CHAPTER 10: RECOVERY ACTIONS

"When I first came in – 1906 there was plenty of fish and game; Anderson Valley and its hills were a boy hunter's paradise. When we lived in Mendocino I fished in Russian Gulch many times. The fish were small but it was not trouble to catch fifty which was the limit.

The Navarro River was a fine stream for its entire length even to its smallest tributaries. Hookbills (coho) and steelhead both ran in great numbers, although it was harshly treated by the lumber industry, not as bad however as the Garcia.

Fifty years, looking back is quite awhile but we well remember when the fish houses in Noyo were piled with big king salmon every day and everyone was busy. We bought them for awhile for 10 cents a pound.

Throughout the years, the supply of fish and game has risen and fallen, nature took care of things. Now with smaller limits and "managing" plus civilization; fish and game as we knew it is about gone; soon we hang up the rifle and put aside the rod. We few old ones left had it; we too are also about gone."

Judge Tindall 1966-1977 Mendocino County Remembered

TAKING ACTION FOR SALMON

The decline of CCC coho salmon and their path to recovery parallels our human story. In fact, the plight of salmon worldwide is intimately tied to the story of the evolving human configured landscape. Naturalists and biologists across Europe and North America have monitored salmon and chronicled their decline and extinctions. Biologists alone cannot shift a species trajectory from extinction to recovery; it requires a united community of experts and lay people forming alliances to this single purpose. While salmon now need us to innovate sustainable uses for our land and water, we also need salmon; perhaps more so. Salmon can support whole communities and businesses; they are our recreation, our food, and a part of our natural heritage. To achieve this end, we can do something uniquely human, contemplate our future and shift our thinking and our actions. Nothing else can do this. Improving the human well-being while innovating sustainable use of our natural resources (including securing a future for our salmon) are a one-in-the-same challenge.

This story of the salmon crisis is nothing new. Europe once had mesmerizing salmon runs, in fact salmon helped feed the Roman legions and formed the basis of large commercial fishing operations. However, gradual changes to natural freshwater systems through a long history of human induced impacts left the fish homeless; despite repeated warnings of salmon demise. Charles Dickens in 1861 spoke of the need

for salmon protections in his weekly magazine All Year Round; a Salmon Fisheries Act of 1861 was established for England and Wales and later a Rivers Pollution Act of 1876.

However, the lack of enforcement and the "old plea of ruin… to undertake such work [salmon protections]" (Montgomery 2003) and the human predisposition to place blame on each other for the decline prevailed. A similar story can be told for other countries including our own and the decline of the Maine salmon populations. For over a century salmon haven't been seen in England; until recently. Actions to reduce pollution and improve stream conditions are working and salmon have been seen in recent years returning to cleaner and more habitable rivers such as the Thames and Seine. If we fail to learn the lessons of these other countries or the stories of salmon extinction due to changes to watershed processes it tells us more about ourselves and societal priorities as it does about the salmon.

PRIORITY RECOVERY ACTIONS FOR CCC COHO SALMON

An array of conditions has reduced the population size and historical distribution of coho salmon across the ESU. Many of the causes of decline are systemic and persistent, and cross numerous environmental and political boundaries. The sources and reasons for decline are identified in Federal Register Notices, the Recovery Strategy for California Coho Salmon (DFG 2004), and this recovery plan. Effectively addressing these causes involves multiple challenges and opportunities including: (1) development of new and effective implementation of current laws, policies and regulations; (2) securing adequate funding for recovery implementation; (3) developing strategic partnerships; (4) assuring prioritization and implementation of restoration, threat abatement, and monitoring actions; and (5) conducting education and outreach. The status of CCC coho salmon requires addressing the highest priority issues at all appropriate levels described above (*e.g.*, policy, funding, partnerships, restoration and outreach) which in turn, dictates that a substantial and targeted investment in resources is needed for recovery.

The Chapter outlines priority recovery actions that apply within and across the overall ESU, or within and across Diversity Strata, and across spatial scales. At the ESU level, these priorities are organized by actions that need to be undertaken in the next few years to prevent extinction. Underpinning these larger scale actions are watershed-specific objectives, recovery actions, and action steps. These were developed for each of the 28 focus watersheds. These actions provide watershed specific recommendations for improving the most limiting current conditions, and minimize and abate the highest future threats. They focus and prioritize recovery actions and key areas for immediate restoration and threat abatement. The entire data set of conditions, threats and strategic actions for each watershed are provided below with populations listed alphabetically. Recovery implementation schedules have been developed for watersheds listed below:

- **Lost Coast Diversity Strata:** Albion River; Big River; Big Salmon Creek; Caspar Creek; Cottaneva Creek; Noyo River; Pudding Creek; Ten Mile River; Usal Creek; and Wages Creek;
- **Navarro Point Diversity Strata:** Garcia River; Gualala River; Navarro River;
- **Coastal Diversity Strata:** Lagunitas Creek; Pine Gulch Creek; Redwood Creek; Russian River; Salmon Creek; and Walker Creek; and

- **Santa Cruz Mountain:** Aptos Creek, Gazos Creek; Pescadero Creek; San Lorenzo River; San Gregorio Creek; San Vicente Creek; Scott Creek; Soquel Creek; and Waddell Creek.

ESU LEVEL RECOVERY ACTIONS

Overarching recovery actions address major threats across the ESU and implementation will affect a large geographic area, and will benefit multiple populations. Successful implementation will have positive long term effects and move the species toward recovery. As such, these actions are the highest priority across the ESU and within individual populations.

ESU level recovery actions to be implemented within the next one to five years include:

- Ensuring current populations of CCC coho salmon are protected from harm or take and protecting all historical habitats from further habitat degradation:
    - All work adjacent to, or within, waterways occupied by coho salmon should be conducted during the summer low flow period (June 15th - October 15th);
    - NMFS should provide information to the appropriate regulatory bodies regarding the current status of CCC coho salmon, priority watershed processes needing consideration, and recommendations that provide no take or incidental take assurances;
    - All relevant parties are recommended to conduct extensive outreach to improve education and awareness for agencies, professional organizations, landowners, and the public regarding the importance and imperative need for immediate and direct actions to prevent extinction and/or increase regulatory oversight on projects that may impair habitats or result in direct harm to coho salmon;
    - No-Take guidance should be considered to assist NMFS staff and stakeholders in avoiding and minimizing potential take or harm to CCC coho salmon or their habitats when evaluating or planning land use practices (*e.g.*, livestock grazing, agriculture, road construction and maintenance, channel modification, *etc.*);
    - All relevant parties are recommended to strongly encouraging appropriate agencies to secure funding for, and engage in, full enforcement of relevant laws, codes, regulations and ordinances protective of coho salmon and their habitats;
- Conducting actions that significantly increase the probability of survival of each individual in both the marine and freshwater environments;
    - Implementing and enforcing the most conservative version of AB 2121, which codified (in sections 1259.2 and 1259.4 of the California Water Code) DFG and NMFS' Water Diversion Guidelines to ensure protective flows for all life stages of coho salmon;
    - Work with DFG to develop protective regulations to minimize impacts from offshore fishing during migratory periods (*e.g.* until sandbars open naturally) within one mile of the river mouths of the focus watersheds;
    - Work with DFG to improve freshwater sport fishing regulations to minimize unintentional and unauthorized take, and incidental mortality, of CCC coho salmon by anglers during the CCC coho salmon migration period. Considerations may include

low-flow closure thresholds (including emergency closure during adult migration beginning 2010), seasonal fishing closures, and angler outreach programs;

- Improving coordination between the agencies, particularly the SWRCB, to effectively address illegal water diverters and out-of-compliance diverters, seasons of diversion, off-stream reservoirs, and bypass flows fully protective of CCC coho salmon;
- Petitioning SWRCB to have all CCC coho salmon watersheds with existing populations and ongoing diversions declared as fully appropriated;
- Encouraging amendments to Army Corps 404 Clean Water Act exemptions for farming, logging, and ranching activities to terminate Section 404(f) exemptions for discharges of dredged or fill material into US waters (channelization) associated with agriculture, logging, ranching and farming;
- Develop water conservation measures at local and State levels to include a drought management plan for each watershed that is triggered by minimum flow requirements.
    - Work with the agricultural community to develop water conservation strategies protective of salmonids while allowing ongoing agricultural land uses (*i.e.*, off-channel storage ponds).
- Projects involving high underwater sound pressure levels should implement sound attenuation methods to assure that (1) no physical injury to coho salmon results, (2) adverse modification to behavior is avoided and (3) extent of area impacted is reduced. Where sound attenuation cannot meet the three criteria above then work should be conducted during established seasonal work windows (summer low flow period only) to avoid harm to CCC coho salmon.
- Immediately implement or initiate the following rangewide recommendations outlined in the 2004 Recovery Strategy for California Coho Salmon: stream flow, water rights, water temperature, ecological refugia, large woody debris, riparian vegetation, land uses and outreach.
- Initiate discussions on the following rangewide recommendations outlined in the 2004 Recovery Strategy for Coho Salmon: integration with other plans and programs, permitting, enforcement of existing laws and assessment, monitoring and research.
- Collaborate and support the SWRCB to increase oversight and responsibility for regulating groundwater hydrologically connected to surface flows; and
- Collaborate with CalFire to coordinate fire fighting and post fire response with the resource agencies;

❑ Collaborate with DFG to finalize and implement the Statewide Coastal Monitoring Plan. Implementation of the Statewide Coastal Monitoring Plan is essential for evaluating the long-term viability of CCC coho salmon as well as other species of listed salmonids in California;

- Conduct population research and monitoring focusing on life stage survival (e.g., life cycle stations) within each Diversity Stratum including survival and fitness in wetland, estuaries and lagoons;

- Conduct research and monitoring of freshwater habitats and their suitability to support each life stage (adult, egg, summer/winter rearing, smolt outmigration including adult/juvenile/smolt survival in wetlands and estuarine/lagoon habitats);

- Establish mechanisms to maintain existing genetic diversity through intervention and augmentation. This may include (1) juvenile capture from the wild and rearing in an established conservation hatchery for release as adults and (2) developing comprehensive broodstock programs similar to the Russian River Coho Salmon Captive Broodstock program.
    - Utilize existing population models and genetic information for each watershed and associated Diversity Stratum to identify minimum redd or adult counts that would trigger the need for augmentation or intervention;
    - Appropriate augmentation or intervention strategies may vary based upon knowledge of population genetics, ability of the watershed to support and maintain coho salmon through the freshwater lifestage, and long-term recovery objectives;
        - Evaluate and test success of adult releases to watersheds to augment existing coho salmon genetic diversity;
    - Re-assess marking protocol of broodstock versus hatchery fish to minimize possible mis-identification by recreational fishermen;

- Prioritizing restoration funding (*e.g.*, Pacific Coast Salmon Restoration Fund (PCSRF) and California's Fisheries Grant Restoration Program) on those actions that increases the probability of freshwater survival in Core areas in the next four years and improvements to nearby expansion habitats (e.g. Phase I) followed by habitat improvements to Phase II areas thereafter;
    - Aggressively promoting installation of instream large woody debris and improving off-channel/floodplain habitats to immediately benefit freshwater survival in areas with extant population;
        - Fully implementing the Programmatic Section 7 consultation for restoration projects administered by the NOAA Restoration Center that permits placement of instream large woody debris;
    - Promote restoration projects in habitats most limiting for CCC coho salmon - critical over-wintering habitats (such as alcoves, backchannels, off channel areas, and estuaries), and critical summer rearing habitat (such as complex pool habitat and unimpeded summer flows).

- Developing a multi-agency CCC coho strike team to address critical and immediate threats;
    - Evaluating establishment of an Emergency Drought Operations Center (similar to the Emergency Drought Operations Center developed in Washington State), comprised of the SWRCB, DFG, NMFS, and others to develop emergency rules for augmenting water supplies and mitigating the effects of drought and extreme climate (due to climate change) on CCC coho salmon and their habitats;

- Working with the California Board of Forestry, CalFire, DFG, professional organizations and landowners to secure forest lands from conversion, promote sustainable forestry practices and provide incentives for growing large trees and conducting restoration actions. For example:

- Modify the timber harvest permitting process to provide opportunities and incentives for LWD recruitment during timber harvest operations;
- Urge the California Board of Forestry to apply for a statewide Forestry Habitat Conservation Plan (similar to that developed in Washington State) and seek funding opportunities to support the effort or approve Rules that ensure no-take or harm;
- Evaluate the timber harvest review processes to ensure CalFire, DFG, Water Quality, foresters and landowners are familiar with the specific areas and issues of concern;

- Establishing recovery plan implementation groups across each Recovery Unit (*e.g.*, diversity strata) and securing funding (*e.g.*, Pacific Coast Salmon Restoration Fund) for four designated representatives to act as liaisons and coordinator for each implementation group. These liaisons will also work with grassroots watershed groups to implement recovery efforts;
- Evaluating geological patterns in the CCC ESU to identify sources of karst and similar geology. These sites may provide sources of cool water refugia and serve as locations that can buffer populations in the advent of climate change;
- Participating in land and water use planning with local, county, and State agencies that have direct control and responsibilities over non-Federal practices;
  - Encourage counties in revising their General Plans to consider building their planning along watershed boundaries to include Area Planning and associated analyses;
  - Evaluate other State programs that monitor and regulate land and water uses and initiate new sustainable innovations on uses regarding, and policies for, these natural resources.
  - Conduct an assessment of the mechanisms motivating conversion (from forest to agricultural or rural residential land uses) and develop policies aimed at protecting forestlands;
  - Promote programs that purchase land or develop conservation easements encouraging the protection, re-establishment and/or enhancement of natural riparian communities;
- Implementing monitoring programs to assess spawner abundance and population viability and key habitat attributes. These programs will require consistent methods, reporting, databasing and adaptive management across the ESU to evaluate population and habitat responses to recovery actions;
  - Developing standardized watershed assessment protocols (*e.g.* DFG habitat assessment protocols) within sub-watersheds to define limiting factors specific to those areas;
  - Development of a centralized database and analysis tool for population and habitat data collected under standardized monitoring protocols;
- Support and engage CalTrans, FishNet 4C, counties and others with oversight on road practices to reduce sediment delivery to streams from road networks and channelization from poorly situated roads. This should be accomplished through education, laws and policies designed to educate staff and road engineers and improve construction, maintenance, and decommissioning practices;
- Working with Federal and State agencies to coordinate and develop programmatic permits for incidental take authorization for actions that contribute to the recovery of CCC coho salmon and their habitats;

- Coordinating with DFG and RWQCB to develop streamlined permitting for non-PCSRF funded restoration projects;

DIVERSITY STRATA RECOVERY ACTIONS

Diversity Strata recovery actions are more general than the watershed specific actions that follow, but they also affect large geographic areas, and benefit multiple populations. Strata are organized from North to South.

Lost Coast

- Establish mechanisms to promote sustainable forestry practices and reduce forest conversions;
- Continue to participate and promote the collaborative effort between agencies and landowners on the pilot large woody debris enhancement project;
- Establish HCPs protective of coho salmon and their habitat for industrial and non-industrial timber harvest;
    - Finalize Mendocino Redwood Company HCP;
    - Encourage development of a HCP/NCCP with industrial and non-industrial forestland owners including Jackson Demonstration State Forest, State Parks, The Conservation Fund, Coastal Ridges, Redwood Forest Foundation, Campbell Timberland and Hawthorne Timber Company;
- Implement other Logging and Wood Harvesting strategies outlined in this recovery plan;
- Strongly encourage Mendocino County (including cities and local jurisdictions) to take a greater leadership role and work with their various departments on permitting, road maintenance, ordinances, etc. to reduce the ongoing impacts of urbanization, agriculture, road building, grading activities, timber conversions, etc. to salmon and their habitats. Mendocino County currently supports over 85% of remaining populations of CCC coho salmon.

Navarro-Gualala Point

- Establish mechanisms to promote sustainable forestry practices and reduce forest conversions;
- Promote a collaborative effort between agencies and landowners on the pilot large woody debris enhancement project and floodplain/offchannel restoration;
- Establish HCPs protective of coho salmon and their habitat for industrial and non-industrial timber harvest;
- Implement other Logging and Wood Harvesting strategies outlined in this recovery plan;
- Evaluate the need and feasibility of developing a Captive Broodstock Program; and
- Strongly encourage Mendocino County (including cities and local jurisdictions) to take a more leadership role and work with their various departments on permitting, road maintenance, ordinances, etc. to reduce the ongoing impacts of urbanization, agriculture, road building,

grading activities, timber conversions, etc. to salmon and their habitats. Mendocino County currently supports over 85% of remaining populations of CCC coho salmon.

Coastal

- Explore strategies to augment or intervene to assure continuation of existing genetic diversity.
    - Augmentation and intervention such as juvenile collection and retention at established rearing facilities for release as adults (or other intervention methods) may be necessary at this time due to the extremely low populations to ensure long-term genetic diversity is preserved. Watersheds of particular interest are Lagunitas/Olema, Redwood Creek and Pine Gulch and Walker.
- Work with Sonoma and Marin counties to develop more protective regulations in regard to vineyard, rural residential, and urban development;
- Implement water diversion and agricultural strategies outlined in this recovery plan;
- Establish HCPs protective of coho salmon and their habitat;
    - Encourage development of a Sonoma County-wide HCP that includes State Parks, major water diverters in the Russian River Watershed, the County of Sonoma, municipalities, timberland, and vineyard owners;
    - Encourage development of a Marin County-wide Habitat Conservation Plan that includes State Parks, major water diverters in the coastal watersheds, the County of Marin, and municipalities;
- As the largest freshwater wetland in the CCC coho salmon ESU a historical ecology study of the Laguna de Santa Rosa is recommended to identify physical processes that have been diminished. The study would provide the foundation for a conceptual plan to prevent wetland loss and improve wetland habitats and functions for CCC coho salmon.
    - Conduct a feasibility study regarding the potential contribution the Laguna de Santa Rosa to Russian River viability targets. If determined to be feasible, a resource management plan should be developed to coordinate land use to protect, restore and enhance the Laguna de Santa Rosa.
- Strongly encourage the counties (including cities and local jurisdictions) to take a greater leadership role to work with their various departments on permitting, road maintenance, ordinances, etc. to reduce the ongoing impacts of urbanization, agriculture, road building, grading activities, timber conversions, etc. to salmon and their habitats. Marin County is leading this type of effort for San Geronimo in Lagunitas.

San Francisco Bay

- Evaluate the feasibility and likelihood of success of re-establishing coho salmon populations into Corte Madera Creek, Sonoma Creek, the Napa River, and other local watersheds with the potential to support coho salmon populations.

Santa Cruz Mountains:

- Establish HCPs protective of coho salmon and their habitat;
    - Finalize the City of Santa Cruz HCP, and
    - Work with forest landowners in this stratum to investigate opportunities to develop a multi-landowner forestry HCP.
- Conduct outreach and education to private landowner regarding the importance of instream large wood and it's role in providing critical habitats for coho salmon survival;
- Secure long term funding of captive broodstock program for the Kingfisher Flat facility (Scott Creek);
- Continue working with the Santa Cruz Resource Conservation District and Coastal Conservancy to identify willing landowners to implement restoration projects in Core and Phase 1 areas;
- Work with DFG to improve freshwater sport fishing regulations to minimize unintentional and unauthorized take, and incidental mortality, of CCC coho salmon by anglers during the CCC coho salmon migration period. This effort should include the development of appropriate low-flow closure thresholds (including consideration of emergency closure during adult migration beginning 2010), seasonal fishing closures, and angler outreach programs.
- Strongly encourage Santa Cruz County (including cities and local jurisdictions) to take a greater leadership role to work with their various departments on permitting, road maintenance, ordinances, etc. to reduce the ongoing impacts of urbanization, agriculture, road building, grading activities, timber conversions, etc. to salmon and their habitats. Santa Cruz county currently supports over a few remaining populations of CCC coho salmon.
- Conduct a thorough historical analysis (including archeological analysis of Indian middens) and determine whether coho salmon occupied streams south of Elkhorn Slough in Monterey County. If positive data are discovered, evaluate the feasibility and likelihood of success of re-establishing coho salmon populations into the Big Sur and Little Sur Rivers.

IMPLEMENTATION SCHEDULE

The watershed specific implementation schedules that follow outline the recommended recovery actions and estimated costs for the recovery of CCC coho salmon over a 60-year period. The first five years are itemized. The implementation schedules are specific guides for carrying out recovery actions, and meeting the long term recovery goals outlined in this plan. Actions are organized to build on each other, with overarching objectives supported by recovery actions, and these, in turn, are supported and implemented by a series of action steps. Each action links back to key habitat features that are currently in poor condition and will be improved by the action, or to threats the action is expected to abate. Each action has a unique identifying recovery strategy number which facilitates implementation tracking, and a succinct description of the recommended action.

Each action step was assigned a priority, which was defined as follows:

Priority 1

An action that must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future;

Priority 2

An action that must be taken to prevent significant decline in species population/habitat quality or some other significant negative impact short of extinction; and

Priority 3

All other actions necessary to provide for full recovery of the species.

An estimated duration required to complete the actions, the recovery partners responsible for actions (either funding, permitting, reviewing, or carrying out), and estimated costs to complete the action are also outlined. Parties with authority, responsibility, or expressed interest to implement a specific recovery action are identified in the implementation schedules. Listing a party in the implementation schedule does not require the identified party to implement the action(s) or to secure funding for implementing the action(s). Agencies and cooperating entities may voluntarily participate in any aspect of implementation of particular tasks listed with this recovery plan. Recovery partners may willingly participate in project planning, funding, provide technical assistance, staff time, or any other contributions to recovery goals.

Costs of many recovery tasks cannot be estimated at this time due in part to difficulties obtaining cost estimates from other identified parties and because estimating costs becomes increasingly imprecise the further into the future they are projected. In addition, many actions build on previous actions, which have not yet been implemented. Costs will vary depending on landowner and agency participation, available information, site specific and social constraints, and expertise of agency staff. Costs of developing and implementing some management and protection plans will vary with local circumstances and details of individual plans. As a result of these uncertainties, the total costs shown in the implementation schedules likely substantially underestimate the real cost of recovering the species. Many actions also contain comments that provide additional specificity or information on cost estimates.

INTRODUCTION TO POPULATION LEVEL ACTIONS

An analysis was conducted for each population using the TNC CAP tool and protocols which include (1) evaluation of current watershed conditions using readily available information from DFG and others, (2) anticipated threats to watershed processes and marine environments which are likely to worsen conditions into the future and (3) development of recovery actions that are intended to improve current conditions and abate future threats. Each watershed or population profile in the following Chapters display (1) Viability and Threats Tables from the CAP analysis process which provide a summary of our understanding of current watershed conditions and threats, and (2) recovery action implementation schedules outlining all recovery actions and their priority for that watershed/population. Many of these actions are those in the State of California Recovery Strategy for Coho Salmon (DFG 2004) and others identified in watershed assessment and monitoring documents.

We stress that these results are only preliminary and should not be viewed as static. The information herein is a platform for discussion regarding additional data and information to improve this draft during the public comment period. The information following displays only the outputs of the CAP workbook analysis. Due to the volume of information behind our analysis, all available data were not included. If more information is desired please email or phone the Santa Rosa office and we will be happy to provide the additional datasets.