



**NOAA  
FISHERIES**

**SPECIES *in the* SPOTLIGHT**

**Priority Actions: 2016-2020**

**Central California  
Coast Coho Salmon**

***Oncorhynchus kisutch***



## SPECIES SPOTLIGHT BACKGROUND

The 5-year action plan is part of a strategy to marshal resources on species listed under the Endangered Species Act of 1973 (ESA) for which immediate, targeted efforts are vital for stabilizing their populations and preventing their extinction. Eight species were identified by the National Marine Fisheries Service (NMFS) as among the most at-risk of extinction:

- Atlantic Salmon Gulf of Maine Distinct Population Segment (DPS)
- Central California Coast Coho Evolutionarily Significant Unit (ESU)
- Cook Inlet Beluga Whale DPS
- Hawaiian Monk Seal
- Pacific Leatherback Sea Turtle
- Sacramento River Winter-run Chinook ESU
- Southern Resident Killer Whale DPS
- White Abalone

These species were identified as among the most at-risk of extinction based on three criteria (1) endangered listing, (2) declining populations, and (3) are considered a recovery priority #1<sup>1</sup>. We know the threats facing these species and understand the management actions we can take that will have a high probability of success. The 5-year action plan builds upon existing recovery or conservation plans and details the focused efforts needed over the next 5 years to reduce threats and stabilize population declines. We will engage our partners in the public and private sectors in actions they can take to support this important effort. We will report on our progress through the Biennial Report to Congress and post updates on our website: <http://www.nmfs.noaa.gov/pr/>.

This strategy will guide agency actions where we have the discretion to make critical investments to safeguard these most endangered species. The strategy will not divert resources away from the important and continued efforts to support all ESA-listed species under our authority. Many of our species have long-standing conservation programs supported by multiple partners. We remain committed to those programs. This action plan is designed to highlight the actions that can be taken by us, other federal and state resource agencies, environmental organizations, Native American Tribes and other partners to turn the trend around for this species from a declining trajectory to a trajectory towards recovery.

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<sup>1</sup> Priority #1 is defined as a species whose extinction is almost certain in the immediate future because of a rapid population decline or habitat destruction, whose limiting factors and threats are well understood and the needed management actions are known and have a high probability of success, and is a species that is in conflict with construction or other developmental projects or other forms of economic activity. NMFS Endangered and Threatened Listing Recovery Guidelines (55 FR 24296, June 15, 1990).

## **CENTRAL CALIFORNIA COAST COHO SALMON STATUS**

Central California Coast coho salmon were first listed as a threatened species in 1996, and subsequently reclassified as endangered in 2005. This unique run of coho salmon, at the southern extent of the species' range, has teetered on the brink of extinction. All available time series show a continued and significant downward trend, poor adult returns, and an increase in the risk of extinction since 2005 (Spence and Williams 2011). The two exceptions are Russian River and Santa Cruz, California, where recent increases of adults and naturally-spawned young have been observed due to the operation of conservation hatchery programs.

## **CENTRAL CALIFORNIA COAST COHO SALMON KEY CONSERVATION EFFORTS/CHALLENGES**

NMFS' recovery strategy for Central California Coast coho salmon outlines the following three priorities: (1) expand conservation hatchery programs to rebuild self-sustaining wild populations as habitats are restored; (2) focus restoration and outreach in priority watersheds; and (3) invest in monitoring and research that supports and informs conservation hatchery programs, restoration, and status assessments.

### ***Conservation Hatchery Programs***

The two current conservation hatchery programs are the Captive Broodstock Conservation Program on the Russian River in Sonoma County, California, and small Kingfisher Flat Hatchery on Scott Creek, Santa Cruz County, California. While differing in size and funding, both programs were initiated in 2001 in response to severely depressed coho salmon numbers. Fish are collected from the wild, brought into the hatcheries, genetically tested, and spawned to maximize diversity and prevent inbreeding. In the hatchery, fish are raised to various ages, fed krill, tagged, and released into streams throughout the watersheds. This release strategy allows the fish to imprint on the creek with the aim that they will return to these streams as adults and spawn naturally.

These conservation programs have boosted populations and prevented extinction. However, consistent funding for facility improvements and staffing is a constant challenge in an environment with increased demands for water and a severe drought. On the Russian River, adults returning to their release streams have increased steadily, and naturally-spawned offspring have been observed in most release streams as well as historically barren unstocked streams. The program integrates fish from other nearby watersheds recognizing that recovery requires multiple healthy populations. On Scott Creek, the number of returning adults and naturally-spawned offspring during the 2014-2015 season was the largest observed over the past decade (Brian Spence, pers. comm. 2015). This increase appears due to a combination of modified mating strategies that incorporated broodstock from the Russian River program coupled with

implementation of a staggered juvenile release strategy across a longer timeframe, which preliminary data suggest has improved marine survival (Brian Spence, pers. comm. 2015). Fish were also observed in other Santa Cruz County streams during the 2015 survey season that were previously considered extirpated or nearly so in the last status review (Spence and Williams 2011).

### ***Habitat Restoration, Outreach, and Education***

Pacific Coastal Salmonid Funds (PCSRF) matched with California State grant funds provide resources supportive of outreach, education and habitat restoration. NMFS West Coast Region (WCR) and NMFS Restoration Center work closely with California Department of Fish and Wildlife (CDFW) to ensure high priority geographies and projects are eligible and explicitly link to State and Federal recovery actions for coho salmon recovery. Furthermore, NMFS and the State have formed a “Priority Action Coho Team” (PACT) to assemble State and Federal recovery plan priorities and develop a shared vision of recovery and strategic focus on immediate actions we can relay to the public and partnering agencies.

### ***Monitoring and Research***

Monitoring and research: (1) are integral to the management of the conservation hatchery programs; (2) inform restoration efforts as well as recovery criteria; and (3) provide needed information on status and trends. Monitoring and research work has led to alterations in hatchery practices and release strategies of the conservation programs to improve coho salmon survival, fitness, and genetic diversity. This work is also providing information on population status and trends which has improved considerably due to the implementation of the State’s Coastal Monitoring Program. The Coastal Monitoring Program is based on redd count surveys of stream reaches using a statistically-valid sampling design expanded to adult estimates based on spawner:red ratios. The program is now informing NMFS’s 5-Year Status Reviews and provides a substantially better basis for assessing status compared with previous status reviews and will increase greatly in value as these time series become longer (Spence, pers. comm. 2015). Long-term dedicated resources to support California’s monitoring program and critical science questions are needed.



## **KEY ACTIONS NEEDED 2016-2020**

The key actions that follow represent a small subset of the recovery actions identified in the 2012 recovery plan, and represent actions NMFS and partners can take in the next five years to promote recovery of the species. The partners identified below have indicated their interest in helping achieve the action, but are not committed to a specific activity or commitment of resources. This list is not comprehensive of all potential partners, and we welcome partnering with others not identified within this plan.

### **Continue and Expand Conservation Hatchery Programs to Prevent Extinction**

**Description and Background:** Since the conservation hatchery programs were instituted in 2001, increases overtime of hatchery-origin fish returning to produce naturally-spawned offspring have been observed. The capability of these programs to provide adequate staffing,

land, equipment, electrical needs, water, water cooling, etc., as well as genetic management, research, and monitoring requires a significant commitment of resources.

**Expected Benefits to the Species:** Conservation hatcheries can provide the needed boost in numbers, distribution, and genetic fitness as unoccupied habitats are restored and threats are abated. The intent of conservation hatcheries is to supplement the coho salmon populations until they are determined as self-sustaining in the wild.

**Source:** Conservation hatcheries are discussed as high priorities in the Coho Salmon Recovery Plan (NMFS 2012), Assessment of Protective Efforts (Vol I: Chapter 5), Species-Level Recovery Actions (Vol II) and Population-Level Recovery Actions (Vol III).

#### **A. Conservation Hatchery – Russian River**

**Location:** Warm Springs Hatchery, Sonoma County, California

**NMFS Point of Contact:** Bob Coey, WCR Santa Rosa Area Office, [Bob.Coey@noaa.gov](mailto:Bob.Coey@noaa.gov), 707/575-6090

**Lead Partners:** US Army Corps of Engineers (USACE), CDFW (hatchery operations), NMFS WCR, NMFS Southwest Fisheries Science Center (SWFSC) (genetic management), and University of California Cooperative Extension/California Sea Grant Extension Program (monitoring and research)

**Partners:** Sonoma County Water Agency, US National Parks Service, Marin Municipal Water District, North Coast Regional Water Quality Control Board, The Nature Conservancy, The Conservation Fund, and private landowners (access, coordination and outreach)

**Proposed Start Date:** Ongoing

**Expected Completion Date:** 2025

**Current Status:** Current funding and capacity (250,000 juveniles and 1,000 adults) for the Russian River program is provided by the USACE. Field surveys, genetic monitoring, and smolt stocking is conducted in the Russian River via requirements within a Section 7 Biological Opinion. CDFW, Sonoma County Water Agency, Marin Municipal Water District, and PCSRF-Fisheries Restoration Grant Program (FRGP) grants have facilitated stocking and monitoring efforts in other Sonoma County streams. The National Parks Service provides funding for the Marin stream stocking and monitoring programs. Additional funds would expand the current program to provide rearing of 500,000 juveniles and 2,000 adults. The USACE and CDFW are working on a Hatchery Genetic Management Plan. Discussions are underway to consider program expansion to the northern portion of the Central California Coast (CCC) coho salmon range should funding become available. Outreach to new potential partners for funding new efforts has begun in Marin, Sonoma, and Mendocino Counties.

**Updates:** Update annually end of each fiscal year



**Resources:***Funding:*

Construction and operating costs are provided by the USACE for the existing Russian River coho program facility which are estimated at \$5,000,000 and \$1,500,000 annually (including personnel). A one-time \$5,750,000 for the proposed regional expansion of the CCC coho facility (\$5,000,000) including new rearing (\$500,000) and release equipment (\$250,000). Expansion of this program beyond the Russian River would also require an additional annual investment in facility personnel of \$500,000, \$250,000 for field monitoring and \$50,000 for genetic management.

*Opportunities for Partners:*

- We encourage sustained partnerships with USACE, CDFW, University of California Cooperative Extension/California Sea Grant Extension Program, Sonoma County Water Agency, National Parks Service, Marin Municipal Water District, North Coast Regional Water Quality Control Board, The Nature Conservancy, The Conservation Fund, private landowners, and seek additional partners in Marin, Sonoma, and Mendocino Counties to support the Russian River hatchery program.

**B. Conservation Hatchery – Scott Creek and all streams draining to the Pacific Ocean in Santa Cruz/San Mateo Counties, California**

**Location:** Scott Creek and all streams in Santa Cruz/San Mateo County, California

**NMFS Point of Contact:** Joel Casagrande, WCR Santa Rosa Area Office [Joel.Casagrande@noaa.gov](mailto:Joel.Casagrande@noaa.gov), 707-575-6016; Erick Sturm, SWFSC, [Erick.Sturm@noaa.gov](mailto:Erick.Sturm@noaa.gov), 831-420-3964

**Lead Partners:** CDFW, Monterey Bay Salmon and Trout Project, NMFS WCR and SWFSC

**Partners:** Big Creek Lumber Company, participating landowners, agencies and non-profit organizations

**Proposed Start Date:** Ongoing

**Expected Completion Date:** 2025

**Current Status:** Captive rearing efforts are currently limited to the program at Kingfisher Flat Hatchery run jointly by the Monterey Bay Salmon and Trout Project and NMFS. Husbandry practices and spawning protocols for captive broodstock have improved since initiation of operations in 2001. Due to poor returns of hatchery-origin fish to Scott Creek from 2006 to 2012, the SWFSC initiated experiments to extend the release timing of juveniles over an eight-week period between March and May versus a one-two week period in late March. Preliminary results are encouraging with the 2014-2015 spawning year having the largest return of coho salmon to Scott Creek in a decade despite the severe drought in California and poor ocean conditions.

Although this program is essential in preventing local extirpation of coho salmon, in its current condition, it is unlikely to serve as a regional recovery hatchery. Expanding the current facility is not possible due to limited space, limited water supply, and water quality issues that

contributed to a fungal outbreak among both adult broodstock and smolts over the past three years. A significant fraction of adult broodstock has died from these fungal infections prior to spawning. The high rate of infection is likely a function of four contributing factors: (1) the drought, which has limited the amount of water available to the hatchery, (2) the high rearing densities of fish in the raceways compared with previous years, (3) the lack of an operational filtration system until February 2015, and (4) the lack of chillers to maintain cooler water temperatures.

CDFW and NMFS are working along two paths: (1) secure funds to improve the functional operations at the Kingfisher Flat Hatchery as an emergency measure to prevent losses of coho salmon at the hatchery, and (2) secure funds to identify a new site for a regional conservation hatchery with a dependable water supply. Current funding and capacity (40,000 smolts and 400 adults) for the Scott Creek program is provided by the State's FRGP funding (~\$275,000/year) and NMFS base funds for NMFS SWFSC staff to assist with operations and monitoring. NMFS and CDFW have been developing a regional approach for a Hatchery Genetic Management Plan with the long term intent to expand the program with additional partners to the entire Santa Cruz Diversity Stratum should funding become available.

**Updates:** Updates annually at the of the fiscal year

**Resources:**

*Funding:*

Improving current operations is estimated at \$250,000 with annual investments to maintain operations an additional \$250,000. This involves the installation of four new holding tanks that will allow for better turnover of water (e.g., better water quality), that will provide the ability to isolate and treat infected fish, and will allow for separation of fish to maintain various release groups to maintain migration timing diversity. Such tanks will have an improved water supply circulation system than the existing raceways, be easier to clean and maintain, and allow for chemical treatment of infected fish should an outbreak of fungus or other diseases occur. A portion of the water exiting these tanks would be recirculated back through the filtration systems, helping to minimize fungal spores and increase the available water supply.

In addition, CDFW pathologists have indicated that a regular (3 times weekly) prophylactic treatment of adults and smolts may be required in order to prevent recurrence of a fungal outbreak. Expansion of this disease prevention program would also require an additional investment in facility personnel of 1 to 1.5 staff.

Costs of relocating the facility are estimated at \$7,000,000. Monitoring costs are estimated at \$500,000 annually. These funds would support adult and juvenile monitoring and an expanded PIT-tag antenna array network vital for assessing status and abundance in the region and the effectiveness of the conservation hatchery operations to inform adaptive management options.



*Opportunities for Partners:*

- We encourage sustained partnerships with CDFW, Monterey Bay Salmon and Trout Project, Big Creek Lumber Company, participating landowners, agencies, and non-profit organizations, and seek additional partners to support operations at the Kingfisher Flat Hatchery and siting of a new regional conservation hatchery with a dependable water supply.

**Continue and Expand Restoration and Funding Partnerships through  
Implementation of Priority Recovery Actions in Targeted Locations**

**Description and Background:** The PCSRF and California State grant funds have provided critical resources to support education, outreach, and habitat restoration actions identified in recovery plans. NMFS WCR, NMFS Restoration Center, and CDFW are working on a more strategic focus for State and Federal resources for the State's FRGP. This focus is to set our goals on a set of shared priorities outlined in recovery plans, send a consistent message, and solicit projects in locations where populations play a greater role in coho salmon recovery. This includes a NMFS-CDFW PACT effort, consideration of locations associated with long-term monitoring, captive broodstock outplanting, and coordinated ecosystem-based restoration activities. PACT is designed to relay information to recovery partners regarding education, outreach, enforcement, regulatory and habitat restoration priorities. A high priority recovery action across the CCC coho salmon range is restoration of estuarine and floodplain habitats that can influence survival and fitness of salmon at population-level scales.

**Expected Benefits to the Species:** A strategic approach to bring habitat restoration funds together with priority populations, captive broodstock efforts, monitoring, research, outreach, and education will yield a greater benefit to rebuilding those core populations that support the overall viability of the species. Communicating, implementing, and funding this more strategic approach and establishing a focus for restoration work will bring shared resources from both public and private partnerships and build a coalition around addressing the greatest limiting factors and most important populations for recovery.

**Source:** Restoration, outreach and education are discussed as high priorities in the Coho Salmon Recovery Plan (NMFS 2012), Assessment of Protective Efforts (Vol I: Chapter 5), Species-Level Recovery Actions (Vol II) and Population-Level Recovery Actions (Vol III).

**Location:** Punta Gorda, Mendocino County, California, to Aptos Creek, Santa Cruz County, California

**NMFS Point of Contact:** Charlotte Ambrose, WCR, [Charlotte.A.Ambrose@noaa.gov](mailto:Charlotte.A.Ambrose@noaa.gov), 916-930-3704; Bob Coey, WCR Santa Rosa Area Office, [Bob.Coey@noaa.gov](mailto:Bob.Coey@noaa.gov), 707-575-6090; Pat Rutten, NMFS Restoration Center, [Patrick.Rutten@noaa.gov](mailto:Patrick.Rutten@noaa.gov), 707-575-6059

**Lead Partners:** WCR, NMFS Restoration Center, CDFW

**Partners:** State, Federal, public and private recovery partners identified in the Recovery Plan and PACT document

**Proposed Start Date:** Ongoing

**Expected Completion Date:** Restoration funding is ongoing through PCSRF and the State.

**Current Status:** PCSRF and State funds continue to provide critically needed resources used for instream restoration, monitoring, education, and outreach. The State's Fisheries Restoration Grant Program, partially funded by PCSRF, has dedicated 146 total projects of 433 for Central Coast coho salmon between 2004 and 2011 (CDFW 2015).

**Updates:** California submits annual reporting regarding PCSRF funds.

**Resources:**

*Funding:*

Continued funding would be a significant contributor to the ongoing effort to strategically invest in the highest priority projects for coho salmon. An additional \$5,000,000 to \$10,000,000 investment in CCC coho salmon projects would advance implementation of recovery priorities over the next five years. No funds have been allocated to date for PACT except agency staff time as part of their job duties. Approximately \$100,000 is needed annually to support identified priorities. A dedicated contractor or full-time employee would benefit the finalization and implementation of this effort.

*Opportunities for Partners:*

- We encourage sustained partnerships with all our partners involved in the NMFS-CDFW PACT effort and seek additional partners to support priority recovery efforts in locations where salmon populations play a greater role in recovery.

**A. Restoration Project - Lagoon at Scott Creek in Santa Cruz, California**

**Description and Background:** The Highway 1 bridge over Scott Creek in northern Santa Cruz County is nearing the end of its serviceable life and needs replacement. The Scott Creek floodplain, lagoon, and outlet to the Pacific Ocean were dramatically altered when the bridge was built in 1936. Approximately 1200 feet of lagoon and beach interface were impacted by fill used to build road approaches and levees built to straighten the channel through the narrow bridge abutments. The alterations have resulted in degradation to highflow refugia and marsh plain habitats including significant shifts in bar opening and closing dynamics. The degradation of habitat has impacted survival and fitness of wild and broodstock CCC coho salmon in Scott Creek. Replacement of the Highway 1 Bridge, to include restoration of the marsh-lagoon complex of Scott Creek, is the highest recovery priority in the Santa Cruz area. The local Resource Conservation District and Regional Transportation Commission are working with Caltrans and the state and federal resource agencies to collaboratively develop a marsh-lagoon restoration plan as a complement to the bridge replacement project. While CCC Coho recovery

is driving this effort, the project will result in benefits for other federally listed species including steelhead, tidewater goby, California red-legged frogs, and snowy plover.

**Expected Benefits to the Species:** Estuaries and lagoons on California’s central coast have been documented as important rearing habitat for coho salmon and steelhead and can contribute a disproportionate number of returning adults compared to stream habitats. Restoration of natural breaching dynamics allow fish to enter and exit the system when conditions are optimal. Restoring winter refuge and rearing habitat will improve the carrying capacity of the stream. It will also improve the size and fitness of CCC coho salmon juveniles making it more likely for them to survive their ocean life stage and return as adults to spawn. Restoration investments in Scott Creek will complement investments in the conservation hatchery program. Restoring the Scott Creek lagoon will have direct benefits to the survival and fitness of the CCC coho salmon raised in the Kingfisher Flat Hatchery.

**Source:** CCC Coho Salmon Recovery Plan (NMFS 2012): ScC-CCC-13.1.1.1; ScC-CCC-13.1.1.2; ScC-CCC-13.1.2.1

**Location:** Scott Creek, Northern Santa Cruz Co, Central California

**NMFS Point of Contact:** Joel Casagrande, WCR Santa Rosa Area Office  
[Joel.Casagrande@noaa.gov](mailto:Joel.Casagrande@noaa.gov), 707-575-6016

**Lead Partners:** Resource Conservation District of Santa Cruz County; Santa Cruz County Regional Transportation Commission; Caltrans; Cal Poly Swanton Ranch (landowner)

**Partners:** CDFW, NMFS, NMFS Restoration Center, U.S. Fish & Wildlife Service (USFWS), USFWS Coastal Program, California Coastal Conservancy, California Coastal Commission, Central Coast Regional Water Quality Control Board, County of Santa Cruz, (interagency collaboration facilitated through the Integrated Watershed Restoration Program –IWRP)

**Proposed Start Date:** 2013 (formally enter into collaboration)

**Expected Completion Date:** Based on funding availability, the team is focused on having the restoration design and bridge design and California Environmental Quality Act requirements completed by early 2017 with implementation to follow.

**Current Status:** The lead partners for this effort to include Caltrans, the landowner, and Cal Poly’s Swanton Pacific Ranch signed a memorandum of understanding to collaborate on this project in July of 2013. Over the subsequent 2 years, the project partners hosted a series of workshops with all local, state and federal resource agencies (IWRP Technical Advisory Committee) to build consensus and develop a draft marsh-lagoon restoration plan. This concept plan and the associated materials were finalized and distributed to the IWRP Technical Advisory Committee in February of 2014 and currently has support from all agencies. As of September 2015, Caltrans engineers are completing a bridge feasibility analysis to refine costs and provide information about the future crossing to enable the restoration planning and technical analysis such as water balance, breaching analysis and other key technical analyses to move forward. Current funding for the design and technical analysis is limited to \$10,000 from the USFWS Coastal Program, \$86,000 from Caltrans fine money, and \$10,000 from the State Coastal

Conservancy to fund the project management and facilitation. Caltrans is working on encumbering funds to support the bridge design and permit work, but funding for the restoration design as well as construction of the bridge and associated restoration work is currently unfunded.

**Updates:** Updates annually end of each fiscal year

### **Resources**

#### *Funding:*

Phase 1 of the Restoration Plan is currently funded by USFWS and Caltrans; Phase 2 of the Restoration Plan is unfunded and the cost is estimated at \$150,000; Bridge Design and Permitting of the bridge and restoration to be funded by Caltrans at an approximate cost of \$1,150,000; Implementation estimated at \$12,000,000-\$14,000,000 with Caltrans cost-share currently undetermined.

#### *Opportunities for Partners:*

- We encourage the local Resource Conservation District and Regional Transportation Commission to continue to work with Caltrans and the state and federal resource agencies to collaboratively develop a marsh-lagoon restoration plan as a complement to the bridge replacement project.

### **B. Restoration Project - Garcia River Estuary Restoration, Land Purchase/Easement & Outreach Project**

**Description and Background:** The Garcia River watershed is comprised almost entirely of agricultural and timber lands with many acres federally owned or under protected easements. A recovered population in the Garcia River is conceivable with targeted land purchases or easements, restoration, monitoring, and outreach. The Bureau of Land Management recently acquired the scenic Garcia Headlands from the Stornetta family. Additional acquisitions or easements of the Garcia River estuarine and floodplain areas would facilitate implementation of key restoration actions. Restoration would include removing passage barriers, improving tidal and floodplain habitats, replanting riparian vegetation lost to grazing and controlling sources of erosion. Additionally, expanded education and outreach efforts would support an agreement between the Manchester Band of Pomo Indians and State and Federal fisheries agencies facilitated by Congressman Jared Huffman and his staff. The agreement focuses on coordinating efforts to combat poaching on tribal and private lands.

**Expected Benefits to the Species:** Because the entire Garcia River coho population rears in the estuary prior to ocean migration, a land purchase or easement to include restoration of winter habitat will benefit the entire population. Reduced poaching through outreach and education will improve survival of adults, increase the spawning population and work in concert with the ongoing restoration work in the watershed to improve survival and fitness of Garcia River coho salmon.

**Source:** CCC Coho Recovery Plan Actions: GR-CCC-1.1.3.3; GR-CCC-1.1.3.4; GR-CCC-1.1.3.5; GR-CCC-10.1.1.3; GR-CCC-10.1.1.4; GR-CCC-10.1.2.2.

**Location:** Garcia River, Northern California

**NMFS Point of Contact:** Josh Fuller, WCR Santa Rosa Area Office Joshua.Fuller@NOAA.GOV, 707-575-6096; Joe Pecharich, NMFS Restoration Center, [Joe.Pecharich@noaa.gov](mailto:Joe.Pecharich@noaa.gov), 707-575-6059

**Lead Partners:** Bureau of Land Management, The Nature Conservancy; The Conservation Fund, NMFS

**Partners:** CDFW, NMFS Restoration Center, North Coast Regional Water Quality Control Board, private landowners, Manchester Bank of Pomo Indians

**Proposed Start Date:** 2015

**Expected Completion Date:** 2025

**Current Status:** In 2004 the Conservation Fund acquired the 23,780-acre Garcia River Forest, protecting the upper Garcia from conversion to vineyards or second-home development. Sustainably managing the forest and rebuilding commercial timber inventories in support of the local economy will help repay loans taken to acquire the property, upgrade roads and restore stream conditions. The Nature Conservancy owns the conservation easement and has helped to develop the forest's management plan, conduct forest-carbon research and monitor biodiversity conservation on the property. Currently, an estuary enhancement plan has been funded through PCSRF funding (via CDFW's FRGP), which will identify key sites and conceptual plans for restoring habitat. The Bureau of Land Management has recently purchased the Garcia Headlands. In 2015, fishing identification materials were distributed and informational signage posted to reinforce anti-poaching efforts with support from The Nature Conservancy, Trout Unlimited and The Conservation Fund.

**Updates:** Updates annually end of each fiscal year

**Resources:**

*Funding:*

Enhancement Plan Currently funded by PCSRF – FRGP CDFW \$285,000; Implementation estimated at \$5,000,000; Land Purchase estimated between \$3,000,000 and \$5,000,000; Outreach and Education estimated at \$25,000 annually.

*Opportunities for Partners:*

- We encourage sustained partnerships with the Bureau of Land Management, The Nature Conservancy, The Conservation Fund, private landowners and others to protect and restore the Garcia River.

### **C. Restoration Project - Ten Mile River Estuary and Winter Refugia Habitat Restoration**

**Description and Background:** Develop and implement restoration projects designed to create or restore alcoves, backchannels, ephemeral tributary and seasonal pond habitats in the lower Ten Mile River. The Nature Conservancy has recently established several large conservation

easements in the lower Ten Mile, and has developed a science-based floodplain and salmon habitat enhancement plan. Phase 1 Projects have been designed for the lower 1.7 miles of the South Fork Ten Mile River, which will enhance winter survival, foraging habitat and rearing capacity in the lower mainstem wetland complex and tributaries. Phase 2 projects are in the process of development on the lower Ten Mile River mainstem and estuary.

**Expected Benefits to the Species:** The Ten Mile River has been identified as a focus population in the CCC Coho Recovery plan. It has a high potential for restoration due to other substantial restoration work (over 40 miles of large complex wood shelter additions), low number of land use threats, and relatively large ownerships with protected easements.

**Source:** CCC Coho Recovery Plan: TMR-2.1.1.1

**Location:** Ten Mile River, Mendocino County, California

**NMFS Point of Contact:** Bob Coey, WCR Santa Rosa Area Office, [Bob.Coey@noaa.gov](mailto:Bob.Coey@noaa.gov), 707-575-6090; Joe Pecharich, NMFS Restoration Center, [Joe.Pecharich@noaa.gov](mailto:Joe.Pecharich@noaa.gov); 707-575-6095

**Lead Partners:** The Nature Conservancy; NMFS Restoration Center

**Partners:** Private Landowners, State Coastal Conservancy, Campbell Global Inc., CDFW, USFWS

**Proposed Start Date:** 2012

**Expected Completion Date:** Phase 1 Implementation: 2020; Phase 2 Planning: 2017

**Current Status:** The Nature Conservancy has applied for restoration funds for Phase 1 restoration and acquiring additional conservation easements throughout the lower watershed. The California Wildlife Conservation Board recently funded an additional \$3.4 million for another conservation easement on 2,500 acres in the lower Ten Mile River, in partnership with the State Coastal Conservancy.

**Updates:** update annually end of each fiscal year

#### **Resources**

##### *Funding:*

Phase 1 restoration (\$2.7 million); Phase 2 restoration (\$2.5 – 3 million).

##### *Opportunities for Partners:*

- We encourage sustained partnerships with The Nature Conservancy, State Coastal Conservancy, Campbell Global Inc., CDFW, USFWS, private landowners and others to restore and protect the Ten Mile River.

## **Restore Key Habitats for Conservation Hatchery Outplanting and Improve Freshwater Survival of Coho Salmon**

**Description and Background:** Strategically focused restoration is needed in areas where conservation hatchery broodstock outplanting is conducted or forecasted. Many of these



locations occur on private land (e.g., agriculture, timber operations, etc.). Outreach to these landowners and assistance with project design and permitting will be needed to restore key habitats in strategic locations. For the Russian River Conservation Program the following are envisioned: outreach and permit assistance to agricultural entities and private landowners, continuation of the Habitat Blueprint, implementation of the Safe Harbor Agreement, and development of Voluntary Drought Initiatives. For the Scott Creek Program the following are envisioned: outreach and permit assistance to private landowners, Scott Creek Lagoon Restoration and Bridge Replacement Project, restoration of floodplain and offchannel habitats, flow enhancement initiatives, instream large wood projects, road improvement and riparian planting.

**Expected Benefits to the Species:** Restoring instream habitats where conservation program coho salmon are outplanted will improve their likelihood of freshwater and marine survival.

**Source:** CCC Coho Recovery Plan: Scott Creek and Russian River Chapters

**Location:** Outplanting locations across Sonoma, Marin, and Santa Cruz in California.

**NMFS Point of Contact:** Bob Coey, WCR Santa Rosa Area Office, [Bob.Coey@noaa.gov](mailto:Bob.Coey@noaa.gov), 707-575-6090; Joel Casagrande, WCR Santa Rosa Area Office, [Joel.Casagrande@noaa.gov](mailto:Joel.Casagrande@noaa.gov), 707-575-6016; Pat Rutten, NMFS Restoration Center, [Patrick.Rutten@noaa.gov](mailto:Patrick.Rutten@noaa.gov), 707-575-6059

**Lead Partners:** CDFW, Sonoma County Water Agency, USACE, WCR

**Partners:** SWFSC, CalPoly, private landowners, non-profit organizations, CalTrans, Counties

**Proposed Start Date:** Ongoing

**Expected Completion Date:** 2025

**Current Status:** Ongoing

**Updates:** Updates annually at end of fiscal year

**Resources:**

*Funding:*

10 to 15 million for targeted restoration

*Opportunities for Partners:*

- We encourage sustained partnerships with CDFW, Sonoma County Water Agency, USACE, CalPoly, private landowners, non-profit organizations, CalTrans, and affected Counties to restore key habitats for outplanting.

## Ensure Adaptive Management for Conservation Hatchery Programs and Restoration is Informed by Monitoring and Research

**Description and Background:** Monitoring and research has provided critical information used to adapt conservation hatchery practices, broodstock release strategies and restoration work. It also provides needed information on status, trends, conservation, and recovery of coho salmon.

**Expected Benefits to the Species:** Continued and expanded monitoring and research will benefit the species by providing data and information: (1) essential for gauging efficacy of conservation hatchery practices and adapting practices to improve survival and genetic diversity; (2) that can inform restoration priorities and practices; and (3) needed for status and trends assessments.

**Source:** Monitoring and research are discussed as high priorities in the Coho Salmon Recovery Plan (NMFS 2012), Monitoring Chapter (Vol I: Chapter 11), and Guidance for Monitoring Recovery of Pacific Northwest Salmon & Steelhead Listed under the Federal Endangered Species Act (Crawford and Rumsey 2011).

**Location:** Punta Gorda, Mendocino county, California, south to, and including, Aptos Creek, Santa Cruz county, California

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**Lead Partners:** CDFW, SWFSC, WCR

**Partners:** Public and private entities assisting with coho monitoring across the coast. This includes The Nature Conservancy, Campbell Timberlands, Redwood Science Lab, Marin Municipal Water District, National Parks, and many others.

**Proposed Start Date:** Ongoing

**Expected Completion Date:** Ongoing through delisting.

**Current Status:** Monitoring for coho salmon has improved since 2011 and results are informing the 2015 5-Year Status Review process conducted by the SWFSC and Regions. The state is developing a statewide database, refining the sampling frameworks and field methods, working to link habitat with fish responses, communicating to the public, and building partnerships. Funds for monitoring have been made available, in large part, through the competitive FRGP process; however, the long term success of the program is dependent on building a stable and consistently reliable funding base. Research for CCC coho salmon is led by the SWFSC and has informed the management of the conservation hatchery programs.

**Updates:** Updated annually at end of fiscal year and reported through 5-Year Status Reviews

**Resources:***Funding:*

The total cost to monitor CCC coho salmon populations is estimated at >4 million annually with >2 million for critical research. The Coastal Monitoring Program would benefit having a dedicated full-time employee to support needed communication and coordination between the State and WCR.

*Opportunities for Partners:*

- We encourage sustained partnerships with CDFW, science and academic organizations, public and private entities, The Nature Conservancy, other state and federal agencies, counties, water agencies and many others, and seek additional partners to assist with coho monitoring across the coast.

## REFERENCES

California Department of Fish and Wildlife. 2015. Recovery Strategy for California Coast Salmon Progress Report 2004 – 2012. A report prepared for the California Fish and Game Commission.

Crawford, B.A. and S.M. Rumsey. 2011. Guidance for Monitoring Recovery of Pacific Northwest Salmon & Steelhead listed under the Federal Endangered Species Act. National Marine Fisheries Service, Northwest Region.

National Marine Fisheries Service. 2012. Final Recovery Plan for Central California Coast coho salmon (*Oncorhynchus kisutch*) Evolutionarily Significant Unit. National Marine Fisheries Service, Southwest Region, Santa Rosa, California.

Spence, B.C. 2015. Personal communication.

Spence, B.C. and T.H. Williams. 2011. Status review update for Pacific salmon and steelhead listed under the endangered species act: Central California Coast Coho Salmon ESU. NOAA-TM-NMFS-SWFSC-475.



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