

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-1.1	Objective	Estuary	Address the present of threatened destruction, modification or curtailment of habitat or range
cccc-CCC-1.1.1	Recovery Action	Estuary	Increase quality and extent of estuarine habitat
cccc-CCC-1.1.1.1	Action Step	Estuary	Work with landowners/stakeholders to remove dikes and levees limiting the current extent of estuary systems.
cccc-CCC-1.1.1.2	Action Step	Estuary	Work with landowners/stakeholders to preserve or restore primary processes in support of a properly functioning estuary/lagoon ecosystem.
cccc-CCC-1.1.1.3	Action Step	Estuary	Prevent development of surface water diversions that, independently or cumulatively, will reduce inflow or impair estuarine water quality conditions during spring/summer/fall months.
cccc-CCC-1.1.1.4	Action Step	Estuary	Prevent future alterations (e.g., jetties, tide gates, roads, bridge abutments, dredging, artificial breaching, etc.) to river mouth, inner estuary or lagoon dynamics that change estuary opening patterns.
cccc-CCC-1.1.1.5	Action Step	Estuary	For restoration/rehabilitation estuary projects, identify physical (hydrology, water quality, substrate, tidal circulation, freshwater input, inundation period, habitat complexity, etc.) and functional (productivity/growth, staging, migration, refuge, etc.) attributes needed for coho salmon.
cccc-CCC-1.1.1.6	Action Step	Estuary	Promote the historical seasonal formation and timing of estuary/lagoon barrier beach through removal of problematic infrastructure and fill materials.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-1.2	Objective	Estuary	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-1.2.1	Recovery Action	Estuary	Increase quality and extent of estuarine habitat
cccc-CCC-1.2.1.1	Action Step	Estuary	Develop and implement Estuary Inflow Protection and Enhancement Guidelines to maintain estuary function and provide information for estuary restoration.
cccc-CCC-1.2.1.2	Action Step	Estuary	Work with local county/city and state organizations to develop alternative methods of flood control to reduce artificial breaching frequency.
cccc-CCC-1.2.1.3	Action Step	Estuary	Implement patrols by citizens groups, City employees, and law enforcement to ensure seasonal sandbars are not illegally breached.
cccc-CCC-1.2.1.4	Action Step	Estuary	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-2.1	Objective	Floodplain Connectivity	Address the present or threatened destruction, modification, or curtailment of habitat or range
cccc-CCC-2.1.1	Recovery Action	Floodplain Connectivity	Improve floodplain connectivity with the main channel
cccc-CCC-2.1.1.1	Action Step	Floodplain Connectivity	Undeveloped and active floodplains should be protected from channelization, development, forest conversion, and other disturbances.
cccc-CCC-2.1.1.2	Action Step	Floodplain Connectivity	Protect and promote restoration or enhancement projects in critical over-wintering habitats (e.g., floodplains, alcoves, backchannels, off channel areas, estuaries and lagoons).

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-2.1.1.3	Action Step	Floodplain Connectivity	Evaluate opportunities and implement restoration actions to re-establish main channel function (e.g., meandering, substrate deposition, seasonal patterns of overbank flows) and its connection with historical floodplains and offchannel habitats.
cccc-CCC-2.1.1.4	Action Step	Floodplain Connectivity	Evaluate opportunities for planned retreat of urban development or other incompatible land uses from floodplains (similar to the City of Napa, Napa County, CA) and alluvial valley streams to recreate natural floodplain processes and complex off-channel habitat.
cccc-CCC-2.2	Objective	Floodplain Connectivity	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-2.2.1	Recovery Action	Floodplain Connectivity	Improve floodplain connectivity with the main channel
cccc-CCC-2.2.1.1	Action Step	Floodplain Connectivity	Prevent impacts from new development through enforcing land use zoning appropriate to the site to protect floodplain and riparian processes.
cccc-CCC-2.2.1.2	Action Step	Floodplain Connectivity	County zoning should consider the 20-year and 100-year floodprone areas and design protective ordinances and compatible land use designations in these locations.
cccc-CCC-2.2.1.3	Action Step	Floodplain Connectivity	Undeveloped and active floodplains should be protected from channelization, development, forest conversion, and other disturbances by conservation easements, county zoning, grading ordinances and other mechanisms.
cccc-CCC-2.2.1.4	Action Step	Floodplain Connectivity	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-3.1	Objective	Habitat Complexity	Address the present or threatened destruction, modification, or curtailment of habitat or range

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-3.1.1	Recovery Action	Habitat Complexity	Improve habitat complexity
cccc-CCC-3.1.1.1	Action Step	Habitat Complexity	Conduct outreach to potential applicants of FRGP to develop projects addressing high-priority areas and issues identified in the recovery plan for all four diversity strata.
cccc-CCC-3.1.1.2	Action Step	Habitat Complexity	Prioritize restoration funding 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.
cccc-CCC-3.1.1.3	Action Step	Habitat Complexity	Identify historical CCC coho salmon habitats lacking in channel complexity, and promote restoration projects designed to create or restore complex habitat features that provide for localized pool scour, velocity refuge, and cover. Prioritize Core areas first, followed by Phase I and Phase II areas.
cccc-CCC-3.1.1.4	Action Step	Habitat Complexity	Encourage landowners to implement restoration projects as part of their ongoing operations in stream reaches where large woody debris is lacking.
cccc-CCC-3.1.1.5	Action Step	Habitat Complexity	Maintain current LWD, boulders, and other structure-providing features to maintain current stream complexity, pool frequency, and depth (CDFG 2004).

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cccc-CCC-3.1.1.6	Action Step	Habitat Complexity	Habitat restoration and enhancement activities should emphasize rehabilitation of ecological processes and functions, not artificial creation of habitat. Placement of permanent or semipermanent habitat structures in streams should be discouraged unless it can be clearly demonstrated no other reasonable alternative is available. Existing artificial structures that impede the trajectory of watershed recovery towards properly functioning conditions should be removed or remediated.
cccc-CCC-3.1.1.7	Action Step	Habitat Complexity	Utilize non-lethal methods to manage beaver depredation issues (e.g. flooding, crop damage) within the range of CCC salmonids such as flow devices, fencing and beaver re-location and enhance habitat complexity.
cccc-CCC-3.1.1.8	Action Step	Habitat Complexity	Where non-lethal methods prove unfeasible to resolve depredation issues, relocate beaver populations to remote CCC coho streams where habitat enhancement is needed and resource conflict is low.
cccc-CCC-3.2	Objective	Habitat Complexity	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-3.2.1	Recovery Action	Habitat Complexity	Improve watershed conditions
cccc-CCC-3.2.1.1	Action Step	Habitat Complexity	Expand permit coverage of the FRGP permits to include all qualifying restoration projects. Expanded permit coverage to include actions that do not receive FRGP grant funding to expedite implementation of essential coho salmon habitat improvement projects.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-3.2.1.2	Action Step	Habitat Complexity	Work with Federal and State agencies to coordinate and develop programmatic permits that expedite development and implementation of high priority recovery actions.
cccc-CCC-3.2.1.3	Action Step	Habitat Complexity	Work with California BOF, CDFG, RWQCB and others to modify the timber harvest permitting process (including CDFG Lake and Streambed Alteration Agreement process) and provide opportunities and incentives for the implementation of LWD placement and other restoration priorities during timber harvest operations.
cccc-CCC-3.2.1.4	Action Step	Habitat Complexity	Develop and update a Beaver Management Plan for California to benefit salmonids.
cccc-CCC-3.2.1.5	Action Step	Habitat Complexity	Work with CDFG and the CDFG Commission to reclassify beavers from a “non-native nuisance” animal within the CDFG code and literature to a “native non-nuisance” animal.
cccc-CCC-3.2.1.6	Action Step	Habitat Complexity	Work with CDFG and the CDFG Commission to modify Title 14 CCR to prohibit recreational hunting/trapping of beavers within all counties within the NCCC Recovery Domain.
cccc-CCC-3.2.1.7	Action Step	Habitat Complexity	Work with CDFG and the CDFG Commission to remove beavers from CDFG's list of depredated animals, and/or authorize only non-lethal management and relocation methods within the NCCC Recovery Domain.
cccc-CCC-3.2.1.8	Action Step	Habitat Complexity	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-4.1	Objective	Hydrology	Address the present or threatened destruction, modification, or curtailment of habitat or range

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-4.1.1	Recovery Action	Hydrology	Improve flow conditions throughout the watershed
cccc-CCC-4.1.1.1	Action Step	Hydrology	Expand number of stream flow gauging stations for priority watersheds within the CCC coho salmon ESU and improve the network of those gauges by coordinating monitoring activities with the SWRCB, landowners, and other partnerships with ongoing monitoring programs. Work with other entities to develop a long-term source of funding that provides for monitoring, equipment, personnel, databases, analyses to develop bypass flows, public interface, and other necessities for stream flow information.
cccc-CCC-4.1.1.2	Action Step	Hydrology	Patterns of water runoff, including surface and subsurface drainage, should match to the greatest extent possible the natural hydrologic pattern for the region in both quantity and quality. Effects of consumptive water uses on both the timing and quantity of flow should be minimized. Water-management technologies promoting restoration of natural runoff patterns and water quality should be encouraged.
cccc-CCC-4.1.1.3	Action Step	Hydrology	Work with the RWQCBs to encourage landowners to increase groundwater recharge, permeable surfaces, and percolation through swales and recharge basins in an effort to reduce the flashiness of hydrographs and increase summer baseflow.
cccc-CCC-4.1.1.4	Action Step	Hydrology	Water conservation projects should be instituted that shift reliance from on-stream storage to offstream storage, resolve frost protection issues, and ensure necessary flows for all freshwater lifestages in all water years.
cccc-CCC-4.1.1.5	Action Step	Hydrology	Prioritize projects to support and expand existing efforts to increase off-stream storage capacity (e.g., ponds) as a method to offset summer diversions.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-4.1.1.6	Action Step	Hydrology	Evaluate geological patterns in the ESU to identify areas with karst formations or similar geology. These sites may provide sources of cool water and serve as locations to buffer populations against climate change and on-going water diversions.
cccc-CCC-4.1.1.7	Action Step	Hydrology	Work with the agricultural community to develop water conservation strategies protective of all freshwater life stages.
cccc-CCC-4.1.1.8	Action Step	Hydrology	Develop incentives for instream water right dedications. Support financing and expedited permitting for water users willing to shift the timing and manner of diversion from less protective practices (e.g., direct diversion during low-flow periods) to more protective practices (e.g., properly conditioned diversions to off-stream storage during the rainy season, etc.).
cccc-CCC-4.1.1.9	Action Step	Hydrology	Work with rural residential communities to develop water conservation strategies protective of salmonids while allowing for domestic water use.
cccc-CCC-4.1.1.10	Action Step	Hydrology	Work to ensure that road drainages are disconnected from the stream network to dampen the effects of discharge peaks during intense rain events.
cccc-CCC-4.2	Objective	Hydrology	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-4.2.1	Recovery Action	Hydrology	Improve flow conditions throughout the watershed
cccc-CCC-4.2.1.1	Action Step	Hydrology	Participate in water use planning with local, county, and State agencies with direct control and responsibilities over non-Federal practices.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-4.2.1.2	Action Step	Hydrology	Encourage local governments to condition new development to reduce or eliminate human water demand (e.g., new homes should have drought-tolerant landscaping, rainwater catchment systems, and permeable surfaces; new vineyards should demonstrate that their water supply development would have no adverse impacts of fisheries resources).
cccc-CCC-4.2.1.3	Action Step	Hydrology	Protect spring and large groundwater seeps from development and water removal; subterranean water sources will be increasing important when surface flows are altered by climate change.
cccc-CCC-4.2.1.4	Action Step	Hydrology	Collaborate and support the SWRCB and local agencies to increase oversight and responsibility for regulating groundwater extraction from aquifers hydrologically connected to surface flows.
cccc-CCC-4.2.1.5	Action Step	Hydrology	Encourage local governments to integrate meaningful groundwater regulation for land use planning and to increase coordination with State agencies to ensure that local permit applicants secure necessary State permits (e.g., water rights) as part of local permitting processes.
cccc-CCC-4.2.1.6	Action Step	Hydrology	Improve coordination between the agencies, particularly the SWRCB, to effectively identify and address illegal water diverters and out-of-compliance diverters, seasons of diversion, off-stream reservoirs, and bypass flows fully protective of CCC coho salmon.
cccc-CCC-4.2.1.7	Action Step	Hydrology	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-5.1	Objective	Landscape Patterns	Address the present or threatened destruction, modification, or curtailment of habitat or range
cccc-CCC-5.1.1	Recovery Action	Landscape Patterns	Reduce adverse impact to landscape patterns

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-5.1.1.1	Action Step	Landscape Patterns	Aggressively promote implementation of restoration projects that can serve immediate, near-term, benefits to the freshwater survival of current CCC coho salmon populations and seek program efficiencies and pathways to reduce burdens on project applicants proposed such projects.
cccc-CCC-5.1.1.2	Action Step	Landscape Patterns	Restoration actions should be considered in context to overall recovery priorities for the watershed and be coordinated across a watershed and coho salmon life stages.
cccc-CCC-5.1.1.3	Action Step	Landscape Patterns	Promote programs that purchase land or develop conservation easements encouraging the protection, re-establishment and/or enhancement of natural riparian communities.
cccc-CCC-5.1.1.4	Action Step	Landscape Patterns	The continuation of groups such as FishNet4C and the 5 Counties Salmon Protection Conservation Program that educate, coordinate and facilitate priority restoration by the counties are a high priority.
cccc-CCC-5.1.1.5	Action Step	Landscape Patterns	Residential landowners should utilize the Stewardship Guide for the Russian River (Sotoyome Resource Conservation District, 2011), and Groundwork: A Handbook for Small-Scale Erosion Control in Coastal California (MRCD, 2007), and Management Tips to Enhance Land & Water Quality for Small Acreage Properties (Sotoyome Resource Conservation District, 2007).
cccc-CCC-5.1.1.6	Action Step	Landscape Patterns	Where local watershed restoration coalitions and coordinators exist, NMFS will work to coordinate coho recovery efforts. Where such groups do not exist, NMFS will work with CDFG to facilitate the creation of watershed restoration coalitions.

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cccc-CCC-5.1.1.7	Action Step	Landscape Patterns	Establish recovery plan implementation groups across each Recovery Unit (e.g., diversity strata) and secure funding (e.g., Pacific Coast Salmon Restoration Fund) for four designated representatives to act as liaisons and coordinators for each implementation group. Liaisons should work with grassroots watershed groups to implement recovery efforts.
cccc-CCC-5.1.1.8	Action Step	Landscape Patterns	Conduct extensive outreach to improve education and awareness for agencies, professional organizations, landowners, and the public regarding the importance for adopting measures to minimize the likelihood of harm from their actions to listed coho salmon.
cccc-CCC-5.1.1.9	Action Step	Landscape Patterns	Coordinate with NRCS, RCDs, and watershed groups to provide information to legal cannabis producers regarding water conservation, beneficial rural road maintenance practices and proper use and disposal of toxic materials.
cccc-CCC-5.1.2	Recovery Action	Landscape Patterns	Prevent impairment to watershed hydrology
cccc-CCC-5.1.2.1	Action Step	Landscape Patterns	Residential landowners should utilize BMP's from Basins Of Relations: A Citizen's Guide to Protecting and Restoring Our Watersheds (OAEC, 2007), Slow it. Spread it. Sink it! (Santa Cruz Resource Conservations District, 2009) to conserve water resources.
cccc-CCC-5.1.3	Recovery Action	Landscape Patterns	Increase density, abundance, spatial structure and diversity
cccc-CCC-5.1.3.1	Action Step	Landscape Patterns	All work adjacent to, or within, waterways occupied by coho salmon should be conducted during the summer low flow period (June 15th - October 15th).

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cccc-CCC-5.1.3.2	Action Step	Landscape Patterns	Prioritize ESA section 7 consultations including important recovery actions, and include recovery actions in section 7 Reasonable and Prudent Alternatives and Conservation Recommendations.
cccc-CCC-5.1.4	Recovery Action	Landscape Patterns	NMFS staff will facilitate discussions with the outlined entities on those items found inadequate for Listing Factor A as outlined in the Federal Register Notice Chapter in Volume I.
cccc-CCC-5.2	Objective	Landscape Patterns	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-5.2.1	Recovery Action	Landscape Patterns	Reduce adverse impacts to landscape patterns
cccc-CCC-5.2.1.1	Action Step	Landscape Patterns	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. Encourage increased regulatory oversight for actions impairing salmonid habitat or result in direct harm to coho salmon.
cccc-CCC-5.2.1.2	Action Step	Landscape Patterns	Use Mitigation and Conservation Banking as a means for public participation in CCC coho salmon recovery and remove barriers to development and implementation. Banks offer large scale and long-term restoration opportunities and monitoring tailored to site specific needs. Over 85% of the CCC coho salmon range is privately owned and without public/private partnerships recovery will not be possible.

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cccc-CCC-5.2.1.3	Action Step	Landscape Patterns	Work with Federal and State agencies to streamline and prioritize permitting for a core set of conservation actions contributing to the recovery of salmonids and their habitats. Coordinate on development of comprehensive programmatic permits for such actions, particularly streamlined permitting for non-FRGP funded restoration projects.
cccc-CCC-5.2.1.4	Action Step	Landscape Patterns	Encourage appropriate agencies to minimize use of exemptions and engage in full enforcement of relevant laws, codes, regulations and ordinances protective of domain salmonids and their habitats.
cccc-CCC-5.2.1.5	Action Step	Landscape Patterns	Evaluate possible funding assistance or waivers where counties are deemed economically disadvantaged and restoration work is a high priority (Priority 1) as outlined in the recovery plan.
cccc-CCC-5.2.1.6	Action Step	Landscape Patterns	Discourage home building or other incompatible land use in areas identified as timber production zones (TPZ).
cccc-CCC-5.2.1.7	Action Step	Landscape Patterns	Participate in land and water use planning with local, county, and State agencies that have direct control and responsibilities over non-Federal practices.
cccc-CCC-5.2.1.8	Action Step	Landscape Patterns	Work with law enforcement agencies to abate illegal cannabis operations. Stream reaches with high quality salmonid habitat that may be affected by cannabis operations should be prioritized for abatement actions.
cccc-CCC-5.2.1.9	Action Step	Landscape Patterns	Fully implement the Programmatic Section 7 consultation for restoration projects administered by the NOAA Restoration Center that permits placement of instream woody debris and other work.

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cccc-CCC-5.2.1.10	Action Step	Landscape Patterns	Consider developing No-Take guidance 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.).
cccc-CCC-5.2.1.11	Action Step	Landscape Patterns	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-5.2.2	Recovery Action	Landscape Patterns	Encourage counties to better integrate water and land use planning efforts, and ensure their permitting staff and applicants are informed about required water and endangered species permits (and encourage applicants to consult with SWRCB and/or CDFG about water rights and Streambed Alteration Agreement requirements prior to issuance of local permits).
cccc-CCC-5.2.3	Recovery Action	Landscape Patterns	NMFS staff will facilitate discussions with the outlined entities on those items found inadequate for Listing Factor D as outlined in the Federal Register Notice Chapter in Volume I.
cccc-CCC-5.2.4	Recovery Action	Landscape Patterns	NMFS will initiate actions outlined in the Implementation Chapter of Volume I.
cccc-CCC-5.3	Objective	Landscape Patterns	Address other natural or manmade factors affecting the species' continued existence
cccc-CCC-5.3.1	Recovery Action	Landscape Patterns	NMFS staff will facilitate discussions with the outlined entities on those items found inadequate for Listing Factor E as outlined in the Federal Register Notice Chapter in Volume I.
cccc-CCC-6.1	Objective	Passage	Address the present or threatened destruction, modification, or curtailment of habitat or range

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-6.1.1	Recovery Action	Passage	Creating safe passage to and from the ocean for all life freshwater life stages of CCC coho salmon is a high priority.
cccc-CCC-6.2	Objective	Passage	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-6.2.1	Recovery Action	Passage	Consider statutory changes to prevent certain projects through the LSAA agreement process
cccc-CCC-6.2.1.1	Action Step	Passage	Adopt NMFS Guidelines for Salmonid Passage at Stream Crossings (NMFS 2001a) and review appropriate barrier databases when developing new or retrofitting existing road crossings.
cccc-CCC-6.2.1.2	Action Step	Passage	Identify and address high priority road related barriers and restore passage per NMFS' Guidelines for Salmonid Passage at Stream Crossings (NMFS 2001a).
cccc-CCC-6.2.1.3	Action Step	Passage	All new crossings and upgrades to existing crossings (bridge, culverts, fills, and other crossings) must accommodate 100-year flood flows and associated bedload and debris.
cccc-CCC-6.2.1.4	Action Step	Passage	Monitor and maintain the Coastal Conservancy database of barriers to fish passage (CDFG 2004).
cccc-CCC-6.2.1.5	Action Step	Passage	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-7.1	Objective	Pool Habitat	See restoration recommendations under habitat complexity.
cccc-CCC-8.1	Objective	Riparian	Address the present or threatened destruction, modification, or curtailment of habitat or range

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-8.1.1	Recovery Action	Riparian	Improve riparian condition
cccc-CCC-8.1.1.1	Action Step	Riparian	Promote growth of larger diameter trees inadequately sized buffers where appropriate.
cccc-CCC-8.1.1.2	Action Step	Riparian	Protect and manage existing riparian areas for site potential composition and structure such that trees are allowed to mature, provide canopy, die and recruit to streams naturally.
cccc-CCC-8.1.1.3	Action Step	Riparian	A comprehensive evaluation and monitoring program should be implemented to determine areas where poor canopy conditions are producing water temperatures limiting salmonid survival.
cccc-CCC-8.1.1.4	Action Step	Riparian	Forestry, agricultural, and grazing practices should allow riparian zones to maintain a full range of natural vegetative characteristics, i.e., characteristics occurring in watersheds with natural disturbance regimes. Riparian zones should ideally be wide enough to fulfill all functions necessary for maintaining aquatic productivity.
cccc-CCC-8.2	Objective	Riparian	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-8.2.1	Recovery Action	Riparian	Improve riparian condition
cccc-CCC-8.2.1.1	Action Step	Riparian	Develop adequately sized riparian setbacks/buffers where they do not currently occur, and enforce requirements of local regulations where they do.
cccc-CCC-8.2.1.2	Action Step	Riparian	Promote streamside conservation measures, including conservation easements, setbacks, and riparian buffers (CDFG 2004). Work cooperatively with land trusts, etc.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-8.2.1.3	Action Step	Riparian	Counties should develop a riparian strategy to grow older larger diameter trees for improved canopy and appropriate natural recruitment to the stream.
cccc-CCC-8.2.1.4	Action Step	Riparian	Enforce requirements of local regulations and riparian/setbacks.
cccc-CCC-8.2.1.5	Action Step	Riparian	Discourage encroachment into riparian zones from road widening projects, residential and commercial development, or other infrastructure expansion.
cccc-CCC-8.2.1.6	Action Step	Riparian	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-9.1	Objective	Sediment	Address the present or threatened destruction, modification, or curtailment of habitat or range
cccc-CCC-9.1.1	Recovery Action	Sediment	Improve instream gravel quality
cccc-CCC-9.1.1.1	Action Step	Sediment	Sediment from all land uses should be reduced to magnitudes appropriate to the geologic setting of the watershed.
cccc-CCC-9.1.1.2	Action Step	Sediment	Restoration work should consider re-establishment of natural instream sediment processes (e.g., sorting and distribution) through wood placement, bank protections, tree plantings, etc.
cccc-CCC-9.2	Objective	Sediment	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-9.2.1	Recovery Action	Sediment	Improve instream gravel quality
cccc-CCC-9.2.1.1	Action Step	Sediment	Fund and implement sediment TMDL recommendations within the CCC ESU.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-9.2.1.2	Action Step	Sediment	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-9.3	Objective	Sediment	See also recommendations under threat of roads.
cccc-CCC-10.1	Objective	Viability	Address the present or threatened destruction, modification, or curtailment of habitat or range
cccc-CCC-10.1.1	Recovery Action	Viability	Increase density, abundance, spatial structure and diversity
cccc-CCC-10.1.1.1	Action Step	Viability	To prevent extinction of CCC coho salmon, all mechanisms and opportunities to improve survival probability of the 28 focus populations should be considered and implemented (e.g., intervention, broodstock development, outplanting opportunities, coho salmon response to restoration, etc.).
cccc-CCC-10.1.1.2	Action Step	Viability	Conduct outreach to key entities and prioritize restoration funds, that increase viability and probability of freshwater survival in Core areas, or areas meeting the definition of Core (e.g. occupied) first. High profile projects that increase public awareness should be strongly encouraged.
cccc-CCC-10.1.1.3	Action Step	Viability	Develop a centralized database and analysis tools for population and data collected.
cccc-CCC-10.1.1.4	Action Step	Viability	Evaluate and conduct nutrient enrichment projects to improve freshwater growth and increase smolt escapement utilizing available carcasses from hatcheries and other methods.
cccc-CCC-10.2	Objective	Viability	Address the overutilization for commercial, recreational, scientific or educational purposes

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cccc-CCC-10.2.1	Recovery Action	Viability	NMFS staff will facilitate discussions with the outlined entities on those items found inadequate for Listing Factor B as outlined in the Federal Register Notice Chapter in Volume I.
cccc-CCC-10.3	Objective	Viability	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-10.3.1	Recovery Action	Viability	Increase density, abundance, spatial structure and diversity
cccc-CCC-10.3.1.1	Action Step	Viability	Coordinate with the U.S. Department of Justice and the District Attorney’s environmental prosecutors in all counties across the ESU to outline the dire status of CCC coho salmon and discuss coordination on potential enforcement actions (NOAA’s Office of Law Enforcement can refer cases to District Attorneys on behalf of CDFG for 1600 and 5650 violations).
cccc-CCC-10.3.1.2	Action Step	Viability	Initiate a comprehensive effort to educate CDFG Wardens and NOAA OLE Special Agents on; (1) the status of CCC coho salmon, (2) important habitat requirements, (3) key issues limiting their survival, and (4) potential vulnerability to various human-caused activities (particularly water diversion related impacts). Education efforts should be initiated immediately and consist of a series of yearly one-day workshops, at a minimum, for the next three years for all enforcement staff. One module of the workshop would consist of a primer on water law.
cccc-CCC-10.3.1.3	Action Step	Viability	Collaborate with CDFG and others to finalize and implement the Statewide Coastal Monitoring Plan. The plan is essential to informing recovery criteria and factors limiting CCC coho salmon survival and abundance.

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cccc-CCC-10.3.1.4	Action Step	Viability	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.
cccc-CCC-10.3.1.5	Action Step	Viability	Consider establishing a multiagency task force to address high priority issues limiting coho salmon fishery in focus watersheds.
cccc-CCC-10.3.1.6	Action Step	Viability	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.
cccc-CCC-10.3.1.7	Action Step	Viability	Implement 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. Long-term funding, for the continuation of current programs and their expansion, should be secured.
cccc-CCC-10.3.1.8	Action Step	Viability	During five-year status reviews update, if necessary, recovery actions.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-10.3.1.9	Action Step	Viability	Evaluate the efficacy and potential benefits of legislative creation of salmon refuges across the ESU. This legislation could be similar to the protections afforded to fish in Scott Creek by the California Legislature from 1915 until 1943. Some public lands are currently protected as wildlife refuges by local, State, or Federal entities. Potential watersheds include, but are not limited to, Waddell Creek, lower Scott Creek, San Vicente Creek, lower Big River, Garcia River, Usal Creek and Caspar Creek.
cccc-CCC-10.4	Objective	Viability	Address other natural or manmade factors affecting the species' continued existence
cccc-CCC-10.4.1	Recovery Action	Viability	Increase density, abundance, spatial structure and diversity
cccc-CCC-10.4.1.1	Action Step	Viability	Evaluate expansion of the Warm Springs Hatchery broodstock program to include coho from other strata in the CCC ESU. Expansion of this facility may be the most feasible and expeditious alternative for rapid implementation to conserve broodstock across the ESU.
cccc-CCC-10.4.1.2	Action Step	Viability	Utilize population models, recovery plan information and genetic information for each watershed and associated diversity stratum to identify minimum redd or adult counts that would trigger augmentation or intervention for CCC coho salmon.
cccc-CCC-10.4.1.3	Action Step	Viability	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.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-10.4.1.4	Action Step	Viability	Perform a feasibility study for new coho recovery conservation hatcheries and establish a mechanism for intervention (e.g., juveniles captured from the wild, reared in an established conservation hatchery and released as adults).
cccc-CCC-10.4.1.5	Action Step	Viability	Provide logistical and financial support to ensure maximum productivity and effectiveness of current captive broodstock programs to include program improvement and expansion.
cccc-CCC-10.4.1.6	Action Step	Viability	Re-assess marking protocol of broodstock versus hatchery fish to minimize possible mis-identification by recreational fishermen.
cccc-CCC-11.1	Objective	Water Quality	Address the present or threatened destruction, modification, or curtailment of habitat or range
cccc-CCC-11.1.1	Recovery Action	Water Quality	Prevent impairment to water quality
cccc-CCC-11.1.1.1	Action Step	Water Quality	Conduct outreach to increase awareness of the effects of pesticides and contaminants that impact the continued existence and habitat of CCC coho salmon.
cccc-CCC-11.1.1.2	Action Step	Water Quality	Toxic waste products from industrial, mining, agricultural, and urban activities should receive the appropriate treatment before being discharged into any body of water in the ESU.
cccc-CCC-11.1.1.3	Action Step	Water Quality	Support the development and implementation of stormwater BMPs in cities, towns and rural area.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-11.1.1.4	Action Step	Water Quality	Work with pesticide users to educate and advocate for an “integrative pest management framework (IPM)” for pesticide control. When feasible support the implementation the IPM. Preventative best management practices within the IPM include biological control, pesticide choices, removal of pest habitat and resources, barriers, optimal fertilization and irrigation, trap plants, intercropping, and cover crops, and synthetic mulches.
cccc-CCC-11.1.1.5	Action Step	Water Quality	Work with the academic, local, government and non-profits entities (Natural Resource Conservation District, San Francisco Estuary Institute, etc) to support funding to help develop alternatives for pesticide use through research. These alternatives may include technologies that reduce the amount of pesticides that need to be applied or pest management strategies (listed above) that require very little pesticide use.
cccc-CCC-11.2	Objective	Water Quality	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-11.2.1	Recovery Action	Water Quality	Incorporate appropriate elements of the Recovery Plan into the state-sponsored and funded Integrated Regional Water Management Plan (IRWMP).
cccc-CCC-11.2.1.1	Action Step	Water Quality	Work with EPA, RWQCBs, and CDFG to identify and prioritize potential contaminants of concern and develop protective standards and programs in the CCC ESU.
cccc-CCC-11.2.1.2	Action Step	Water Quality	Work with EPA, RWQCBs, and local stakeholders to implement actions under section 303(d)(1)(C) and (D) of the Clean Water Act requiring States to prepare TMDLs for all water bodies targeted in this recovery plan not currently meeting State of California water quality standards.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-11.2.1.3	Action Step	Water Quality	Avoid, or at a minimum regulate, the use of commercial and industrial products (e.g. pesticides) with high potential for contamination of local waterways.
cccc-CCC-11.2.1.4	Action Step	Water Quality	Work with the California Pesticides Regulation Department (CPRD) to support changes to professional pesticide application methodologies and timing (e.g., change building infrastructure applications of pyrethroids on monthly schedules throughout the entire year including the rainy season to seasons of interest) to limit the potential exposure of watercourses to pesticide runoff.
cccc-CCC-11.2.1.5	Action Step	Water Quality	Work with the Regional Water Quality Control Board to support and fast track promulgation of methods to detect impacts from pesticides and other CECs) under 40 C.F.R. Part 136, followed by adoption of water quality criteria for pollutants cover by these methods.
cccc-CCC-11.2.1.6	Action Step	Water Quality	Work with agencies to advocate for refinement of the State adopted CWA general pesticide permit.
cccc-CCC-11.3	Objective	Water Quality	See also recommendations under sediment and roads.
cccc-CCC-12.1	Objective	Agricultural Practices	Address the present or threatened destruction, modification or curtailment of habitat or range
cccc-CCC-12.1.1	Recovery Action	Agricultural Practices	Prevent adverse alterations to riparian species composition and structure
cccc-CCC-12.1.1.1	Action Step	Agricultural Practices	Encourage landowners to implement restoration projects as part of their ongoing practices in priority stream reaches and where riparian habitat is in poor or fair condition.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-12.1.1.2	Action Step	Agricultural Practices	Implement programs to purchase land/conservation easements to encourage the re-establishment and/or enhancement of natural riparian communities.
cccc-CCC-12.1.1.3	Action Step	Agricultural Practices	Develop and implement riparian setbacks/buffers that protect existing native riparian species composition and structure.
cccc-CCC-12.1.1.4	Action Step	Agricultural Practices	Ensure that mature trees within the stream riparian corridor are not disturbed or lost due to agricultural activities.
cccc-CCC-12.1.2	Recovery Action	Agricultural Practices	Prevent impairment to hydrology
cccc-CCC-12.1.2.1	Action Step	Agricultural Practices	If water is used for frost protection measures, flow metering should accompany water management to ensure flows are maintained for other beneficial uses.
cccc-CCC-12.1.2.2	Action Step	Agricultural Practices	Maintain properly functioning conditions, and do not allow further degradation, of flow conditions.
cccc-CCC-12.1.2.3	Action Step	Agricultural Practices	Utilize BMP's for irrigation (cover crop, drip) and frost protection (wind machines, cold air drains, heaters, or micro-sprayers) which eliminate or minimize water use.
cccc-CCC-12.1.3	Recovery Action	Agricultural Practices	Prevent impairment to instream substrate/food productivity (gravel quality and quantity)
cccc-CCC-12.1.3.1	Action Step	Agricultural Practices	Continue the use of cover crops in agriculture fields to reduce sediment runoff.
cccc-CCC-12.1.3.2	Action Step	Agricultural Practices	Encourage and assist the NRCS and RCDs to increase the number of landowners participating in sediment reduction planning and implementation.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-12.1.3.3	Action Step	Agricultural Practices	Work with landowners to assess and address erosion control measures throughout the winter period.
cccc-CCC-12.1.4	Recovery Action	Agricultural Practices	Prevent increased landscape disturbance
cccc-CCC-12.1.4.1	Action Step	Agricultural Practices	Complete Farm Conservation Plans (through the SRCD, NRCS, Fish Friendly Farming program or other cooperative conservation programs) to address sediment source reduction, riparian habitat, forest health, and restoration.
cccc-CCC-12.2	Objective	Agricultural Practices	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-12.2.1	Recovery Action	Agricultural Practices	Prevent impairment to riparian species composition and structure
cccc-CCC-12.2.1.1	Action Step	Agricultural Practices	Develop riparian setbacks/buffers where they do not currently occur, and enforce requirements of local regulations where they do.
cccc-CCC-12.2.1.2	Action Step	Agricultural Practices	Work with EPA and CDFG to identify and prioritize potential contaminants of concern and develop protective standards and programs in the NCCC domain that directly or indirectly adversely affect the continued existence of ESA listed salmonids.
cccc-CCC-12.2.1.3	Action Step	Agricultural Practices	Reduce water pollutants such as fine sediments, pesticides, and other non-point sources, and point source waste discharges to protect habitat and life-history requirements.
cccc-CCC-12.2.1.4	Action Step	Agricultural Practices	Utilize HCPs, Safe Harbor or other regulatory authorities to protect coho salmon and their habitat.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-12.2.1.5	Action Step	Agricultural Practices	Strongly encourage the counties (included cities and local jurisdiction) to take greater leadership role to work with their various departments on permitting, road maintenance, ordinance, etc. to reduce the ongoing impacts of agriculture to salmon and their habitats.
cccc-CCC-12.2.1.6	Action Step	Agricultural Practices	Encourage 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.
cccc-CCC-12.2.2	Recovery Action	Agricultural Practices	Prevent increased landscape disturbance
cccc-CCC-12.2.2.1	Action Step	Agricultural Practices	Prevent impacts from new vineyard development by enforcement of land use zoning appropriate to the site to protect floodplain and riparian processes.
cccc-CCC-12.2.2.2	Action Step	Agricultural Practices	Incentive programs and incentive-based approaches should be explored for landowners who conduct operations in a manner compatible with salmonid recovery requirements.
cccc-CCC-12.2.2.3	Action Step	Agricultural Practices	Technical support to counties by NMFS staff should be conducted to encourage county general plan updates and ordinances designed to conserve and protect coho salmon and their habitats.
cccc-CCC-12.2.2.4	Action Step	Agricultural Practices	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-13.1	Objective	Channel Modification	Address the present or threatened destruction, modification, or curtailment of habitat or range

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-13.1.1	Recovery Action	Channel Modification	Prevent impairment to floodplain connectivity
cccc-CCC-13.1.1.1	Action Step	Channel Modification	Flood control projects or other modifications facilitating new development (as opposed to protecting existing infrastructure) should be avoided.
cccc-CCC-13.1.1.2	Action Step	Channel Modification	Beneficial long-term effects of natural disturbances, such as flooding and stream bank erosion, should be preserved or restored whenever possible.
cccc-CCC-13.1.2	Recovery Action	Channel Modification	Prevent impairment to instream habitat complexity (reduced large wood and/or shelter)
cccc-CCC-13.1.2.1	Action Step	Channel Modification	Channel modifying projects should be designed to ensure potential effects to CCC coho habitat are fully minimized or mitigated, and where possible, existing poor conditions are remediated.
cccc-CCC-13.1.2.2	Action Step	Channel Modification	Eliminate the use of gabion baskets and undersized rock within the bankfull channel.
cccc-CCC-13.1.2.3	Action Step	Channel Modification	Educate landowners, land managers, and County and municipal staffs on the importance of LWD to coho survival and recovery, and watershed processes.
cccc-CCC-13.1.2.4	Action Step	Channel Modification	Where riprap and other bank hardening is necessary, integrate other habitat-forming features – including large woody debris and riparian plantings and other methodologies to minimize habitat alteration effects.
cccc-CCC-13.1.3	Recovery Action	Channel Modification	Prevent impairment to passage

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-13.1.3.1	Action Step	Channel Modification	Ensure that all future and existing channel designed for flood conveyance incorporate features enhance coho salmon migration under high and low flow conditions.
cccc-CCC-13.1.4	Recovery Action	Channel Modification	Reduce adverse impacts to watershed processes
cccc-CCC-13.1.4.1	Action Step	Channel Modification	Promote streamside conservation measures, including conservation easements, setbacks, and riparian buffers (CDFG 2004).
cccc-CCC-13.1.4.2	Action Step	Channel Modification	Thoroughly investigate the ultimate cause of channel instability prior to engaging in site specific channel modifications and maintenance. Focus on ensuring minimal disruption to watershed processes.
cccc-CCC-13.2	Objective	Channel Modification	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-13.2.1	Recovery Action	Channel Modification	Reduce adverse impacts to watershed processes
cccc-CCC-13.2.1.1	Action Step	Channel Modification	Modify city and county regulatory and planning processes to eliminate provisions allowing new construction of permanent infrastructure that will adversely affect watershed processes, particularly within the 100-year flood prone zones in all historical CCC coho watersheds.
cccc-CCC-13.2.1.2	Action Step	Channel Modification	Encourage FEMA to set regulatory standards in its Flood Insurance Program to explicitly address the protection of natural fluvial processes essential for the maintenance of naturally functioning riverine and riparian habitats.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-13.2.1.3	Action Step	Channel Modification	Counties and municipalities should adopt a policy of “managed retreat” (removal of problematic infrastructure and replacement with native vegetation or flood tolerant land uses) for areas highly susceptible to, or previously damaged from, flooding.
cccc-CCC-13.2.1.4	Action Step	Channel Modification	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-14.1	Objective	Disease/Predation/Competition	Address disease or predation
cccc-CCC-14.1.1	Recovery Action	Disease/Predation/Competition	Prevent reduced density, abundance, and diversity
cccc-CCC-14.1.1.1	Action Step	Disease/Predation/Competition	Provide funding to investigate and remediate impacts of disease and predation to overall ESU viability.
cccc-CCC-14.1.1.2	Action Step	Disease/Predation/Competition	Evaluate impacts of stripped bass predation in coastal estuaries to juvenile and smolt coho salmon and implement abatement strategies where appropriate.
cccc-CCC-14.1.1.3	Action Step	Disease/Predation/Competition	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-14.1.2	Recovery Action	Disease/Predation/Competition	NMFS staff will facilitate discussions with the outlined entities on those items found inadequate for Listing Factor C as outlined in the Federal Register Notice Chapter in Volume I.
cccc-CCC-15.1	Objective	Fire/Fuel Management	Address the present or threatened destruction, modification, or curtailment of habitat or range
cccc-CCC-15.1.1	Recovery Action	Fire/Fuel Management	Prevent adverse alterations to riparian species composition and structure

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-15.1.1.1	Action Step	Fire/Fuel Management	Review prescribed fire plans to ensure they provide adequate protection for riparian corridors.
cccc-CCC-15.1.2	Recovery Action	Fire/Fuel Management	Prevent impairment to instream substrate/food productivity (impaired gravel quality and quantity)
cccc-CCC-15.1.2.1	Action Step	Fire/Fuel Management	Collaborate with CalFire to coordinate firefighting and post fire response with the resource agencies.
cccc-CCC-15.1.3	Recovery Action	Fire/Fuel Management	Prevent impairment to water quality
cccc-CCC-15.1.3.1	Action Step	Fire/Fuel Management	Locate chemicals, petroleum products, latrines, camp sites, etc., as far from fish bearing streams and tributary watercourses as possible. Place on flat ground.
cccc-CCC-15.1.4	Recovery Action	Fire/Fuel Management	Prevent impairment to watershed processes
cccc-CCC-15.1.4.1	Action Step	Fire/Fuel Management	Identify historical fire frequency, intensities and durations and manage fuel loads in a manner consistent with historical parameters.
cccc-CCC-15.1.4.2	Action Step	Fire/Fuel Management	Include CDFG and NMFS participation on rehabilitation planning teams. During rehabilitation, consider leaving felled trees in streams as LWD source. Re-contour massively modified areas. Storm-proof roads immediately after use. Where organic materials need disposal, windthrow on disturbed soils on contour. Where larger organic material is available, place in severely burned-out watercourses (assure CDFG/NMFS is a part of this design and decision). Seeding, preferably with local seed-stock, at high hazard/risk areas should be done whenever feasible.
cccc-CCC-15.1.5	Recovery Action	Fire/Fuel Management	Prevent impairment to hydrology

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-15.1.5.1	Action Step	Fire/Fuel Management	Obtain water from lakes and reservoirs not occupied by listed salmonids when possible. In fish-bearing streams, excavate active channel areas outside of wetted width to create off-stream pools for water source. Require all water trucks/tenders be fitted with CDFG and NMFS approved fish screens when water is acquired at fish bearing streams. Put up a silt fence or other erosion controls around the water extraction locations. Avoid significantly lower stream flows during water drafting.
cccc-CCC-15.2	Objective	Fire/Fuel Management	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-15.2.1	Recovery Action	Fire/Fuel Management	Prevent impairment to watershed processes
cccc-CCC-15.2.1.1	Action Step	Fire/Fuel Management	Work with County planners to define future impacts of proposed urban and infrastructure development on fire suppression and fuel load buildup.
cccc-CCC-15.2.1.2	Action Step	Fire/Fuel Management	Establish fire contingency plans that involve CalFire, local fire districts and regulatory agencies with expertise in fisheries issues.
cccc-CCC-15.2.1.3	Action Step	Fire/Fuel Management	Disseminate NMFS' October 9, 2007, jeopardy biological opinion on the use of fire retardants and its impacts to salmonids, to local fire fighting agencies and CalFire.
cccc-CCC-15.2.1.4	Action Step	Fire/Fuel Management	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-16.1	Objective	Fishing/Collecting	Address the overutilization for commercial, recreational, scientific or educational purposes
cccc-CCC-16.1.1	Recovery Action	Fishing/Collecting	Prevent reduced density, abundance and diversity

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-16.1.1.1	Action Step	Fishing/Collecting	<p>NMFS has concerns regarding how fisheries are managed; thus, fisheries managers should use recovery criteria explained in this recovery plan to manage fisheries consistent with recovery of CCC coho salmon. The assessment of fishery impacts requires data to inform management, and if those data are not currently collected a system to do so should be established. Fishery managers should work with NMFS to develop Fishery Management and Evaluation Plans to prevent extinction and ensure fishery management is consistent with recovery of the species, and cover incidental take of federally listed salmonids.</p>
cccc-CCC-16.1.1.2	Action Step	Fishing/Collecting	<p>Work with CDFG and Fish and Game Commission 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 could include development specific emergency regulations during adult migration periods between September and January, low-flow closures (much like Washington State) and angler outreach programs specifically for the 28 focus watersheds identified for coho recovery. This effort should include close coordination with CDFG Wardens and development of outreach programs.</p>
cccc-CCC-16.1.1.3	Action Step	Fishing/Collecting	<p>Work with CDFG and the Fish and Game Commission to improve saltwater fishing regulations to minimize incidental bycatch and reduce injury to coho salmon. This effort should include close coordination with CDFG Game Wardens and development of outreach programs.</p>

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-16.1.1.4	Action Step	Fishing/Collecting	Work with CDFG to develop protective regulations and seek funds for additional Game Wardens to minimize impacts from fishing during migratory periods (e.g., until sandbars open naturally) within one mile of the river mouths of the focus watersheds.
cccc-CCC-16.1.1.5	Action Step	Fishing/Collecting	The streams of Albion, Big River, Cottaneva, Garcia, Gualala, Navarro, Noyo, and Ten Mile do not have hatchery trout or steelhead, yet the California Freshwater Sport Fishing Regulations sets forth bag limits for these watersheds. Resources such as the Northern California Atlas & Gazetteer (DeLorme 2011) use the Regulations to provide anglers a list of watersheds where fishing is allowed. The Regulations should be amended to reflect current fisheries conditions.
cccc-CCC-16.1.1.6	Action Step	Fishing/Collecting	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-17.1	Objective	Hatcheries	Address other natural or manmade factors affecting the species' continued existence
cccc-CCC-17.1.1	Recovery Action	Hatcheries	Improve density, abundance and diversity of CCC coho salmon populations
cccc-CCC-17.1.1.1	Action Step	Hatcheries	Work with hatchery managers to implement the recommendations in the California Hatchery Scientific Review Group report (California HSRG 2012), where appropriate.
cccc-CCC-17.1.1.2	Action Step	Hatcheries	Ensure the threat of hatcheries remains low for the CCC coho salmon for current, and all future, hatchery programs. Develop a HGMP under section 10 (a) (1) that comports with the hatchery criteria identified in Spence et al. (2008).
cccc-CCC-17.1.1.3	Action Step	Hatcheries	During five-year status reviews update, if necessary, recovery actions.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-17.2	Objective	Hatcheries	See viability for specific recommendations regarding hatchery practices.
cccc-CCC-18.1	Objective	Livestock	Address the present or threatened destruction, modification, or curtailment of habitat or range
cccc-CCC-18.1.1	Recovery Action	Livestock	Improve watershed conditions
cccc-CCC-18.1.1.1	Action Step	Livestock	Aid willing landowners to fence livestock from the stream channel and riparian zones and develop offstream alternative water sources.
cccc-CCC-18.1.1.2	Action Step	Livestock	Livestock and Ranch Managers should utilize Groundwork: A Handbook for Small-Scale Erosion Control in Coastal California (MRCD, 2007), and Management Tips to Enhance Land & Water Quality for Small Acreage Properties (Sotoyome RCD, 2007), and The Grazing Handbook (Sotoyome RCD, 2007).
cccc-CCC-18.1.1.3	Action Step	Livestock	Substitute continuous season-long use of pastures in favor of rotational grazing strategies to reduce runoff, improve soil conditions, minimize noxious weeds, and encourage native revegetation.
cccc-CCC-18.2	Objective	Livestock	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-18.2.1	Recovery Action	Livestock	Prevent impairment to water quality (e.g. turbidity, suspended sediment)
cccc-CCC-18.2.1.1	Action Step	Livestock	Establish conservative residual dry matter (RDM) target per acre to ensure areas are not overgrazed by leaving 1000 lbs RDM (residual dry matter)/acre left end of grazing season. Remove cattle from pasture before soils dry out.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-18.2.1.2	Action Step	Livestock	Implement water quality standards as outlined in the University of California guidelines for water quality protection (Ristow 2006).
cccc-CCC-18.2.1.3	Action Step	Livestock	Implement recommendations of the California Rangeland Water Quality Management Program.
cccc-CCC-18.2.1.4	Action Step	Livestock	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-19.1	Objective	Logging	Address the present or threatened destruction, modification, or curtailment of habitat or range
cccc-CCC-19.1.1	Recovery Action	Logging	Prevent conversions and improve forest conditions throughout the ESU
cccc-CCC-19.1.1.1	Action Step	Logging	California BOF could consider requiring (1) EIRs for all conversions, (2) adopting a Conversion THP, (3) elimination of the subdivision exemption, (4) raising conversion permit fees, (5) developing requirements to offset loss of timberland, (6) incentivize restoration of unproductive timberlands, (7) investigate conservation banking programs and (8) coordinate with the other agencies involved for more CalFire oversight on forest conversions.
cccc-CCC-19.1.1.2	Action Step	Logging	Work with California BOF, CalFire, CDFG, professional organizations and landowners to protect forest lands from conversion, promote sustainable forestry practices and provide landowner incentives for growing late seral forests in riparian areas and conducting restoration actions.
cccc-CCC-19.1.1.3	Action Step	Logging	Support the Monitoring Study Group and encourage coordination with other state programs and monitoring.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-19.2	Objective	Logging	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-19.2.1	Recovery Action	Logging	Prevent impairment to watershed processes
cccc-CCC-19.2.1.1	Action Step	Logging	Discourage Counties from rezoning forestlands or identified TPZ areas to rural residential or other land uses (e.g., vineyards).
cccc-CCC-19.2.1.2	Action Step	Logging	Establish greater oversight and post-harvest monitoring by the permitting agency for operations within high value habitat areas in focus watersheds.
cccc-CCC-19.2.1.3	Action Step	Logging	Partner in the development of a framework similar to Washington State that establishes a scientific framework for monitoring the effectiveness of practices in meeting watershed process goals and a decision-making process that is adaptive to the new information.
cccc-CCC-19.2.1.4	Action Step	Logging	Work with CalFire and BOF to explore no-take rules and/or apply for a statewide Forestry HCP (similar to that developed in Washington State), GCP, safe harbor and seek funding opportunities to support the effort.
cccc-CCC-19.2.1.5	Action Step	Logging	Encourage development of a GCP/HCP/Natural Community Conservation Plan (NCCP) or other procedures such as conservation easements, conservation banks, and safe harbor agreements with industrial or non-industrial forestland owners.
cccc-CCC-19.2.1.6	Action Step	Logging	Investigate opportunities to programmatically permit the forest certification program to authorize incidental take for landowners through Section 10(a)(1)(B).

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-19.2.1.7	Action Step	Logging	NMFS and CDFG should continue to provide information and recommendations to the BOF regarding salmonid priorities and needed revisions to forest practices that are in compliance with the ESA.
cccc-CCC-19.2.1.8	Action Step	Logging	Work with the BOF, CalFire, CDFG, professional organizations and landowners to modify the timber harvest permitting process to provide opportunities and incentives for LWD recruitment during timber harvest operations.
cccc-CCC-19.2.1.9	Action Step	Logging	Consider assigning NMFS staff to conduct THP reviews of the highest priority areas using revised "Guidelines for NMFS Staff when Reviewing Timber Operations: Avoiding Take and Harm of Salmon and Steelhead" (NMFS 2004).
cccc-CCC-19.2.1.10	Action Step	Logging	The State should consider a Salmonid Watershed Database (similar to the CDFG Northern Spotted Owl database) for RPFs to acquire standardized information on populations and habitat conditions in the watersheds associated with their harvest plan.
cccc-CCC-19.2.1.11	Action Step	Logging	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-19.2.2	Recovery Action	Logging	Prevent reduced density, abundance, and diversity
cccc-CCC-19.2.2.1	Action Step	Logging	Provisions for sensitive species designation allow the Board of The BOF should consider designating CCC coho salmon as a sensitive species. The majority of CCC coho salmon populations persist on forestlands and a sensitive species designation could provide increased protection from potential timber harvest impacts.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-20.1	Objective	Mining	Address the present or threatened destruction, modification, or curtailment of habitat or range
cccc-CCC-20.1.1	Recovery Action	Mining	Prevent adverse alterations to riparian species composition and structure
cccc-CCC-20.1.1.1	Action Step	Mining	Ensure protection of natural in-channel, floodplain, and riparian habitats from, in-river sand and gravel mining practices.
cccc-CCC-20.1.2	Recovery Action	Mining	Prevent impairment to watershed processes
cccc-CCC-20.1.2.1	Action Step	Mining	NMFS gravel mining guidelines (Sediment Removal Guidelines) should be strictly adhered to for all existing and proposed projects.
cccc-CCC-20.1.2.2	Action Step	Mining	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-21.1	Objective	Recreation	See recommendations for sediment and roads.
cccc-CCC-22.1	Objective	Residential/Commercial Development	Address the present or threatened destruction, modification, or curtailment of habitat or range
cccc-CCC-22.1.1	Recovery Action	Residential/Commercial Development	Prevent impairment to watershed processes
cccc-CCC-22.1.1.1	Action Step	Residential/Commercial Development	Institutionalize programs to purchase land/conservation easements to encourage the re-establishment and/or enhancement of natural riparian communities.
cccc-CCC-22.1.2	Recovery Action	Residential/Commercial Development	Prevent impairment to water quality (increased turbidity, suspended sediment, and/or toxicity)

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-22.1.2.1	Action Step	Residential/Commercial Development	Design new developments to avoid unstable slopes, wetlands, areas of high habitat value, and similarly constrained sites that occur adjacent to a CCC coho salmon watercourse.
cccc-CCC-22.1.2.2	Action Step	Residential/Commercial Development	Maintain intact and properly functioning riparian buffers to filter and prevent fine sediment input from entering streams.
cccc-CCC-22.1.2.3	Action Step	Residential/Commercial Development	Disperse discharge from new or upgraded commercial and residential areas into a spatially distributed network rather than a few point discharges, which can result in locally severe erosion and disruption of riparian vegetation and instream habitat.
cccc-CCC-22.1.2.4	Action Step	Residential/Commercial Development	Toxic waste products from urban activities should receive the appropriate treatment before being discharged into any body of water that may enter any historic CCC coho salmon waters.
cccc-CCC-22.1.3	Recovery Action	Residential/Commercial Development	Prevent impairment to stream hydrology (impaired water flow)
cccc-CCC-22.1.3.1	Action Step	Residential/Commercial Development	Restore patterns of sediment and water runoff, including surface and subsurface drainage, to the greatest extent possible to the natural hydrologic pattern for the watershed in timing, quantity, and quality.
cccc-CCC-22.2	Objective	Residential/Commercial Development	Address the inadequacy of existing regulatory mechanisms
cccc-CCC-22.2.1	Recovery Action	Residential/Commercial Development	Prevent impairment to water quality (increased turbidity, suspended sediment, and/or toxicity)
cccc-CCC-22.2.1.1	Action Step	Residential/Commercial Development	Implement performance standards in Stormwater Management Plans.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-22.2.1.2	Action Step	Residential/Commercial Development	New development in all historical CCC coho salmon watersheds should meet a zero net increase in storm-water runoff, changes in duration, or magnitude of peak flow.
cccc-CCC-22.2.1.3	Action Step	Residential/Commercial Development	Address impacts from failing septic systems in rural areas.
cccc-CCC-22.2.2	Recovery Action	Residential/Commercial Development	Prevent impairment to stream hydrology (impaired water flow)
cccc-CCC-22.2.2.1	Action Step	Residential/Commercial Development	As mitigation for hydrograph consequences, municipalities and counties should investigate funding of larger detention devices in key watersheds with ongoing channel degradation or in sub-watersheds where impervious surface area > 10 percent.
cccc-CCC-22.2.2.2	Action Step	Residential/Commercial Development	Support the development and implementation of regulations for activities that intercept groundwater recharge.
cccc-CCC-22.2.2.3	Action Step	Residential/Commercial Development	Standards and recommendations regarding development should apply to all jurisdictions, including school districts and other special districts not subject to county and/or state related ordinances or policies.
cccc-CCC-22.2.2.4	Action Step	Residential/Commercial Development	Develop legislation that will fund county planning for environmentally sound growth water supply development and work in coordination with California Dept. of Housing, Association of Bay Area Governments and other government associations (CDFG 2004).
cccc-CCC-22.2.3	Recovery Action	Residential/Commercial Development	Prevent impairment to watershed processes
cccc-CCC-22.2.3.1	Action Step	Residential/Commercial Development	Enforce existing building permit programs to minimize unpermitted construction.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-22.2.3.2	Action Step	Residential/Commercial Development	Modify Federal, State, city and county regulatory and planning processes to eliminate provisions allowing new construction of permanent infrastructure that will adversely affect watershed processes, particularly within the 100-year flood prone zones in all historic CCC coho salmon watersheds.
cccc-CCC-22.2.3.3	Action Step	Residential/Commercial Development	Educate county and city public works departments, flood control districts, and planning departments, etc., on the critical importance of maintaining a mature and properly functioning riparian zone.
cccc-CCC-22.2.3.4	Action Step	Residential/Commercial Development	Identify forestlands or oak woodland areas at high risk of conversion, and develop incentives and alternatives for landowners to discourage conversion.
cccc-CCC-22.2.3.5	Action Step	Residential/Commercial Development	Standards and recommendations regarding local development should apply to all jurisdictions, including school districts and other special districts not subject to county and/or state related ordinances or policies.
cccc-CCC-22.2.3.6	Action Step	Residential/Commercial Development	Encourage infill and high density developments over dispersal of low density rural residential development.
cccc-CCC-22.2.3.7	Action Step	Residential/Commercial Development	Develop legislation that will fund county planning for environmentally sound growth and water supply and work in coordination with California Dept. of Housing, Association of Bay Area Governments, and other government associations (CDFG 2004).
cccc-CCC-22.2.3.8	Action Step	Residential/Commercial Development	During five-year status reviews update, if necessary, recovery actions.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-23.1	Objective	Roads/Railroads	Address the present or threatened destruction, modification or curtailment of habitat or range
cccc-CCC-23.1.1	Recovery Action	Roads/Railroads	Prevent impairment to watershed hydrology
cccc-CCC-23.1.1.1	Action Step	Roads/Railroads	Size culverts to accommodate flashy, debris-laden flows and maintain trash racks to prevent culvert plugging and subsequent road failure.
cccc-CCC-23.1.1.2	Action Step	Roads/Railroads	Restoration projects that upgrade or decommission high risk roads adjacent to streams supporting coho salmon should be considered an extremely high priority for funding (e.g., PCSRF).
cccc-CCC-23.1.2	Recovery Action	Roads/Railroads	Prevent impairment to instream substrate/food productivity
cccc-CCC-23.1.2.1	Action Step	Roads/Railroads	Hydrologically disconnect roads and ensure road use, maintenance, and construction are not resulting in riparian losses and sediment discharge to streams.
cccc-CCC-23.1.2.2	Action Step	Roads/Railroads	Conduct road and sediment reduction assessments to identify sediment related and runoff related problems and determine level of hydrologic connectivity.
cccc-CCC-23.1.2.3	Action Step	Roads/Railroads	Support and engage CalTrans, 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.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-23.1.2.4	Action Step	Roads/Railroads	Implement strategies to decommission and/or upgrade high risk roads (and skid trails on forestlands), maintain existing roads and construct new roads.
cccc-CCC-23.1.2.5	Action Step	Roads/Railroads	Design and implement a program of BMPs for road maintenance on private roads similar to programs for public roads (Sommarstrom, 2002).
cccc-CCC-23.1.2.6	Action Step	Roads/Railroads	Use best management practices for road construction, maintenance on private roads similar to programs for public roads (e.g. Hagans & Weaver, 1994; Sommarstrom, 2002; Oregon Department of Transportation, 1999).
cccc-CCC-23.1.2.7	Action Step	Roads/Railroads	Evaluate stream crossing for their potential to impair natural geomorphic processes. Replace or retrofit crossings to achieve more natural conditions that meet sediment transport goals.
cccc-CCC-23.1.2.8	Action Step	Roads/Railroads	Conduct outreach and continual education regarding the adverse effects of roads and the types of best management practices protective of salmonids. Education should address watershed process and the adverse effects of improper road construction and maintenance on salmonids and their habitats.
cccc-CCC-23.1.2.9	Action Step	Roads/Railroads	Design new roadways to avoid unstable slopes, wetland, floodplains and other areas of high habitat value.
cccc-CCC-23.1.3	Recovery Action	Roads/Railroads	Prevent impairment to passage and migration
cccc-CCC-23.1.3.1	Action Step	Roads/Railroads	Adopt NMFS Guidelines for Salmonid Passage at Stream Crossings (NMFS 2001a) and review appropriate barrier databases when developing new or retrofitting existing road crossings.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-23.1.3.2	Action Step	Roads/Railroads	Bridges associated with new roads or replacement bridges (including railroad bridges) should be free span or constructed with the minimum number of bents feasible in order to minimize drift accumulation and facilitate fish passage.
cccc-CCC-23.1.3.3	Action Step	Roads/Railroads	Update the California Fish Passage Assessment Database with road related barriers to fish passage on year basis.
cccc-CCC-23.1.3.4	Action Step	Roads/Railroads	All new crossings and upgrades to existing crossings (bridges, culverts, fills, and other crossings) should accommodate 100-year flood flows and associated bedload and debris.
cccc-CCC-23.1.3.5	Action Step	Roads/Railroads	Where high underwater sound pressure levels are produced during impact pile driving the following should be implemented: (1) sound attenuation methods should be developed and implemented to keep sound levels below thresholds for onset of physical injury to fish (see NMFS' 2008 Interim Criteria for Injury to Fish from Pile Driving), avoid adverse behavioral effects (e.g., during adult migration, etc.), and to reduce the size of the area impacted (e.g., sound field); and 2) in situations where sound attenuation is not able to keep sound pressure at sub-injurious levels (i.e., sound levels that will not harm or injure fish), work should be conducted during seasonal work windows to avoid CCC coho (see established work windows).
cccc-CCC-23.1.4	Recovery Action	Roads/Railroads	Prevent adverse alterations to riparian species composition and structure
cccc-CCC-23.1.4.1	Action Step	Roads/Railroads	Educate county and city public works departments, flood control districts and planning departments, etc., on the critical importance of maintaining a mature riparian and healthy riparian zone for salmonids.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-23.2	Objective	Roads/Railroads	Address the inadequacy of regulatory mechanisms
cccc-CCC-23.2.1	Recovery Action	Roads/Railroads	Prevent adverse alterations to riparian species composition and structure
cccc-CCC-23.2.1.1	Action Step	Roads/Railroads	Minimize new road construction within riparian corridors. Limit construction of new road crossings.
cccc-CCC-23.2.1.2	Action Step	Roads/Railroads	Encourage implementation Vegetation Management Plans for the roadside maintenance activities to discourage or eliminate unwanted vegetation and promote desirable (native) vegetation (County of Santa Cruz's Integrated Vegetation Management Plan for Roads Near Perennial Waters (URS, 2011)).
cccc-CCC-23.2.2	Recovery Action	Roads/Railroads	Prevent impairment to instream substrate/food productivity (impaired gravel quality and quantity)
cccc-CCC-23.2.2.1	Action Step	Roads/Railroads	Hydrologically disconnect roads and ensure road use, maintenance, and construction are not resulting in riparian losses and sediment discharge to streams.
cccc-CCC-23.2.2.2	Action Step	Roads/Railroads	For all rural (unpaved) and seasonal dirt roads apply (at a minimum) the road standards outlined in the most recent version of the California Forest Practice Rules.
cccc-CCC-23.2.2.3	Action Step	Roads/Railroads	Evaluate and mitigate (where appropriate) the effects of transportation corridors and infrastructure on estuarine and stream fluvial processes. Mitigating measures may include, elevating existing approach, fill and maximizing clear spanning of upstream active channel(s), floodways, and floodplains to accommodate natural riverine and estuarine fluvial processes.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-23.2.2.4	Action Step	Roads/Railroads	Conduct annual inspections of roads prior to winter. Correct conditions that are likely to deliver sediment to streams.
cccc-CCC-23.2.2.5	Action Step	Roads/Railroads	Encourage enforcement of existing regulations regarding grading, riparian and building violations and sediment release from county roads.
cccc-CCC-23.2.2.6	Action Step	Roads/Railroads	Reduce sediment sources from road networks, maintenance activities and other actions that deliver sediment to stream channels through improved, or new laws and policies, and/or enforcement of existing laws and policies.
cccc-CCC-23.2.3	Recovery Action	Roads/Railroads	Prevent impairment to floodplain connectivity (impaired quality & extent)
cccc-CCC-23.2.3.1	Action Step	Roads/Railroads	Protect channel migration zones and their riparian areas by designing new roads to allow streams to meander in historical patterns.
cccc-CCC-23.2.3.2	Action Step	Roads/Railroads	During five-year status reviews update, if necessary, recovery actions.
cccc-CCC-24.1	Objective	Severe Weather Patterns	Address other natural or manmade factors affecting the species continued existence
cccc-CCC-24.1.1	Recovery Action	Severe Weather Patterns	Prevent impairment to watershed processes due to climate change

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-24.1.1.1	Action Step	Severe Weather Patterns	Develop a climate strategy to include both the reduction of fossil fuels as well as sustaining forestlands and discouraging forest change and conversions. For example, promote biological carbon sequestration best management practices (BMPs), where feasible, that are consistent with NMFS policies and guidelines. Focus on forestlands to store carbon and reduce greenhouse gasses, prevent forest loss, conserve and manage for older forest, and restore forests where they have been converted to other land uses.
cccc-CCC-24.1.1.2	Action Step	Severe Weather Patterns	Tools such as the Regional Climate System Model, Sea Level Rise and Coastal Flooding Impacts Viewer, etc. should be used to improve ecological forecasting of the threat of climate change, human population growth, and their impacts to salmonids and their habitats.
cccc-CCC-24.1.1.3	Action Step	Severe Weather Patterns	Actively conduct outreach to stakeholders and the public regarding anticipated effects of climate change to salmonids and increase awareness that human actions can offset these effects. The public, local, state and federal agencies should become familiar with, and implement as necessary through lifestyle and policy changes, recommendations of the Intergovernmental Panel on Climate Change (IPCC). See the website http://www.ipcc.ch to view a summary of climate change issues for North America and the suite of actions from the IPCC to be considered for ecosystem (and human health) due to climate change.
cccc-CCC-24.1.1.4	Action Step	Severe Weather Patterns	Expand research and monitoring to improve predictions of climate change and its effects on salmon recovery.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-24.1.1.5	Action Step	Severe Weather Patterns	Promote and support policies that explicitly maintain instream flow by limiting water withdrawals, enhancing floodplain connectivity by opening historically flooded areas where possible, removing anthropogenic barriers for fish passage, and riparian forest to increase habitat resilience.
cccc-CCC-24.1.1.6	Action Step	Severe Weather Patterns	Encourage and increase voluntary carbon accounting in the forest sector through certification with the California Climate Action Registry and their Forest Protocols.
cccc-CCC-24.1.1.7	Action Step	Severe Weather Patterns	Minimize anthropogenic increases in water temperatures by maintaining well-shaded riparian areas. Work to encourage and incorporate climate change vulnerability assessments and climate change scenarios in consultations, permitting, and restoration projects to access the impacts on coho salmon.
cccc-CCC-24.1.1.8	Action Step	Severe Weather Patterns	Maintain headwater areas in an undisturbed state to ensure a continuous source of cool water downstream.
cccc-CCC-24.1.1.9	Action Step	Severe Weather Patterns	Maximize connectivity, and increase diversity, of instream habitats to allow a full range of opportunities for salmon to exploit as environmental conditions shift.
cccc-CCC-24.1.1.10	Action Step	Severe Weather Patterns	During 5-year status review update existing climate change recovery actions.
cccc-CCC-24.1.2	Recovery Action	Severe Weather Patterns	Prevent impairment to watershed processes due to droughts and flooding events

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-24.1.2.1	Action Step	Severe Weather Patterns	Evaluate feasibility and benefits of establishing an Emergency Drought Operations Center (similar to the Emergency Drought Operations Center developed in Washington State), comprised of the SWRCB, CDFG, NMFS, and others to develop emergency rules for augmenting water supplies and mitigating the effects of drought and extreme climate on CCC coho salmon and their habitats.
cccc-CCC-24.1.2.2	Action Step	Severe Weather Patterns	Institute water conservation strategies that provide for drought contingencies without relying on interception of surface flows or groundwater depletion.
cccc-CCC-24.1.2.3	Action Step	Severe Weather Patterns	Coordinate protection measures and develop rules for augmenting water supplies and mitigating the effects of drought on salmonids.
cccc-CCC-24.1.2.4	Action Step	Severe Weather Patterns	Design habitat restoration projects to account for long-term changes including sea level rise, flooding frequency and loss of sediment, by increasing resiliency of existing habitat types and facilitating upstream passage (California State Coastal Conservancy et al. 2010).
cccc-CCC-25.1	Objective	Water Diversion/Impoundment	Address the inadequacy of regulatory mechanisms
cccc-CCC-25.1.1	Recovery Action	Water Diversion/Impoundment	Improve flow conditions
cccc-CCC-25.1.1.1	Action Step	Water Diversion/Impoundment	Establish comprehensive stream flow evaluation programs to determine instream flow needs for coho salmon.
cccc-CCC-25.1.1.2	Action Step	Water Diversion/Impoundment	Determine and monitor 1600 program compliance related to water diversions (CDFG 2004).

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-25.1.1.3	Action Step	Water Diversion/Impoundment	Counties should consider forbearance agreements that eliminate withdrawals during low-flow conditions.
cccc-CCC-25.1.1.4	Action Step	Water Diversion/Impoundment	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.
cccc-CCC-25.1.1.5	Action Step	Water Diversion/Impoundment	CDFG staff should conduct compliance audits of LSAA in priority watersheds. Audits would be conducted using a two tiered approach in all focus CCC coho salmon watersheds – compliance checks on existing agreements and compliance review to identify unpermitted activities impacting coho. Mitigation measures for LSAA agreements should be standardized per specific life history impacts.
cccc-CCC-25.1.1.6	Action Step	Water Diversion/Impoundment	For those streams known to support CCC coho salmon, including those with ongoing diversions, consider petitioning SWRCB to declare the stream as fully appropriated during the summer months. Encourage existing water rights holders and new applicants, to shift the timing or manner of diversion, from a less protective to a more protective practice, as appropriate.
cccc-CCC-25.1.1.7	Action Step	Water Diversion/Impoundment	Collaborate and support the SWRCB and local agencies to increase oversight and responsibility for regulating groundwater extraction from aquifers hydrologically connected to surface flows.
cccc-CCC-25.1.1.8	Action Step	Water Diversion/Impoundment	Encourage local governments to integrate meaningful groundwater regulation for land use planning and to increase coordination with State agencies to ensure local permit applicants secure necessary State permits (e.g., water rights) as part of local permitting processes.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-25.1.1.9	Action Step	Water Diversion/Impoundment	Collaborate and support the SWRCB to prioritize review and processing of water right projects within the 28 focus populations and 11 supplemental populations, enforce existing bypass flow requirements and reduce the impacts of authorized surface water diversions for populations where water flow is identified as a limiting factor.
cccc-CCC-25.1.1.10	Action Step	Water Diversion/Impoundment	Improve coordination between the agencies, particularly the SWRCB and county District Attorneys, to effectively identify and address illegal water diverters and out-of-compliance diverters, seasons of diversion, off-stream reservoirs, and bypass flows so they are fully protective of CCC coho salmon.
cccc-CCC-25.1.1.11	Action Step	Water Diversion/Impoundment	Until site specific studies are conducted, implement and enforce the North Coast Instream Flow Policy developed and adopted pursuant to AB2121 for the 28 focus populations and 11 supplemental population. AB2121 codified (in sections 1259.2 and 1259.4 of the California Water Code) portions of CDFG and NMFS Water Diversion Guidelines to ensure protective flows for all life stages of coho salmon.
cccc-CCC-25.1.1.12	Action Step	Water Diversion/Impoundment	Work with CDFG and SWRCB to develop specific regulatory mechanisms to fully and effectively implement CDFG Code Section 5937 requirements.
cccc-CCC-25.1.1.13	Action Step	Water Diversion/Impoundment	Evaluate benefits of requiring State and Federal Incidental Take Permits for all new water diversions in watersheds with extant populations of CCC coho salmon.
cccc-CCC-25.1.1.14	Action Step	Water Diversion/Impoundment	The State Water Board should adopt the new Frost Protection regulations as soon as possible.

Strategy Number	Level	Targeted Attribute or Threat	Action Description
cccc-CCC-25.1.1.15	Action Step	Water Diversion/Impoundment	The State Water Board should exercise their regulatory authority over summer water diversions especially those under riparian rights including the ones that pre-date 1915.
cccc-CCC-25.1.2	Recovery Action	Water Diversion/Impoundment	Prevent impairment to stream hydrology (impaired water flow)
cccc-CCC-25.1.2.1	Action Step	Water Diversion/Impoundment	Promote passive diversion devices designed to allow diversion of water only when minimum streamflow requirements are met or exceeded (CDFG 2004).
cccc-CCC-25.1.2.2	Action Step	Water Diversion/Impoundment	Promote conjunctive use of water with water projects whenever possible.
cccc-CCC-25.1.2.3	Action Step	Water Diversion/Impoundment	Require the SWRCB to conduct interagency consultation with the California Department of Fish and Game, and seek technical assistance from NMFS on the issuance of water rights permits.
cccc-CCC-25.1.2.4	Action Step	Water Diversion/Impoundment	Request that SWRCB review and/or modify water use based on the needs of coho salmon and authorized diverters (CDFG 2004).
cccc-CCC-25.1.3	Recovery Action	Water Diversion/Impoundment	Prevent reduced density, abundance, and diversity
cccc-CCC-25.1.3.1	Action Step	Water Diversion/Impoundment	Adequately screen water diversions to prevent juvenile salmonid mortalities.
cccc-CCC-26.1	Objective	Watershed Process	See recommendations under Landscape Patterns.