



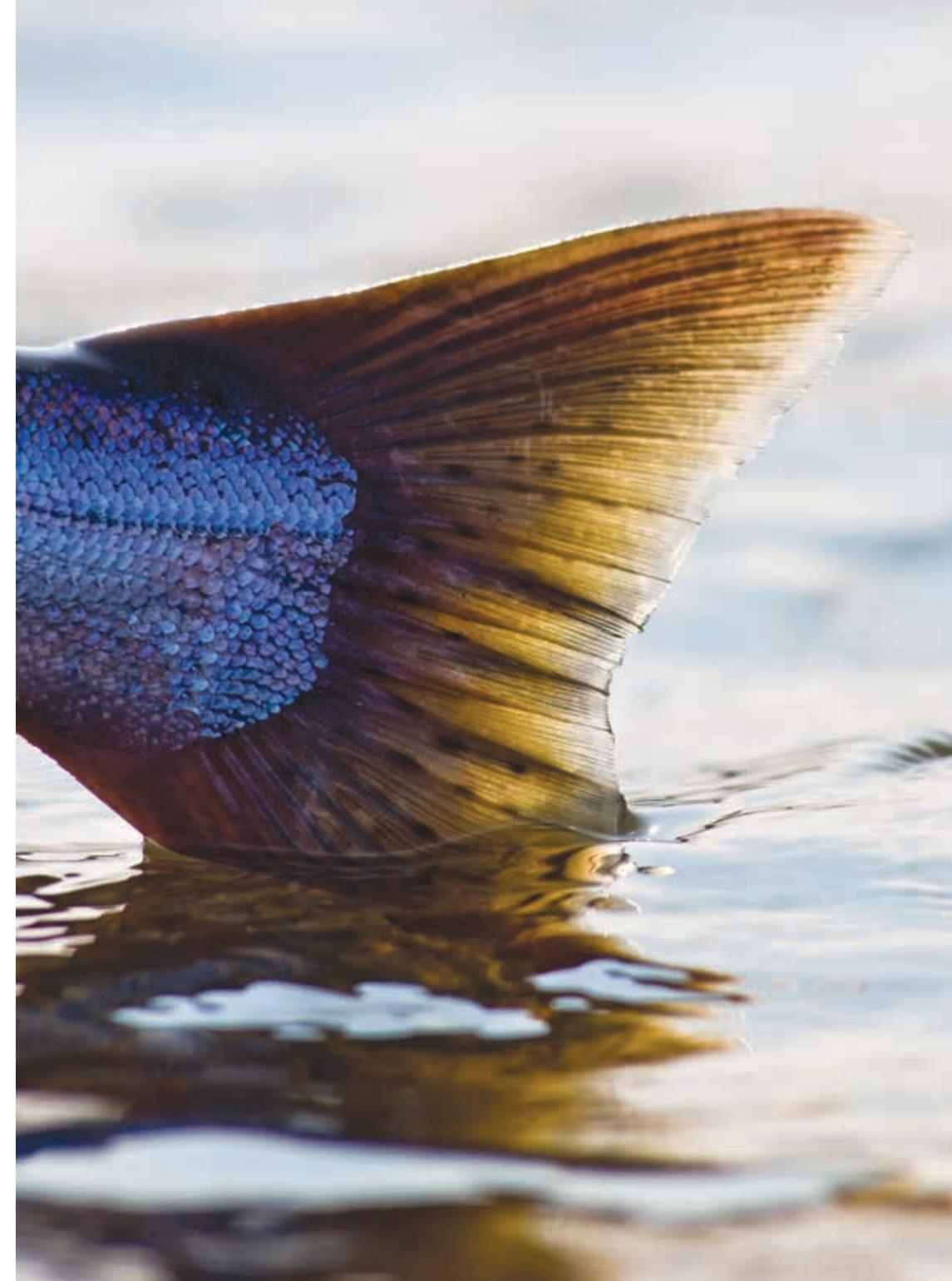
# **DROUGHT RESPONSE**

**CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE**

**QUARTER 2, OCTOBER-DECEMBER 2014**



[www.wildlife.ca.gov](http://www.wildlife.ca.gov)



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 a progress report through the second quarter of the fiscal year (October-December 2014).

# 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

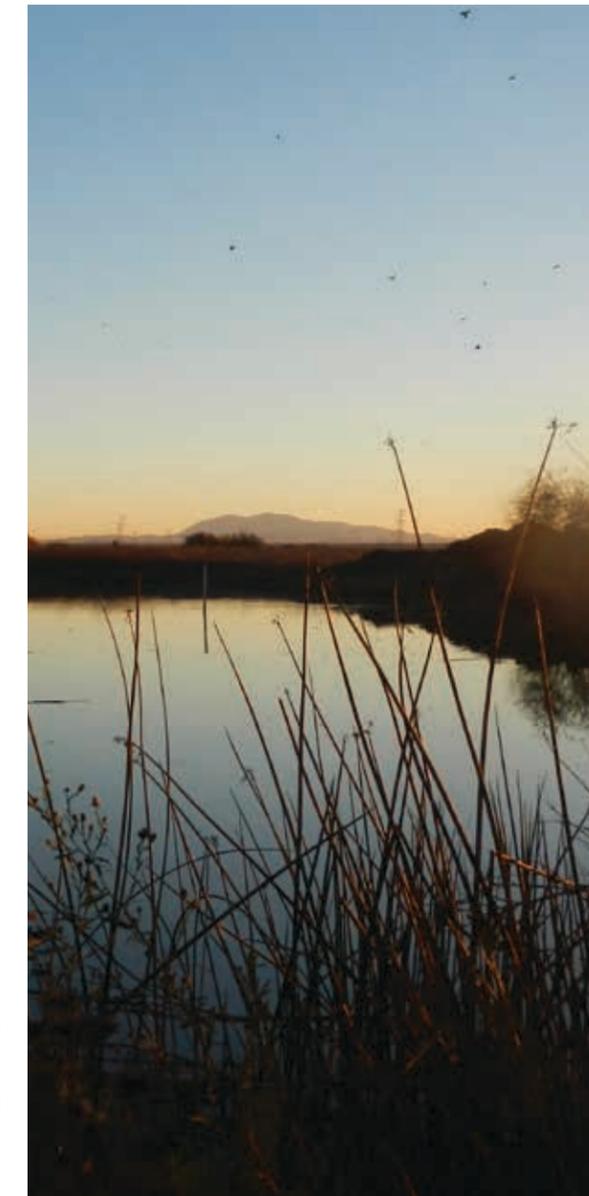
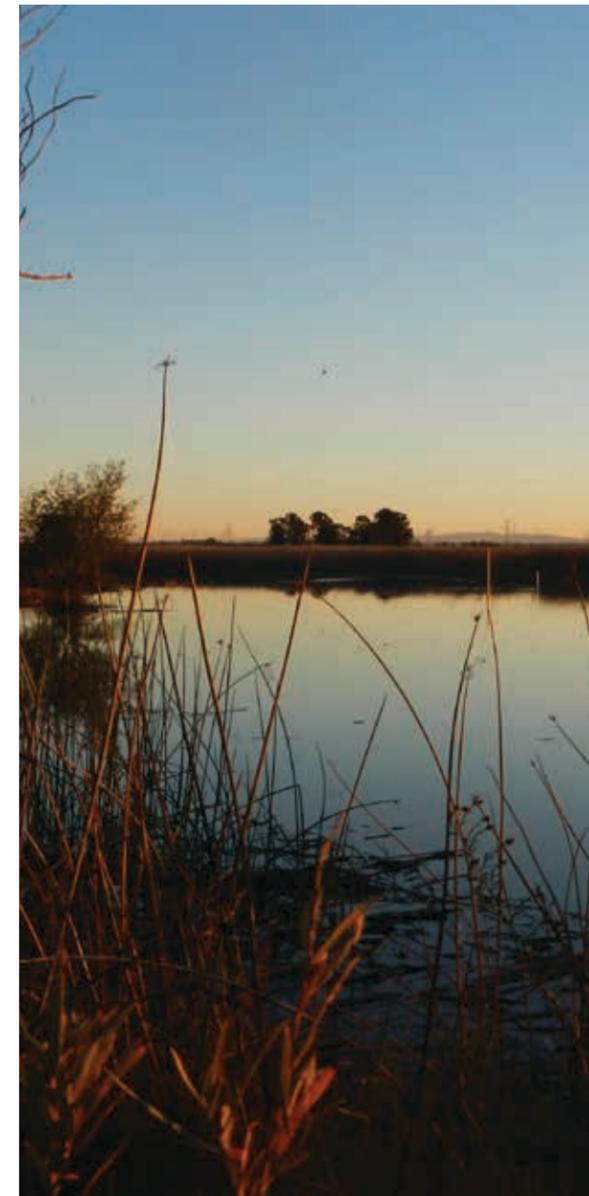
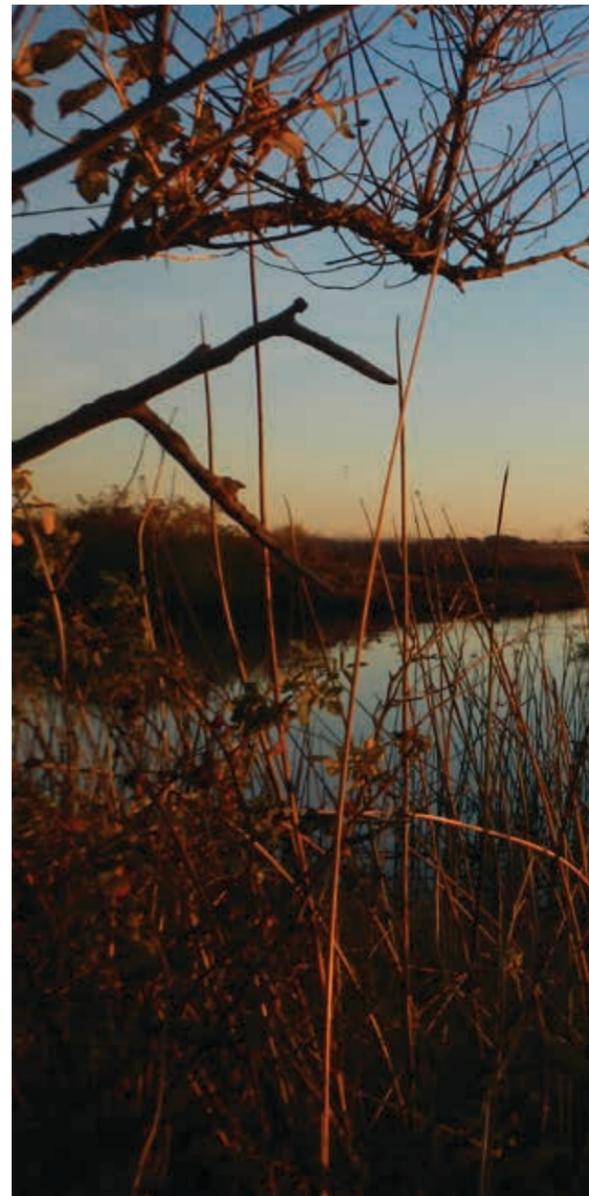
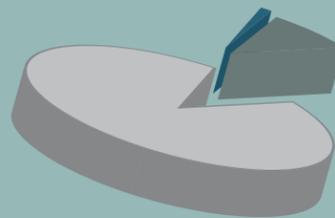
CDFW is restoring 150 acres of fresh and brackish water tidal emergent wetlands and 69 acres of alkali wetlands by reconnecting diked lands in Lindsey Slough, in the Cache Slough area in Solano County. Construction and tidal restoration was completed November 21, 2014.

## HILL SLOUGH TIDAL RESTORATION PROJECT

CDFW 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 summer of 2015 and will take two years to construct.

### BY THE NUMBERS:

The total budget for this is \$3,685,230 of which \$431,143 has been allocated or spent by the end of the second quarter. The total project cost for the two restoration projects is estimated at \$10,800,000. The project budget consists of \$3,700,000 in drought funds and the other \$7,100,000 will consist of Proposition 50, Proposition 84 and two mitigation accounts to account for the additional funds to implement the restoration projects.



### NEXT STEPS:

In the third quarter of the fiscal year, CDFW will finalize a contract for the construction of the Hill Slough tidal restoration project, develop plans and secure permits for Hill Slough through June 2015 when we anticipate breaking ground.

# EMERGENCY HELP FOR SALMON AND SMELT

**GOAL:** Improve existing monitoring for several runs of salmon, and Delta and longfin smelt through increased 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.



In November CDFW finalized a contract with the U.S. Fish and Wildlife Service to design and install a fish trap at the Anderson-Cottonwood Irrigation District fish ladder. This fish trap will support the collection of adult winter run Chinook salmon that will be spawned at the Livingston Stone National Fish Hatchery (LSNFH). The juvenile winter run Chinook salmon will be released the following year to offset reduced numbers of fish in the wild.

In December the purchase of 600 acoustic tags and a satellite uplink hydrophone was made to support the release of winter-run juvenile Chinook salmon later this year. These fish were raised at LSNFH and the use of this equipment will help state and federal agen-

cies monitor their survival and transit times as they emigrate down the Sacramento River and through the Delta, ultimately making their way out to the ocean.

Drought funding also supported a real-time temperature logging station being installed near Anderson on the Sacramento River will begin operation in early January. This temperature station assists the agencies in evaluating temperature conditions in the Sacramento River and in the development of alternative water management operations to ensure sensitive fish species protections.

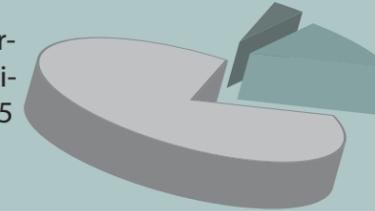
Additionally, CDFW is improving monitoring efforts of Delta smelt to better understand

how Delta smelt use the Delta in drought years during key spawning and rearing periods, as well as evaluate health and growth patterns. Through the second quarter, drought funds have supported initiating the analysis of archived Delta smelt otoliths collected from CDFW surveys conducted between 2009-2014 and the continuing collection of Delta smelt from surveys conducted in the fall of 2014 and winter of 2015.

Finally, CDFW is processing water samples collected to determine the effects of toxins on the food web in the Delta. This study is being done in coordination with the Department of Water Resources and U.C. Davis.

## BY THE NUMBERS:

The total budget for this is \$5,790,844 of which \$1,221,508 has been allocated or spent through the second quarter. CDFW is redirecting \$511,185 of these funds toward upgrading technology for monitoring.



## NEXT STEPS:

In the third quarter of the fiscal year, CDFW will continue to monitor water and fish population conditions in the Sacramento River and Delta and implement key emergency restoration projects in the Sacramento River Valley for winter-run Chinook salmon (e.g., Battle Creek Reintroduction Plan, Deer and Battle Creek barrier removal projects).



# INCREASED INVESTMENT IN THE SAN JOAQUIN RIVER RESTORATION PROGRAM

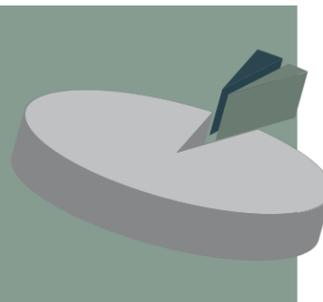
**GOAL:** Improve infrastructure at San Joaquin fish hatcheries, San Joaquin River Restoration Program (SJRRP) Interim Facility and a temporary fish rearing facility at the base of Friant Dam on USBR property which will provide cold water refuge sites in the face of the drought. Provide drought specific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



CDFW will further increase the investment in the SJRRP to protect spring and fall-run Chinook salmon. This effort will include two fish transport vehicles and temporary chillers to maintain cooler water temperatures, which is vital to the fish.

## BY THE NUMBERS

The total budget for this is \$2 million of which \$1,135,500 was allocated or spent at the end of the second quarter.



## NEXT STEPS

CDFW will improve functionality and upgrade equipment at the SJRRP facility below Friant dam and the SJRRP Interim Facility to allow

translocation of spring-run eggs and juveniles from Feather River Fish Hatchery for release in the San Joaquin River by installing water reuse and chiller systems to reduce the amount of water necessary for raising spring and fall-run Chinook and protect them from unprecedented higher water temperatures during the drought and minimize impacts from limited water supplies. This will also support fall-run spawning and rearing activities and the maintenance of spring-run at the SJRRP Interim Facility. Remaining funds will be used to make improvements to the San Joaquin fish hatchery water supply, purchase two transport vehicles that will provide safe fish movement for rescue and release and provide for improved monitoring and fish trapping/holding equipment that will be deployed to ensure Chinook survive unsuitable river conditions.



# 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 during the second quarter of drought response plan implementation. Two projects have been completed, four projects are underway, and 17 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:

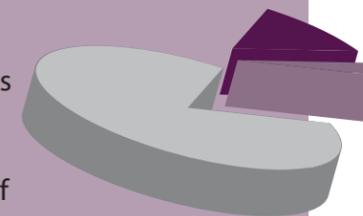
**Groundwater improvements:** Such as refurbishing or replacing existing wells and related infrastructure.

**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.

## BY THE NUMBERS

The total budget for this is \$5,700,000 of which \$4,485,770 was allocated or spent through the end of the second quarter of the fiscal year.



## NEXT STEPS

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.



# 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](#).



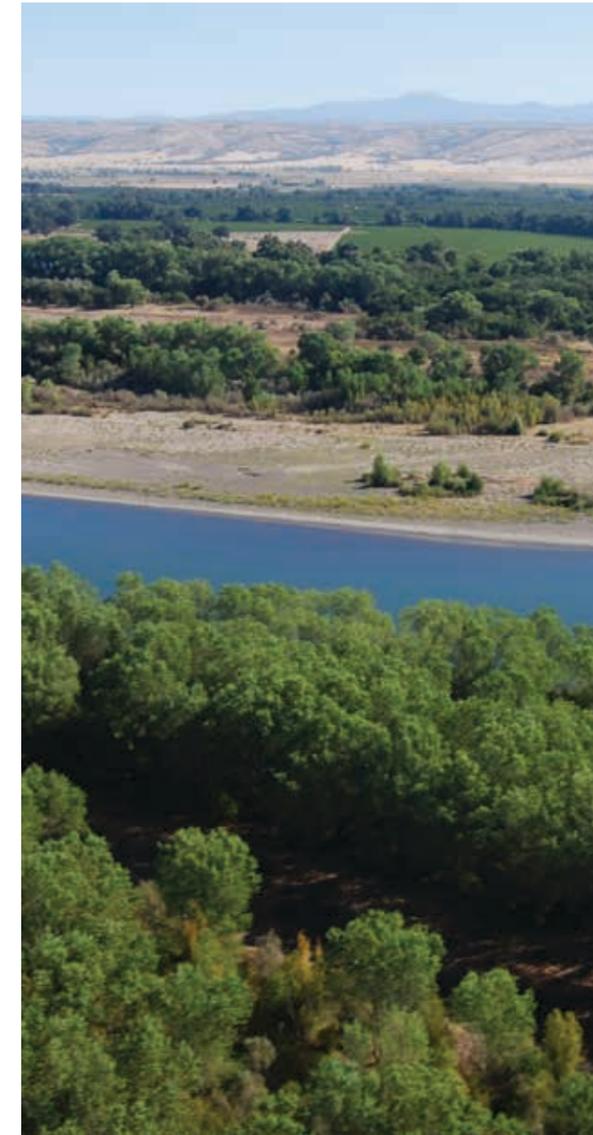
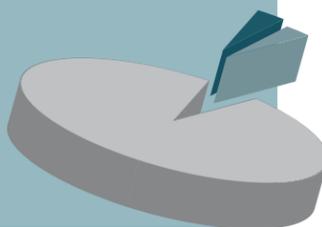
CDFW has contracted with U.C. Davis to assess the growth and spread of submerged and floating aquatic plant species in the Delta using aerial surveillance and spectral imaging. These species can be problematic because they can change how native fish move through, and survive in the Delta. Aerial surveillance flights were conducted late in the fall of 2014, with work now shifting to assessing the images. A full analysis and report should be available July 2015.

CDFW is finalizing a steelhead monitoring program looking at population abundance and distribution in the Sacramento River ba-

sin, and some major milestones in this effort were completed this quarter. This includes the purchases of items such as traps, vehicles and boats that are much needed and key to implementing a successful steelhead monitoring program.

## BY THE NUMBERS

The total budget for this is \$6,800,000. At the end of the second quarter, \$954,115 had been spent.



## NEXT STEPS

Additional CDFW efforts to improve monitoring capabilities and inform management decisions are still under contract development and expected to be finalized in the third quarter. These efforts include establishing a Passive Integrated Transponder (PIT) tag detection system in the Delta, San Joaquin River and tributaries, Sacramento River and tributaries and major diversion facilities; implementing a sturgeon program to capture, acoustically tag and monitor the movements of juvenile sturgeon; and implementing a steelhead monitoring program looking at population abundance and distribution in the Sacramento River basin.

**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 (disease, strandings, dewatered redds, high water temperature, low flow). Monitoring in some areas of the state decreased into the late fall and early winter and will increase again in late February. The total budget for this project is \$1,049,549 of which \$464,277 has been spent in first half of the fiscal year.

**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 more than 300 rescues throughout the state's coastal and Central Valley rivers and creeks. 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. Rescued redband trout are being held at Mt. Shasta Hatchery and 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. The total budget for this project is \$798,235 of which \$247,982 has been spent.





### 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 part of the Real Time Drought Operations Management Team (RTDOT) and Water Operations Management Team (WOMT). These teams make modifications to current water operations as well as plan for how to minimize impacts to fish in a continuing drought. Efforts during the second quarter

included continuing operations of the Rotary Screw Traps at Knights Landing and Tisdale on the Sacramento River, participation in the multi-agency development of the [Interagency 2015 Drought Strategy](#), [CVP and SWP Drought Contingency Plan](#), [CVP and SWP Drought Contingency Biological Monitoring Plan](#) and [Draft Review Of Applied Adaptive Management](#), and initiating Spring Kodiak Trawl and Early Warning sampling.

Spring Kodiak Trawl and Early Warning sampling began in December in compliance with the [Central Valley Project and State Water Project Drought Contingency Biological Monitoring Plan For Water Year 2015 and Beyond](#). The Early Warning sampling helps to evaluate smelt movement into the interior Delta so that water project operations can be

adjusted to reduce the risk of entrainment and loss. Results of the December Spring Kodiak Trawl sampling confirmed the very low abundance levels detected by the Fall Midwinter Trawl for Delta Smelt, suggesting that impacts resulting from drought conditions are severe. Coordinating this additional sampling with existing mandated surveys on the distribution, relative abundance and spawning condition of Delta Smelt can create scheduling delays and concerns, as these same boats and crews are then required to get back on the water without much down time. This can be especially challenging during the winter high-flow events and storms, requiring extra preparation and sometimes resulting in costly equipment repairs. The total budget for water operations coordination is \$730,000 of which \$190,000 has been spent.

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

CDFW is modifying existing hatcheries by installing self-contained, recirculating fish tanks complete with water chillers and ultraviolet sterilization to safely hold fish rescued and removed from their natural locations. At some locations modifications are complete. These fish will be safely held at the hatchery until there is sufficient water of adequate quality to return them to their wild habitat.

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 will be used in the coming months when water quality is not suitable for rearing fish.

CDFW also installed an ultraviolet water disinfection system, fish rearing tanks and fish feeders for Mount 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 and ultraviolet disinfection at Mojave River Hatchery, Iron Gate Hatchery, Kern River Hatchery, Crystal Lake Hatchery and Silverado Fisheries Base to benefit rescued southern steelhead, Scott River coho salmon, Kern River rainbow trout, Goose Lake redband trout, Warner Valley redband trout, and coastal coho and steelhead. The total budget for preparing hatcheries to hold rescued fish is \$1,950,000 of which \$1,914,234 has been spent.



### BY THE NUMBERS

The total budget for these activities is \$4,530,000. At the end of the first three months, \$2,816,493 had been spent.

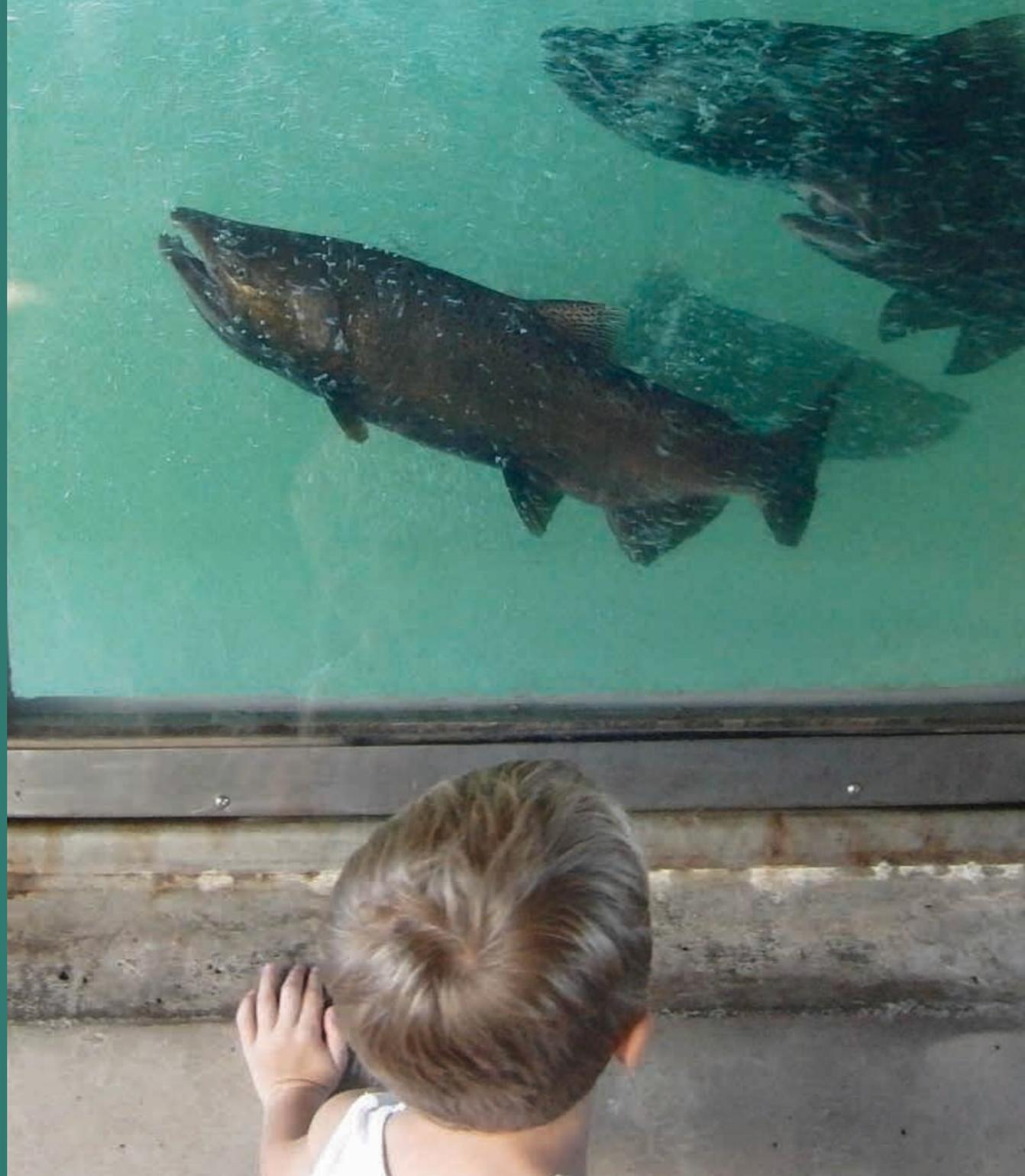


### NEXT STEPS

CDFW will continue monitoring efforts and will conduct fish rescues as needed. Emergency hatchery modifications will be finalized in order to receive rescued fish if necessary. Water operations coordination will continue through inter-agency collaboration as the water year develops.

# TAKING STEPS TO AVOID COMMERCIAL FISHERY IMPACTS

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



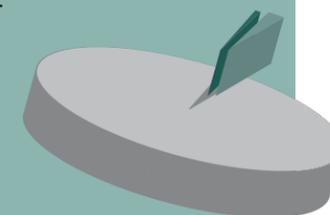
Hatchery produced Central Valley fall-run Chinook salmon are the primary contributors to ocean commercial and recreational fisheries. Hatchery salmon released upstream and near hatchery facilities face a gauntlet of hazards on their way to the ocean which include: water diversions, poor water quality, 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 is prepared to implement the trucking of fall run Chinook salmon smolts in the spring of 2015 if water quality conditions are not suitable for downstream migration and survival. The trigger conditions have been agreed upon by the U.S. Fish and Wildlife Service and National Marine Fisheries Service

Drought funds in this focus area provided for 25 percent of the fall-run Chinook salmon to be tagged at the Feather River Hatchery with coded wire tags. These fish will be released in the spring of 2015.

## BY THE NUMBERS:

The total budget for this is \$900,000, of which \$238,000 has been spent.



## NEXT STEPS:

CDFW is prepared to tag 25 percent of Feather River Hatchery fall-run Chinook salmon in March. Additionally, CDFW will collaborate with federal fish management agencies to truck juvenile Chinook salmon from upstream hatcheries to acclimation pens located downstream of the Delta.

# 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 February 2015, the Law Enforcement Division had logged 32,022 hours to drought related activities. Within these hours, wildlife officers have had 37,352 contacts, issued 1,779 warnings and 1,194 citations and made 260 arrests.

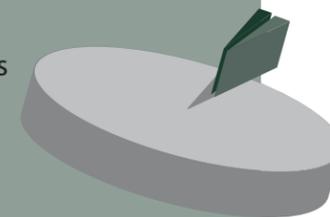
Between July 2014 and February 2015, key issues facing the Law Enforcement Division were water diversion, wildlife calls relating to low food levels, fish rescue, monitor closed or special restricted rivers and streams and marijuana grows.

## NEXT STEPS:

Wildlife officers will continue to focus enforcement efforts where drought impacts combined with illegal activities are likely to prove most harmful for fish and wildlife.

## BY THE NUMBERS:

The total budget for this is \$1,170,000 of which \$582,872 has been spent.



# 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.

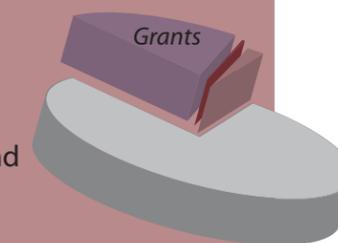


CDFW released a public Proposal Solicitation Notice on July 1, 2014. The public Peer Review Committee reviewed and scored grant applications in September and forwarded their recommendations to the Director of CDFW in October. CDFW developed and released the mitigated Negative Declaration, the Environmental Review document for the potential restoration projects, in December. The Director of CDFW made grant approval decisions in February 2015.

## BY THE NUMBERS:

The total budget for this is \$8,000,000 is to implement habitat restoration grants for drought and forest land improvement and for CDFW staff to be redirected to these actions.

Funding breakdown- \$5,200,000 is meant for grants addressing the 2014 drought or preparing watersheds and local communities for future droughts; \$2,000,000 is targeted for addressing forestry legacy effects on state and private forestlands; \$800,000 is for personnel and field support. \$118,133 has been spent on staff support to-date.



## NEXT STEPS:

Drought and forest land grants will commence in June and July.

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 box is overlaid on the center of the image, containing white text.

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