9.0 ACTIONS, COSTS & IMPLEMENTATION

"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 a while 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 a while 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

9.1 TURNING A PLAN INTO ACTION

The plight of salmon is tied to the story of the changing landscape. Naturalists, fishermen and biologists across Europe, the Eastern Pacific and North America have monitored salmon and chronicled their decline and extinctions. For over a century, salmon were seldom seen in England or France, that is, until recently. Actions to reduce pollution and improve stream conditions are working and salmon have returned in recent years to rivers such as the Thames in England, and Seine in France.

Fisheries biologists alone cannot shift a species trajectory from extinction to recovery; it requires a united community forming alliances and strategically implementing recovery actions to this single purpose. Salmon survival will depend on our sustainable uses of land and water. However, we also depend on salmon; perhaps more so. Salmon can support whole communities and businesses; they are our recreation, our food, a part of the environment, and our natural heritage. To achieve these goals, we can do something uniquely human, contemplate our impact on the environment and shift our actions when necessary. Improving

and sustaining the human well-being, while sustainably using our natural resources (including securing a future for our salmon), are one-in-the-same challenge.

9.2 RECOVERY ACTIONS

An array of conditions have reduced the population size and historical distribution of coho salmon across the CCC 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 the listing rule, the Recovery Strategy for California Coho Salmon (CDFG 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, dictate that a substantial and targeted investment is needed for recovery. Furthermore, action must be targeted and occur equitably across the four diversity strata; to disproportionately conduct actions in one strata over another would compromise ESU viability.

9.2.1 POPULATION PROFILES, RECOVERY ACTIONS AND COSTS

The recovery actions are organized at the ESU, diversity strata and population scales (Volume II). For each population a summary of current conditions and threats are provided along with outputs of; (1) maps providing information on Core Areas and where instream restoration should occur first, (2) CAP results tables for Viability and Threats, and (3) recovery actions and associated information (*e.g.*, priority, duration, cost, partners, *etc*.).

9.2.2 COST OF RECOVERY

Section 4(f) of the ESA requires that recovery plans include "estimates of the time required and the cost to carry out those measures needed to achieve the plan's goal and to achieve intermediate steps toward that goal" (Lindley *et al.* 2007). NMFS estimates recovery of CCC coho salmon will cost approximately 1.5 billion dollars over 100 years.

9.2.3 BENEFITS OF RECOVERY

Healthy salmon populations provide significant economic benefits. Entire communities, businesses, jobs and even cultures have been built around the salmon of California. Monetary investments in watershed restoration projects can promote the economic vitality in a myriad of ways. These include stimulating the economy directly through the employment of workers, contractors, and consultants, and the expenditure of wages and restoration dollars for the purchase of goods and services. Habitat restoration projects stimulate job creation at a level comparable to traditional infrastructure investments such as mass transit, roads, or water projects (Nielsen-Pincus and Moseley 2010). In addition, viable salmonid populations provide ongoing direct and indirect economic benefits as a resource for fishing, recreation, and tourist-related activities. Dollars spent on CCC coho salmon recovery will promote local, state, Federal, and tribal economies, and should be viewed as an investment that yields societal, environmental (*e.g.*, clean rivers, healthy ecosystems), and economic returns.

Based on studies that examined streams in Colorado and salmon restoration in the Columbia River Basin (Washington, Oregon and Idaho), the San Joaquin River (California), and the Elwha River (Washington), the value of salmonid recovery could be significantly larger than the fiscal or socioeconomic costs of recovery (CDFG 2004). Importantly, the general model for viewing cost versus benefits should be viewed in terms of long-term benefits derived from short-term costs. Recovery actions taken on behalf of CCC coho salmon are likely to benefit other imperiled species in the NCCC Domain, thus increasing the cost effectiveness of the actions. Habitats restored to properly functioning conditions offer enhanced resource value such as improved water quality, and future savings associated with reduced expenditures on bank

stabilization or flood control actions. In addition, restoration of habitat in watersheds provides substantial benefits for human communities. These benefits include: improving and protecting the quality of important surface and ground water supplies and reducing damage from flooding resulting from floodplain development. Restoring and maintaining healthy watersheds also enhances important human uses of aquatic habitats, including outdoor recreation, ecological education, field-based research, aesthetic benefits, and the preservation of tribal and cultural heritage. Salmonid recovery is an investment and opportunity to diversify and strengthen the economy while enhancing the quality of life for present and future generations. The dollars necessary to recover salmon should be made available without delay such that the suite of benefits can begin to accrue as soon as possible.

The largest economic returns resulting from recovered salmon (and steelhead) populations are associated with sport and commercial fishing. On average 1.6 million anglers fish the Pacific region annually (Oregon, Washington, and California) and six million fishing trips were taken annually between 2004 and 2006 (NMFS 2010c). Most of these trips were trips out of California by anglers living in California. Projections of the economics and jobs impact of restored salmon and steelhead fisheries for California have been estimated from $118 million to $5 billion dollars with the creation of several thousand jobs (Southwick Associates 2009; Michael 2010). With a revived sport and commercial fishery, these substantial economic gains and the creation of jobs would be realized across California, most notably for river communities and coastal counties.

9.3 OUTREACH AND STEWARDSHIP

Successful implementation of the recovery plan will require the efforts and resources of many entities. NMFS' primary role is to promote the recovery strategy and provide technical information and expertise to other entities implementing the plan or contemplating actions that may impact the species' chances of recovery. To be successful, NMFS must commit to creating and maintaining a cooperative working environment which includes listening to stakeholders, recognizing concerns, problem-solving and developing a dialog with partners and constituents.

NMFS defines outreach as "two-way communication between the agency and the public to establish and foster mutual understanding, promote public involvement, and influence behaviors, attitudes and action with the goal of improving the foundations for stewardship" (NMFS 2012e). In addition, the agency recognizes that outreach encompasses constituent, congressional, corporate, media, non-governmental and governmental relations and includes public involvement, public information activities, and informational products.

The National Outreach Plan for NMFS was developed to help in the execution of a strategy identified in NOAA's Strategic Plan. Specifically, the strategy is to "…*develop coordinated regional and national outreach and education efforts to improve public understanding and involvement in stewardship of coastal and marine ecosystems.*" To that end and to focus our stewardship and outreach efforts in areas critical for recovery NMFS shall serve as ambassadors of the recovery plan to:

- Inform Federal, state and local governmental agencies of the provisions of the Plan, and discuss how the respective agencies' activities, planning and regulatory efforts can assist in the implementation of the plan;
- Develop outreach and educational materials to increase public awareness and understanding of the multiple societal and economic benefits that can be gained from salmon recovery;
- Develop partnerships to facilitate dissemination of information to a broad array of interested and affected parties about salmon and steelhead recovery efforts;
- Provide technical support and assistance to partners engaged in implementing recovery action's identified in the plan;
- Facilitate and participate in public forums and workshops designed to provide the public with an opportunity to directly share experiences and ideas, and learn about the methods and mechanism for implementing recovery actions;
- Advise watershed groups and other non-governmental organizations about the plan, and the role of on-going watershed conservation efforts that are directly or indirectly related to implementing recovery actions within their respective watersheds; and

- Work with all entities to support compliance of existing protective legal requirements for land and water use, natural resource protection laws, codes, regulations and ordinances for recovery of salmon.

9.4 WATERSHED RESTORATION

CCC coho salmon habitat quality currently diverges significantly from historical conditions. This divergence, along with a recent shift in marine conditions that has lowered salmon survival in the marine environment, has led to the extreme decline in CCC coho salmon abundance across the ESU. CCC coho salmon population numbers are so low that a coordinated effort across each watershed looking at limiting habitats and life stages is needed. For example, retrofitting a problem culvert can improve passage upstream, but unless upstream habitat exists that allows completion of all life stages this single action will have little effect on improving probability of survival or a net gain to the population. In this plan, restoration actions are emphasized to improve freshwater survival probability across life stages, increase carrying capacity, and ultimately improve population numbers.

This recovery plan proposes actions expected to result in substantial increases in the abundance, productivity, spatial distribution of CCC coho salmon. Recovery will require a systematic and sustained watershed by watershed approach to rehabilitate impaired habitats and degraded watershed processes and protect currently functioning processes. This will take time.

We recommend a watershed view for restoration. For example, implementing Priority 1 actions which coincide with Core Areas should be considered a high priority for immediate implementation. Difficult, expensive, controversial and unpopular projects ranking as high priorities should not be delayed in favor of uncontroversial projects with lower priority rankings. Projects must be built to appropriate specifications with appropriate funding commitments to ensure they are adequately maintained. Monitoring must reflect the goals and scale of the restoration project. Monitoring and evaluation do not usually affect the success of

individual projects, but they improve the design of future projects and are an important component of a restoration strategy.

Early coordination is essential for timely approval and execution of restoration projects, particularly when many stakeholders are involved or for potentially contentious restoration projects (*i.e.*, large wood supplementation in urban areas). Considerable support is usually available to individuals and organizations willing to undertake restoration projects, even difficult or controversial projects. Local, State, and Federal agencies can provide technical and financial assistance for use in design, implementation, and monitoring. Numerous non-governmental organizations (NGOs) provide similar services and also offer project management, liability coverage, and environmental compliance coordination and support. These services are typically provided at no or low cost to the landowner or project proponent. Private consulting firms also provide technical assistance, project management, environmental compliance, monitoring, as well as engineering and other services necessary for successful project implementation.

The availability of in-kind services and grant funding depends on:

- Location: most programs serve a limited geographic area;
- Land ownership and use: some programs serve only private, public, agricultural or urban lands;
- Importance or priority of the project;
- The identification of a project in a stream inventory, watershed plan, or within a local/state/Federal management plan;
- Ecosystem type: some programs focus on streams, wetlands, estuaries or uplands; and
- Cost share, commitment or participation by private landowners or a local sponsor.

Permitting and project management can be considerable obstacles to landowners, individuals, and small organizations wishing to carry out restoration projects. Permit waivers or programmatic permits can reduce costs and streamline the regulatory process by providing

umbrellas for local, state or Federal consultation. However, the availability of permit waivers or programmatic permits depends on project type, location, and funding source. Additional work by public agencies is essential to facilitate projects and remove unnecessary or redundant regulatory obstacles. Permit streamlining is an absolute necessity to provide incentives to landowners and managers wanting to implement restoration and enhancement projects, particularly for projects that do not receive funding assistance through the Pacific Coastal Salmon Recovery Fund (PCSRF) and Fisheries Restoration Grant (FRGP) programs administered by CDFG.

9.4.1 OPPORTUNITIES AND CHALLENGES FOR RESTORATION PROJECTS

Many project types use well-understood and documented techniques that have been consistently demonstrated to benefit salmonids and their habitats. Examples include: barrier removal; installing properly sized instream woody materials; and establishing and protecting riparian buffers.

High priority projects designed to lead to long-term restoration of functional stream processes, but which are not as well understood, will require more research, monitoring, and long-term evaluation to ensure success. Examples include:

- Reconnecting incised stream channels with their floodplains;
- Reconnecting wetlands with streams and re-creating off-channel habitat, especially in developed areas where channel stability is questionable or flooding is a concern; and
- Providing safe passage for adult and juvenile salmonids through channelized streams with inadequate flows, as often found in urbanized and agricultural areas.

To be more widely implemented, some high priority projects need regulatory solutions to reduce costs, time, and risk to private landowners and public entities. Examples include:

- Off-channel water storage during winter, with the goal of reducing dependency on summer water diversions (without increasing total annual water withdrawals, or impairing aquifer recharge and channel forming flows);

- Addition of secured and engineered large wood projects upstream of culverts, bridges, and urban infrastructure; and
- Actions to improve degraded lagoons and estuaries where urban or agricultural encroachment is a concern or conflicts with other listed/protected species occur.

Because many of the actions outlined in this recovery plan will be carried out on a voluntary basis, public support is important. NMFS believes collaboration by public and private entities is essential to the survival and long-term recovery of CCC coho salmon, particularly in light of the significant amount of privately owned land within the ESU. Conducting outreach and assisting interested and affected parties to become partners in restoration and recovery is critical to success, particularly for complicated and controversial projects. NMFS and other regulatory agencies must improve their outreach efforts to bring critical landowners and organizations into recovery planning efforts. Important stakeholders in restoration projects include:

- Landowners who wish to carry out restoration activities in critical stream reaches on their own property, either alone or in cooperation with agencies and NGOs. Project management and grant funding is available to help landowners carry out projects at no or reduced cost to themselves;
- Resource Conservation Districts and NGOs, who often serve as a bridge between government agencies and private landowners to assist in navigating the permitting process, assuage fears regarding regulations, and to encourage landowners to implement recovery actions;
- Members of the public who do not own land suitable for restoration yet contribute by volunteering in restoration, monitoring, or planning efforts; and
- Clubs, social organizations, and other organized groups assisting in restoration by providing volunteer labor for projects, conducting outreach within their communities, and coordinating and contacting regulatory agencies.

9.4.2 RESTORATION PARTNERS

The following is a partial list of organizations that can assist in restoration design and implementation. Additional resources are available in most areas from watershed groups, alliances, or other NGOs. Occasional funding may be available from agencies in the form of mitigation or disbursements from environmental fines. Congress established the Pacific Coast Salmon Recovery Fund to contribute to restoration and conservation of Pacific salmon and steelhead populations and their habitats (Chapter 11).

The NOAA Restoration Center

The NOAA Restoration Center provides funding and technical assistance for restoration projects benefiting NOAA trust resources, including salmon and steelhead. Since 1996, the Restoration Center has funded over 300 projects benefiting California salmon and steelhead. The Restoration Center works with NMFS staff and others to develop and implement projects addressing limiting factors to salmonid recovery; partners with grassroots organizations to encourage hands-on citizen participation, and delivers technical support to help ensure project success.

NMFS PRD will work with the NOAA Restoration Center to coordinate recovery efforts for CCC coho salmon. The PRD and the NOAA Restoration Center, in combination with other funding programs, will facilitate funding, permit streamlining, technical assistance, and outreach to the restoration community. The NOAA Restoration Center will bring its funding and restoration partners into the recovery process, while also networking to find new recovery partners and determining who is best suited to address specific recovery actions. The NOAA Restoration Center's goal to fund community-based habitat restoration and provide technical restoration assistance directly compliments the goals of the recovery plan.

NMFS Science Centers

The NMFS PRD will coordinate with the NMFS' Southwest Fisheries Science Centers to identify and address research needs for recovery.

State & Local Governmental Agencies

The State of California has a final CCC Coho Salmon Recovery Strategy (CDFG 2004) and NMFS participates on the State Coho Recovery Team. NMFS will continue coordination with the CDFG and other state agencies on planning, research, monitoring, and carrying out projects and programs. These agencies include: CDFG; CalFire; California Coastal Conservancy; University of California Cooperative Extension; California Conservation Corps; Resource Conservation Districts; the State Water Resources Control Board; local flood control districts; water agencies; and city and county governments.

Non-Governmental Organizations

Numerous non-profits, volunteer groups, watershed groups, professional organizations, and quasi-governmental organizations are engaged in ecological restoration. Where their focus intersects with NMFS recovery goals, NMFS will coordinate with those NGOs to facilitate planning, research, monitoring, and project implementation. Some NGOs include Trout Unlimited, The Nature Conservancy, Mid-Peninsula Open Space District, CalTrout, and many others.

9.4.3 RESTORATION ASSISTANCE

Federal programs that provide information, funding and/or technical assistance include:

- NMFS, Southwest Region swr.nmfs.noaa.gov
- NOAA Restoration Center nmfs.noaa.gov/habitat/restoration/
- USFWS Partners for Fish and Wildlife fws.gov/partners/ and Coastal Programs fws.gov/coastal/CoastalProgram
- US EPA epa.gov
- NRCS nrcs.usda.gov
- USACE http://www.usace.army.mil/missions/environment.html

State programs that provide information, funding and/or technical assistance include:

- California Department of Fish and Game www.dfg.ca.gov/fish/

- California Coastal Conservancy www.scc.ca.gov
- State Water Resources Control Board www.swrcb.ca.gov
- California Conservation Corps www.ccc.ca.gov/
- University of California Cooperative Extension http://ucanr.org/index.cfm

Local and regional programs that provide information, funding and/or technical assistance include:

- CalFish www.calfish.org
- Coastal Watershed Planning and Assessment Program (CWPAP) http://coastalwatersheds.ca.gov/Home/tabid/54/Default.aspx
- Resource Conservation Districts www.carcd.org
    - Santa Cruz Resource Conservation District http://www.rcdsantacruz.org/
    - San Mateo County Resource Conservation District http://www.sanmateorcd.org/
    - Gold Ridge Resource Conservation District http://www.goldridgercd.org/
    - Sotoyome Resource Conservation District http://sotoyomercd.org/
    - Marin Resource Conservation District http://www.marinrcd.org/
    - Southern Sonoma Resource Conservation District http://www.sscrcd.org/
    - Mendocino County Resource Conservation District http://www.mcrcd.org/
    - And others
- Various city and county governments
- Five Counties Salmonid Conservation Program www.5counties.org
- Fishnet 4C http://fishnet.marin.org
- The Fish Passage Forum:

  http://www.calfish.org/ProgramsandProjects/FishPassageForum/tabid/127/Default.aspx
- Klamath Resource Information System (KRIS) http://www.krisweb.com/
- Salmonid Restoration Federation http://www.calsalmon.org/
- Trout Unlimited http://www.tu.org/
- California Trout http://www.caltrout.org/
- The Nature Conservancy http://www.nature.org/