



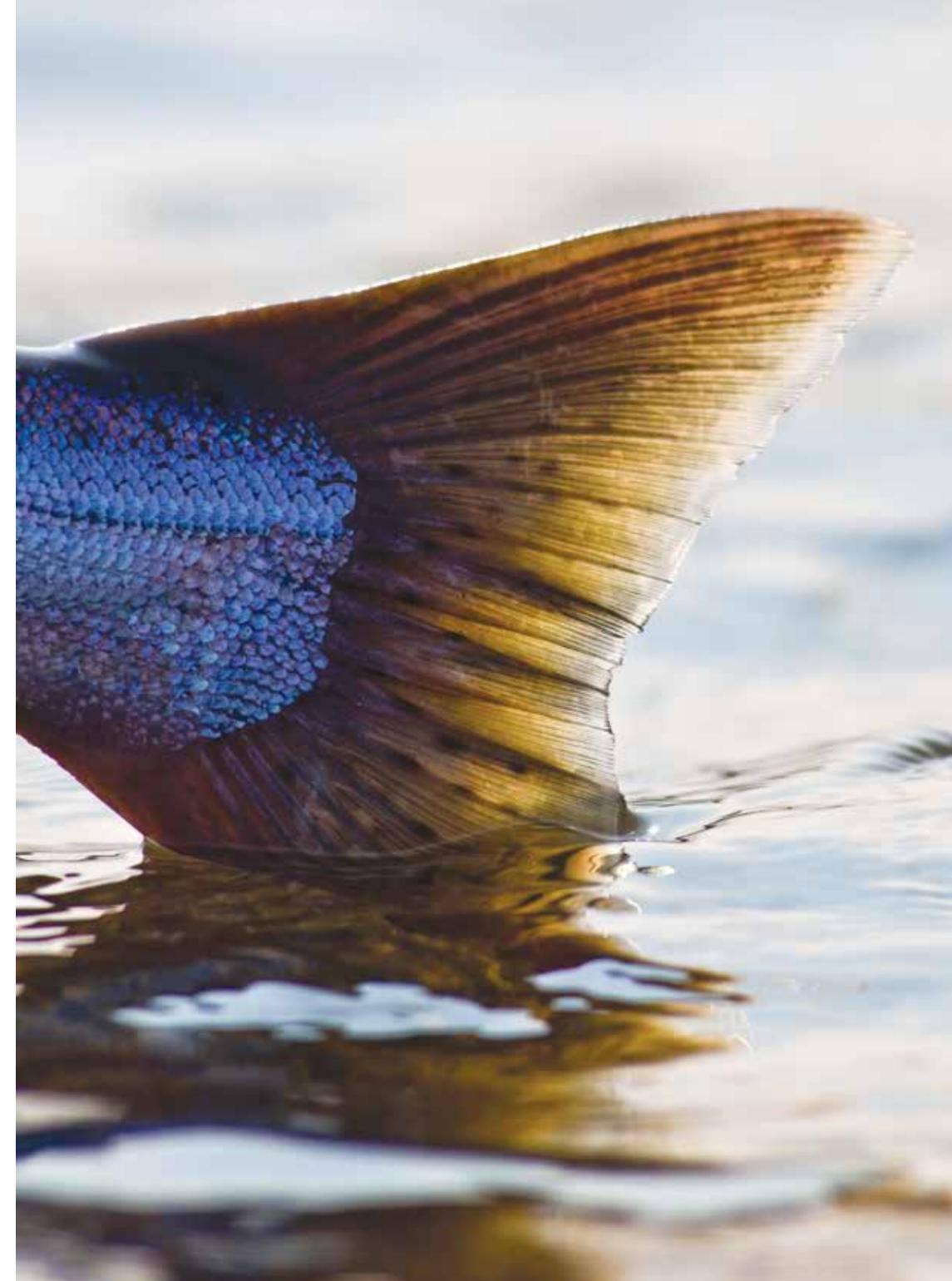
# **DROUGHT RESPONSE**

**CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE**

**QUARTER 4, APRIL-JUNE 2015**



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The 2014-15 state budget included \$38 million for the California Department of Fish and Wildlife (CDFW) to respond to the effects of the California drought on fish and wildlife. The department identified focus areas for response that included a variety of actions including river monitoring, rescue and relocation operations, holding the most threatened and vulnerable fish populations in captivity and restoring impacted habitat. The following is the final quarterly report (April-June 2015) and completes the entirety of the budget year. Any funds that remained in specific categories of response below were used for other drought response projects within this report.

# HABITAT RESTORATION

GOAL: Restore 1,100 acres of fresh and brackish water tidal emergent wetlands and 69 acres of alkali wetlands.



## LINDSEY SLOUGH TIDAL RESTORATION PROJECT

Lindsey Slough Tidal Restoration Project: The department is restoring 150 acres of fresh and brackish water tidal emergent wetlands and 69 acres of alkali wetlands by reconnecting diked lands in Lindsey Slough, in the Cache Slough area in Solano County. Construction and tidal restoration was completed November 21, 2014.

## HILL SLOUGH TIDAL RESTORATION PROJECT

Hill Slough Tidal Restoration Project: The department is restoring 950 acres of fresh and brackish water tidal emergent wetlands by reconnecting diked lands of Hill Slough, in Suisun Marsh in Solano County. The project is proposed to start in the spring of 2016 and will take two years to construct.

### BY THE NUMBERS:

The final project consists of \$6,398,000 in drought funds and \$4,113,000 from Proposition 204 and two mitigation accounts to implement the restoration projects.



# EMERGENCY HELP FOR SALMON AND SMELT

**GOAL:** Intensify existing monitoring for several runs of salmon and Delta and longfin smelt via enhanced sampling frequency and duration at key locations in the Delta and its tributaries and then assess habitat responses in relation to operation of the state water project under drought conditions.



CDFW partnered with the Interagency Ecological Program, and state and federal water operations teams and other resource agencies to improve monitoring of these at-risk fish species during the drought. The department has partnered with researchers to better understand how Delta smelt use the Delta during key spawning and rearing periods. In addition, the department is working with the UC Davis Fish Health Laboratory to study smelt health and growth patterns. This project will be integrated with the previous study.

In a separate action under this goal, the department funded a study to determine the effects of toxins on the food web in the Delta. Finally, the department is supporting the National Marine Fisheries Service (NMFS) and U.S. Bureau of Reclamation (USBR) to evaluate the potential effects of the prolonged drought on winter-run Chinook salmon.

## BY THE NUMBERS:

The final project consists of \$5,540,000 of which have been allocated or spent.



# INCREASED INVESTMENT IN THE SAN JOAQUIN RIVER RESTORATION PROGRAM

GOAL: Improve infrastructure at San Joaquin fish hatcheries, San Joaquin River Restoration Program (SJRRP) Interim Facility, and a temporary fish rearing facility at the base of Friant Dam on USBR property, which will provide cold water refuge sites in the face of the drought. Provide drought-specific fish rescue, monitoring, and enhanced restoration activities.



CDFW increased investment in the SJRRP to protect spring and fall-run Chinook salmon under severe drought conditions. This effort includes two fish transport vehicles and water conservation and chiller equipment to maintain water quality and supply at fish rescue and holding facilities.

CDFW is installing water reuse, chiller systems, and water supply enhancements to provide protection and rescue capabilities for Chinook salmon at the SJRRP Interim Salmon Conservation and Research Facility and satellite incubation and rearing facility below Friant Dam. These upgrades increase fish holding capacity, reduce water supply needs and maintain suitable water temperatures, supporting reintroduction and management of both spring- and fall-run Chinook. Two fish transports were also purchased to facilitate fish rescues for translocation to drought-resistant habitat and holding facilities. To monitor conditions in-river and at its rescue facilities, CDFW also installed temperature and water quality monitoring equipment. In anticipation of continued drought conditions, all improvements will be in place by the end of 2015 to permit Chinook salmon survival during unsuitable river conditions and ensure continued progress in restoration of the San Joaquin River.

## BY THE NUMBERS

The final project consists of \$2 million of which all funds were allocated or spent.



# LASTING LEGACY FOR PUBLIC WILDLIFE REFUGES

GOAL: Improve water conveyance systems on state-owned wildlife areas and provide water to state wetlands for purposes of lessening the impact of drought on migratory waterfowl and other wildlife.



CDFW continues to make significant progress in addressing the effects of the drought on state wildlife areas. Eleven projects have been completed, 26 projects are underway and two additional projects are in development that will improve water supply, water delivery and water use efficiency for the benefit of wetlands and the wildlife they support. These projects include:

## **GROUNDWATER IMPROVEMENTS:**

Such as refurbishing or replacing existing wells and related infrastructure.

## **WATER EFFICIENCY IMPROVEMENTS:**

Such as installation of rainwater catchment and water delivery infrastructure; replacement of damaged pipes, water delivery systems and inefficient equipment; and habitat restoration and management to maximize the availability of existing water sources for wildlife.

## **WATER USE MONITORING IMPROVEMENTS:**

Such as installation of metering devices to track and maximize efficiency of water use.

CDFW will complete most of the projects underway on wildlife areas by October 2015. Additional projects on department lands will be implemented to improve water supply, water delivery, and water use efficiency for the benefit of wetlands and the wildlife they support.

## **BY THE NUMBERS**

The final project consists of \$5,253,000 in funds allocated or spent.



# APPLYING 21ST CENTURY TECHNOLOGY TO MONITORING

GOAL: Applying new technology to improve monitoring of salmonids, smelt and sturgeon as described in the [California Water Action Plan](#) and [2014 Drought Operations Plan](#).



CDFW has contracted with the Pacific State Marine Fisheries Commission (PSMFC) to support implementing a steelhead monitoring program to evaluate population abundance and distribution in the Sacramento River Basin. Specific activities will include operating dyke traps, tagging adult steelhead and operating video stations and antenna arrays on the Sacramento River and its tributaries.

CDFW has entered into a contract with UC Davis as a key partner in implementing a sturgeon program to capture, acoustically tag and monitor the movements of juvenile sturgeon. Another key partner in this project is the National Oceanic and Atmospheric Administration's Southwest Fisheries Science Center and finalization of an agreement with them occurred in June 2015.

Additional CDFW efforts to improve monitoring capabilities and inform management decisions are completed. These efforts included finalization of two contracts with the Southwest Fisheries Science Center: one to establish a Passive Integrated Transponder (PIT) tag detection system in the Delta, San Joaquin River and tributaries, Sacramento River and tributaries and major diversion facilities; and the other to implement the sturgeon program.

## BY THE NUMBERS

The final project consists of \$5,644,000 in funds allocated or spent.



# MONITORING, FISH RESCUES, EMERGENCY HATCHERY IMPROVEMENTS AND WATER OPERATIONS COORDINATION



## **GOAL 1:** Continue monitoring of environmental stressors and increase monitoring of threatened and endangered species.

CDFW is monitoring streams and rivers on a consistent basis, often more than once a week. Fish condition, habitat, and water parameters are measured to evaluate and track environmental conditions, and increasing threats to fish (i.e. disease, strandings, dewatered redds, high water temperature, low flow)

## **GOAL 2:** Rescuing fish and other aquatic species and, where necessary, relocating fish to hatcheries to prevent extirpation or extinction.

CDFW, in collaboration with other resource management agencies and local organizations, has conducted nearly 600 rescues of approximately 200,000 fish in 45 watersheds in 22 counties. Focal species for rescues have been salmon, steelhead and native trout, and populations of at-risk suckers, Sacramento perch and stickleback also have been monitored during the drought. In some cases, rescued fish were taken to hatcheries to ensure the at-risk populations survived the drought. Mt. Shasta Hatchery is holding 732 rescued redband trout and 40 Merced River steelhead are being held at Merced River Hatchery. Coho salmon rescued from the Scott River and held at Iron Gate Hatchery were released back to the wild in the fall.

## **GOAL 3:** Preparing department hatcheries to hold rescued fish.

CDFW has modified existing hatcheries by installing self-contained, recirculating fish tanks complete with water chillers, biological filters and ultraviolet sterilization to safely hold fish rescued and removed from their natural locations. Hatcheries with fully operational systems include Iron Gate, Mount Shasta, Merced River, Mojave River and Fillmore hatcheries.

In April through June 2015, 42 pairs of redband trout were spawned producing 5,200 eggs of which 3,745 hatched into fry and are being reared at the hatchery.

In January, 12 steelhead females were spawned resulting in 650 steelhead fingerlings at the Merced River Hatchery. Fish in captivity will be safely held at the hatchery until there is sufficient water of adequate quality to return them to their wild habitat. Currently drought conditions will not support their survival.

CDFW installed water cooling equipment for the American River Trout Hatchery to benefit Lahontan Cutthroat Trout and to incubate fall-run Chinook salmon eggs from the American River. This system is currently operational and is being utilized for Lahontan Cutthroat Trout



due to excessively high water temperatures in the uncooled portion of the hatchery. The water quality is not suitable for rearing fish and for the second consecutive year trout are being evacuated from American River Hatchery except for the cooled water areas of the hatchery building where Lahontan Cutthroat Trout are being kept.

CDFW also installed an ultraviolet water disinfection system, fish rearing tanks and fish feeders for Mt. Shasta Hatchery. CDFW is expanding this system to hold additional fish due to poor conditions in the McCloud River watershed that are preventing these fish from being returned to the wild.

Finally, CDFW purchased eight self-contained, re-circulating fish rearing units with chillers, biological filters and ultraviolet disinfection for use at American River Hatchery, Kern River Hatchery, Mt. Shasta Hatchery and Silverado Fisheries Base to benefit rescued Lahontan Cutthroat, Kern River rainbow trout, McCloud River redband trout, and coastal coho salmon and steelhead.

## **GOAL 4:** Constant and dedicated coordination with the Department of Water Resources to minimize drought effects on aquatic species and implement Delta-specific regulatory flexibility decisions.

CDFW is a participant on the Real Time Drought Operations Management Team and Water Operations Management Team. These teams make modifications to water projects operations as well as plan on how to minimize impacts to fish in the continuing drought. Efforts over the year included continuing operations of the Rotary Screw Traps at Knights Landing and Tisdale on the Sacramento River and participation

in the development and review of the State and Federal Water Project's request to the State Water Resources Control Board for a [temporary urgency change petition](#).

The total budget for water operations coordination is \$730,000 of which \$290,000 has been spent.



### **BY THE NUMBERS**

The final project consists of \$4,503,000 in funds allocated or spent.



# TAKING STEPS TO AVOID COMMERCIAL FISHERY IMPACTS

GOAL: Continue trucking all or part of the Central Valley Chinook salmon to selected net pens locations downstream to increase the survival of these hatchery-produced fish.



Hatchery produced Central Valley fall-run Chinook salmon are the primary contributors to ocean commercial and recreational fisheries.

Hatchery salmon released upstream and near hatchery facilities face a gauntlet of hazards on their way to the ocean which include: water diversions, poor water quality, predation and other factors. These conditions, joined with abnormally low water levels and elevated water temperatures due to drought, make it extremely difficult for salmon to survive migration to the ocean. Trucking all or part of the Sacramento and San Joaquin River basin hatchery produced salmon to acclimation net pens downstream of the Delta bypasses these obstacles and is expected to increase the survival of hatchery produced salmon.

CDFW implemented the trucking of fall-run Chinook salmon smolts

which began in late March and continued through early June 2015 because water quality conditions were not suitable for downstream migration and survival. The trigger conditions were agreed upon by the U.S. Fish and Wildlife Service, National Marine Fisheries Service and CDFW.

CDFW continues to design projects for selected salmon hatcheries for water treatment systems to improve survival of fall-run Chinook salmon eggs and fish at the hatchery prior to their release. Hatcheries under consideration are Iron Gate, Nimbus and Merced River.

## BY THE NUMBERS:

The final project consists of \$640,000 in funds allocated or spent.

# ENSURING EXISTING WILDLIFE PROTECTION LAWS ARE ENFORCED

GOAL: Provides for overtime to sustain increased field presence of the department's enforcement staff in the parts of the state where drought impacts combined with illegal activities are likely to prove most harmful for fish and wildlife.



Through the end of the fiscal year, the Law Enforcement Division had logged 47,433 hours to drought related activities. Within these hours, wildlife officers have had 66,241 contacts, issued 2,522 warnings and 2,011 citations and made 301 arrests.

Late summer brings the peak of marijuana growing season. Wildlife officers remain actively involved in the investigation of water theft caused by marijuana growers. In many of these cases, growers take every drop of water from nearby creeks and streams. Already this summer, wildlife officers have taken significant actions in the pursuit to end these environmental destroyers. In two specific operation details, wildlife officers helped eradicate more than 100,000 water-guzzling marijuana plants and investigated more than 200 Fish and Game Code violations related to environmental damage and water theft. This type of illegal water theft has deprived local fish and wildlife populations of their most basic need.

As previously mentioned, CDFW has conducted numerous fish rescues on drought impacted waterways. Many CDFW trout and salmon hatcheries have been evacuated due to unhealthy water quality caused by drought. Because the fish were planted earlier than usual, in some cases it makes them more vulnerable to poachers who net small salmonids for use as bait to catch other fish. In the last quarter, due to extremely low water conditions on the Sacramento River, wildlife officers cited poachers for illegally netting juvenile salmon on sand bars never before exposed. These same, previously unknown sand bars have also caused many recreational boaters to unintentionally ground their vessels and need assistance from CDFW patrol boat crews.

## BY THE NUMBERS:

Wildlife officers have used the entire \$985,000 in allocated funds.

# FISHERIES RESTORATION GRANT PROGRAM ENHANCEMENTS FOR SALMON AND STEELHEAD RESTORATION

GOAL: Leverage existing Fisheries Restoration Grant Program (FRGP) funding to increase and enhance restoration projects along the coast and in the Sacramento River watershed.



CDFW released a public Proposal Solicitation Notice on July 1, 2014. The public Peer Review Committee reviewed and scored grant applications in September 2014 and forwarded their recommendations to the Director of CDFW in October 2014. CDFW developed and released the mitigated Negative Declaration, the Environmental Review document for the potential restoration projects, in December 2014. The Director of CDFW made grant approval decisions in February 2015 for drought and forest land restoration projects. Twenty-three drought projects were selected, totaling over \$3.5 million. Five forest land grants were awarded, totaling over \$500,000.

CDFW will evaluate and score 2015 drought and forest land grant agreements by October 2015, for the Director's selection of approved grants in February 2016.

## BY THE NUMBERS:

The total budget for this item is \$8 million, of which \$3,542,000 was awarded to drought restoration grants and \$554,000 was awarded to forest legacy restoration grants. The remainder of the drought grant funding, \$1,500,000, was made available for 2015-16 grants through Public Solicitation released July 1, 2015. The remaining \$1,446,000 for forest legacy restoration was made available for additional grants through a Public Solicitation released February 1, 2015. Of the \$800,000 for staff support, \$486,000 was spent for the year. The remaining \$314,000 was transferred to other drought projects within this report.

An aerial photograph of a river delta, likely the Sacramento-San Joaquin River Delta, showing a complex network of waterways and agricultural fields. A semi-transparent dark blue rectangular box is overlaid on the center of the image, containing white text.

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