# 6. Implementation Program

## 6.1 Conservation Community

The recovery plan is a roadmap to recovery. Voluntary communication, coordination, and collaboration among a wide variety of entities, which could also be called conservation partners. A conservation partner is anyone who has an interest in the recovery of the species. Conservation partners are essential to the implementation of the recovery plan. Conservation partners may be individuals, groups, government or non-government organizations, industry, or tribes who have an interest in the recovery of SONCC coho salmon. Recovery plans are not regulatory documents, and no entity is required by the ESA to implement them. Plans that benefit coho salmon are developed and implemented by many entities. This recovery plan identifies, prioritizes, and ranks recovery actions. NMFS anticipates that conservation partners will choose to participate in implementation of the plan to advance their missions as part of funding and contractual agreements, and as a result of outreach. In fact, there are many examples of recovery actions already underway.

## 6.2 Recovery Program

### 6.2.1 ESU Recovery Program

Many recovery actions, and their respective priority, are identified for each population. These actions, combined with criteria previously described, collectively comprise the ESU Recovery Program. Recovery action themes are described below. The seven diversity strata in the SONCC Coho Salmon ESU share stresses and threats which must be resolved for SONCC coho salmon to recover. Recovery actions are designed to both address acute issues, and restore processes which create and maintain coho salmon habitat. Recovery actions should focus on areas where coho salmon currently persist and on unoccupied areas of suitable habitat, to maximize the chance of preserving existing coho salmon. The best available information on coho salmon distribution is described in Chapters 7 through 45.

#### Flow

Stream flow quantity, quality, and timing are insufficient across much of the ESU. Insufficient flows contribute to problems with water quality in many populations. Instream flow criteria should be established. Flows should be restored, through actions such as reducing the number of diversions, encouraging water conservation, streamlining water leasing and instream dedication processes, and improving timber, grazing, and irrigation practices. The current timing and volume of flow should be assessed in the Eel, Klamath, Trinity, and Rogue Rivers, and dams and diversions should be operated so that the timing and volume of flow better approximates pre-disturbance conditions.

#### Floodplain and Channel Structure

Floodplain and channel structure is insufficient in every population. Habitat should be reconnected and restored. Large wood or other structure should be added to streams, or recruitment promoted. Off-channel ponds, wetlands, and side channels should be restored or connected to the channel, possibly by reintroducing beavers. Levees and dikes should be

removed, set back, or reconfigured and the natural channel form and floodplain connectivity re-established. To reduce fine sediment delivery to streams, roads should be upgraded, maintained, or decommissioned, slopes stabilized, and logging and grazing practices improved. Mature forests should be established along streams to increase the potential for large woody debris by improving timber harvest practices, planting conifers, releasing conifers from competition with hardwoods, and establishing a healthy fire regime.

### Estuaries

In coastal basins, estuaries have been disconnected from their floodplains by major highways or levees, drained or filled, or converted to freshwater. Restoration of the hydrologic function of estuaries is necessary to provide tidal habitat used by rearing juvenile coho salmon. The tidal exchange of water should be increased by setting back or removing levees and improving or removing tide gates. Tidal channels, wetlands, sloughs, and the estuary should be connected. Channelized reaches should be restored. Remaining estuarine habitat should be protected from development, dredging, or filling.

### Dams

In the Klamath and Trinity rivers, dams block access to large amounts of habitat needed to produce coho salmon. Four dams should be removed from the Upper Klamath River: Iron Gate, Copco 1, Copco 2, and JC Boyle. On the Trinity River, removal of Lewiston Dam should be considered. If habitat above dams becomes accessible, it should be restored.

### Hatcheries

The ecological and genetic impacts of fish produced by the Trinity River Hatchery and Iron Gate Hatchery should be reduced. Hatchery genetic management plans should be developed for every hatchery in the ESU.

Some populations of coho salmon are so small that they suffer from effects of low population size which increase the possibility of population extirpation. Enhancement programs such as captive broodstock, rescue rearing, or conservation hatcheries should be considered and, if appropriate, employed to support coho salmon populations in the Mainstem Eel River, Middle Mainstem Eel River, Mattole River, and Shasta River.

### Disease and Non-Native Species

A plan to disrupt the life cycle of the C. Shasta parasite should be developed and implemented in the Upper Klamath River. In the Interior Rogue and Interior Klamath strata, a plan to reduce the number of warm-water, non-native fish should be developed and implemented. In the Interior Trinity stratum, brown trout should be eradicated. Throughout the Eel River, Sacramento pikeminnow abundance should be substantially reduced.

### Fishing

Fisheries should be managed consistent with recovery of the SONCC coho salmon ESU.

### 6.2.2 Implementation Schedule

The last table of Chapters 7 through 45 lists the population-specific recovery actions that make up the SONCC coho salmon Recovery Program, including the recovery action number, recovery action step number, objective, recovery action, action step, area, priority, and key limiting factor status. Appendix F lists the recovery action step number, potential lead agency and estimated cost for each action. Together, the tables in Chapters 7 through 45 and Appendix F make up the implementation schedule.

**Recovery Action Tables in Population Profiles**

The fields in the recovery action tables found in each population profile provides a unique identifier for each recovery action, information about which limiting factor (stress) each action is meant to address, the purpose of the action, the particular action to be completed and the steps needed to complete it, the location where the action should be completed, the priority assigned to each action, and whether the action addresses a key limiting factor.

*Recovery Action Number*

A unique recovery action number is assigned to every recovery action) to facilitate reference to the recovery action. For example, in the recovery action number SONCC-HBT.2.2, "SONCC" refers to the ESU, "HBT" refers to the population, the first "2" is the strategy ID number (see Table 6-1), and the second "2",refers to the recovery action.

*Recovery Action Step Number*

The recovery action step number is a unique identifier assigned to each step of a particular recovery action to facilitate reference to a particular recovery action step number. It consists of the Recovery Action Number, with an additional number which refers to the sequential order of the action step (i.e., 1, 2, 3, or 4). For example, in SONCC-HBT.2.2.1, the "1" refers to the action step, in this case the first in a sequence of steps.

*Strategy*

The strategy is the primary stress the recovery action is designed to address (e.g., the strategy "Sediment" is meant to address the stress "Altered sediment supply"). Table 6-1 shows the stategy ID number, the strategy, and the limiting factor (stress) addressed by that strategy. Note that a recovery action may address more than one stress, and therefore more than one strategy. However, only one strategy is associated with each recovery action in the implementation schedule.

Table 6-1. Limiting factor (stress) addressed by each strategy.

| Strategy ID* | Strategy | Limiting Factor (Stress) Addressed |
|---|---|---|
| 1 | Estuary | Impaired Estuarine Function |
| 2 | Floodplain and Channel Structure | Lack of Floodplain and Channel Structure |

| Strategy ID* | Strategy | Limiting Factor (Stress) Addressed |
|---|---|---|
| 3 | Hydrology | Impaired Hydrologic Function |
| 5 | Passage | Barriers |
| 7 | Riparian | Degraded Riparian Forest Conditions |
| 8 | Sediment | Altered Sediment Supply |
| 10 | Water Quality | Impaired Water Quality |
| 14 | Disease/Predation/Competition | Disease/Predation/Competition |
| 16 | Fishing/Collecting | Adverse Fishery-Related Effects |
| 17 | Hatcheries | Adverse Hatchery-Related Effects |
| 26 | Low Population Dynamics | Not applicable |
| 27 | Monitor | Not applicable |
| *gaps in strategy ID numbers reflect categories not used for SONCC plan but used for other recovery plans in California. | | |

*Objective*

The objective describes the purpose of the recovery action: To increase, reduce, or maintain particular characteristics of the stress (e.g., reduce delivery of sediment to streams).

*Recovery Action*

Action to be completed (e.g., reduce road-stream hydrologic connection).

*Action Step*

Steps to accomplish action (e.g., assess and prioritize road-stream connection, and identify appropriate treatments to meet objective; decommission roads, guided by assessment).

*Area*

Location where action should be completed (e.g., all tributaries of the alluvial coastal plain downstream of Rock Creek, Indian Creek, and Bagley Creek, especially the Butler Creek watershed).

*Priority*

Each recovery action has been assigned a recovery task priority number, which is explained in Section 6.2.3.

*Key LF*

Some recovery actions address key limiting factors (Key LF), which are those limiting factors (stresses) that have the greatest impact on current population viability. Key LFs are explained in

Section 6.2.3. If a recovery action addresses a Key LF, this field will read "Yes". If not, it will read "No".

**Appendix F**

*Recovery Action Step Number*

Unique recovery action step identifier. Recovery Action Number, with an additional number which refers to the sequential order of the action step (e.g., 1, 2, 3, or 4). E.g., recovery action number SONCC-HBT.2.2, recovery action step number SONCC-HBT.2.2.1 refers to first recovery action step of that recovery action number). Provided so reader can cross reference information about a particular recovery action between the tables in the profiles and Appendix F.

*Potential Lead*

The "Potential Lead" is the entity most likely to carry out a recovery action based on its authority, expertise, or other factors. Identification of a candidate "Potential Lead" does not require the identified party to implement an action or to secure funding for such, nor does it preclude any other party from implementing the action or obtaining funds to do so.

*5 Year Cost*

The 5 year cost is the estimated cost to carry out action in years 1 to 5. The method used to estimate cost is described in Section 6.2.4 and Appendix D.

*10 Year Cost*

The 10 year cost is the estimated cost to carry out action in years 6 to 10. The method used to estimate cost is described in Section 6.2.4 and Appendix D.

*15 Year Cost*

The 15 years cost is the estimated cost to carry out action in years 11 to 15. The method used to estimate cost is described in Section 6.2.4 and Appendix D.

*20 Year Cost*

The 20 year cost is the estimated cost to carry out action for years 16 to 20. The method used to estimate cost is described in Section 6.2.4 and Appendix D.

*25 Year Cost*

The 25 year cost is the estimated cost to carry out action for years 21 to 25. The method used to estimate cost is described in Section 6.2.4 and Appendix D.

*26+ Year Cost*

The 26+ year cost is the estimated cost to carry out action for years 26 and after. The method used to estimate cost is described in Section 6.2.4 and Appendix D.

*Total Cost*

The total cost is the estimated cost to carry out action over all years. The method used to estimate cost is described in Section 6.2.4 and Appendix D.

### 6.2.3 Guidance for Understanding the Priority and Importance of Recovery Actions

When choosing recovery actions to implement, conservation partners should consider the priority and importance rankings.

**Priority rankings**

Each recovery action has been assigned a recovery task priority number, based on the criteria described in NMFS' listing and recovery priority guidelines (NMFS 1990) and an added category (BR), meaning the priority is not applicable to the action but the action would address "broad sense" recovery goals (Chapter 4). The recovery action task priority definitions are designed to call out those actions that are necessary to prevent extinction of the ESU or prevent a significant negative impact to the ESU short of extinction. In addition, the priority definitions allow differentiation between those actions which are necessary to provide for full recovery of the ESU versus those which would contribute to broad-sense recovery goals but which are not necessary to provide for ESA recovery of the ESU.

Table 6-2. Recovery action task priority definitions.

| Priority | Type of Task |
|---|---|
| **1** | Actions that must be taken to prevent extinction [of the ESU] or to identify those actions necessary to prevent extinction [of the ESU]. |
| **2** | Actions that must be taken to prevent a significant decline1 in population numbers, habitat quality2 or in some other significant negative impact short of extinction [of the ESU]. |
| **3** | All other actions necessary to provide for full recovery of the species/ESU. |
| **BR** | Actions which are not necessary to provide for ESA recovery of the ESU, but which would contribute to broad-sense recovery (BR) goals. |

[1] NMFS SWR defined "actions that must be taken to prevent a significant decline" as those that: prevent loss of one or more year classes; prevent abundance from falling below the depensation threshold; prevent take of coho salmon; prevent loss of a critical life history requirement (e.g., summer rearing habitat, migratory habitat); reduce a limiting stress; reduce a critically important threat; or prevent the loss of occupied habitat.

[2] Significant declines [in habitat quality]' is defined as the elimination of habitat to the point where thepopulation area does not support all life stages.

None of the recovery actions described in this plan is assigned a Priority 1. This is consistent with NMFS guidance: "It should be noted that even the highest priority tasks within a plan are not given a Priority 1 ranking unless they are actions necessary to prevent a species from becoming extinct or to identify those actions necessary to prevent extinction. Therefore, some plans will not have any Priority 1 tasks (NMFS 1990)."

The recovery task prioritization system is part of a larger system used by NMFS to prioritize recovery actions across ESUs and DPSs so that "…the most critical activities for each listed species can be identified and evaluated against other species recovery actions. This system recognizes the need to work toward the recovery of all listed species (NMFS 1990)." NMFS guidelines state "…these priority systems are guidelines and should not be interpreted as inflexible frameworks for making final decisions on funding or on performance of tasks. They will be given considerable weight by the agency in making decisions; however, the agency will also evaluate the cost-effectiveness of funding and tasks and take advantage of opportunities. For example, the agency may be able to conduct a relatively low priority item in conjunction with an ongoing activity at little cost." To provide NMFS and other conservation partners with other considerations when choosing which recovery actions to implement, the "Importance Ranking" was developed.

### Importance Rankings

Several factors are combined in the importance ranking: The priority of the action, whether the action addresses a key limiting factor, and whether the population is at high risk of extinction.

*Priority*

The extent to which an action prevents extinction or a significant decline is described by the priority system as described above, which is used to assign a priority 1, 2, 3, or BR to every action.

*Key Limiting Factor*

This plan uses the terms "limiting factor" and "stress" interchangeably. Key limiting factors (Key LF) are those limiting factors that have the greatest impact on current population viability.

*Population Size Relative to Depensation Threshold*

Some populations are at high risk of extirpation because they are below the depensation threshold. Conservation partners should consider the current biological status of a population, specifically whether it is extirpated and whether it is above or below the depensation threshold, when funding and implementing recovery actions. The current status of each population is described in Chapters 7 through 45, and more recent information available after the recovery plan is finalized could also be used. Populations that are not extirpated but are below the depensation threshold are at high risk of extinction and in more need of recovery actions to restore the population and its habitat than populations that are above the depensation threshold. The Importance Ranking of a recovery action considers the extinction risk of the benefiting population, whether the action would best address a Key LF, and the priority of the action.

*Importance Ranking*

**Actions of Primary Importance (API):**

Priority 1 (see column N in Implementation schedule).

OR

Priority 2 or 3

AND

Would benefit a population with a current number of spawners greater than zero but less than or equal to the depensation threshold

AND

Would address one or more key limiting factors.

**Actions of Secondary Importance (ASI):**

Priority 2 or 3

AND

Would benefit a population with a current number of spawners greater than the depensation threshold

AND

Would address one or more key limiting factors.

**Actions of Tertiary Importance (ATI):**

Priority 2 or 3

AND

Would benefit a population with a current number of spawners greater than zero but less than the depensation threshold (see population profile, Chapters 7 through 45, for more current information)

AND

Would not address a key limiting factor.

**Action of Quaternary Importance (AQI):**

Priority 2 or 3

AND

Would benefit a population with any number of spawners, including zero.

### 6.2.4 Cost

Cost is estimated for all recovery actions (Appendix F). The method used to calculate cost is described in Appendix D, and the cost of actions rated priority 1, 2, or 3 is explained in Appendix F. No cost was estimated for actions rated priority BR. Cost is estimated in accordance with the year the action would occur relative to when implementation of this plan begins (year 1). Costs are broken into five-year increments (i.e., 1-5, 6-10, 11-15, 16-20, and 21-25) except for the last category, 26+, which includes cost after year 25. The calculation of cost estimates does not imply funding availability. The cost of SONCC coho salmon recovery actions is presented by population and diversity stratum in Table 6-3.

Table 6-3. Summary of estimated cost of recovery actions for each population and diversity stratum.

| Stratum | Population | Population Type | Cost for Recovery Actions |
|---|---|---|---|
| Southern Coastal | Mattole River | Independent; Non-Core 1 | $70,266,865 |
| | Bear River | Potentially Independent, Non-Core 2 | $28,194,418 |
| | Lower Eel/Van Duzen rivers | Independent; Core | $473,195,149 |
| | Humboldt Bay Tributaries | Independent; Core | $81,400,408 |
| | Guthrie Creek | Dependent | $572,315 |
| *Stratum Total* | | | *$653,629,156* |
| Interior Eel | Mainstem Eel River | Potentially Independent, Core | $107,892,354 |
| | Middle Mainstem Eel River | Potentially Independent, Core | $140,433,116 |
| | Upper Mainstem Eel River | Potentially Independent, Non-Core 2 | $4,467,086 |
| | South Fork Eel River | Independent, Core | $227,863,612 |
| | Middle Fork Eel River | Independent, Non-Core 2 | $4,904,220 |
| *Stratum Total* | | | *$485,560,388* |
| Central Coast | Smith River | Independent, Core | $170,120,783 |
| | Lower Klamath River | Independent, Core | $138,708,796 |
| | Redwood Creek | Independent, Core | $204,662,734 |
| | Maple Creek/Big Lagoon | Potentially Independent, Non-Core 2 | $43,454,963 |

| Stratum | Population | Population Type | Cost for Recovery Actions |
|---|---|---|---|
| | Little River | Potentially Independent, Non-Core 1 | $57,554,367 |
| Central Coast | Mad River | Independent, Non-Core 1 | $190,767,970 |
| | Elk Creek | Dependent | $622,458 |
| | Wilson Creek | Dependent | $5,612,644 |
| | Strawberry Creek | Dependent | $3,384,031 |
| | Norton/Widow White creeks | Dependent | $3,305,607 |
| *Stratum Total* | | | *$818,194,354* |
| Trinity | Upper Trinity River | Independent, Core | $20,124,422 |
| | Lower Trinity River | Independent, Core | $78,326,272 |
| | South Fork Trinity River | Independent, Non-Core 1 | $141,759,766 |
| *Stratum Total* | | | *$240,210,460* |
| Interior Klamath | Upper Klamath River | Independent, Core | $616,240,058 |
| | Middle Klamath River | Potentially Independent, Non–Core 1 | $12,342,284 |
| | Salmon River | Potentially Independent, Non-Core 1 | $4,775,533 |
| | Shasta River | Independent, Core | $98,029,971 |
| | Scott River | Independent, Core | $91,380,973 |
| *Stratum Total* | | | *$822,768,819* |
| Interior Rogue | Illinois River | Independent, Core | $196,828,698 |
| | Middle Rogue/Applegate rivers | Independent, Non-Core 1 | $35,266,447 |
| | Upper Rogue River | Independent, Core | $224,069,681 |
| *Stratum Total* | | | *$456,164,826* |
| Northern Coastal | Elk River | Independent, Core | $26,525,230 |
| | Lower Rogue River | Potentially Independent, Non-Core 1 | $60,721,512 |
| | Chetco River | Independent, Core | $14,910,879 |
| | Winchuck River | Potentially Independent, Non-Core 1 | $6,812,091 |
| | Hubbard Creek | Ephemeral | $0 |
| | Euchre Creek | Ephemeral | $0 |
| | Brush Creek | Dependent | $1,443,992 |
| | Mussel Creek | Dependent | $1,394,745 |
| | Hunter Creek | Dependent | $1,938,760 |
| | Pistol River | Dependent | $4,445,434 |
| *Stratum Total* | | | *$118,192,644* |

| Stratum | Population | Population Type | Cost for Recovery Actions |
|---|---|---|---|
| **ESU Total** | | | **$3,594,720,645** |

## 6.3 Review of Recovery Progress

NMFS will regularly review the recovery actions accomplished and actions still in need of implementation, in order to track implementation status and identify any additional recovery needs. NMFS is required to review the status of listed species at least once every five years (ESA Section 4(c)2(A)). As part of each status review, NMFS will compare the status of the ESU, stresses, and threats to the delisting criteria. All available monitoring data will be used to determine the status of the ESU, describe progress made toward delisting, and identify any needed changes to the recovery program.

## 6.4 Changing the Recovery Plan

The recovery plan may be changed at any time. There are three types of plan modifications: update, revision, and addendum.

### 6.4.1 Update

An update to a recovery plan involves relatively minor changes. An update may identify specific actions that have been initiated since the plan was completed, as well as changes in species status or background information that do not alter the overall direction of the recovery effort. An update cannot suffice if substantive changes are made in the recovery criteria or if any changes in the recovery strategy, criteria, or recovery actions indicate a shift in the overall direction of recovery. In this case, a revision would be required.

### 6.4.2 Addendum

An addendum can be added to a plan after a recovery plan has been finalized. Types of addenda can range from implementation strategies or participation plans, to minor information updates. Addenda that represent significant additions to the recovery plan should undergo public review and comment before being attached to the recovery plan. An example of a significant addendum is one that adds a species to a plan.

### 6.4.3 Revision

A revision is a substantial rewrite of at least a portion of a recovery plan and is usually required if major changes are required in the recovery strategy, objectives, criteria, or actions. A revision may be required when new threats to the species are identified, when research identifies new life history traits or threats that have significant recovery ramifications, or when the current plan is not achieving its objectives. The planning process for revising a recovery plan is the same as for original plan development.

### 6.4.4 Notification, Review, and Approval of Plan Modifications

Updates to recovery plans and minor addenda represent minor changes and can be approved at the field office or at the Regional Administrator level. Updates do not require formal public comment. Contributors, stakeholders, and the Headquarters offices will be sent a copy of the changes to the plan and the changes will be posted on regional and national NMFS websites.

Because plan revisions represent a significant change to the recovery plan, they go through the same review and clearance procedures as a draft and final recovery plan including a public comment period announced in the Federal Register. If plan revisions or major addenda are planned, NMFS will publish a Federal Register Notice of Intent at the outset of the process. This Notice will solicit data, provide information about public review and comment, and state the purpose of the revision. Because plan revisions represent a significant change to the recovery plan, they go through the same review and clearance procedures as a draft and final recovery plan including a public comment period announced in the Federal Register.

## 6.5 Implementation Database

NMFS plans to track funding and implementation of SONCC coho salmon recovery actions using an implementation database. Conservation partners will be able to update the recovery action database on the internet, and generate reports on action parameters.