CHAPTER 8: STRATEGY FOR RECOVERY

"In the end, we will conserve only what we love. We will love only what we understand. We will understand only what we are taught."

Baba Dioum, Senegal

PREVENTING THE EXTINCTION OF CCC COHO SALMON

California may soon lose their coho salmon. The salmon decline is intimately tied to the human story of the region. For millennia CCC coho salmon thrived in abundance despite challenging and shifting natural marine and freshwater environmental conditions including predation. The human configured landscapes are leaving salmon without a home. Without cool clean water that flows relatively unimpaired from the headwaters to the ocean, CCC coho salmon are not expected to persist.

The underlying strategy for recovery is to rebuild what was once a social fabric and safety net for salmon: awareness. The stories of extinctions are not new, many have been told by our world's historians. Worldwide biologists have long monitored and chronicled a species decline and extinction. Biologists and historians cannot save salmon alone; only communities can. The strategy for recovery is to engage our communities on the issues and discuss solutions to the complex problems that face our salmon, our water and our watershed processes (e.g., landscapes). The collapse of our salmon populations and their well-being has bearing on our own. Salmon are not only an integral member in the processes of our natural world but salmon are our jobs, food, cultural heritage and recreation.

Others have fought and won similar situations of extinction and send a message of hope that California can bring back salmon as a resource for this State. In Washington State, whole communities including interest groups, businesses, local/State governments, scientists, etc. have formed alliances for the single purpose of ensuring a future for their iconic species: salmon. If Washington can do it; so can California.

Thus, the strategy for recovery is three fold:

1. Increase awareness and build solution-oriented collaborations and partnerships;
2. Provide an outline of immediate actions needed to prevent extinction and shift the trajectory of these populations back towards recovery;
3. Institute a process that provides a rapid feedback and response to successes and necessary shifts in priorities.

To accomplish these three strategic goals NMFS has included in the recovery plan:

(A) Implementation by NMFS Chapter that outlines how NMFS will proactively engage with the public;

(B) Restoration Chapter designed to provide more information on funding sources and processes should the public wish to engage in restoration actions;

(C) Instituted a process in this recovery plan whereby populations are prioritized, priority areas within populations are identified for immediate restoration and expectations of response time of populations for recovery actions are outlined (Provided in this Chapter).

(D) Monitoring Chapter outlining recommendations to establish a mechanism for understanding salmon and salmon habitats and their responses to restoration actions.

The dire status of CCC coho salmon is a call for immediate action to:

1. Prevent CCC coho salmon extinction by protecting, and conducting actions to increase survival of, <u>all</u> current individuals and populations;
2. Facilitate expanded distribution through focused and prioritized restoration actions in critical areas;
3. Prevent degradation of existing high quality habitats across the historical range (especially areas that have supported populations within the last four generations);
4. Restore habitat conditions and watershed processes across the CCC coho salmon historical range; and
5. Control and abate future threats to the species, and provide for their long-term survival and recovery.

Prioritizing Populations

Currently 28 CCC coho salmon populations are identified as the focus of this recovery plan (the geographic range of each CCC coho salmon population coincides with watershed boundaries). However, due to their status, and the great uncertainty of the various populations' response to recovery efforts, it is highly unwise to allow any CCC coho population (watershed) to further degrade and be precluded from the recovery scenario. NMFS encourages all watershed groups, agencies, NGOs, and planners to continue protection, enhancement and restoration activities and monitoring in all historical CCC coho salmon watersheds, particularly those with persisting populations. NMFS will review new data regarding populations, threats and implementation success of recovery actions to adapt the recovery plan (as appropriate) during the next iteration of the recovery plan.

Priority Areas within Populations

Within the focus watershed "Core Areas", "Phase I Expansion Areas" and "Phase II Expansion Areas" were identified to further prioritize recovery actions.

Core Areas are:

1. Areas within each watershed identified for immediate focus of restoration and threat abatement actions. Not all focus watersheds have identified Core Areas.

2. Locations known to have current or recent occupancy of CCC coho salmon according to (a) status reviews conducted prior to the initial listing on October 31, 1996 (61 FR 56138) and (b) data

provided by numerous agencies, individuals, and others including the presence/absence database developed by DFG.

Core areas should be prioritized, without delay, for restoration and threat abatement actions with the goal of increasing the likelihood of freshwater survival. Highest priorities are to: (1) prevent harm or death of any individual at any life stage; (2) halt all further habitat degradation; (3) implement specific restoration and enhancement activities immediately benefiting freshwater survival; and (4) abate future threats to secure existing populations. This approach front-loads recovery actions into areas critical for species survival, and further emphasizes protection of remaining habitats and their populations. These existing habitats and populations function as the foundation for expanding and recovering wild populations. Restoration in these areas must evaluate possible short term negative impacts against long term benefits. Large scale restoration projects, for example, may have significant inputs of sediment and short term habitat degradation, but will result in large long term benefits. In some special cases, short term impacts cannot be tolerated if the species is to persist in a particular watershed. All possible impacts to remaining CCC coho salmon populations should be carefully considered. Recovery actions in Core Areas are extremely high priorities for the next six years.

Phase I Areas are:

1. Areas within each watershed identified for near term expansion of CCC coho salmon populations and for near term focus of restoration and threat abatement actions; and

2. Locations adjacent or near to currently identified Core Areas with a reasonable chance of re-colonization by straying fish from Core Areas and, where habitat restoration is feasible.

Recovery actions in Phase I areas are designed to improve habitat conditions for expanding populations to allow distribution and abundance to shift towards patterns resembling historical patterns. Further work is necessary to assess the relevance of upstream and upslope processes that contribute significantly to the overall health of the watershed. In general, recovery actions in Phase I areas are high priorities for the next nine years (three coho salmon generations).

Phase II Areas are:

1. All remaining potential habitats needed by CCC coho salmon to achieve full recovery; and

2. While not the focus of immediate restoration, these areas are critical upstream sources of wood water and sediment. Further work is needed to provide priorities on these highly relevant upstream and upslope areas that contribute significantly to the overall health of the watershed. Consideration for Phase II areas should focus primarily on preventing further degradation and re-establishing or maintaining watershed processes functions.

Recovery actions in Phase II areas should enhance, and prevent degradation of, habitat conditions for expanding populations such that distribution and abundance begin to shift towards patterns resembling historical patterns; the long-term survival of the species depends on this shift. In general, recovery actions in Phase II areas are high priorities for the next 9 to 12 years.

Timing for Recovery

CCC coho salmon populations have been in steep decline for at least 40 years. Operating on the premise recovery actions will shift the ESU population trajectory from extinction to recovery; NMFS predicts recovery will take as much time as it did for the species to become imperiled. Existing populations of CCC coho salmon are very low, and recovery will require appropriate recovery actions over an extended period of time. Recovery is likely to be a challenging and slow process (Lindley *et al.*, 2007). Recovery actions, even those implemented now, will take time to result in improved habitat conditions and/or increased population abundance. In addition, because the species has a three year life cycle with distinct lineages with relatively little interbreeding (compared to some other salmonids), the response of a given population (and cohort) may not be observable for many years.

NMFS estimates that in general, habitats will respond to restoration actions (depending on physical processes) between one to five years. Some recovery actions, such as inputting large woody material where CCC coho salmon are present, may have more immediate results. Other recovery actions such as growing large diameter trees in the riparian corridor, or reducing stream temperatures may take considerably longer. NMFS estimates measurable increases in population abundance as a result of recovery actions can be expected between three to four generations. Each three year cycle represents a single generation; therefore a sustained generational response is not like to be observable for 12 to 15 years. Populations are expected to respond positively to incremental improvements in habitat conditions, even though increased abundances may not be readily observable. Population response will be measured as the annual average number of wild spawning adults in a watershed over the most recent 12 years of record.

The dire status of CCC coho salmon is a call for immediate action. However, the conditions required and the long timeframe (100 years) required achieving a fully recovered CCC coho salmon ESU may seem unreachable. These interim timelines were developed to provide more achievable and realistic steps on the long road to recovery.

Photo Courtesy: Steelhead (right) and coho (left) from Bean Creek (2005), San Lorenzo River tributary, Santa Cruz County, CA. First juvenile coho documented in the San Lorenzo watershed in 23 years and represents significant hope for recovering this species. Don Alley - Alley and Associates.