10.0 RECOVERY GOALS AND DELISTING CRITERIA

"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

10.1 KEY FACTS & ASSUMPTIONS

CCC coho salmon populations have been in steep decline for more than four or five decades and their risk of extinction is great. Many CCC coho salmon streams are in poor condition and these conditions limit survival across multiple life stages. While some conservation efforts are improving conditions, the rate of ongoing habitat degradation is likely greater than the rate of habitat restoration and recovery. In addition, tracking recovery will continue to be a challenge without a systematic and consistently funded monitoring program (*i.e.,* CMP) at spatial scales sufficient to evaluate status and progress.

CCC coho salmon populations are near extinction

Habitats are limiting coho survival across life stages

Rate of habitat degradation is greater than rate of restoration

Monitoring is critical to track habitats and populations

NMFS expects it may take as long to recover salmon as it did for them to decline to their current levels. Recovering a species is a challenging and slow process (Adams *et al.* 2011) as habitat conditions and population responses are typically not observable for many years once recovery or restoration actions are implemented. 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 installing large woody material where salmonids are present, may have more immediate results. Other recovery actions, such as growing large diameter trees in the riparian corridor for long term natural wood recruitment or increasing shade for stream

temperature improvements, will take considerably longer. Populations are expected to respond positively to incremental improvements in habitat conditions even though increased abundances may not be readily observable for three to four coho salmon generations or longer. Therefore, NMFS anticipates at least 40 years or more will be necessary to change the trajectory of the species from extinction to recovery after recovery actions are fully implemented, and nearly 100 years to realize delisting.

10.1.1 PRIMARY FOCUS & PRIORITIES

The current strategy for CCC coho salmon recovery is based on the following:

- ✓ Designation of 28 focus populations and development of minimum spawner density targets across four Diversity Strata;
- ✓ Designation of 11 supplemental populations;
- ✓ Recommendations to improve habitat conditions and watershed processes;
- ✓ Recommendations to abate threats that led to the decline of habitats and populations and those to abate and/or prevent future threats; and
- ✓ Employ all ESA protections (including retention of current critical habitat designation) for the conservation of all populations, including populations not designated in the recovery scenario.

The focus of this strategy includes:

Preserve genetic integrity and provide for population growth overtime:

- ❑ Protect all extant populations and their habitats to prevent extinction;
- ❑ Conserve existing genetic diversity and provide opportunities for interchange of genetic material between and within metapopulations;
- ❑ Evaluate conservation hatchery (broodstock) programs; and
- ❑ Maintain current distribution of salmonids and restore their distribution to previously occupied watersheds and subwatersheds identified as focus populations.

Conserve habitat diversity:

- Maintain and restore freshwater and estuarine environments and the natural physical interactions of land, water, wood and sediment to support the extent, diversity and quality of habitats required for spawning, rearing, food productivity, migration, growth, predator avoidance, *etc.* that allow coho to thrive and be self-sustaining in the wild.

Adapt and modify restoration and conservation techniques to ensure they account for impacts from existing and future development and environmental change:

- Human population growth and development, and expected shifts in climate and marine conditions will demand novel and innovative approaches to planning and conservation (*e.g.*, retreats from floodplains, building climate change scenarios into restoration, *etc.*).

Shift paradigms; the status quo is insufficient to recover CCC coho salmon:

- Ongoing declines of CCC coho salmon populations are an indication the status quo, for most protective measures (in regard to land and water management) and restoration actions, are insufficient to prevent extinction.

Monitor fish and habitats and adapt to new information:

- Without long term monitoring, progress in developing and refining appropriate actions will be slow and potentially misguided. Develop, fund and maintain an adaptive program of monitoring, research, and evaluation to advance our understanding of the complex array of factors associated with salmonid survival and recovery.

10.2 RECOVERY GOALS AND OBJECTIVES

The vision of this plan is to ensure freshwater habitats, improved through restoration and threat abatement, are supporting self-sustaining and well-distributed wild CCC coho salmon populations that are providing significant ecological, cultural, social and economic benefits to the people of California.

The overarching goal of the recovery plan is to realize downlisting and delisting of the CCC coho salmon ESU. Additional goals of this recovery plan include:

1. Preventing CCC coho salmon extinction in the wild and reversing population declines;
2. Immediately protecting CCC coho salmon occupied habitats and those in good condition;
3. Restoring impaired habitats; and
4. Facilitating improvements for listing factors and protective efforts.

Objectives of the recovery plan and associated timing are:

Prevent extinction and reverse population declines over the next 24 years by:

- ✓ Ensuring adequate funding for current captive broodstock facilities in the Russian River (Sonoma County), and Scott Creek (Santa Cruz County);
- ✓ Increasing capacity of broodstock programs and/or developing additional facilities; and
- ✓ Immediately implement focused instream restoration actions where coho salmon persist to increases the probability of salmonid survival within, and across, all freshwater life stages.

Protect habitats in good conditions and supporting populations of coho salmon:

- ✓ Pursue conservation banking, easements or other mechanisms to protect, in perpetuity, high quality coho salmon habitats; and
- ✓ Secure outplanting sites with high quality habitats on private lands; and
- ✓ Immediately conduct restoration in key locations identified for broodstock outplanting.

Restore currently impaired habitats:

- ✓ Prioritize restoration projects that can have immediate benefits to coho salmon freshwater survival probability; and
- ✓ Consider restoration and threat abatement coordination at the life stage and population scales (*e.g.*, coordinate restoration in a watershed focusing on ensuring successful life stage transition to and from the marine environment).

Facilitate improvements of listing factors and protective efforts:

- ✓ Organize a comprehensive recovery implementation strategy for the ESU and each diversity stratum to reduce identified threats and improve protective efforts;
- ✓ Support and fund the CMP to ensure a long term salmonid monitoring program;
- ✓ Conduct a comprehensive education and outreach program to inform the public on the priorities for salmon recovery and how they can contribute to recovery; and
- ✓ Plan for severe weather including climate change.

10.3 CRITERIA: FRAMEWORK FOR DELISTING

Evaluating a species potential for downlisting or delisting requires both an explicit analysis of population or demographic parameters (biological recovery criteria) and the physical or biological conditions that affect the species' continued existence, categorized under the ESA section 4(a)(1) listing factors (listing factor criteria). Together these make up the "objective, measurable, criteria" and the "delisting criteria" required under section 4(f)(1)(B)[16] of the ESA.

Downlisting and delisting criteria are organized by the Section 4(a)(1) listing factors below (Table 21, Table 22) and include criteria for populations, habitat conditions, threats and implementation of recovery actions. During status reviews or consideration of a downlisting or delisting decision, NMFS will determine whether the populations have achieved viability and if section 4(a)(1) listing factors have been adequately addressed, *i.e.* whether the underlying causes of decline have been addressed and mitigated and are not likely to re-emerge.

[16] See NMFS 2010 and Fund for Animals v. Babbitt 903 F. Supp. 96 (D.D.C. 1995, Appendix B).

Table 21: Criteria for downlisting of the CCC coho salmon ESU

	Biological Downlisting Criteria		Section 4(a)(1) Listing Factor Downlisting Criteria
ALL 28 Focus Populations	**For Each Diversity Stratum:**		**50% of ESU & Diversity Strata Actions Implemented**
	Downlisting spawner target achieved		**For Each Population:** **<u>CAP Attributes:</u>** *Hydrology & Water Quality Indicators:* Rank **FAIR, GOOD or VERY GOOD** across all life stages *Remaining CAP Habitat* Condition Attributes:* Rank **FAIR** or better across populations **<u>CAP Overall Threat Ranks:</u>** Threats status for targets rank **Medium** or better **<u>Actions Assigned to Listing Factors:</u>** All Priority 1 actions implemented; 50% of Priority 2 actions for all Listing Factors are implemented or plans are in place for implementation; - AND - During status reviews, assess progress of recovery action implementation by identifying (1) actions completed, (2) new actions needed or (3) actions no longer relevant (due to unforeseen or changed circumstances). **For Each Diversity Stratum:** Two Independent populations and 50% of the remaining populations meet biological and Listing Factor criteria. *excludes landscape and size attributes

Table 22: Delisting Criteria for the CCC coho salmon ESU

	Biological Delisting Criteria		Section 4(a)(1) Listing Factor Delisting Criteria
			All ESU & Diversity Strata Actions Implemented
All Independent Populations **All Dependent Populations**	Effective population size per generation > 500 OR Total population size per generation > 2500 - AND - No population decline apparent or probable - AND - Catastrophic decline not apparent - AND - Delisting spawner target achieved See Table 23 - AND - No evidence of adverse genetic, demographic, or ecological effects of hatchery fish on wild populations Delisting spawner target achieved See Table 23		**<u>For Each Population</u>** **<u>CAP Attributes:</u>** *Hydrology & Water Quality Indicators:* Rank **GOOD** or **VERY GOOD** across all life stages *Remaining CAP Habitat* Condition Attributes:* Rank **GOOD** or better across populations **<u>CAP Overall Threat Ranks :</u>** Threats status rank **LOW** **(Medium for Listing Factor E)** **<u>Actions Assigned to Listing Factors:</u>** All Priority 1 actions implemented or deemed no longer necessary All Priority 2 actions implemented or deemed no longer necessary 75% of Priority 3 actions implemented or deemed no longer necessary - AND - During status reviews, assess progress of recovery action implementation by identifying (1) actions completed, (2) new actions needed or (3) actions no longer relevant (due to unforeseen or changed circumstances). **For Each Diversity Stratum:** All Independent populations, 75% of the remaining focus populations and all supplemental populations must meet criteria. *excludes landscape and size attributes
Supplemental Populations	Confirm presence of juveniles or adults for at least one year class over 12 years AND 50% of Attribute Actions for each listing factor have been implemented or determined not necessary See Figure 37		

10.4 BIOLOGICAL CRITERIA

Downlisting Criterion:

DW-BC1	All diversity strata (and 28 focus populations) meet minimum spawner density. See Table 23.

Delisting Criteria:

DL-BC2	Effective population size per generation > 500 OR Total population size per generation > 2500 for all independent populations.
DL-BC3	No population decline apparent or probable for all independent populations.
DL-BC4	Catastrophic decline not apparent for all independent populations.
DL-BC5	Minimum spawner density achieved for all 28 populations.
DL-BC6	No evidence of adverse genetic, demographic, or ecological effects of hatchery fish on wild populations.
DL-BC7	Populations selected to support connectivity within and between Diversity Strata (*i.e.,* supplemental populations) confirm presence of juveniles or adults for at least one year class over 12 years. See Figure 37.

10.5 LISTING FACTOR CRITERIA

10.5.1 LISTING FACTOR A: PRESENT OR THREATENED DESTRUCTION, MODIFICATION, OR CURTAILMENT OF HABITAT OR RANGE

Downlisting Criteria

Downlisting Criterion (DW-A1): For each population the CAP Attributes (Hydrology and Water Quality) rank fair, good or very good across all life stages – AND – remaining CAP attributes rank fair or better across populations.

- AND -

Downlisting Criterion (DW-A2): For each population the Overall CAP Threat Ranks rank medium or low. This applies to all threats except Disease Predation and Competition, Fishing and Collecting, Hatcheries and Aquaculture and Severe Weather Patterns (downlisting criteria for these threats are outlined in other listing factor categories).

- AND -

Downlisting Criterion (DW-A3): For each population all Priority 1 actions implemented, 50% of Priority 2 actions under Listing Factor A are either implemented, plans are in place for implementation or the actions are deemed no longer necessary.

- AND -

Downlisting Criterion (DW-A4): During status reviews, assess progress of recovery action implementation by identifying (1) actions completed, (2) new actions needed or (3) actions no longer relevant (due to unforeseen or changed circumstances).

- AND -

Downlisting Criterion (DW-A5): For each Diversity Stratum: Two Independent populations and 50% of the remaining populations are meeting both spawner and listing factor criteria.

-AND-

Downlisting Criterion (DW-A6): For the ESU & Diversity Strata: 50% of the ESU and Diversity Strata Actions are implemented.

Delisting Criteria

Delisting Criterion (DL-A1): For each population the CAP Attributes are ranked good or very good across all life stages

- AND -

Delisting Criterion (DL-A2): For each population the CAP Threat Ranks are low. This applies to all threats except Disease Predation and Competition, Fishing and Collecting, Hatcheries and Aquaculture and Severe Weather Patterns (delisting criteria for these threats are outlined in other listing factor categories).

- AND -

Delisting Criterion (DL-A3): All Priority 1 actions implemented, all Priority 2 actions implemented, and 75% of Priority 3 actions implemented for this listing factor or deemed no longer necessary.

- AND -

Delisting Criterion (DL-A4): During status reviews, assess progress of recovery action implementation by identifying (1) actions completed, (2) new actions needed or (3) actions no longer relevant (due to unforeseen or changed circumstances).

- AND -

Delisting Criterion (DL-A5): For each Diversity Stratum: All Independent populations, 75% of the remaining focus populations and all supplemental populations meet population and listing factor criteria.

-AND-

Delisting Criterion (DL-A6): For the ESU & Diversity Strata: All ESU and Diversity Strata Actions are implemented.

10.5.2 LISTING FACTOR B: OVERUTILIZATION FOR COMMERCIAL, RECREATIONAL, SCIENTIFIC, OR EDUCATIONAL PURPOSES

Downlisting Criteria

Downlisting Criterion (DW-B1): For each population the CAP Attribute, Viability, is ranked fair, good or very good across all life stages.

- AND -

Downlisting Criterion (DW-B2): For each population the CAP Threat Rank for Fishing and Collecting is ranked medium or low.

- AND -

Downlisting Criterion (DW-B3): For each population all Priority 1 actions implemented, 50% of Priority 2 actions under Listing Factor B are either implemented, plans are in place for implementation or the actions are deemed no longer necessary..

- AND –

Downlisting Criterion (DW-B4): During status reviews, assess progress of recovery action implementation by identifying (1) actions completed, (2) new actions needed or (3) actions no longer relevant (due to unforeseen or changed circumstances).

-AND-

Downlisting Criterion (DL-B4): For the ESU & Diversity Strata: 50% of the ESU and Diversity Strata Actions are implemented.

Delisting Criteria

Delisting Criterion (DL-B1): For each population the CAP Attribute (Viability) is ranked good or very good across all life stages.

- AND -

Delisting Criterion (DL-B2): For each population the CAP Threat Rank for Fishing and Collecting is ranked low.

- AND -

Delisting Criterion (DL-B3): All Priority 1 actions implemented, all Priority 2 actions implemented, and 75% of Priority 3 actions implemented for this listing factor or deemed no longer necessary.

- AND -

Delisting Criterion (DL-B4): During status reviews, assess progress of recovery action implementation by identifying (1) actions completed, (2) new actions needed or (3) actions no longer relevant (due to unforeseen or changed circumstances).

-AND-

Delisting Criterion (DL-B5): For the ESU & Diversity Strata: All ESU and Diversity Strata Actions are implemented.

10.5.3 LISTING FACTOR C: DISEASE OR PREDATION

Downlisting Criteria

Downlisting Criterion (DW-C1): For each population the CAP Attribute, Viability, is ranked fair, good or very good across all life stages.

- AND -

Downlisting Criterion (DW-C2): For each population the CAP Threat Rank for Disease and Predation is ranked medium or low.

- AND -

Downlisting Criterion (DW-C3): For each population all Priority 1 actions implemented, 50% of Priority 2 actions under Listing Factor C are either implemented, plans are in place for implementation or the actions are deemed no longer necessary.

- AND –

Downlisting Criterion (DW-C4): During status reviews, assess progress of recovery action implementation by identifying (1) actions completed, (2) new actions needed or (3) actions no longer relevant (due to unforeseen or changed circumstances).

-AND-

Downlisting Criterion (DW-C5): For the ESU & Diversity Strata: 50% of the ESU and Diversity Strata Actions are implemented.

Delisting Criteria

Delisting Criterion (DL-B1): For each population the CAP Attribute Viability is found good or better across all life stages.

- AND -

Delisting Criterion (DL-B2): For each population the CAP Threat Rank for Disease and Predation is ranked medium or better.

- AND -

Delisting Criterion (DL-B3): All Priority 1 actions implemented, all Priority 2 actions implemented, and 75% of Priority 3 actions implemented for this listing factor or deemed no longer necessary.

- AND -

Delisting Criterion (DL-B4): During status reviews, assess progress of recovery action implementation by identifying (1) actions completed, (2) new actions needed or (3) actions no longer relevant (due to unforeseen or changed circumstances).

-AND-

Delisting Criterion (DL-B5): For the ESU & Diversity Strata: All ESU and Diversity Strata Actions are implemented.

10.5.4 LISTING FACTOR D: THE INADEQUACY OF EXISTING REGULATORY MECHANISMS

Downlisting Criteria

Downlisting Criterion (DW-D1): For each population all Priority 1 actions implemented, 50% of Priority 2 actions under Listing Factor D are either implemented, plans are in place for implementation or the actions are deemed no longer necessary.

– AND –

Downlisting Criterion (DW-D2): During status reviews, assess progress of recovery action implementation by identifying (1) actions completed, (2) new actions needed or (3) actions no longer relevant (due to unforeseen or changed circumstances).

-AND-

Downlisting Criterion (DW-D3): For the ESU & Diversity Strata: 50% of the ESU and Diversity Strata Actions are implemented.

Delisting Criteria

Delisting Criterion (DL-D1): All Priority 1 actions implemented, all Priority 2 actions implemented, and 75% of Priority 3 actions implemented for this listing factor or deemed no longer necessary.

– AND –

Delisting Criterion (DL-D2): During status reviews, assess progress of recovery action implementation by identifying (1) actions completed, (2) new actions needed or (3) actions no longer relevant (due to unforeseen or changed circumstances).

-AND-

Delisting Criterion (DL-D3): For the ESU & Diversity Strata: All ESU and Diversity Strata Actions are implemented.

10.5.5 LISTING FACTOR E: OTHER NATURAL AND MANMADE FACTORS AFFECTING THE SPECIES' CONTINUED EXISTENCE

Downlisting Criteria

Downlisting Criterion (DW-E1): For each population the CAP Attribute, Viability, is ranked good or very good across all life stages.

– AND –

Downlisting Criterion (DW-E2): For each population the CAP Threat Rank for Severe Weather Patterns, Hatcheries and Aquaculture are ranked medium or better.

– AND –

Downlisting Criterion (DW-E3): For each population all Priority 1 actions implemented, 50% of Priority 2 actions under Listing Factor E are either implemented, plans are in place for implementation or the actions are deemed no longer necessary.

– AND –

Downlisting Criterion (DW-E4): During status reviews, assess progress of recovery action implementation by identifying (1) actions completed, (2) new actions needed or (3) actions no longer relevant (due to unforeseen or changed circumstances).

-AND-

Downlisting Criterion (DL-E5): For the ESU & Diversity Strata: 50% of the ESU and Diversity Strata Actions are implemented.

Delisting Criteria

Delisting Criterion (DL-E1): For all populations the CAP Attribute, Viability, is ranked good or very good across all life stages.

– AND –

Delisting Criterion (DL-E2): For each population the CAP Threat Rank for Severe Weather Patterns and Hatcheries and Aquaculture are ranked medium.

– AND –

Delisting Criterion (DL-E3): All Priority 1 actions implemented, all Priority 2 actions implemented, and 75% of Priority 3 actions implemented for this listing factor or deemed no longer necessary.

– AND –

Delisting Criterion (DL-E4): During status reviews, assess progress of recovery action implementation by identifying (1) actions completed, (2) new actions needed or (3) actions no longer relevant (due to unforeseen or changed circumstances).

-AND-

Delisting Criterion (DL-E5): For the ESU & Diversity Strata: All ESU and Diversity Strata Actions are implemented.

Table 23: Population Level Downlisting & Delisting Spawner Density Criteria

Diversity Strata	**Population**	**Status**	**Miles of Potential Habitat**	**Downlisting Spawner Target**	**Delisting Spawner Target**
Lost Coast	Usal Creek	D	10.9	180	360
	Cottaneva Creek	D	14.5	235	469
	Wages Creek	D	9.8	170	340
	Ten Mile River	I	118.5	1850	3700
	Pudding Creek	D	26.4	492	983
	Noyo River	I	127.0	2000	4000
	Caspar Creek	D	12.5	218	435
	Big River	I	214.8	2750	5500
	Albion River	I	59.2	1150	2300
	Big Salmon Creek	D	16.8	289	578
				Stratum Total: 7,750	**Stratum Total: 15,500**
Navarro-Gualala Point					
	Navarro River	I	220.4	2850	5700
	Garcia River	I	103.7	1850	3700
	Gualala River	I	266.6	3100	6200
				Stratum Total: 7,800	**Stratum Total: 15,600**
Coastal	**Russian River**	I	457.5	5050	10,100
	Salmon Creek	D	35.9	684	1367
	Pine Gulch	D	11.4	197	394
	Walker Creek	I	67.6	1300	2600
	Lagunitas Creek	I	64.5	1300	2600
	Redwood Creek	D	6.8	136	272
				Stratum Total: 7,650	**Stratum Total: 15,300**
Santa Cruz Mountains					
	San Gregorio	D	36.7	682	1363
	Pescadero Creek	I	54.9	1150	2300
	Gazos Creek	I	7.1	140	279
	Waddell Creek	D	8.0	157	313
	Scott Creek	D	13.9	255	510
	San Vicente Creek	D	3.4	53	105
	San Lorenzo River	I	117.5	1900	3800
	Soquel Creek	D	31.9	561	1122
	Aptos Creek	D	26.0	466	932
				Stratum Total: 5,462	**Stratum Total: 10,924**

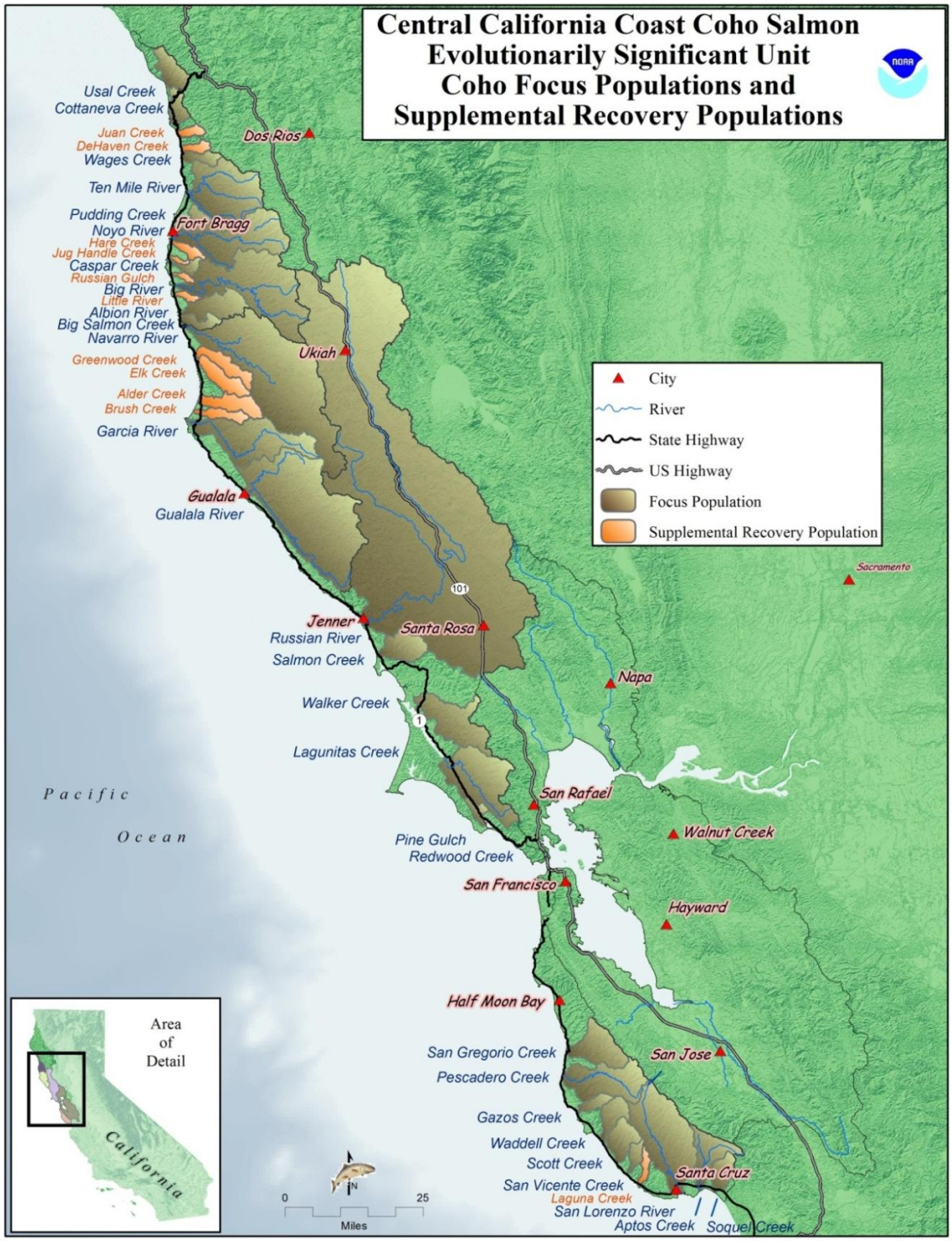

Figure 37: Coho Focus and Supplemental Populations for Recovery