urban centers in the Greater Sacramento and San Francisco Bay areas.

The project also provides water to restore and protect fish and wildlife, and to enhance water quality. It is a major source of water for 19 National Wildlife Refuges. Five of the refuges are located in the Sacramento Valley and 14 are in the San Joaquin Valley.

Construction of major CVP facilities began in 1938 with breaking of ground for Shasta Dam on the Sacramento River near Redding in Northern California. Over the next five decades, the CVP was expanded into a system of 20 dams and reservoirs that together can hold nearly 12 million acre-feet. The CVP includes 500 miles of canals and aqueducts and 11 hydroelectric powerplants. In Sacramento, the Central Valley Operations Office jointly controls, with the California Department of Water Resources, the CVP and its companion, the State Water Project.



CVP Flood Control Value

A critical role for the CVP is providing flood protection for northern California and its Central Valley, which is essential as a food source to the nation and home to millions of people. Generally, reservoirs offer flexibility by temporarily storing large flows of water that would have been damaging if not managed, and allowing gradual water release rates that downstream channels can more easily absorb. This process also partially lowers the reservoirs so the cycle can be repeated for coming storms.

Major CVP Dams and Reservoirs

Dam and Reservoir	River System	Storage Capacity (Acre-Feet)
Shasta Dam and Reservoir	Sacramento	4,552,000
Trinity Dam and Reservoir	Trinity	2,448,000
Folsom Dam and Reservoir	American	977,000
New Melones Dam and Reservoir	Stanislaus	2,420,000
Friant Dam and Millerton Reservoir	San Joaquin	520,000
San Luis Dam and Reservoir	Offstream Storage	966,000 (Federal share)



Friant Dam and Friant-Kern Canal

Wet Year

Above-average precipitation during the 2011 Water Year improved hydrological conditions throughout the Region, including California’s Central Valley Project. Precipitation at eight key stations in Northern California was about 145 percent of the historic seasonal average. For the Friant Division, in the San Joaquin Valley, the precipitation total for the Huntington Lake station was 151 percent of the historic seasonal average.

The improved hydrology and opportunities to exercise CVP operational flexibility influenced water supply availability, allowing a 100 percent allocation for all CVP water contractors, except for the South-of-Delta agricultural water service contractors, who were allocated 80 percent of their more than 1.9 million acre-feet contracted water supply. This 80 percent represented an increase of 30 percentage points from the initial allocation in February 2011 and 35 percentage points above their final allocation for 2010.

The CVP’s Friant Division contractors’ allocations, which come from Millerton Reservoir on the upper San Joaquin River, was 100 percent

of “Class 1” water (800,000 acre-feet) and 20 percent of the contracted supply of 1.4 million acre-feet of “Class 2” water (280,000 acre-feet). The first 800,000 acre-feet of water supply is considered Class 1 and any remaining water is considered Class 2. Class 1 is the supply of water in Millerton Reservoir which is available for delivery as a dependable supply. Class 2 water is made available, subject to contingencies, in addition to the supply of Class 1 water.

Going into the 2012 Water Year (October 1, 2010 to September 30, 2011), WY 2011 carryover storage in the CVP was 9.3 million acre-feet, the third highest carryover storage on record, with six key reservoirs at 78 percent of capacity--20 percentage points above the 15-year carryover average of 58 percent and significantly higher than the WY 2010 carryover.

The measurement of total reservoir storage was the combined amount of water remaining at the end of WY 2011 in Shasta, Trinity, Folsom, New Melones and Millerton reservoirs and the federal share of the joint federal-state San Luis Reservoir.

CVP Reservoir Capacities and End of Water Year 2011 Storage In Million Acre-feet								
Reservoirs	Annual Storage Comparisons						15-Year Average Storage 1996-2011	
	CVP Reservoirs and Capacities	2011	% of Capacity	% of Average	2010	% of Capacity	% of Average	Average
Shasta, 4.552	3.3	73	124	3.3	73	124	2.7	59
New Melones, 2.42	2.1	85	128	1.3	53	81	1.6	66
Trinity, 2.448	2.2	89	135	1.6	65	100	1.6	65
Folsom, .977	.74	76	135	.62	63	113	.55	56
Millerton, .52	.36	68	148	.25	48	104	.24	46
Federal San Luis, .966	.64	67	268	.37	38	154	.24	24
Total, 11.8	9.3	78	135	7.4	63	107	6.9	58

Comparison of Previous End-of-Storage (million acre-feet)					
2011	2010	2009	2008	2007	1997 (Lowest Carryover)
9.3	7.4	4.8	4.1	5.5	1.5

CVP Facilities

Central Valley Project facilities include reservoirs on several rivers, including the Trinity, Sacramento, American, Stanislaus and San Joaquin rivers.

Beginning in Northern California, water from the Trinity River is stored in Trinity Lake, Lewiston Lake and Whiskeytown Reservoir, then diverted through a system of tunnels and powerplants into the Sacramento River for the Central Valley. In addition to the Trinity system, water is stored in two major facilities -- Shasta and Folsom reservoirs. Water from these reservoirs, and others operated by the State Water Project and local water rights holders, flows into the Sacramento River. Some CVP contractors divert water directly from, or immediately below, the dams' outlets. Other CVP contractors, Sacramento River water rights contractors, and water rights holders divert water directly from the Sacramento and American rivers.

The Sacramento River carries water to the Sacramento-San Joaquin Delta where the C.W. "Bill" Jones Pumping Plant at the southern end of the Delta lifts water into the Delta-Mendota Canal. The canal delivers water to CVP contractors and exchange contractors on the San Joaquin River and water rights contractors on the Mendota Pool. The CVP water is also conveyed to the San Luis Reservoir for deliveries to CVP contractors through the San Luis Canal. Water from the San Luis Reservoir is also conveyed through the Pacheco Tunnel to CVP contractors in Santa Clara and San Benito counties. Throughout the project, CVP canals also deliver water to wildlife refuges.

Water is also delivered to wildlife refuges in accordance with programs to restore and protect wildlife.

The CVP delivers water from Friant Dam on the San Joaquin River to CVP contractors serviced by the Madera and Friant-Kern canals. Water is stored in New Melones Reservoir for water rights holders in the Stanislaus River watershed and CVP contractors in the northern San Joaquin Valley.

The CVP and the separate State Water Project both convey water in the Sacramento River and the Delta. The CVP reservoir operations are coordinated to obtain maximum yields and deliver water into the main river channels and canals of the project in the most efficient and environmentally sensitive manner.

CVP irrigation and municipal water is delivered in accordance with long-term contracts negotiated with irrigation districts, cities, and other users. Water is also delivered to wildlife refuges in accordance with programs to restore and protect wildlife.

CVP Divisions and Units

The complex operations of the CVP are organized into divisions and units:

- American River Division
- Delta Division
- East Side Division, New Melones Unit
- Friant Division
- Sacramento River Division, Sacramento Canals Unit
- San Felipe Division
- Shasta-Trinity River Divisions
- West San Joaquin Division, San Luis Unit

More information: http://www.usbr.gov/projects/Project.jsp?proj_Name=Central+Valley+Project.

Major CVP Canals		
Canal	Length (miles)	Capacity (cubic feet per second)
Corning	21.0	500
Tehama-Colusa	110.9	2,530
Contra Costa	47.7	350
Folsom South	26.7	3,500
Delta-Mendota	117.0	4,600
Friant-Kern	151.8	5,000
Madera	35.9	1,250
Coalinga	11.6	1,100
San Luis (Joint Federal/State)	102.5	13,100

CVP's Tracy Fish Collection Facility

The Tracy Fish Collection Facility is a system of louvers, bypasses and holding tanks operated to protect and salvage fish from the operations of the nearby C.W. "Bill" Jones Pumping Plant.

The facility collects Delta fish species as a primary mitigation feature for the pumping plant and returns them to the Delta. Threadfin shad, striped bass, and American shad made up the bulk of the collection. There are about 50 species of fish collected at the facility, including listed species such as the Delta smelt, winter-run and spring-run Chinook salmon, steelhead and green sturgeon.

CVP's Delta Pumping Plant

The C.W. "Bill" Jones Pumping Plant at the southern end of the Sacramento-San Joaquin Delta lifts water into the Delta-Mendota Canal. The plant can pump 4,300 cubic feet per second, which is about 2 million gallons per minute or 8,500 acre-feet per day. The canal delivers water to CVP water service contractors, exchange contractors, and wildlife refuges. The CVP water is also conveyed with pumping units to the San Luis Reservoir for deliveries to CVP contractors through the San Luis Canal.



The Tracy Fish Collection Facility protects fish natural to the Sacramento-San Joaquin Delta from the nearby C.W. "Bill" Jones Pumping Plant.

CVP's Water Deliveries

The CVP's water comes from rain and runoff from the Sierra Nevada Mountains snowpack flowing into reservoirs. Releases from dams pass through rivers and canals to the Central Valley, serving contractors in the northern half, referred to as the Sacramento Valley, and the southern half, known as the San Joaquin Valley.

Providing CVP water for agricultural, municipal and industrial, and environmental purposes is a complex process, driven by numerous factors, including hydrology, regulations, court decisions, environmental considerations, input from other agencies and organizations, and operational limitations.



Almond orchard along the west San Joaquin Valley.



The CVP has long-term agreements to supply water to more than 250 contractors in 29 of California's 58 counties. Deliveries by the CVP include providing an annual average of 5 million acre-feet of water for farms; 600,000 acre-feet of water for municipal and industrial uses (enough water to supply about 2.5 million people for a year); and water for wildlife refuges and maintaining water quality in the Delta.

CVP's Agricultural Benefits in 2011

The CVP's annual agricultural benefits can be measured at least two ways. Farm-related jobs totaled more than 210,000 in counties served by the CVP, according to the latest figures reported by the California Department of Employment Development. In addition, the California Department of Food and Agriculture reported the following agricultural production on acreage served by the CVP:

- Acreage serviced, 3 million
- Principal crops, 24 million tons
 - Field crops, 10 million tons
 - Vegetable/melons, 9 million tons
 - Fruit/nut crops, 5 million tons
- Largest producing counties include:
 - Fresno: Grapes, almonds, poultry, dairy, tomatoes
 - Tulare: Oranges, cattle, grapes, alfalfa, dairy
 - Kern: Grapes, citrus, almonds, carrots, dairy
 - Merced: Chickens, almonds, cattle, potatoes, dairy
 - Stanislaus: Almonds, chickens, cattle, dairy
 - San Joaquin: Grapes, walnuts, cherries, almonds, dairy
 - Kings: Dairy, cotton, cattle, alfalfa, tomatoes

CVP's Support of Wildlife Refuges

The CVP, under terms of the Central Valley Project Improvement Act, delivers water for 19 wildlife refuges in the Sacramento and Joaquin valleys. The refuges provide wetlands habitat, and are essential resting and feeding areas for migratory birds on the Pacific Flyway.

In the Sacramento Valley, there are five refuges: the Sacramento, Delevan, Colusa and Sutter national wildlife refuges, and the Gray Lodge Wildlife Area.

The San Joaquin Valley refuges total 14. There are seven in the San Luis National Wildlife Refuge Complex, the San Luis, West Bear Creek, East Bear Creek, Freitas and Kesterson units, the Merced National Wildlife Refuge, and the Los Banos Wildlife Area; in the North Grasslands Wildlife Area Complex, there are five refuges, the China Island and Salt Slough units, the Mendota and Volta wildlife areas, and the Grasslands Resource Conservation District; and in the Tulare Lake Basin, there are two refuges, the Kern and Pixley national wildlife refuges.

CVP Hydroelectric Power Production and Benefits

There are 11 hydroelectric powerplants in the CVP with a combined capacity of about 2,100 megawatts. A megawatt is enough to supply nearly 1,000 homes.

CVP powerplants produce about 4.5 million megawatt hours in an average water year. (A megawatt hour is continuous production of one megawatt over an hour.) Because of the wet winter, high runoffs and high reservoir levels, by the end of Fiscal Year 2011, the CVP produced more than 5 million MWh.

About a third of the electricity generated by the CVP is used for pumping water throughout the project. The rest is made available to the Western Area Power Administration for sale and distribution in the western United States.

CVP Powerplants and Capacities (in megawatts)

Northern California Area Office (NCAO)

Shasta Dam	710 MW
Trinity Dam	140 MW
Judge Francis Carr	154 MW
Spring Creek	180 MW
Keswick Dam	105 MW
Lewiston Dam	.350 MW

Central California Area Office (CCAO)

Folsom Dam	207 MW
Nimbus Dam	17 MW
New Melones Dam	383 MW

South-Central California Area Office (SCCAO)

O'Neill	14.4 MW
San Luis	202 MW

A view inside the powerplant at Shasta Dam.

Other California Projects

Northern California

Orland

The Orland Project, which is located in the Sacramento Valley, about 100 miles north of Sacramento, collects runoff from the eastern Coast Range. The project provides irrigation water to about 20,000 acres of farmland. The project is comprised of East Park Dam on Little Stony Creek, and Stony Gorge Dam on Stony Creek. It also includes Rainbow and Northside diversion dams.



East Park Dam

Central California

Solano

The Solano Project, which is located northeast of San Francisco Bay on Putah Creek, collects runoff from the eastern Coast Range. The project provides irrigation water to about 95,000 acres of farmland and municipal and industrial water to the cities of Vallejo, Vacaville, Fairfield, Benicia and Suisun. The project is comprised of Lake Berryessa, behind Monticello Dam. It also includes Putah Diversion Dam, Putah South Canal, Green Valley Conduit and Terminal Dam and Reservoir.



Monticello Dam, with Glory Hole Spillway

Three California Seacoast Projects: Capturing Seasonal Floodwaters for Beneficial Uses

Cachuma

The Cachuma Project is located near Santa Barbara on the Santa Ynez River. The project provides irrigation water for about 35,000 acres of farmlands and municipal and industrial water for the cities of Santa Barbara, Goleta, Montecito and Carpinteria. The project is comprised of Lake Cachuma behind Bradbury Dam, Lauro Dam and Reservoir, Ortega Dam and Reservoir, Carpinteria Dam and Reservoir, Glen Anne Dam and Reservoir, Tecolote Tunnel, South Coast Conduit and Sheffield Tunnel.



Bradbury Dam

Santa Maria

The Santa Maria Project is located about 150 miles northwest of Los Angeles on the Cuyama River. The project provides irrigation water for about 35,000 acres of farmland. It is comprised of Twitchell Dam and Reservoir.



Twitchell Dam and Reservoir

Ventura River

The Ventura River Project is located about 60 miles northwest of Los Angeles on the Ventura River. The project provides irrigation water to about 7,000 acres of farmland and supplies water to about 60,000 municipal and industrial users. It is comprised of Casitas Dam and Reservoir, Robles Diversion Dam and Fish Passage Facility, and Robles-Casitas Canal.



Casitas Dam and Reservoir



Lahontan Basin map

Nevada Projects

Newlands

The Newlands Project is located in western Nevada and the eastern Sierra Nevada Mountains of California. The project provides irrigation water from the Truckee and Carson rivers for about 57,000 acres of farmland in the Lahontan Valley, near Fallon and Fernley, in western Nevada. The project also serves the Pyramid Lake Paiute Indian Tribe. It is comprised of the Lahontan Dam and Reservoir, Lake Tahoe Dam, Derby Diversion Dam, Truckee Canal and Carson River Diversion Dam.



Lahontan Dam and Reservoir

Washoe

The Washoe Project is located in west-central Nevada and eastern California. The project provides water from the Truckee and lower Carson rivers to benefit fish and wildlife. It is comprised of Prosser Creek Dam and Reservoir, Stampede Dam and Reservoir, Marble Bluff Dam and Pyramid Lake Fishway.



Prosser Creek Dam and Reservoir



Truckee

The Truckee Storage Project is located in western Nevada on the Little Truckee River. The project provides irrigation water for about 29,000 acres of farmland in Truckee Meadows, surrounding Reno and Sparks. It is comprised of Boca Dam and Reservoir.



Boca Dam and Reservoir

Humboldt

The Humboldt Project is located in northwestern Nevada, near Lovelock, on the Humboldt River. The project provides irrigation water for about 45,000 acres of farmland. It is comprised of the Rye Patch Dam and Reservoir.

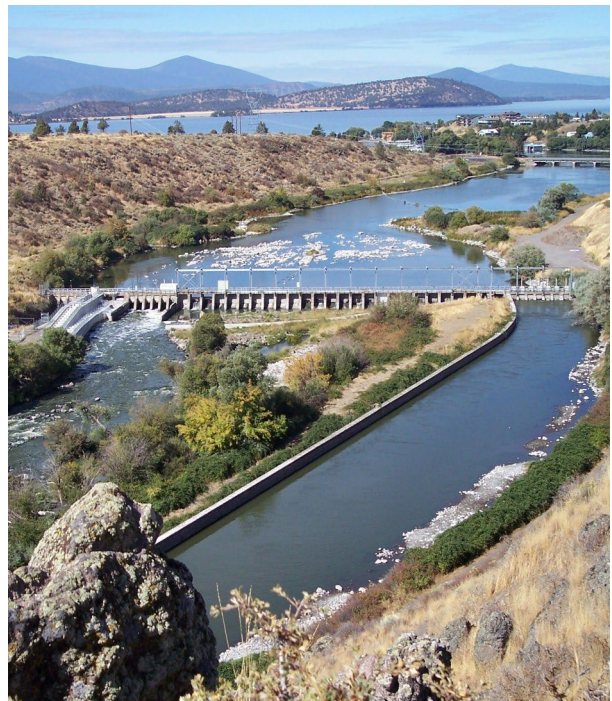


Rye Patch Dam and Reservoir

Oregon Projects

Klamath

The Klamath Project is located in southern Oregon and northern California. The project provides water from the Klamath River and Lost River for irrigation of about 210,000 acres of farmland. It is comprised of Clear Lake Dam and Reservoir, Gerber Dam and Reservoir, Link River Dam, Lost River Diversion Dam, Anderson-Rose Diversion Dam, Malone Diversion Dam, Miller Diversion Dam, Tule Lake Tunnel and Klamath Straits Drain.



Link River Dam

Wildlife Refuges

The Region's Oregon and Nevada water projects support numerous wildlife refuges. The Klamath Project provides water to four National Wildlife Refuges: Lower Klamath, Tule Lake, and Clear Lake Refuges in California; and Upper Klamath Refuge in southern Oregon. The Nevada projects provide water to Stillwater and Fallon National Wildlife Refuges. More information: <http://www.usbr.gov/recreation/wildlife.html>

Recreation

The Region has more than 60 recreation areas, including reservoirs, campgrounds, wildlife refuges, hiking trails and fish hatcheries.

The facilities provide a wide range of recreation opportunities such as boating, camping, picnicking, horseback riding, hiking, fishing, biking, rock climbing, sightseeing and viewing of wildlife.

Their locations range from areas near cities to rugged, remote sites. Some are managed by the Region; others by federal, state and local government partners, among them, the California Department of Parks and Recreation, the Nevada Division of State Parks, the California Department of Fish and Game, and the U.S. Forest Service.

The Region directly manages six areas:

- Agency Ranch Lake (Klamath Basin Area Office).
- East Park Reservoir and Stony Gorge Reservoir (Northern California Area Office).
- Folsom-South Canal Recreation Trail, Lake Berryessa and New Melones Lake (Central California Area Office).

The Region's other major recreational sites include:

- Lake Shasta in Northern California near Redding.
- Millerton Lake in the Sierra Nevada Mountain foothills near Fresno.
- Folsom Lake, Lake Natoma, the Auburn Project Lands and Lake Clementine near Sacramento.
- San Luis Reservoir near Los Banos, California.
- Boca Reservoir near Truckee, California.
- Rye Patch Reservoir near Lovelock, Nevada.

The Region's recreational and educational offerings include the American River Water Education Center near Folsom Lake in Central California. The center's mission is to increase the public's knowledge of the American River watershed -- both the natural features and human interactions within the watershed. The center shows individuals how they can actively participate in resource conservation and informs them about Folsom Dam's multiple roles in meeting water needs for agriculture, cities and industries, and the environment.

More information: www.recreation.gov



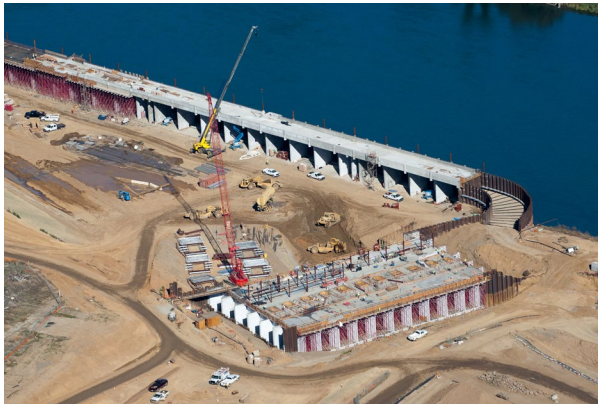
Water skiing on the Boca Reservoir near Reno, Nevada.

MAJOR PROJECTS/ PROGRAMS ADVANCE

Red Bluff Fish Passage Improvements

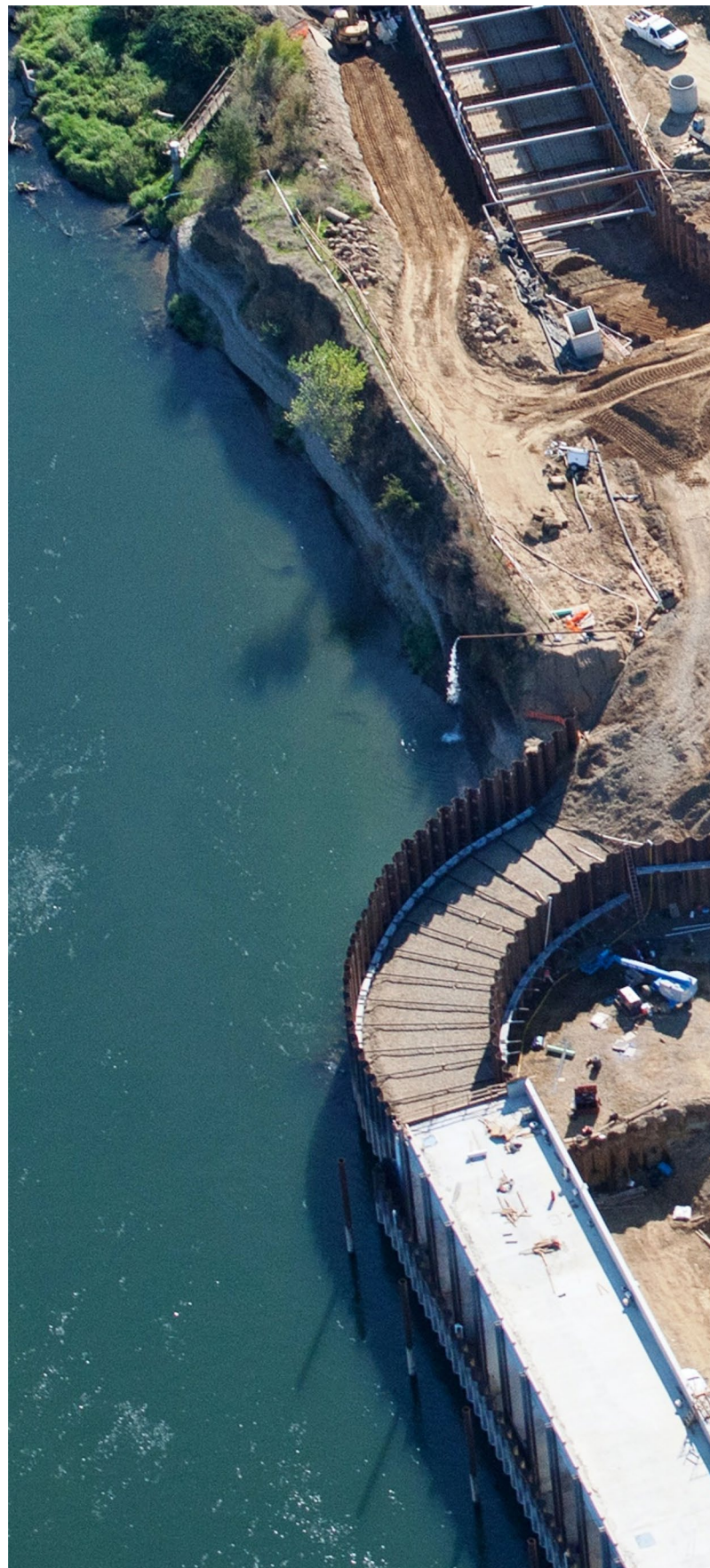
The Region worked throughout 2011 on construction of the Red Bluff Fish Passage Improvement Project, which was begun in 2010 and is scheduled for completion in 2012.

The \$190 million in funding for the project includes \$115.5 million from the 2009 American Recovery and Reinvestment Act, the largest single outlay of ARRA funding in the nation by the Department of the Interior.



Fish screen and pumping plant at the Red Bluff project.

The project, near Red Bluff in Northern California, involves construction of a pumping plant, screened to protect fish, which will convey water from the Sacramento River to the Tehama-Colusa and Corning canals. The improvement is required under the Central Valley Project Improvement Act of 1992.



Aerial view of the Red Bluff fish passage project shows major elements.



The pumping plant will replace the existing Red Bluff Diversion Dam, which creates a barrier to migrating fish, some of which are listed under the Endangered Species Act. The diversion dam gates will be permanently placed in the open position for free migration of fish. The new pumping plant will ensure continued water deliveries to 150,000 acres of farmland throughout a four-county area, served by 17 water districts.

During 2011, construction progressed on key components such as the pumping plant intake; the pumping plant itself, which will have an initial pumping capacity of 2,000 cubic feet per second; an 1,118-foot-long fish screen structure; a canal siphon; and a 660-foot-long bridge that will allow maintenance workers access to the project.

More information: <http://www.usbr.gov/mp/rbfish/>



The extensive size of the project shows in this aerial view.

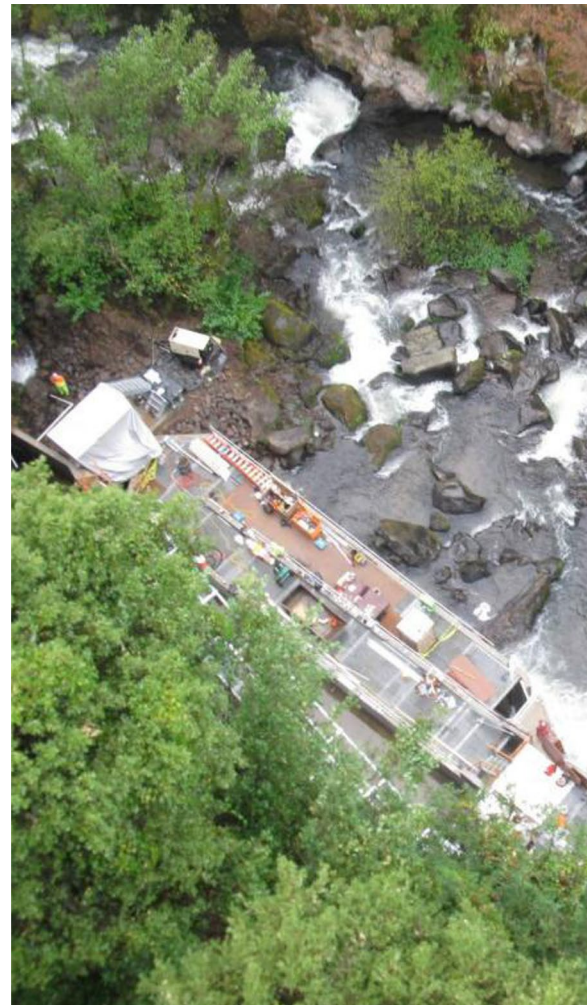
Battle Creek Salmon and Steelhead Restoration Project

During 2011, the Region advanced the Battle Creek Salmon and Steelhead Restoration Project, which is among the largest cold-water anadromous fish restoration projects in North America. The project is an effort to increase threatened and endangered Chinook salmon and Central Valley steelhead trout populations by restoring about 48 miles of habitat — 42 miles in Battle Creek and another six miles in its tributaries, while maintaining renewable energy production at the Battle Creek Hydroelectric Project, owned and operated by the Pacific Gas and Electric Company.

Restoration, begun in 2010 and scheduled for completion in 2015, is being accomplished in three phases, primarily through the removal of five diversion dams, placement of screens and ladders on three other diversion dams, and increasing stream flows, all within Tehama and Shasta counties in Northern California.

The following is a progress report on phases of the project:

- Phase 1A: With the removal of Wildcat Diversion Dam in 2010, about 15 miles of stream habitat was restored for Chinook salmon and Central Valley steelhead trout. The majority of fish screen and ladder construction was completed on the North Battle Creek Feeder and Eagle Canyon Diversion Dams in 2011. (Upon full completion in 2012-13, an additional nine miles of stream habitat will be restored. Asbury-Baldwin Creek barrier weir design efforts proceeded in 2011 and construction is scheduled to begin in late 2012, thereby completing all of Phase 1A by the end of 2013 and restoring 25 miles of stream habitat.)
- Phase 1B: Construction of the Inskip Powerhouse discharge outlet and a bypass to Coleman Canal on the South Fork of Battle Creek (to prevent mixing of north and south fork waters) continued throughout 2011. Phase 1B construction is expected to be completed by the end of 2012.
- Phase 2: Agreements to receive funding from the state of California for the final phase were drafted and reviewed in 2011. The funding will support the installation of a fish screen and ladder on Inskip Diversion Dam, installation of a South Powerhouse discharge outlet connector, and removal of Lower Ripley Creek Feeder, Soap Creek Feeder, and Coleman and South Diversion Dams. Phase 2 construction is scheduled to occur from 2013 to 2015. Upon completion of Phase 2, 23 more miles of stream habitat will have been restored.





Via a Memorandum of Understanding (MOU), signed in June 1999, Reclamation, the National Marine Fisheries Service, U.S. Fish and Wildlife Service, the California Department of Fish and Game (DFG) and PG&E initiated work on the project. In addition to the MOU partners, the project has been developed in collaboration with various resource agencies, including the California Wildlife Conservation Board (WCB), and in conjunction with participation from the public, stakeholders, and landowners, including the Greater Battle Creek Watershed Working Group and the Battle Creek Watershed Conservancy.

The project is being supported with federal, state and private funding. The American Recovery and Reinvestment Act of 2009, the CALFED Bay-Delta Program, and the Iron Mountain Mine Trustee Council are contributing federal funds; the DFG, the WCB, and the California Department of Transportation are contributing state funds; and the Packard Foundation (via The Nature Conservancy) is contributing private funds. Additional state funding is anticipated from the California Department of Water Resources. PG&E is contributing in the form of foregone energy generation, voluntarily pursuing amendments to the Battle Creek Hydroelectric Project's federal energy generation license, and transferring certain water rights to DFG.

More information: <http://www.usbr.gov/mp/battlecreek/>



Fish Returning to Battle Creek

Reclamation and its partners in the Battle Creek restoration project announced in November 2011 that larger numbers of threatened Chinook salmon have returned to spawn upstream in newly restored habitat on North Fork Battle Creek. The development signifies that the goal of increasing anadromous fish populations is already starting to be achieved as work continues on the overall project.

Fish monitoring reports in fall 2011 showed more than four times the number of spring-run Chinook salmon redds (nests) were seen further upstream in North Fork Battle Creek, above where Wildcat Diversion Dam once stood, than in previous years. In the past decade, an average of about 7 percent of the redds were upstream of the dam. In 2011, 33 percent of the redds were upstream of the former dam site.

Center photographs: *Top*: Shows new fish screen and ladder structure adjacent to the existing Eagle Canyon Diversion Dam. *Bottom*: Crews work on stairs and a walkway that provide access to the facility.

Delta-Mendota Canal/California Aqueduct Intertie Project

Crews worked throughout the year toward completion of the Delta-Mendota Canal/California Aqueduct Intertie Project, which will link the two Central Valley canals to improve water supply reliability south of the Sacramento-San Joaquin Delta.

Although the \$28 million project is relatively small compared to many other water infrastructure improvements, the benefits are significant. U.S. Senator Dianne Feinstein of California, Secretary of the Interior Ken Salazar, Bureau of Reclamation Commissioner Mike Connor and other leaders attended the groundbreaking ceremony in October 2010, emphasizing that the project adds operational flexibility and more efficient delivery of water in an area with a limited supply.

Reclamation provided nearly \$16 million in ARRA funds, which combined with other funding sources, made it possible to begin construction. Reclamation's partners in the project are the San Luis and Delta-Mendota Water Authority and the California Department of Water Resources.

The Intertie, located in Alameda County, west of Tracy, will potentially increase average annual deliveries to the Central Valley Project (CVP) by as much as 35,000 acre-feet by addressing conveyance conditions in the Delta-Mendota Canal (DMC) that restrict use of the nearby C. W. "Bill" Jones Pumping Plant to less than its design capacity.

The DMC receives water pumped by the Jones plant and is the primary federal delivery facility sending water to CVP contractors



Motors and pumps are installed in the pumphouse.



Top: Shows construction of the pump station at the Delta-Mendota Canal end of the Intertie Project.



south of the Delta. The State Water Project’s California Aqueduct operates in much the same way.

The Intertie is being constructed at a point where the canals are just 500 feet apart. They will be linked via two 108-inch diameter pipelines. The tie will allow more conveyance to storage south of the Delta, provide redundancy in the distribution system in case of emergency, and make maintenance and repair work less disruptive to water deliveries.

During 2011, workers removed a section of the DMC’s concrete liner, installed a cofferdam, and constructed an underground sump structure to collect and channel water from the canal. Above ground, workers erected a pump house and installed four sets of 1,000-horsepower motors and pumps, each with a capacity of 117 cubic feet per second (cfs). Crews also constructed a 4.5-mile overhead 69-kilovolt power transmission line from a Tracy substation to the site.

On the California Aqueduct side of the project, workers installed a cofferdam in May 2011, then removed a section of concrete liner and excavated about 25 feet for a turnout structure. Crews completed the structure’s two reinforced concrete bays and began laying twin pipes to connect the canals.

The state canal is 50 feet higher than the federal canal. When the Intertie is complete in 2012, operators will be able to pump 468 cfs of water uphill from the federal canal to the state canal. In reverse operation, up to 900 cfs of water can be conveyed from the state canal to the federal canal via gravity flow.

More information: <http://www.usbr.gov/mp/intertie/index.html>



Bottom: Shows construction of the turnout at the California Aqueduct end of the Intertie Project.



A view from inside the Intertie pump house looking out at pipe support structures.

San Joaquin River Restoration Program

The San Joaquin River Restoration Program is a comprehensive, long-term effort to restore flows to the San Joaquin River from Friant Dam to the confluence of the Merced River in Central California, in order to create a self-sustaining Chinook salmon fishery in the river while reducing or avoiding adverse water supply impacts from restoration flows.

Primary Goals

There are two primary goals: Restoration and water management. The restoration goal is to restore and maintain fish populations 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. The water management goal is to reduce or avoid adverse water supply impacts to all of the Friant Division long-term water contractors that may result from interim and restoration flows. Federal participation in the program is mandated under the San Joaquin River Restoration Settlement Act, part of the Omnibus Public Land Management Act of 2009.

Interim Flow Releases

The second year of interim flows concluded September 30, 2011. Interim flow releases first began in October 2009 and the San Joaquin River was reconnected to the Sacramento-San Joaquin Delta in March 2010, a stretch of roughly 330 river miles -- an event that had not occurred in more than 60 years without flood flow releases. During 2011, data collection continued in support of interim flows, including water temperature, groundwater levels, sediment, water quality, dissolved oxygen and biological studies.

Seepage management activities that supported interim flows included:

- Updating the Seepage Management Plan to incorporate landowner feedback on thresholds and operations.
- Working on a process for selecting and installing projects and beginning development with landowners of a Seepage Project Handbook to document the process.
- Continuing to monitor shallow groundwater wells to address seepage concerns and installing an additional 35 wells in Water Year 2011 to expand the groundwater monitoring network to 146 wells on public and private property to better understand changes in shallow groundwater conditions in response to interim flow releases.



The San Joaquin River in Central California.

Additional Highlights of 2011

Other developments during Fiscal Year 2011 included:

- A Draft Program Environmental Impact Statement/Report was released for public comment and hearings were conducted within the study area and Sacramento.
- Allocated more than 680,000 acre-feet and delivered more than 350,000 acre-feet of Recovered Water Account water to date, of which 480,000 acre-feet was allocated in 2011.
- Recaptured and recirculated more than 29,600 acre-feet of Interim Flows in 2011.
- Information continued to be collected on some of the major constraints in the river channel to fish reintroduction and on what actions will need to be implemented prior to and during reintroduction of salmon.
- The program entered into a financial assistance agreement with the Henry Miller Reclamation District (San Luis Canal Company) for the environmental compliance and design aspects of a fish passageway and modifications to Sack Dam and a fish screen on the Arroyo Canal.
- Reclamation awarded the San Joaquin River Parkway and Conservation Trust a grant to help fulfill the invasive vegetation monitoring and management commitments as part of the interim flow project.
- The SJRRP was one of 17 recipients of the Partners in Conservation Award from the Department of the Interior for its extensive collaborative efforts.

Several other documents were released throughout the year in support of various projects and activities across the program.

Reclamation released:

- An updated Seepage Management Plan coordinated with landowners.
- A Draft 2011 Annual Technical Report summarizing monitoring and analysis results to date related to interim flows.
- A Draft Monitoring and Analysis Plan presenting studies, monitoring network changes, and development of analytical tools scheduled for 2012 implementation of the interim flows.
- A public draft Feasibility Report and Environmental Assessment for the Friant-Kern Canal Capacity Restoration project.
- A final Environmental Assessment and Finding of No Significant Impact for the recirculation of recaptured Water Year 2012 SJRRP Interim Flows.



During 2012

The third year of interim flows began October 1, 2011. The program expects to complete the Friant-Kern Canal Capacity Restoration Feasibility Study and begin construction on the project in 2012. The Friant-Kern Canal Reverse Flow Pumpback and Madera Canal Capacity Restoration Feasibility Studies are anticipated for public review in 2012.

In addition, under the program in Fiscal Year 2012:

- Close monitoring of the shallow groundwater table will continue and the Region will continue to work closely with landowners to address potential seepage concerns.
- Draft environmental documents will be released for public comment on two high priority projects that will significantly improve the ability to move water through the river system and sustain fish habitat.
- Several pilot projects and studies will be conducted as part of the monitoring and analysis required to address areas where more information is needed in order to make the best decisions for the successful habitat restoration and reintroduction of fish to the river.

Challenges

Monitoring and adjusting flows related to seepage will continue to be a primary focus for the program as the Region continues to work with the communities and landowners to address concerns and begin installing projects to help address seepage challenges. Data from groundwater monitoring wells from the first two years of interim flows is being analyzed and is helping determine what channel improvements and mitigation measures are needed for the successful reintroduction of salmon.

Looking Ahead

For the next two years, program activities will focus on continuing interim-flow operations and data collection. Smaller channel improvements and other mitigation projects will be implemented to allow for higher flows and the Arroyo Canal Fish Screen and Sack Dam Fish Passage project will be constructed.

More information: <http://www.restoresjr.net>

Program Wins Award

Secretary of the Interior Ken Salazar selected the Mid-Pacific Region's San Joaquin River Restoration Program as one of 17



Center photos: *Top*: Reclamation's Technical Service Center installed a fish trap at the Hills Ferry Barrier. If adult salmon are captured, they can be tagged and followed with telemetry equipment; *Bottom*: The Hills Ferry Barrier is installed seasonally across the San Joaquin River at the confluence of the Merced River.



recipients for the 2011 Partners in Conservation Awards for its outstanding conservation, collaboration, cooperation and communication achievements. The award recognizes efforts toward the Department of the Interior’s priorities of widespread engagement of youth, tribes, local communities and states, other federal agencies, business and industry, private for-profit and non-profit institutions, and private landowners.



Secretary of the Interior Ken Salazar congratulates San Joaquin River Restoration Program Manager Alicia Forsythe on a 2011 Partners in Conservation Award during a ceremony in Washington, D.C.

Hills Ferry Barrier

Every fall, the California Department of Fish and Game constructs the Hills Ferry Barrier on the San Joaquin River near the Merced River confluence to restrict passage of adult fall-run Chinook salmon and Central Valley steelhead upstream, where habitat and water quality may be unsuitable for these fish.

One of the studies required in legislation on the San Joaquin River Restoration Program called for evaluation in 2011 of the effectiveness of the Hill Ferry Barrier. The study continued in 2012.

Improvements to the structure are currently under consideration to improve opportunities for data collection, manage fish movement, better evaluate barrier effectiveness, and increase the rigidity and “fish tightness” of the structure. The barrier will be used to block anadromous fish species from moving upstream until the restoration area is considered ready for salmon reintroduction.

Bay-Delta Programs

Overview

The San Francisco Bay Estuary and Sacramento-San Joaquin Delta is a region where two of California's largest rivers meet the saltwater from San Francisco Bay, creating the West Coast's largest estuary. The area is a blend of towns, highways, marinas and farmland. More than 50 island tracts are surrounded by levees and about 700 miles of sloughs and winding channels.

The Delta, the hub of the federal Central Valley Project (CVP) and California's State Water Project, is among the most important ecosystems in the nation. Water from the Delta serves the federal and state water projects, which in turn, serve urban and agricultural areas in the San Francisco Bay area, the Silicon Valley, the San Joaquin Valley, the central coast and southern California.

The Delta itself sustains billions of dollars in agricultural and recreational activity. It is also the habitat for hundreds of species of plants and wildlife, and more than 50 species of fish, including some that are threatened and endangered.

The Delta has experienced significant ecological collapse as a result of 150 years of human activity, including California's increasing demand for water; changing environmental and climate conditions; and stressors such as pesticides, pollutant discharges and invasive species. Long-term solutions are needed to ensure reliable, quality water supplies and a sustainable ecosystem. Since the 1970s, urban, agricultural and environmental interests have differed over how to balance water diversions with environmental restoration in the Delta. Reclamation and its partners have implemented short-term solutions and are developing long-term plans for Delta sustainability in order to avert further ecological decline while maintaining reliable water supplies.

Region's Bay-Delta Office

The Region, in July 2010, created the Bay-Delta Office (BDO) to provide a holistic view of Reclamation's effect and responsibilities on and in the Bay-Delta area and ensure that Reclamation's management of CVP and Delta issues and

activities were integrated across the management units of the CVP. The BDO is also the primary point of contact with the U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NMFS), and other federal, state, and local agencies with which Reclamation collaborates on important issues and activities. The office is involved with numerous programs, projects and issues detailed throughout this report.

Ongoing Litigation

Several lawsuits were filed challenging Reclamation's acceptance and implementation of both a 2008 FWS Biological Opinion (BO) and a 2009 NMFS BO and associated Reasonable and Prudent Alternatives (RPA) for the Coordinated Long-term Operation of the CVP and State Water Project. The U.S. District Court for the Eastern District of California remanded the FWS BO on December 14, 2010, and the NMFS BO on September 20, 2011. In both cases, the court found, among other things, that Reclamation had violated the National Environmental Protection Act (NEPA) by failing to conduct NEPA proceedings prior to accepting the BOs and associated RPAs. During 2011, the Bay-Delta Office has responded to several court orders and initiated development, in coordination with its state and federal partners, and other stakeholders, a plan to meet the court order requiring NEPA completion on the FWS BO by December 2013 and the NMFS BO by April 2016.

Because the BOs were remanded without "vacature" by the court, Reclamation's responsibility to implement the BOs and associated RPA actions continues. The BDO continues to work in coordination with the other CVP management units, FWS, NMFS, the state of California, and our other partners, to meet these requirements.

The Interim Federal Action Plan for the Bay-Delta

The Interim Federal Action Plan (IFAP) for the San Francisco Bay Estuary/Sacramento-San Joaquin River Delta was released by federal agencies in September 2009, and was updated for 2011 and beyond. The plan includes provisions for continuing coordination of the federal response to the California water crisis and continuing the partnership with the state of California in addressing California's water supply and



One of many islands in the Sacramento-San Joaquin Delta.

environmental challenges. The federal priorities outlined in the IFAP are:

- Work in concert with the state of California and local agencies.
- Encourage “smarter” use of Bay-Delta water.
- Ensure healthy Bay-Delta ecosystems and improve water quality.
- Help deliver drought relief services and ensure integrated flood risk management.

The Region in 2011 advanced three key projects included in the IFAP: Working toward the goal of “encouraging smarter supply and use of Bay-Delta water,” moving forward on the construction of a canal linking the primary federal and state canals south of the Delta to improve operational flexibility between the federal and state water projects (see page 30), and working toward “addressing the degraded Bay-Delta ecosystem.” As part of that work, the Region advanced the Red Bluff fish passage (see page 26) and Contra Costa fish screen (see page 38) projects toward completion.

Bay Delta Conservation Plan

Reclamation continues its participation in the Bay Delta Conservation Plan (BDCP) consistent with

the IFAP goal of working in concert with the state of California and local authorities.

The BDCP has co-equal goals of providing conservation of sensitive species and their habitat and assuring a reliable water supply. Reclamation participates in BDCP, along with other federal and state resource agencies, to provide technical information and guidance, which ensures compatibility with CVP requirements and responsibilities. Reclamation is a co-lead agency in the development of the Environmental Impact Report/Environmental Impact Statement for the BDCP.

The BDCP is working to:

- Identify conservation strategies to improve the overall ecological health of the Delta.
- Identify ecologically friendly ways to provide a reliable water supply to cities and farms.
- Address toxic pollutants, invasive species and impairments to water quality.
- Establish a framework and funding to implement the plan over time.

More information: <http://www.usbr.gov/mp/BayDeltaOffice/index.html>

Completion of the Contra Costa Fish Screen Project

Secretary of the Interior Ken Salazar and Bureau of Reclamation Commissioner Michael Connor joined state and local officials on September 19, 2011, in dedicating a water infrastructure project that will help ensure a sustainable water supply while protecting sensitive fish species and the ecosystem they inhabit.



Secretary of the Interior Ken Salazar at the Contra Costa Fish Screen Project dedication ceremony.

The Contra Costa Fish Screen Project at Rock Slough, constructed through a partnership between Reclamation and the Contra Costa Water District, advanced the IFAP for the San Francisco Bay/Sacramento-San Joaquin Delta by completing the screening of Contra Costa Canal intakes.

Reclamation awarded \$25.6 million in ARRA funds to complete the state-of-the-art fish screen at Rock Slough, four miles southeast of Oakley, California. Flows are diverted into the Contra Costa Canal. The 48-mile-long canal, built by Reclamation, is the major water delivery system for the Contra Costa Water District, the CVP's largest urban contractor.



A view of the fish screen and Rock Slough.

The Rock Slough project completes the screening of the last of the district's four Delta intakes for protection of resident and migratory fish species, including the threatened Delta smelt and other threatened and endangered fish species that might otherwise be drawn in from the Delta.

The district serves municipal and industrial customers and a population of about 500,000 people in Contra Costa County. The district's water supply capability and reliability is essential to the population and stability of the region's economy.

As a significant step forward in environmental mitigation in the Delta, the fish screen project advances the IFAP for the Bay-Delta while also helping to fulfill requirements of the Central Valley Project Improvement Act and of the 2008 U.S. Fish and Wildlife Service's Los Vaqueros Biological Opinion for the threatened Delta smelt.



Water passes through the new fish screen.

Helping Both the Environment and the Economy

By Bureau of Reclamation Commissioner Michael Connor

ROCK SLOUGH, Calif. (September 19, 2011) -- As I participated in the dedication of the Contra Costa Water District's Fish Screen Project today, the scenes around me were certainly picturesque. There were views of the Delta and its meandering sloughs, lush green farms and wildlife habitat. Ironically though, some important aspects of the dedication ceremony and project were not so visible, not so immediately apparent.

The Bureau of Reclamation provided more than \$25 million from the 2009 American Recovery and Reinvestment Act for construction of the project, which has much meaning for the local economy and the environment.

The immediate impact of the fish screens, which are not visible because they are underwater in the slough, is that they will help preserve endangered and threatened fish species in the Delta. That not only helps fulfill part of Reclamation's mission of environmental mitigation, but also helps to ensure a dependable water supply to a half million people and the surrounding businesses and industries in Contra Costa County--a key part of the San Francisco Bay Area economy. Atop that, construction of the project provided employment for about 90 construction workers locally. In total, the White House Council of Economic Advisors estimates that about 280 jobs were created or saved as a result of this project.



Commissioner Michael Connor speaking at the ceremony.

The project is also a piece of a larger and more complex effort to mitigate the environmental effects of the CVP on the Delta. Even though the project is but one relatively small part of the CVP and a sweeping federal plan for assisting the environmental health of the Delta, it yet again reflects Reclamation's steadfast, long-term commitment to protecting the environment while ensuring reliable water supplies.

Completion of Patterson Fish Screen Project

Representatives of the Mid-Pacific Region joined officials from partner agencies on September 29, 2011 at an opening ceremony for a fish screen intake project on the lower San Joaquin River in California’s Central Valley. Regional Director Don Glaser spoke on behalf of Reclamation, which supplied half of the funding for the project, which is located about 25 miles south of Tracy, California.

Patterson Irrigation District’s new facility prevents fish, such as Chinook salmon and steelhead trout, from entering the intakes, which provide water for irrigation of 13,500 acres of cropland. The opening of the multi-benefit fish screen and pumping facility marked another milestone in efforts to restore California fish populations while building a more secure and sustainable water supply for California. The project advanced the IFAP for the Bay-Delta; the Anadromous Fish Screen Project as authorized by the Central Valley Project Improvement Act; and the CALFED Bay-Delta Ecosystem Restoration Program.

The \$13.8 million project was funded and constructed through a cost-sharing partnership between Reclamation, the California Department of Fish and Game, and the Patterson Irrigation District. Reclamation awarded about \$6.9 million for the project and the state contributed about \$5.4 million of voter-approved bond funding. The district, which first proposed the project about a decade ago, contributed about \$1.5 million to complete the cost-sharing agreement.



Patterson Irrigation District General Manager Peter Rietkerk and Regional Director Don Glaser during the dedication ceremony.

Construction and Inundation, Twice

Construction, which did not interrupt irrigation water deliveries or interfere with fish migrations, began in June 2010 with placement



The completed Patterson Fish Screen Project.



of a temporary cofferdam around a 35-year-old pump station on the San Joaquin River. Construction involved driving more than 420 steel piles to varying depths and pouring a six-foot-thick concrete foundation on the river bottom to support the entire structure.

The construction site flooded in January 2011 due to high river flows. After the water receded, the contractor installed formwork and reinforcement and placed about 3,500 cubic yards of concrete for the new structure.

The site flooded a second time in March 2011. When water receded, crews again resumed work, placing backfill and new pumps. The district used temporary pumps in the San Joaquin River, as well as other available groundwater and CVP contract resources to meet its needs. The new pumps were finished and the switchover to the new pumps came in July 2011.

Pumps and Screens

The new, energy-efficient station pumps at the rate of 195 cubic feet per second, the same rate as the previous system. There are seven pumps, including a harmonic pump to maintain a constant level in the district's canal. Flat-plate screens meet federal and state design criteria, which require a slot size of about 1/16 of an inch. Screens are kept clean of debris by an automatic system consisting of brushes on automatic arms.



Pumps draw water through the new fish screen into an irrigation canal.

ADDRESSING CLIMATE CHANGE

Overview

Secretary of the Interior Ken Salazar released a report in April 2011 that assesses climate changes during the 21st century and how these might impact water operations, hydropower, flood control, and fish and wildlife in the western United States. The report to Congress, prepared by the Bureau of Reclamation, represents the first consistent and coordinated assessment of risks to future water supplies across Reclamation river basins, including those in the Mid-Pacific Region.

Reclamation's SECURE Water Act Report identified the following likely climate changes, on average annually, in the Region:

Sacramento and San Joaquin River Basins

- Temperatures are projected to increase by about 5-6 degrees by the end of the 21st century, with precipitation slightly increasing in California's northern Central Valley and slightly decreasing in the southern Central Valley. The projections also suggest precipitation in the Sacramento and San Joaquin River basins will remain relatively similar over the next century with a slight increase of about 1 percent over the Sacramento River Basin by 2050 and a decrease of about 4 percent over the San Joaquin River Basin by 2050.
- Runoff is projected to increase slightly during the first half of the 21st century and decline slightly in the latter half of the century.
- As the climate warms, more precipitation falling as rain instead of snow at lower elevations will increase winter runoff and decrease summer runoff. The increase in temperature also will result in significantly decreased snowpack at higher elevations.



Sacramento and San Joaquin River Basins

Klamath River Basin

- Temperatures in the Klamath River Basin in southern Oregon and northern California may increase by about 5–6 degrees during the 21st century, with a projected increase of about 2 percent in precipitation by 2050.
- Runoff is projected to increase anywhere from 3-10 percent by 2050.
- Increased warming is expected to reduce snowpack and snowmelt, resulting in less runoff during the late spring through early autumn. Snowpack decreases are projected to be more substantial in the warmer parts of the basin.

Climate Change Activities

The following actions are under way in the Region:



Klamath River Basin

Truckee River Basin

- Temperatures in the Truckee River Basin in the Sierra Nevada Mountains of California and Nevada are projected to increase about 3–5 degrees during the 21st century, with a decrease in precipitation of about 1 percent by 2050.
- Runoff is projected to decrease by about 3-5 percent by 2050.
- Warmer conditions will likely turn snow into rain, increasing December–March runoff and decreasing April–July runoff.



Truckee River Basin

- During Fiscal Year 2011, three studies have been initiated that address climate change concerns in the major Region river basins identified in the Secure Water Act of 2009. For more information on the basin studies:
 - Sacramento-San Joaquin: <http://www.usbr.gov/climate/SECURE/factsheets/sacramento-sanjoaquin.html>
 - Klamath: <http://www.usbr.gov/climate/SECURE/factsheets/klamath.html>
 - Truckee: <http://www.usbr.gov/climate/SECURE/factsheets/truckee.html>
- Several of the WaterSMART Program climate tool matching grants that were announced in 2011 should benefit the Region's climate change assessment and adaptation strategy planning capabilities. These include grants to the Desert Research Institute to develop tools to better simulate the effects of global climate changes in the Sierra Nevada regions, as well as improvements in methods of quantifying agricultural water needs.

More information: <http://www.usbr.gov/WaterSMART/bsp/>

- West-wide Climate Risk Assessments will establish a foundation for more in-depth analyses and the development of adaptation options through basin studies, operations planning and other activities.

More information: <http://www.usbr.gov/WaterSMART/wcra/index.html>

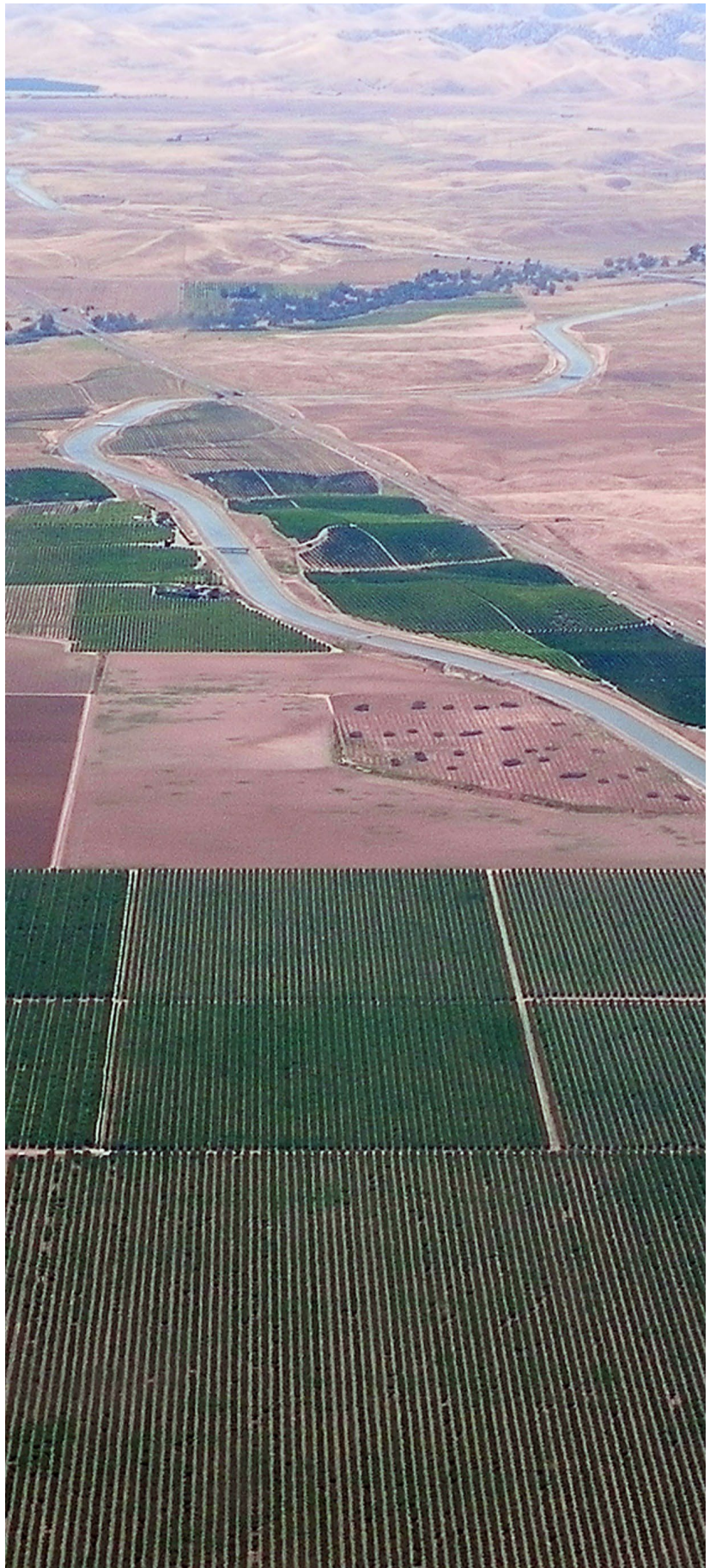
- The Region is conducting other planning studies that will include assessments of the effects of climate changes. These include the Bay Delta Conservation Plan, CALFED Bay-Delta Program storage project investigations and the Central Valley Project Integrated Resource Plan.

More information on climate change: <http://www.usbr.gov/climate/>

Basins Under Study:

Reclamation is assessing climate change and adaptation strategies for several river basins, including California's Sacramento Valley, below, and San Joaquin Valley, right. Photos by Robert Campbell, left, and Sara Kling.





WATERSMART AND OTHER PROGRAMS

Overview

Water is our most precious natural resource and is increasingly stressed by the demands our society places on it. Adequate water supplies are an essential element in human survival, ecosystem health, energy production and economic sustainability. Significant climate change-related impacts on water supplies are well documented in scientific literature and scientists are forecasting changes in hydrologic cycles.

Congress recognized these issues with the passage of the SECURE Water Act, a law that authorizes federal water and science agencies to work together with state and local water managers to plan for climate change and the other threats to our water supplies, and take action to secure our water resources for the communities, economies, and the ecosystems they support.

To implement the SECURE Water Act, and ensure that the Department of the Interior is positioned to meet these challenges, Secretary of the Interior Ken Salazar established the WaterSMART (Sustain and Manage America's Resources for Tomorrow) program in 2010.

WaterSMART allows all bureaus of the Department to work with states, tribes, local governments, water agencies and non-governmental organizations to pursue a sustainable water supply for the nation by establishing a framework to provide federal assistance on the efficient use of water, integrating water and energy policies to support the sustainable use of all natural resources, and coordinating the water conservation activities of the various Department offices.

Reclamation plays a key role in the WaterSMART program as the Department's main water management agency. Focused on improving water conservation and helping water and resource managers make wise decisions about water use, Reclamation's portion of the WaterSMART program is achieved through administration of grants, scientific studies, technical assistance and scientific expertise.

WaterSMART provides funding, combined with grant recipient cost-share funds, that support the following types of grants awarded by the Region in 2011: Water and Energy Efficiency Grants, System Optimization Review Grants, Water Conservation Field Services Program Grants, and Title XVI Program Water Reclamation and Reuse Projects. Eligible grant recipients may be irrigation and water



districts, tribes, states and other entities with water or power delivery authority.

More information: <http://www.usbr.gov/WaterSMART>

Grant Awards in the Mid-Pacific Region

In Fiscal Year 2011, the Region awarded 36 water conservation and efficiency grants through WaterSMART and other programs that totaled more than \$13 million. Including local cost-share contributions, more than \$205 million in water management improvement projects will be implemented in the next 24 months. The projects will result in conservation or better management of an estimated 236,500 acre-feet annually.

The following shows the grants awarded by the Region in 2011.

- 21 WaterSMART grants:
 - Water and Energy Efficiency Grants, \$5,029,096
 - Bay-Delta Agricultural Water Conservation and Efficiency Projects, \$4,145,826
 - System Optimization Review Grants, \$355,047
- 8 Water Conservation Field Services Program Grants, \$535,480
- 7 CALFED Water Use Efficiency Grants, \$2,996,047

Grant recipients were diverse, ranging from large water agencies to small municipalities, to non-federal contractors, to agricultural districts. Geographically, recipients spanned the Region. Examples of projects awarded grants in 2011 include: groundwater basin recharge projects, residential landscape retrofit programs, residential water meter replacement, turf rebate programs, canal lining, canal automations and irrigation efficiency improvements.

In addition to awarding new water conservation and efficiency grants, the Region administratively completed and closed out grants for 17 projects that are allowing conservation or better management of water.

The following are examples of these completed projects:

- The Henry Miller Reclamation District No. 2131 in Dos Palos, California, received a \$240,668 WaterSMART Water and Energy Efficiency grant to modernize the Temple Santa Rita Canal system. The district retrofitted existing structures in the canal to achieve more precise water level control, reducing unnecessary spill. The project will conserve an estimated 8,900 acre-feet per year.



Center photos: *Top*: Shows work on the Temple San Rita Canal System; *Bottom*: and on the Bella Vista Water District recycle station.

- Bella Vista Water District in Redding, California, received a WaterSMART Water and Energy Efficiency grant of \$300,000 to improve its water treatment plant. The modifications allow the plant to capture and recycle backwash and filter-to-waste water that had previously been going to waste. In addition, the modifications reduce the district's diversion from the Sacramento River by 540 acre-feet per year.
- The Shafter-Wasco Irrigation District (SWID) in Wasco, California, received a WaterSMART Water and Energy Efficiency Program grant of \$300,000 to construct an interconnection, conveying 50 cubic feet per second, between the district and the North Kern Water Storage District (NKWSD). When floodwater is available in certain areas on the east side of the San Joaquin Valley, the interconnection will provide a way to move water into SWID's southerly distribution system for irrigation. The interconnection may also be used to return water stored underground in NKWSD's facilities to SWID. The project will prevent delivery losses of up to 20 percent, or 3,000 acre-feet annually, compared to the previous delivery method.

Water Management Plans

The Central Valley Project Improvement Act requires certain contractors to prepare water management plans according to specific criteria and best management practices. In 2011, the Region reviewed and approved 26 five-year water conservation plans and 49 water management plan annual updates.

The Region also revised the criteria for evaluating water management plans in 2011 to meet current water conservation needs and to help federal water contractors meet new California water conservation mandates. The Region is working with the California Department of Water Resources to implement state legislation that mandates practices such as agricultural water measurement, quantification of agricultural water use efficiency, water management plans for agricultural and urban water purveyors, and urban demand management measures.

Water Reuse

In 2011, the Region entered into 16 new financial assistance agreements to provide more than \$5.5 million in federal cost-sharing funds for the planning of projects to reclaim and reuse wastewater, and/or naturally impaired ground and surface waters. The local sponsors will provide at least 50 percent of the funding.

The Region also modified two existing agreements to provide about \$2.3 million for the construction of three reuse/reclamation projects. The sponsors will provide at least 75 percent of construction costs.



Workers lower pipe that is part of an interconnection between



Of the more than \$7.8 million total awarded by the Region in 2011, nearly \$4 million came from the WaterSMART Program. The Region’s 2011 projects include locations in the California counties of Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara and Sonoma. The agreements were authorized under the Reclamation Wastewater and Groundwater Study and Facilities Act of 1992, also known as Title XVI. Projects are constructed and owned by non-federal sponsors, uniting local communities with the Federal government to provide change, growth and a future for clean water and environmental stewardship in a broad range of areas.

Primary goals are improved water-use efficiency, creation of additional water supplies, increased drought resistance of existing supplies and a reduction in the reliance on inter-basin water transfers. The reclaimed water may be used for a variety of purposes, including environmental restoration; fish and wildlife uses; groundwater recharge; and certain municipal, domestic, industrial, agricultural and power generation uses.

Reclamation’s role includes coordinating with non-federal project sponsors, providing advice on preparation of necessary reports and reviewing the reports and submittals to determine whether the project meets the criteria of the Title XVI Program.

The following are examples of the projects:

- The Sonoma County Water Agency in Sonoma, California, received a WaterSMART grant of \$1.7 million to construct the Novato South Service Area Project, part of the first phase of the North Bay Water Reuse Program. The program will provide recycled water for a variety of purposes in Marin, Sonoma, Napa and Solano counties. The Novato South Project, which will provide 204 acre-feet annually, will include construction of a new treatment plant and nearly six miles of new pipeline to expand service to additional customers for landscape irrigation.



Reclamation Commissioner Michael Connor speaks during a ceremony recognizing the North Bay Water Reuse Program.

districts near Wasco, California.



Workers construct a facility that is part of the North Bay Water Reuse Program.

- The City of San Jose, California, received a WaterSMART grant of \$2 million to construct the High-Tech Industrial Cooling and Landscape Irrigation Extension Project, part of the South Bay Water Recycling Program. The current water distribution system provides 10,000 acre-feet per year of recycled water to more than 600 customers in the Silicon Valley. The High-Tech Extension Project will provide multiple new customers 200-250 acre-feet per year, with the potential to serve an additional 200 acre-feet per year to additional users in the future.
- The Central Contra Costa Sanitary District in Martinez, California, received a \$180,000 grant for the Contra Costa County Refinery Recycled Water Project to determine the feasibility of providing up to 22,500 acre-feet per year of recycled water to the Shell and Tesoro refineries in Martinez. Recycled water would be used to replace Delta water that is currently used for cooling towers and boiler feedwater at the refineries.

Drought Relief

After California declared a drought emergency, \$40 million in American Recovery and Reinvestment Act funds were set aside in 2009 for drought relief. Projects included increasing the flexibility of existing water supplies so more acres could be served by surface and groundwater supplies during periods of drought, increasing the use of groundwater supplies to supplement limited surface water supplies, and providing domestic and agricultural water to local tribes that suffer from substandard water supplies.

In addition, the Region worked with tribes in California and Nevada to provide wells for drinking and agricultural water. Seven tribes



Workers drill a well near Los Banos, California.

completed projects. The following are examples of the tribal wells projects:

- Reclamation provided a grant of about \$400,000 to the Elk Valley Rancheria in Crescent City, California, to develop reliable sources of agricultural water on their ranching parcels. The seven wells are powered with solar technology.
- The Quartz Valley Indian Reservation completed four new wells, rehabilitated an existing well, and installed 12 monitoring wells. The tribe is located in the Scott and Quartz valleys of California, near Fort Jones. One of the wells is at the tribe's summer camp location. Previously, water had to be trucked to the site and future use of the facility was in question because of wildfire danger. The tribe is now able to continue using the site.



Quartz Valley Indian Tribe's Culture Camp.



One of the new solar-powered wells constructed at the Elk Valley Rancheria in Crescent City, California.

INCREASING WATER STORAGE/ HYDROPOWER

Los Vaqueros Reservoir Expansion

Mid-Pacific Regional Director Don Glaser signed a Record of Decision for the Los Vaqueros Reservoir Expansion Project near Brentwood in Contra Costa County, California, in March 2011. The project, completed in 2012, expands the existing reservoir's storage from 100,000 acre-feet to 160,000 acre-feet, an increase of 60 percent, by raising the dam 34 feet in height to 521 feet.

The Contra Costa Water District, which owns and operates Los Vaqueros Reservoir, funded and constructed the \$120 million project. Reclamation provided about \$18.3 million in planning and permitting assistance, which was essential to construction of the project.

The expansion:

- Improves water supply reliability.
- Improves the quality of water supplies for Contra Costa Water District's municipal and industrial customers in the San Francisco Bay Area, especially during droughts.
- Protects Sacramento-San Joaquin Delta fisheries through operational flexibility.
- Provides enhanced recreation facilities.

The Region's issuance of a Record of Decision was the final step in documenting Reclamation's decision to enter into a coordinated operations agreement with Contra Costa Water District.

After providing technical assistance and funding for the engineering and design of the dam facilities, Reclamation worked with other government agencies to secure permits and establish programs that ensure the protection and preservation of biological, cultural, and water resources that occur throughout the project site.

The reservoir expansion was the first storage project to be implemented under the CALFED Bay-Delta Authorization Act of 2004.

CALFED is a 30-year program that began in 2000 when 18 state and federal agencies signed the CALFED Record of Decision. The program is based on four major resource management objectives that guide actions designed to achieve a healthy ecosystem while supplying 25 million Californians with a reliable water supply. The objectives of CALFED are ecosystem restoration, water supply reliability, water quality and levee system integrity. Reclamation



plays a key role as the federal lead agency for implementing water supply reliability actions in coordination with state and local partner agencies.

Madera Groundwater Banking Project

Mid-Pacific Regional Director Don Glaser delivered the keynote address at a ceremony in August 2011 that marked the beginning of the Madera Ranch groundwater banking project, located west of the City of Madera, in Madera County, California. The manager of the Region’s South-Central California Area Office, Michael Jackson, also spoke at the event.

The project, formally known as the Madera Irrigation District Water Supply Enhancement Project, will ease the overdraft of groundwater in the region while preserving native Central Valley habitat. A steady increase in water needs for agricultural, municipal and industrial uses, together with limited surface supplies and groundwater pumping, has caused the water table to decline, resulting in degraded water quality.

The underlying aquifer will serve as an underground reservoir for up to an estimated 250,000 acre-feet of water. About 55,000 acre-feet of surplus water in wet years, such as 2011, can be stored through groundwater recharge and later pumped to the surface for use when needed in dry years.

The groundbreaking ceremony came after Director Glaser signed a Record of Decision that included approval for the district to bank a portion of its Central Valley Project water outside the district’s service area and approval to construct an extension of a Reclamation-owned canal.

The Omnibus Public Land Management Act of 2009 authorized Reclamation to enter into a cooperative agreement with the district to support the final design and construction of the project. The Act authorizes federal cost sharing and limits it to 25 percent of the total cost of the project, or \$22.5 million, whichever is less.

The project will be completed in two phases:

- Phase I involves constructing delivery infrastructure improvements, selectively using 550 acres of natural swales for recharge, and installing soil berms to direct recharge flows. The swales for the project were chosen in order to have the least possible impact on vernal pools.
- Phase II involves constructing 323 acres of recharge basins and facilities for recovery of banked water.



Center photos: *Top*: Shows construction work on Los Vaqueros Reservoir; *Bottom*: An aerial view of the entire reservoir.



Regional Director Don Glaser talks with a TV news crew after the Madera Ranch ceremony

Madera Ranch covers more than 13,500 acres southwest of Madera, with nearly 3,000 acres used for row crops. The rest is rangeland that is essentially native Central Valley habitat, with grasslands, vernal pools and rare species such as the blunt nose leopard lizard.

The district encompasses an area of about 128,000 acres. It uses a gravity irrigation distribution system that includes 300 miles of open flow canal systems and 150 miles of pipelines. The district serves farms and also provides municipal and industrial water to a large portion of Madera. The city has a population of more than 60,000 and is the county seat of Madera County.

Hydropower Project Under Construction on the Klamath River

Construction of a new hydroelectric powerplant near Klamath Falls, Oregon, began in December 2011.

Reclamation issued a notice of acceptance in April 2011 to the Klamath Irrigation District to construct a hydroelectric facility on Reclamation's C Canal, which is operated by the irrigation



Above: C Canal in Klamath Falls, Oregon, flows at the height of irrigation season. *Right and on page 55:* Photos show progress toward completion of the C-Drop hydropower plant.



district. Reclamation completed environmental compliance for the issuance of a Lease of Power Privilege and alterations permit for construction of the powerplant in October 2011. Reclamation authorized construction to proceed in November 2011.

The district's contractor finished removing an old concrete structure at the site in December 2011 and began construction of the hydropower facility. The plant, scheduled for completion in 2012, will take advantage of existing irrigation flows from the Klamath Project's A Canal down to its C Canal, hence the name of the new powerplant, known as the Klamath C-Drop Hydro Project.

The facility consists of an intake structure, forebay, powerhouse containing generating equipment, and a 150-foot transmission line. An existing fish screen on A Canal, upstream of the project site, helps prevent fish from entering C Canal.

When in full operation, the flow of water will allow production of up to 1.1 megawatts of electricity.



RESTORATION PROGRAMS

Suisun Marsh

Suisun Marsh, near Fairfield, California, east of the San Francisco Bay Area, is the largest contiguous brackish water marsh on the West Coast. In December 2011, the Bureau of Reclamation and the U.S. Fish and Wildlife Service, in partnership with the California Department of Fish and Game, released final environmental impact documents on a restoration plan for the marsh.

The Suisun Marsh Habitat Management, Preservation and Restoration Plan is a comprehensive 30-year plan designed to address various conflicts regarding use of resources within about 50,000 acres of the marsh. The plan focuses on achieving an acceptable multi-stakeholder approach to habitat conservation by providing the stakeholder coordination and environmental compliance foundation for tidal marsh restoration and managed wetland enhancements.

The plan was prepared by the Suisun Charter Group Principal Agencies, which include Reclamation and several other government agencies. It was prepared in coordination with other related resource planning efforts such as the Bay Delta Conservation Plan (BDCP).

The BDCP addresses overall San Francisco Bay Estuary/Sacramento-San Joaquin Delta ecosystem and water supply reliability issues while the

marsh plan is focused specifically on habitat management, preservation, and restoration within the marsh. The majority of the acreage proposed for tidal marsh restoration under the plan would be contributing to the recovery of listed species.

The marsh plan's purposes and objectives include:

- Habitats and Ecological Processes — Implement the CALFED Ecosystem Restoration Program Plan restoration target for the marsh ecoregion of 5,000-7,000 acres of tidal marsh and protection and enhancement of 40,000-50,000 acres of managed wetlands.
- Public and Private Land Use — Maintain the heritage of waterfowl hunting and other recreational opportunities and increase the surrounding communities' awareness of the ecological values of the marsh.
- Levee System Integrity — Maintain and improve the marsh levee system integrity to protect property, infrastructure and wildlife habitats from flooding.
- Water Quality — Protect and, where possible, improve water quality for beneficial uses in the marsh, including estuarine, spawning, and migrating habitat uses for fish species as well as recreational uses and associated wildlife habitat.



The Suisun Marsh near Fairfield, California, is the subject of a major habitat management, preservation and restoration plan.

The December 2011 release of the Suisun Marsh Plan Final Environmental Impact Statement/ Environmental Impact Report will be followed by the signing of decisions that will state actions to be implemented.

The significant wetland and wildlife resource values of the marsh have been recognized since the mid-1970s, with the passage of the Suisun Marsh Preservation Act. In 2001, the principal federal, state and local agencies with jurisdiction or interest in the marsh directed the formation of a charter group to develop a plan that would balance the needs of the CALFED Bay-Delta Program, the Suisun Marsh Preservation Agreement, ongoing operations and maintenance of the managed wetlands, and contributions toward the recovery of listed species.

Trinity River

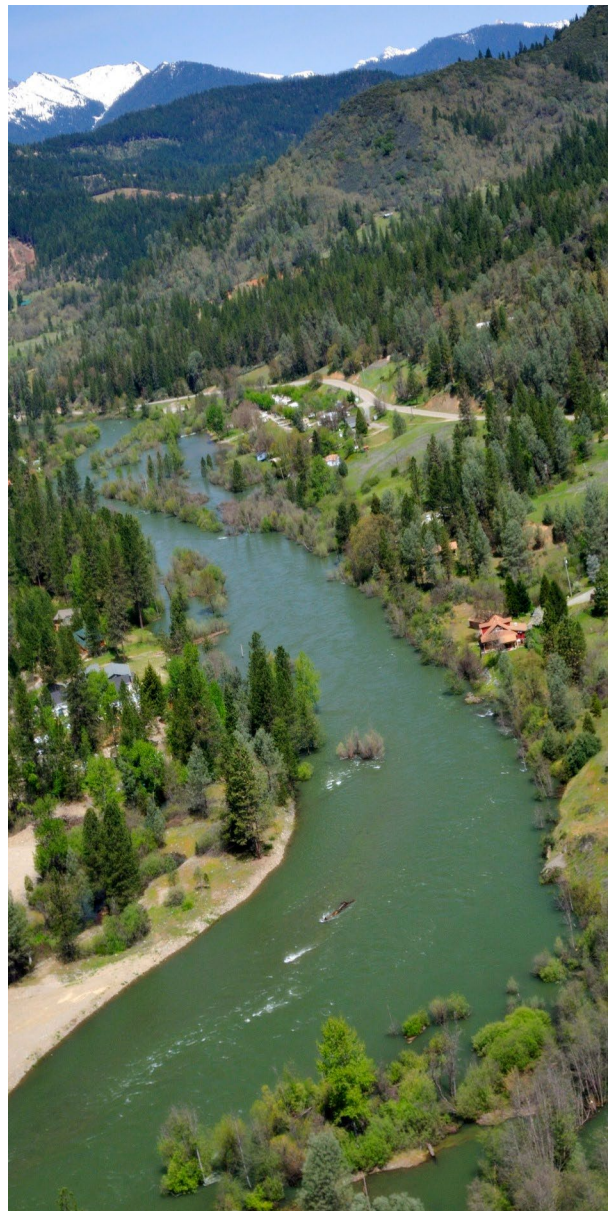
The Trinity River Restoration Program (TRRP) is a long-term, comprehensive effort to restore fish and wildlife populations in the Trinity River below dams that are part of California's Central Valley Project (CVP).

The restoration program includes flow management, channel rehabilitation, sediment control, and watershed restoration. The results are monitored and assessed to incorporate experience into future restoration efforts through adaptive management.

The program differs from many other restoration programs in that it employs a riverine approach intended to create a dynamic river capable of



Work on the Trinity River includes habitat restoration.



The scenic Trinity River flows through Northern California.

building and maintaining sufficient habitat system-wide. The program's goals are to complete necessary infrastructure modifications to allow implementation of higher peak releases; to create sufficient suitable habitat through achievement of healthy river attributes; and to predict, measure and evaluate progress toward long-term goals that also influence short-term management actions.

Restoration of the river, below Trinity and Lewiston dams, is an important aspect of meeting requirements of the 1992 Central Valley Project Improvement Act for fish and wildlife protection and mitigation as the CVP meets its water supply responsibilities. Since the signing of the Trinity

River Restoration Record of Decision (ROD) in 2000, the restoration program has finished Phase 1 of the channel rehabilitation component of the ROD. To date, the program has completed 25 of the originally proposed 47 rehabilitation sites within the 40-mile restoration zone.

In 2011, the TRRP completed the first Phase 2 project and continued to further its goal of river restoration through partnerships with other agencies and organizations by accomplishing the following:

- Conducted a managed release of 11,000 cubic feet per second, the highest restoration flow release in 37 years, to effect changes in the river channel morphology.
- Placed 5,000 cubic yards of coarse sediment gravel at two locations to distribute gravel to improve fish habitat.
- Completed a seven-acre (0.3 river mile) channel restoration project at Wheel Gulch. The construction site consisted of a split-flow channel, a low-flow side channel, an alcove and a habitat enhancement channel to reconnect the existing Wheel Gulch drainage to the

main river. The existing topography was lowered to create floodplains that inundate at various flow levels and eight wood structures were constructed to provide geomorphic complexity and fish habitat.

- Conducted six watershed projects that included road improvements or decommissions to reduce sediment and culvert replacement to remove fish barriers.
- Reported an analysis showing that sand content of the channel bed and banks downstream from Lewiston Dam have declined substantially over the past decade.
- Prepared channel restoration sites, constructed in 2010, for planting. The timing allowed high 2011 spring flows to erode and rework floodplains prior to planting. About 10,000 cottonwood and willow pole cuttings were planted to revegetate restoration sites.

Clear Creek

The Region and its partners, during 2011, advanced several aspects of the restoration program for lower Clear Creek in Northern



One of the Region's projects during 2011 involved removing 3,500 cubic yards of sediment from the Spring Creek Arm of Keswick Reservoir in Northern California. The sediment had blocked access for inspection of the outlet works and spillway structures of the Spring Creek Debris Dam. A dredge, shown here at night, removed the sediment.

California, below Whiskeytown Dam, which is part of the CVP.

Clear Creek historically supported abundant runs of Chinook salmon and steelhead. But past gold mining activities and the construction of Whiskeytown Dam, in combination with other dams such as Saeltzer-McCormick, reduced the extent and quality of salmon habitat in Clear Creek. These dams also restricted the upstream movement of salmon and steelhead in Clear Creek.

A team consisting of several federal, state, and local agencies and private stakeholders, called the Clear Creek Restoration Team, have been involved with identifying and implementing opportunities to restore anadromous fish habitat in lower Clear Creek, downstream of Whiskeytown Dam. The restoration actions have benefitted salmon and steelhead that are listed as threatened species under the federal Endangered Species Act.

Restoration actions in Clear Creek have included removal of the Saeltzer-McCormick Dam, restoring riparian vegetation, gravel placement for spawning areas, creation of fish habitat structures in the stream, and increased stream flows to provide suitable temperatures.

Significant developments during 2011 included:

- Fish Passage – Adult steelhead populations continued to increase, with 217 returning in 2011. The count is 44 percent greater than the 10-year average.
- Gravel Placement – A total of 10,000 tons was placed in five locations in the creek.
- In-Stream Flows and Temperature – Base flows of 200 cubic feet per second were achieved in Clear Creek from October 1 through May 31. Two pulse flows were also conducted in the spring to help attract spring-run Chinook into Clear Creek. Flows to achieve temperature control met the target 77 percent of the time.

Desert Terminal Lakes

In 2011, the Region's Desert Terminal Lakes Program obligated \$129 million for multiple watershed restoration projects in eastern California and western Nevada.

The program is administered by Reclamation through financial assistance, interagency, and Indian Self Determination Act agreements with various entities for ongoing environmental,



Clouds move across Walker Lake.

conservation and research projects. The program areas include three terminal lakes in Nevada (Walker, Pyramid and Summit) and four associated river basins in Nevada and California (Walker, Truckee, Carson and Summit).

As of 2011, Congress had allocated a total of \$375 million for the Desert Terminal Lakes (DTL) Program.

Stakeholders receiving funding through the DTL Program include federal, state and local entities, non-profit organizations, tribal governments, higher education entities, and a water district.

The DTL Program has funded numerous projects such as acquisition of land surrounding a unique lake ecosystem in the Sierra Nevada Mountain Range, federal agency and university research related to watershed health issues, title transfers of Reclamation acquired land, and lake and river fishery and fish hatchery improvements.

The \$129 million obligated in 2011 included:

- \$93 million for the National Fish and Wildlife Foundation for water acquisition for restoration of Walker Lake.
- \$19.2 million for Pyramid Lake, Summit Lake and Walker River Paiute Tribes for conservation and restoration efforts at Pyramid, Summit and Walker lakes.
- \$3.4 million for The Nature Conservancy for Truckee River restoration projects.
- \$13.4 million for six additional projects including water and watershed research, implementation of the Truckee River Operating Agreement, improvement of water measurement gages, and an environmental compliance contract.



Workers prepare temperature control curtain for deployment.



Workers install a replacement temperature control curtain in V

Whiskeytown Temperature Control Curtain

Reclamation constructed temperature control curtains to reduce the temperature of water releases at structures in the Sacramento and Trinity River drainages in Northern California. Increased water temperatures, especially during drought years, are one of the concerns regarding endangered salmon species in the Sacramento River.

The project, begun in the early 1990s, included installation of temperature curtains in both the upper and lower reaches of Whiskeytown Reservoir. Due to deterioration of the temperature curtain at the intake to the Spring Creek Powerplant, the curtain was removed in the fall of 2010 and a new curtain was installed in 2011.

The new curtain measures 2,659 feet in length and reaches a depth of about 100 feet. It was spliced together on the shoreline of the reservoir and assembled as one continuous sheet. The curtain was then attached to 20-foot-long metal floats and anchored by 800-pound weights. The cost for the replacement totaled about \$3 million.

Designed to conform to the contours of the reservoir bottom, a gap at the bottom of the curtain allows colder water to pass underneath and into the powerplant intakes.

Discharge from Spring Creek Powerplant is eventually blended into the Sacramento River below Keswick Dam.

Data is being collected to determine the performance of the new temperature curtain, which is expected to achieve about a 2-4 degree decrease in water temperature.



Whiskeytown Reservoir in Northern California.

A crane is used to lift a piece of the temperature control curtain.

CENTRAL VALLEY PROJECT IMPROVEMENT ACT

CVPIA Program

The Central Valley Project Improvement Act of 1992 amended previous authorizations of the Central Valley Project to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic uses; and fish and wildlife enhancement as a project purpose equal to power generation.

From 1993 through 2011, Reclamation and its partners have completed several large projects, including the Glenn-Colusa Irrigation District fish screen, the Anderson-Cottonwood Irrigation District fish screen, the Shasta Lake Temperature Control Device, the Contra Costa Canal pumping plant, and the Coleman National Fish Hatchery. Currently, the CVPIA Program is comprised of 23 programs that fall into three broad resource areas: fisheries, wildlife refuges and other resources programs.

Fisheries

The fisheries goal is to double the natural production of anadromous fish on a sustainable basis. Accomplishments in Fiscal Year 2011 included:

- In the Sacramento basin in central California, construction began on an Antelope Creek project to improve passage to 13 miles of spawning habitat; Wildcat Dam on Battle Creek has been removed and two fish ladders have been completed; and a contract was awarded for the Mill Creek fish passage assessment and restoration project, intended to improve fish passage for juvenile and adult salmonids.

- For the San Joaquin River Basin in central California, funds were provided to purchase 6,557 tons of spawning gravel to improve natural production of Chinook salmon and steelhead at several spawning sites in the Mokelumne River; construction began on the Calaveras River Passage Improvement Project to restore access to about 10 miles of habitat for salmon; a



Wildlife refuges in Central California teem with life. Employee contest photo taken by

floodplain and side-channel enhancement project to increase juvenile salmonid rearing habitat and decrease predation at Lancaster Road was completed on the Stanislaus River, and construction continued on the Merced River Ranch Floodplain Enhancement Project to restore up to six acres of riparian floodplain and more than a mile of spawning habitat.

- The last component of the Contra Costa Canal Pump Program in the Sacramento-San Joaquin Delta was completed when a new fish screen structure went into operation at the entrance to the canal in Rock Slough (see page 38).



- On Clear Creek in northern California, more than 21,000 square feet of spawning habitat was created by gravel placements at five sites (see page 58).
- There were placements of gravel in three other central California rivers to improve spawning sites: 5,000 tons went into the Sacramento River, 5,000 tons into the Stanislaus River, and 20,770 tons into the American River.
- Construction on four fish screens was completed at three intakes on the Sacramento River and one intake site on the San Joaquin River. Construction continued on the American Basin Fish Screen Project, with completion expected in 2013. Design, environmental compliance and permitting activities for the Yuba City and the Reclamation District 2035 Fish Screen projects advanced, with construction expected to begin on both by 2013.
- The San Joaquin River Restoration Program's projects included Invasive Vegetation Management and Control activities, and completion of the Annual Technical Report and Annual Monitoring and Analysis Plan. Interim flow releases from Friant Dam contributed 106,318 acre-feet to San Joaquin River flows while working toward the goals of fish reintroduction and maintaining the current fish population (see page 38).
- On the Trinity River in Northern California, the restoration program achieved peak flows of 11,000 cubic feet per second. The program also added 5,300 cubic yards of gravel to the river. Watershed projects will keep about 9,600 cubic yards of fine sediment out of the river (see page 57).

Wildlife Refuges

The goals of the Refuge Water Supply Program are to provide certain amounts of two classifications of water to 19 CVPIA federal, state and private wildlife refuges. Due to the wet year, the program was able to achieve deliveries that approached goal amounts:

- The goal is to supply 422,251 acre-feet of Level 2 water to the refuges annually. In 2011, the program delivered 367,592 acre-feet of Level 2 water.
- The other goal is to provide 133,264 acre-feet of Incremental Level 4 water. In 2011, the program supplied 101,854 acre-feet of Incremental Level 4 water.

The CVPIA requires the Region to acquire water supplies, known as incremental Level 4, to meet optimal waterfowl habitat management needs at various wildlife areas in the Central Valley. Incremental Level 4 is defined as the difference between historical annual average water deliveries (Level 2) and water supplies needed to achieve optimal waterfowl habitat management (Level 4).

The amount of water the Region can deliver to wildlife refuges depends on several factors, including the availability of water and ability of Reclamation to deliver water to certain refuges. During 2011, the Region funded design work that is anticipated to lead to the construction of refuge conveyance facilities beginning in 2012. In 2011, Reclamation also funded the installation of groundwater wells at refuge locations in order to improve the ability to deliver more reliable water supplies.



An egret at a wildlife refuge.



A newborn elk nestles in a wildlife refuge in an employee photo contest picture taken

Other Resource Programs

The other resource programs' goals are to protect and restore terrestrial habitat and the species that depend on them.

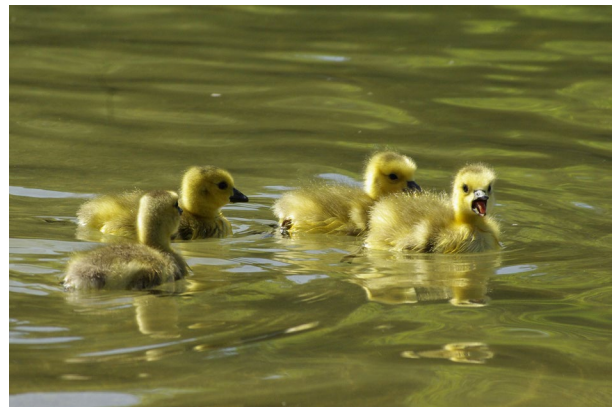
In 2011, the Habitat Restoration Program contributed to the protection of 5,404 acres of land through conservation easement acquisitions of 2,407 acres of vernal pool, grassland, and riparian habitats in Tehama County; and 2,997 acres of vernal pool, grassland, and other habitats in Merced County. Also, the program moved toward restoration of about 28 acres of alkali scrub and 101 acres of riparian woodland vegetation in Kern County, and 492 acres of serpentine grassland and associated habitats at in Santa Clara County.

The Land Retirement Program retired about 220 acres of land from irrigated agricultural production and converted it to native upland habitat.

More information: <http://www.usbr.gov/mp/cvpia/index.html>



h by Ali Warren.



Goslings are shown in this employee photo contest picture taken by Tami Corn.



Frogs are drawn to wetlands such as this one shown in an employee photo contest picture taken by Nina Hemphill.

SAFETY OF DAMS PROGRAM

Reclamation's Safety of Dams Program

The Safety of Dams Program continues to be one of Reclamation's highest priorities. The program helps ensure the safety of Reclamation dams to protect the downstream public.

The program was officially implemented in 1978 with passage of the Safety of Dams Act, which requires that dams be operated and maintained in a safe manner, ensured through inspections for safety deficiencies, analyses utilizing current technologies and designs, and corrective actions if needed based on current engineering practices.

The primary emphasis of the program is to continually perform site evaluations in order to identify any potential safety deficiencies in Reclamation's dams. Dams must be examined by specialists every three years, with additional internal reviews performed annually.

If deficiencies are identified, Reclamation completes the related analyses in order to expedite corrective action. The selected course of action relies on assessments of risks with environmental and public input to the decision-making process.

Reclamation's major efforts currently continue to be focused on modifications to Folsom Dam in the Mid-Pacific Region.



Folsom Dam and Reservoir Improvements

In 2011, the Region and its partners announced the completion of the second phase of the Joint Federal Project and the start of the final three phases as Reclamation handed off the dam safety project to the U.S. Army Corps of Engineers for the final phases at Folsom Dam and Reservoir.

The Joint Federal Project (JFP) is the cornerstone for more than \$1 billion in dam safety and flood damage reduction improvements to further protect more than a million residents in communities downstream from Folsom Dam and Reservoir, which is on the American River, about 25 miles northeast of Sacramento, California.

The final phases of the JFP involve construction of a concrete control structure with submerged gates, lining a 2,400-foot spillway chute, constructing a stilling basin, and building an 1,100-foot-long approach channel that will connect the auxiliary spillway to Folsom Reservoir.

The first two phases of the JFP were completed by Reclamation on schedule and about \$70 million under budget. The work involved the excavation of about 2.5 million cubic yards of material from the spillway and the construction of haul roads, staging and batch plants, and other key infrastructure. The timely completion of Phase II was critical to ensuring a seamless transition to the Corps of Engineers.

During 2011, work on Folsom Dam and Reservoir included modifications to the main dam, Mormon Island Auxiliary Dam and Dikes 4-6. A \$16.6 million project to address seismic deficiencies on the main dam, which was begun in 2010, was completed ahead of schedule in December 2011.

During construction, Reclamation has continued to operate Folsom Dam and Reservoir for water supply, power generation, and fish and wildlife mitigations. There have been only minor impacts on recreation at the popular facility.



Center photos: Aerial photographs show the auxiliary spillway constructed at Folsom Dam near Sacramento, above, and an artist's rendering of the completed project.

INVASIVE SPECIES

Reclamation and its partners continued to conduct programs in 2011 that are designed to prevent the transport and spread of harmful aquatic invasive species to uninfested bodies of water, as well as evaluate and develop remedies to treat facilities already impacted by invasive species.

Mussels

Common invasive species include Quagga and Zebra mussels, which are freshwater mollusks that can rapidly proliferate in dense clusters by adhering to hard surfaces. The mussels are of concern because their spread can damage water storage, water delivery and hydropower systems, as well as impact recreation and aquatic ecosystems.

The mussels spread from infested waters by attaching to the hard surfaces on watercraft and trailers or are transported as larvae in the water left in boat engines, bilges, live wells, buckets or crevices.

The mussels arrived in the United States from Europe and spread to many eastern waterways, rivers and lakes. The mussels were later discovered in Reclamation facilities in Colorado and in San Justo Reservoir in California.

Knowledge and experience in the eastern United States indicates that once introduced, the mussels are nearly impossible to eradicate in bodies of water and in facilities. A key observation about the mussels is that no single eradication method can be applied at all facilities. The mussels react differently at different facilities because of water temperature, water chemistry and other factors.

Reclamation is concentrating on proactive measures, such as public education programs, to help reduce the spread and impacts of the mussels to other Reclamation facilities, thereby lessening the need for the more time-consuming and costly measures of eradication.

More information: <http://www.usbr.gov/mussels/>



Quagga mussels attached to a boat in infested waters.



Water hyacinth spread across the intake channel for the C.W.

Water Weeds

Water hyacinth and hydrilla are rapidly spreading invasive aquatic weeds that have serious impacts. Floating infestations of the weeds restrict water movement; reduce water storage capability; increase stress on levees; clog water intakes, control structures and hydroelectric generators; and damage fish and wildlife habitat.

Like other invasive species, the weeds spread from infested waters via watercraft and trailers, and through other means.

In the Sacramento-San Joaquin Delta at times, the weeds grow into colonies so widespread that they almost completely cover some of the waterways. The hyacinth crowds native species, prevents boating access and clogs water intakes.

During fall 2011, hyacinth grew heavy at the Region's Tracy Fish Collection Facility, which is located at the intake channel for the C.W. "Bill" Jones Pumping Plant at the southern end of the Delta. At one point, up to about 200 truckloads of hyacinth were being removed on a 24-hour basis each day. Ordinarily, the removal system is only used occasionally when Delta flows are high and large debris floats into the intake channel.

Workers at the facility remove hyacinth using a mechanical removal and transport process. A debris barrier, swing arm sweep and conveyor system collects the hyacinth and deposits it into dump trucks for transport to a spoils area.

The water hyacinth infestation in 2011 was unusual, according to the California Department of Boating and Waterways. The agency, which oversees hyacinth control, reported that high water, continued warm temperatures and a delay in receiving approval to start its annual spraying treatment program resulted in unprecedented levels of water hyacinth in some areas.



"Bill" Jones Pumping Plant in the Sacramento-San Joaquin Delta.

AMERICA'S GREAT OUTDOORS ACTIVITIES

Secretary of the Interior Ken Salazar and Bureau of Reclamation Commissioner Michael Connor visited two of the events that were among the several held in 2011 by the Region and its partners to advance the America's Great Outdoors initiative.

President Obama launched the initiative in 2010, calling on the Secretary of the Interior and other federal officials to develop a 21st century conservation agenda that will protect America's natural and cultural resources, and connect people to the outdoors through jobs, education, recreation and service.

In February 2011, Secretary Salazar participated in an America's Great Outdoors (AGO) event in Fresno, California, where about 100 volunteers gathered to plant native trees and do other work at Jensen River Ranch along the San Joaquin River. Secretary Salazar talked with members of the San Joaquin River Parkway and Conservation Trust and, at one point, even paddled a canoe for a time.

In July 2011, Commissioner Connor visited a major exhibit on AGO at the California State Fair in Sacramento. The exhibit, which was popular with the public, was a cooperative effort between agencies within the Department of the Interior.

With hundreds of thousands of people visiting the fair, there was a steady stream passing through the exhibit, which was staffed by employees of Reclamation, the Fish and Wildlife Service, the Bureau of Land Management and the National Park Service.

Commissioner Connor was briefed on specific aspects of the exhibit, which featured activities for all ages and highlighted various aspects of the AGO initiative and the roles of the Department of the Interior agencies.



The exhibit showcased California's wildlife; landscapes; and rivers, lakes and reservoirs. It informed visitors about the myriad ways they can enjoy the outdoors, from bird watching and white-water rafting, to canoeing and driving dune buggies. Activities to engage youth included making water-related bracelets, painting bird masks, playing a bird identification game called "Bird Bingo," and posting promises to help preserve America's outdoors.

As part of AGO's agenda of connecting people to the outdoors through jobs, the Klamath Basin Area Office, located in southern Oregon and northern California, worked with the Klamath Tribes to employ a high school student for three months during the summer of 2011. The Summer Youth Employment Program allows a student to enter the workplace, in this instance, receiving personalized attention from a biologist. The high school student who was selected received training across the spectrum of activities performed by members of the Area Office's Fisheries Division.

The Region also supported--and continues to support--the AGO initiative through a wide range of interpretive and recreational activities at facilities such as the American River Water Education Center near Folsom Lake, and at New Melones, Berryessa and Shasta lakes.

Among the most popular and best known of the events are the Catch a Special Thrill (C.A.S.T.) for Kids Fishing events. Children with disabilities or disadvantages have an opportunity to go fishing out on a boat, many for the first time. The events are supported by Reclamation in a broad partnership with partner agencies and community groups.

More information on the Region's AGO activities:
<http://www.usbr.gov/mp/AGO/>

Center photo: Secretary of the Interior Ken Salazar (front) and George Folsom, president of the San Joaquin River Parkway and Conservation Trust, paddle a canoe in the San Joaquin River during an America's Great Outdoors event.





A guided tour at New Melones Reservoir.



Commissioner Michael Connor at an AGO exhibit at the California State Fair.



A completed accessibility project at Lake Berryessa.



Recreational gathering at New Melones Reservoir.



Cleanup event along the San Joaquin River.



A C.A.S.T. (Catch A Special Thrill) event for children.

THE FUTURE



An intern looks up at radial gate on the Delta Cross Channel in this employee contest photo taken by Jeffrey Valeros.

Stakes Are High As Region Looks Ahead

“This is a critical time for water management in the Mid-Pacific Region. This is the decade where water policy is going to be reset for the next 50 years. At stake are reliable agricultural, municipal and industrial water supplies for the people of California, southern Oregon and northern Nevada; dependable electricity; and sustainable economics and environments.”

--Regional Director

Don Glaser

Web Resources

- Department of the Interior | <http://www.doi.gov>
- Bureau of Reclamation | <http://www.usbr.gov>
- MP Region | <http://www.usbr.gov/mp>

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On the Front Cover. Large background photograph shows Shasta Dam in Northern California releasing flows of 50,000 cubic feet per second during a heavy precipitation period in 2011. The dam's powerhouse is in the foreground. The picture was cropped from the center of a panoramic employee contest photograph taken by Scott Dethlefsen.

On the Back Cover. Photograph shows the state-owned California Aqueduct extending through California's Central Valley, left, and the Delta-Mendota Canal.