

Executive Summary

Congress created the State and Tribal Wildlife Grants (SWG) program in 2000, recognizing the need to fund programs for the conservation of wildlife diversity. Congress mandated each state and territory to develop by 2005 a State Wildlife Action Plan (SWAP) that provided a comprehensive wildlife conservation strategy to continue receiving federal funds through the SWG program. California's first SWAP was completed by California Department of Fish and Game (now the California Department of Fish and Wildlife [CDFW]) and approved by the U.S. Fish and Wildlife Service (USFWS) in 2005. California's SWAP 2005 identified and targeted Species of Greatest Conservation Need (SGCN) and the vital habitats on which they depend. CDFW has received approximately \$37 million in federal support for the state's wildlife conservation activities through the SWG program from 2005 through 2014. The SWG program requires SWAP updates at least every 10 years. CDFW has now prepared SWAP 2015, which is the first comprehensive update of SWAP 2005.

Vision for Wildlife Conservation

In SWAP 2015, CDFW is focusing on conservation of the wildlife resources of the nation's most biologically diverse state using an approach that is in harmony with a growing human population and the need for resilience in the face of a changing climate. SWAP 2015 is a flexible, but scientifically grounded plan. Employing an ecosystem approach to conserve and manage diverse habitats and species, SWAP 2015 provides a blueprint for actions necessary to address highest priorities for conserving California's aquatic, marine, and terrestrial resources. Its implementation relies on making important and helpful conservation information more accessible to resource managers and the public, and on developing lasting partnerships with a broad array of governments, agencies, organizations, businesses, and citizens. CDFW's vision for conserving the state's wildlife is to sustain the floral and faunal biodiversity of California over the next decade, and to establish a solid conservation framework for the decades that follow.

Through SWAP 2015, together with diverse partners, CDFW seeks to:

- maintain and enhance the integrity of ecosystems by conserving key natural processes and functions, habitat qualities, and sustainable native species population levels, so that California's ecosystems are resilient to shifting environmental conditions resulting from climate change;
- promote partnerships with federal, state, and local agencies; tribal governments; and non-governmental organizations with aligned conservation goals to leverage efficient use of funding and other public resources;
- inspire greater understanding and recognition of critical needs for conserving wildlife and their habitats by lawmakers, land use planners, private landowners, and others who have influence in developing and implementing conservation actions;

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- allocate sufficient water and manage water resources to maintain healthy ecosystems and fish and wildlife populations when considering state and regional water supply needs;
- provide resources and coordinate efforts with partners to eradicate or control invasive species and to prevent new introductions;
- sustain the quality of California's natural resources and biodiversity in harmony with predicted economic growth and human population increases;
- continue to prioritize protection of key habitat linkages, sensitive habitats, and specialized habitats for SGCN;
- integrate wildlife conservation with working landscapes and environments, recognizing both the economic and ecological values of agriculture, rangeland, forestry, and fisheries;
- support conservation programs that benefit native species, habitats, and ecosystems through broad-based public funding from federal, state, special district, and local government sources;
- educate the public about wildlife conservation issues and inspire a conservation ethic in present and future generations through public outreach; and
- enhance conservation capacity by clearly articulating conservation purposes, applying adaptive management principles, and effectively using staff and financial resources.

Statewide Goals

Three statewide goals to enhance California ecosystems have been identified for SWAP. These overarching goals, with their associated sub-goals, represent the desired ecological outcomes for SWAP 2015 implementation.

Goal 1 - Abundance: Maintain and increase the extent of ecosystems and the distribution of native species while sustaining and enhancing species richness and abundance in California.

- *Goal 1.1 (Ecosystem Extent):* Maintain and increase the ecosystem extent.
- *Goal 1.2 (Species and Habitat Distribution):* Maintain and increase the distribution of native species and their habitats.
- *Goal 1.3 (Species Abundance and Richness):* Sustain and enhance the abundance of native species and species richness, including genetic diversity.
- *Goal 1.4 (Ecosystem Diversity):* Sustain and enhance ecosystem diversity.

Goal 2 - Enhance Ecosystem Conditions: Maintain and improve ecological conditions vital to ecosystem sustainability in California.

- *Goal 2.1 (Connectivity):* Maintain and improve connectivity vital to ecosystem sustainability (including vegetation, wildlife corridor, genetic permeability, water flow, lateral floodplain extent, and groundwater).

- ▲ *Goal 2.2 (Community Structure and Composition):* Maintain and improve community structure and composition vital to ecosystem sustainability (including those relevant to age class, habitat richness, structural heterogeneity, native species richness, and key species population level).
- ▲ *Goal 2.3 (Water Quantity and Availability):* Maintain and improve water quality (temperature, chemistry, pollutant and nutrient concentrations) vital to ecosystem sustainability, and improve the quantity and availability of water for ecosystems (including ocean, lakes, rivers, streams, groundwater, and snowpack).
- ▲ *Goal 2.4 (Soil Quality):* Maintain and improve soil quality vital to ecosystem sustainability (including soil moisture, chemistry, pollutant and nutrient concentrations and dynamics).

Goal 3 - Enhance Ecosystem Functions and Processes: Maintain and improve ecosystem functions and processes vital to ecosystem sustainability in California.

- ▲ *Goal 3.1 (Successional Dynamics):* Maintain or improve successional dynamics vital to ecosystem sustainability.
- ▲ *Goal 3.2 (Disturbance Regime):* Maintain or improve disturbance regimes vital to ecosystem sustainability (including fire regime, flooding regime, and grazing regime).
- ▲ *Goal 3.3 (Hydrological Regime):* Maintain or improve hydrological regimes vital to ecosystem sustainability (including fresh water hydrodynamics, oceanic circulation, and tidal patterns).
- ▲ *Goal 3.4 (Soil and Sediment Deposition Regime):* Maintain or improve soil and sediment deposition regimes vital to ecosystem sustainability (including hydro-geomorphic processes, wind-driven processes, and soil stability).

Ecosystem Approach

A multi-species, ecosystem approach has been used as the guiding framework for developing SWAP 2015. An ecosystem approach to conservation involves maintaining and enhancing the ecosystem processes, structure, and conditions, recognizing that all components are interrelated in a dynamically changing system. Large-scale landscape approaches are generally the most reliable and preferred method to conserve ecological integrity, including biological diversity. The approach benefits both game and non-game (or harvested and non-harvested) wildlife species, and creates many co-benefits related to both natural values (such as enhanced water quality, soil conservation, or resilience to the effects of climate change) and societal values (such as open space, scenic quality, or outdoor recreation opportunities).

Species of Greatest Conservation Need

A key element of updating the SWAP is identifying and compiling information on the species of wildlife that are indicative of the state's biological diversity and have the greatest need for conservation. These species are referred to as SGCN. For SWAP 2015, regional teams developed

criteria and evaluated species, resulting in a list of over 1,000 species of invertebrates, amphibians, reptiles, fish, birds, mammals, and plants that are considered SGCN. Because of the large number of species, a species-based implementation approach is not feasible; however, it is recognized that dividing California into habitat categories may present limitations that must be balanced with species-specific efforts when needed to effectively address conservation of species.

SWAP 2015 used three criteria to determine the list of SGCN:

- species listed as threatened, endangered, or candidate species in California under the federal Endangered Species Act or the California Endangered Species Act;
- species for which there is a conservation concern (generally equivalent to California Species of Special Concern); or
- species identified by CDFW as being highly vulnerable to climate change.

Consideration of Climate Change

Significant climate-related changes to California's environment have been documented in the last decade, including sea level rise, natural community shifts, increased prevalence of invasive species, increased number and intensity of wildfires, and prolonged drought (CNRA 2009, CNRA 2014). Climate-induced effects on wildlife, in combination with other pressures, have the potential to greatly diminish vulnerable wildlife populations and habitats and must be considered when developing management strategies. Climate change considerations have been given great weight during development of SWAP 2015, in the following ways:

- adopting climate vulnerability as a criterion for selecting SGCN;
- incorporating climate forecasts when assessing the ecological conditions of conservation targets;
- conducting climate change vulnerability analyses for native species and vegetation in California; and
- identifying how the SWAP conservation strategies align with California's Climate Change Adaptation Strategy and the National Fish, Wildlife, and Plants Climate Adaptation Strategy, thus achieving important climate adaptation co-benefits through SWAP implementation.

Prioritizing Conservation Targets

The process to provide the SWAP elements required by USFWS and develop multi-species conservation strategies began by broadly categorizing natural resources in California. The categories used in SWAP 2015 are terrestrial, freshwater aquatic, and marine habitats. SWAP 2015 recognizes that within each of these resource categories, there are strategies that apply to specific geographic regions, and others that are more broadly relevant across many regions or possibly statewide. To assess conservation needs at a manageable scale, the state was

subdivided for each resource category using established and accepted geographic units. These geographic units are ecoregions (adopting “sections” identified under the U.S. Forest Service Ecoregion Classification) for terrestrial resources, hydrologic units (adopting the four digit hydrologic unit codes identified by the U.S. Geologic Survey) for freshwater aquatic resources, and marine conservation units (adopting marine study regions identified under the Marine Life Protection Act [Fish and Game Code Section 2850-2863]), collectively called conservation units. The conservation units were then grouped together into seven major geographic provinces. This approach facilitated the discussion of ecosystems, natural communities and species at a scale appropriate for regional conservation planning. The seven provinces are:

- ▲ North Coast and Klamath
- ▲ Cascades and Modoc Plateau
- ▲ Central Valley and Sierra Nevada
- ▲ Bay Delta and Central Coast
- ▲ South Coast
- ▲ Deserts
- ▲ Marine

An exception to developing conservation strategies within these geographic scales is the analysis for anadromous fish. Anadromous fish begin life in the fresh water of rivers and streams, migrate to the ocean to grow into adults, and then return to fresh water to spawn. Most anadromous fish spend the majority of their life in marine environments and travel great distances to reach their spawning rivers or streams. Because the geographic ranges of anadromous fish span many of the provinces developed for SWAP 2015, the organization of conservation strategies by hydrologic unit or even province does not adequately address their conservation needs. As such, the geographic organization of conservation strategies for anadromous fish has been developed separately to capture all the habitats within their ranges.

For each conservation unit in California, SWAP 2015 developed at least one conservation project, consisting of a set of conservation strategies to improve conditions of a conservation target. The focus of SWAP 2015 is on species deemed to be most rare, imperiled, and in need of conservation. Habitat types with high levels of species richness, high counts of rare and endemic species, and high counts of vulnerable species (including declining and at-risk species and SGCNs), are prioritized for selection as potential terrestrial conservation targets. Expert opinion and knowledge were employed to identify the highest priority freshwater aquatic targets for each hydrologic unit. Marine ecosystem targets were based on priorities identified through work recently completed as part of the Marine Life Protection Act (MLPA). Anadromous fish conservation targets are key species, species guilds, habitat types, or ecological processes essential to the future conservation of anadromous species and were prioritized by CDFW to adequately encapsulate their evolutionary and ecological significance.

Development of Conservation Strategies

Statewide conservation strategies have been developed in SWAP 2015 for terrestrial, freshwater aquatic, and marine resources in the following categories:

- ▲ Data Collection and Analysis
- ▲ Partner Engagement
- ▲ Management Planning
- ▲ Direct Management
- ▲ Economic Incentives
- ▲ Environmental Review
- ▲ Land Acquisition, Easement, and Lease
- ▲ Land Use Planning
- ▲ Law and Policy
- ▲ Outreach and Education
- ▲ Training and Technical Assistance

Specific conservation strategies were developed as part of a conservation project for each conservation target using a systematic approach. First, for each conservation target, key ecological attributes (KEAs) were identified. These attributes are the ecological qualities on which the ecological viability of the conservation target most depends. Stresses, the degraded conditions of ecological attributes, were then identified followed by the identification of pressures that are the sources of degradation of ecological attributes. If applicable, underlying socio-economic causes for the pressures were also recognized. After illustrating the interrelationship of KEAs, stresses and pressures, conservation strategies were developed to either directly or indirectly alleviate negative impacts of pressures or stresses, or to improve or maintain the ecological viability of conservation targets by conserving KEAs. The conservation targets, stresses, pressures, and conservation strategies for each province are summarized in Tables 1-7. (See below, following “Conclusion” section.)

Conservation strategies for anadromous fish are summarized in Table 8 and consist of the following general strategies:

- ▲ Research, Assessment, and Monitoring;
- ▲ Securing Adequate Funding;
- ▲ Habitat Enhancement, Restoration, and Protection; and
- ▲ Developing Water Management Plans.

Integration and Implementation of SWAP 2015

Implementation of California’s SWAP 2015 will involve integrating SWAP features into other resource management programs and plans led by CDFW or partners, developing more detailed SWAP implementation plans, systematically pursuing resources necessary for implementation of conservation strategies, effectively coordinating and collaborating with CDFW partners, and adaptively responding to emerging issues.

Because of California's tremendous biodiversity and the broad spectrum of actions needed to implement conservation strategies across a complex assemblage of resources, land uses, government activities, and resource-consumptive industries, CDFW determined that a more detailed coordination framework for SWAP 2015 implementation was needed beyond the presentation in SWAP 2015. Called "companion plans," these sector-specific action plans will be instrumental in the implementation of SWAP 2015. CDFW, in partnership with other state and federal agencies and organizations involved in the use, management, and conservation of California's natural resources and cultural heritage, are creating nine sector-specific plans.

Sector-Specific Companion Plans:

- ▲ Agriculture
- ▲ Consumptive and Recreational Uses
- ▲ Energy Development
- ▲ Forests and Rangelands
- ▲ Land Use Planning
- ▲ Transportation Planning
- ▲ Tribal Lands
- ▲ Water Management
- ▲ Marine Resources

Companion plans will support development of well-coordinated, collaborative, multi-stakeholder efforts that leverage human and financial resources, as well as increase efficiencies for implementation of strategies, to achieve goals and objectives described in SWAP 2015. These plans will identify shared priorities of SWAP 2015 and CDFW partners, and mutually strengthen the conservation capabilities of CDFW and participating organizations.

Adaptive Management and Monitoring

Natural communities, ecosystems, species population dynamics, and the effects of pressures or conservation actions on the environment are inherently complex. Resource managers often need to take action to conserve species even though scientific information may be incomplete and outcomes of the actions may be uncertain. Adaptive management is essential to implementing effective conservation programs in light of these challenges. Adaptive management of a conservation plan is a process to continually monitor to assess the environment, as well as the effects and effectiveness of conservation strategies, and to adjust the plan when improvement is needed to achieve the desired outcomes. SWAP 2015 has integrated the concept of adaptive management in its preparation and implementation.

For SWAP 2015, CDFW has adopted a framework of effectiveness measures that is consistent with the *Open Standards for the Practice of Conservation* (www.conservationmeasures.org) and that has been proposed by the Association of Fish and Wildlife Agencies (AFWA) (2011). This framework establishes a standardized and readily accessible monitoring and evaluation process to inform and guide SWAP implementation. Under the effectiveness measure framework, the information gathered through monitoring and evaluation can be used to identify successful strategies that should be continued and shared, and also to identify less effective ones that should be improved or abandoned. The effectiveness measure framework also provides a

mechanism for CDFW to report on the status of SWAP implementation to USFWS, conservation partners and the public.

SWAP 2015 employs three types of monitoring: (1) status monitoring, which tracks conditions of species, ecosystems and other conservation factors over time; (2) effectiveness monitoring, which determines if conservation strategies are having their intended results and to identify ways to improve actions that are less effective (i.e., adaptive management); and (3) effect monitoring, addressing whether and how the target conditions are being influenced by the implementation of strategies. The effectiveness measure framework promoted by AFWA and adopted for SWAP 2015 brings these three types of monitoring together to (1) attribute changes in ecosystems and species status to the effectiveness of SWAP conservation strategies, and (2) roll up the results of many different strategies into statewide reports.

Conclusion

California's SWAP 2015 establishes a strategic vision of the integrated conservation efforts needed to sustain the tremendous diversity of wildlife resources found in the state. Although SWAP 2015 is not a specific work plan for CDFW or any other organization, it is meant to visualize, support, complement, and unite the plans of the multiple conservation and management entities within California. More detailed, operation-level plans will be needed to complete many of the strategies identified in SWAP 2015. Such plans should be developed by the appropriate entities whose interest, authority, or responsibility encompass each action and in coordination with the SWAP and its companion plans. Support provided by the SWG program will enable coordination and implementation of many projects identified under the SWAP.

SWAP 2015 is an adaptive plan that will continually be updated, revised, and improved, based on the input and deliberations of all those involved in wildlife conservation. Working together, Californians can shape a future with abundant wildlife, outstanding biodiversity, and healthy ecosystems that define the state and provide for the inspiration, recreation, sustenance, and livelihood of its residents and visitors for current and coming generations.

North Coast and Klamath Province

Table 1 Conservation Targets and Strategies for the North Coast and Klamath Province				
Target	Goals	Key Ecological Attributes (KEAs)	Pressures ¹	Strategy Categories
American Southwest Riparian Forest and Woodland North Coastal and Montane Riparian Forest and Woodland	<p>Northern California Coast Ranges:</p> <ul style="list-style-type: none"> By 2025, acres of habitat are increased by at least 5% from 2015 acres. By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. By 2025, acres/miles with desired channel pattern are increased by at least 5% from 2015 acres/miles. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres. <p>Northern California Coast:</p> <ul style="list-style-type: none"> By 2025, acres of habitat (riparian) are increased at least 5% from 2015 acres. By 2025, acres with desired endemic plant diversity (ground cover, shrubs, understory) are increased at least 5% from 2015 acres. By 2025, acres with native species dominant are increased by at least 5% from 2015 acres. By 2025, acres with desired age class heterogeneity are increased by at least 5% from 2015 acres. By 2025, acres/miles with desired channel pattern (natural floodplain) are increased by at least 5% from 2015 acres/miles. By 2025, miles connected (to natural floodplain) are increased by at least 5% from 2015 miles. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. By 2025, acres/miles with natural hydrologic regime (through management of water operations in the Eel, Klamath, Trinity, Mad, and Russian Rivers) has increased by at least 5% from 2015 acres/miles. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Successional dynamics Age class heterogeneity Hydrological regime 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Dams and water management/use Invasive plants/animals Housing and urban areas Livestock farming and ranching 	<ul style="list-style-type: none"> Partner Engagement Management Planning Direct Management Land Acquisition/ Easement/ Lease Law and Policy Outreach and Education
Freshwater Marsh	<ul style="list-style-type: none"> By 2025, acres of freshwater emergent wetland habitat acre increased by at least 5% from 2015 acres. By 2025, miles of freshwater emergent wetland with native species dominant are increased by at least 5% from 2015 miles. By 2025, population abundance of key species (SGCN) is increased by at least 5% from 2015 population levels. By 2025, acres/miles of freshwater emergent wetland with desired inches of groundwater are increased by at least 5% from 2015. By 2025, acres of freshwater emergent wetland with suitable soil characteristics are increased by 5% from 2015 acres. By 2015, population of key species (beaver) is increased by at least 5% from 2015 population levels. By 2025, acres of freshwater emergent wetland with desired stages of succession are increased by at least 5% from 2015 acres. By 2025, acres/miles with desired channel pattern (connected floodplains) are increased by at least 5% from 2015 acres/miles. By 2025, miles with desired level of discharge (mimicking natural flood frequency, seasonality, and magnitude) are increased by at least 5% from 2015 miles. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Successional dynamics Key species population levels Surface water flow regime 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Housing and urban areas Invasive plants/animals Livestock farming and ranching Other ecosystem modifications 	<ul style="list-style-type: none"> Management Planning Economic Incentives Land Acquisition/ Easement/ Lease Law and Policy Outreach and Education
Pacific Northwest Conifer Forests	<ul style="list-style-type: none"> By 2025, acres of redwood habitat are increased by at least 5% from 2015 acres. By 2025, acres with desired structural diversity (multi-story canopy) are increased by at least 5% from 2015 acres. By 2025, acres/miles with natural hydrologic (udic) regime are increased by at least 5% from 2015 acres/miles. By 2025, acres with suitable soil characteristics (in wet meadows) are increased by at least 5% from 2015 acres. By 2025, acres with desired (late) stages of succession are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Successional dynamics Structural diversity Hydrological regime Soil and sediment deposition regime 	<ul style="list-style-type: none"> Agricultural and forestry effluents Avalanches Fire and fire suppression Introduced genetic material Invasive plants/animals Livestock farming and ranching Logging and wood harvesting Parasites/pathogens/diseases Roads and railroads Wood and pulp plantations 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Outreach and Education Training and Technical Assistance

Table 1 Conservation Targets and Strategies for the North Coast and Klamath Province (continued)				
Target	Goals	Key Ecological Attributes (KEAs)	Pressures ¹	Strategy Categories
Pacific Northwest Subalpine Forest	<ul style="list-style-type: none"> By 2025, acres of habitat are increased by at least 5% from 2015 acres. By 2025, acres with desired structural diversity are increased by at least 5% from 2015 acres. By 2025, acres with desired age class heterogeneity are increased by at least 5% from 2015 acres. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Fire regime Successional dynamics Structural diversity Age class heterogeneity 	<ul style="list-style-type: none"> Climate change Fire and fire suppression Parasites/pathogens/diseases Recreational activities 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Economic Incentives Environmental Review Land Use Planning Training and Technical Assistance
California Foothill and Valley Forests and Woodlands	<ul style="list-style-type: none"> By 2025, acres with desired endemic plant diversity are increased by at least 5% from 2015 acres. By 2025, acres with desired structural diversity (oak recruitment) are increased by at least 5% from 2015 acres. By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. By 2025, acres/miles with desired inches of groundwater are increased by at least 5% from 2015 acres/miles. 	<ul style="list-style-type: none"> Fire regime Successional dynamics Key species population levels Native versus non-native diversity Age class heterogeneity Soil and sediment deposition regime 	<ul style="list-style-type: none"> Fire and fire suppression Invasive plants/animals Livestock farming and ranching Recreational activities 	<ul style="list-style-type: none"> Partner Engagement Direct Management Economic Incentives Land Acquisition/ Easement/ Lease Outreach and Education
Alpine Vegetation	<ul style="list-style-type: none"> By 2025, acres connected are maintained within the ecoregion from 2015 acres. By 2025, acres of macrogroup (target) are maintained within the ecoregion from 2015 acres. By 2025, acres with desired plant diversity (species richness and subgroup/alliance diversity) are maintained within the ecoregion from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Diversity 	<ul style="list-style-type: none"> Climate Change Commercial and industrial areas Invasive plants/animals Livestock farming and ranching Recreational activities 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Economic Incentives Outreach and Education Training and Technical Assistance
Fen (Peatlands) North Coastal and Montane Riparian Forest and Woodland Subalpine Aspen Forests and Pine Woodlands Western Upland Grasslands, Wet Mountain Meadow	<ul style="list-style-type: none"> By 2025, acres of habitat are increased by at least 5% from 2015 acres. By 2025, acres with native species dominant are increased by at least 5% from 2015 acres. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. By 2025, acres/miles with desired channel pattern are increased by at least 5% from 2015 acres/miles. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Fire regime Successional dynamics Native versus non-native diversity Hydrological regime 	<ul style="list-style-type: none"> Fire and fire suppression Invasive plants/animals Logging and wood harvesting 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Direct Management Environmental Review Law and Policy Outreach and Education
Subalpine Aspen Forests and Pine Woodlands	<ul style="list-style-type: none"> By 2025, acres of habitat are increased by at least 5% from 2015 acres. By 2025, acres with desired age class heterogeneity are increased by at least 5% from 2015 acres. By 2025, acres connected are increased by at least 5% from 2015 acres. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Fire regime Connectivity among communities and ecosystems Successional dynamics Age class heterogeneity Soil and sediment deposition regime 	<ul style="list-style-type: none"> Fire and fire suppression Logging and wood harvesting Parasites/pathogens/diseases 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Direct Management Environmental Review Law and Policy Outreach and Education

North Coast and Klamath Province

Table 1 Conservation Targets and Strategies for the North Coast and Klamath Province (continued)				
Target	Goals	Key Ecological Attributes (KEAs)	Pressures ¹	Strategy Categories
Montane Upland Deciduous Scrub	<ul style="list-style-type: none"> By 2025, acres with desired age class heterogeneity are increased by at least 5% from 2015 acres. By 2025, connected montane shrubland and grassland acres are increased by at least 5% from 2015 acres. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. By 2025, acres with suitable soil characteristics are increased by 5% from 2015 acres. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Fire regime Connectivity among communities and ecosystems Successional dynamics Age class heterogeneity 	<ul style="list-style-type: none"> Housing and urban areas Logging and wood harvesting Fire and fire suppression 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Direct Management Environmental Review Law and Policy Outreach and Education
Native Aquatic Species Assemblages/Communities	<ul style="list-style-type: none"> By 2025, miles of streams with target amphibian population are increased by at least 5% from 2015 miles. By 2025, miles of streams with target fish population are increased by at least 5% from 2015 miles. By 2025, population of key species are increased by at least 5% from 2015 population. By 2025, miles of river where native species are dominant are increased by at least 5% from 2015 miles. By 2025, acres/miles with desired concentrations of pollutants are increased by at least 5% from 2015 acres/miles. By 2025, acres/miles with total dissolved solids are decreased by at least 5% from 2015 acres. By 2025, miles with desired stream stage (flow) are increased by at least 5% from 2015 miles. By 2025, acres/miles with desired temperature are increased by at least 5% from 2015 acres/miles. 	<ul style="list-style-type: none"> Area and extent of community Key species population levels Native versus non-native diversity Soil and sediment deposition regime Surface water flow regime Water temperatures and chemistry Pollutant concentrations and dynamics 	<ul style="list-style-type: none"> Agricultural and forestry effluents Annual and perennial non-timber crops Dams and water management/use Fire and fire suppression Garbage and solid waste Household sewage and urban waste water Housing and urban areas Fishing and harvesting aquatic resources Livestock farming and ranching Industrial and military effluents Introduced genetic material Invasive plants/animals Logging and wood harvesting Marine and freshwater aquaculture Mining and quarrying Parasites/pathogens/diseases Renewable energy Roads and railroads 	<ul style="list-style-type: none"> Direct Management Economic Incentives Land Acquisition/ Easement/ Lease Law and Policy Outreach and Education

¹ Pressures can be positive or negative depending on the intensity, timing, and duration of the action on the target habitat.

Table 2 Conservation Targets and Strategies for the Cascades and Modoc Plateau Province				
Target	Goals	Key Ecological Attributes (KEAs)	Pressures ¹	Strategy Categories
North Coastal Mixed Evergreen and Montane Forests	<ul style="list-style-type: none"> By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres. By 2025, acres with desired age class heterogeneity are increased by at least 5% from 2015 acres. By 2025, acres with desired structural diversity are increased by at least 5% from 2015 acres. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. By 2025, miles with desired level of water yield are increased by at least 5% from 2015 miles. 	<ul style="list-style-type: none"> Fire regime Successional dynamics Native versus non-native diversity Age class heterogeneity Hydrological regime 	<ul style="list-style-type: none"> Fire and fire suppression Livestock farming and ranching Logging and wood harvesting Renewable energy Utility and service lines 	<ul style="list-style-type: none"> Data Collection and Analysis Management Planning Land Acquisition/ Easement/ Lease Law and Policy Outreach and Education
Western Upland Grasslands	<ul style="list-style-type: none"> By 2025, acres of habitat are increased by at least 5% from 2015 acres. By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres. By 2025, acres with desired structural diversity (remove in-growth trees from within grassland habitats) are increased by at least 5% from 2015 acres. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Fire regime Successional dynamics Native versus non-native diversity 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Fire and fire suppression Invasive plants/animals Livestock farming and ranching Logging and wood harvesting 	<ul style="list-style-type: none"> Data Collection and Analysis Direct Management Economic Incentives Land Acquisition/ Easement/ Lease Land Use Planning Law and Policy
Big Sagebrush Scrub Great Basin Dwarf Sagebrush Scrub Great Basin Upland Scrub	<ul style="list-style-type: none"> By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres. By 2025, acres of habitat are increased by at least 5% from 2015 acres. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. By 2025, acres with suitable soil characteristics are increased by at least 5% from 2015 acres. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Fire regime Successional dynamics Native versus non-native diversity Soil and sediment deposition regime 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Dams and water management/use Fire and fire suppression Housing and urban areas Invasive plants/animals Livestock farming and ranching Parasites/pathogens/diseases Recreational activities Renewable energy Utility and service lines 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Economic Incentives Law and Policy Outreach and Education
Great Basin Pinyon-Juniper Woodland	<ul style="list-style-type: none"> By 2025, acres with desired native species dominance and desired structural diversity are increased by at least 5% within the presettlement range of pinyon-juniper and juniper habitats in the ecoregion. By 2025, acres of desired successional stage are increased by at least 5% from presettlement habitat acreage. By 2025, acres with desired fire return interval are increased by at least 5% from 2015 levels. 	<ul style="list-style-type: none"> Fire regime Successional dynamics Structural diversity Native versus non-native diversity 	<ul style="list-style-type: none"> Climate change Fire and fire suppression Invasive plants/animals Livestock farming and ranching Other ecosystem modifications 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Direct Management
Eagle Lake Native Fish Assemblage	<ul style="list-style-type: none"> By 2025, miles of streams with target fish population (Eagle Lake Rainbow Trout - ELRT) are increased by at least 5% from 2015 miles. By 2025, miles of river with native species dominant are increased by at least 5% from 2015 miles. By 2025, population of key species (ELRT) are increased by at least 5% from the 2015 population size. By 2025, acres with desired genetic connectivity between lower Pine Creek and lake populations during spawning and migration period are increased by at least 5% from 2015 acres. By 2025, miles connected are increased by at least 5% from 2015 miles. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Key species population levels Native versus non-native diversity Hydrological regime Soil and sediment deposition regime Surface water flow regime Water level fluctuations 	<ul style="list-style-type: none"> Dams and water management/use Introduced genetic material Invasive plants/animals Livestock farming and ranching Logging and wood harvesting Roads and railroads 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Economic Incentives Law and Policy Outreach and Education
Goose Lake Native Fish Assemblage	<ul style="list-style-type: none"> By 2025, acres connected are increased by at least 5% from 2015 acres by improving access to habitat in all lake tributaries and enhancing fish passage. By 2025, populations of key species are increased by at least 5% from 2015 population size. By 2025, miles of river in Pine and Davis Creeks with native species dominant are increased by at least 5% from 2015 miles. By 2025, miles connected between stream and lake populations during spawning and migration period are increased by at least 5% from 2015 miles. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Key species population levels Endemic diversity Native versus non-native diversity Hydrological regime Soil and sediment deposition regime Surface water flow regime Water temperatures and chemistry Water level fluctuations Nutrient concentration and dynamics 	<ul style="list-style-type: none"> Dams and water management/use Introduced genetic material Invasive plants/animals Livestock farming and ranching Logging and wood harvesting Roads and railroads 	<ul style="list-style-type: none"> Data Collection and Analysis Direct Management Law and Policy Outreach and Education

¹ Pressures can be positive or negative depending on the intensity, timing, and duration of the action on the target habitat.

Bay Delta and Central Coast Province

Table 3 Conservation Targets and Strategies for the Bay Delta and Central Coast Province				
Target	Goals	Key Ecological Attributes (KEAs)	Pressures ¹	Strategy Categories
American Southwest Riparian Forest and Woodland	<ul style="list-style-type: none"> By 2025, acres of habitat are increased by at least 5% from 2015 acres of riparian habitat in the Central Coast Ecoregion. By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres. By 2025, miles connected are increased by at least 5% from 2015 miles of riparian habitat. By 2025, miles with desired level of discharge are increased by at least 5% from 2015 miles. By 2025, acres with desired age class heterogeneity are increased by at least 5% from 2015 acres of riparian habitat. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Native versus non-native diversity Age class heterogeneity Water level fluctuations 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Dams and water management/use Invasive plants/animals Livestock farming and ranching Roads and railroads 	<ul style="list-style-type: none"> Direct Management Land Acquisition/ Easement/ Lease Outreach and Education
California Grassland, Vernal Pools, and Flowerfields	<ul style="list-style-type: none"> By 2025, acres of grassland habitat restored are increased by at least 5% from 2015 acres. By 2025, acres of vernal pool habitat restored are increased by at least 5% from 2015 acres. By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres by treatment with managed grazing. By 2025, population of key species (spadefoot toad) is increased by at least 5% from 2015 population levels. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres by reducing encroachment of coyote bush/coastal scrub into grassland. By 2025, miles with desired stream stage are increased by at least 5% from 2015 miles through length of hydroperiod. By 2025, miles with desired level water quality are increased by at least 5% from 2015 miles by meeting standards of Basin Plan. 	<ul style="list-style-type: none"> Area and extent of community Successional dynamics Key species population levels Native versus non-native diversity Surface water flow regime 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Commercial and industrial areas Fire and fire suppression Housing and urban areas Invasive plants/animals Livestock farming and ranching Renewable energy Roads and railroads 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Direct Management Land Acquisition/ Easement/ Lease Land Use Planning
Coastal Sage Scrub Northwest Coast Cliff and Outcrop Coastal Dune and Bluff Scrub North Coast Deciduous Scrub and Terrace Prairie	<ul style="list-style-type: none"> By 2025, acres with desired structural diversity are increased at least 5% from 2015 acres. By 2025, acres connected are increased by at least 5% from 2015 acres. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. By 2025, acres with suitable soil characteristics are increased by 5% from 2015 acres. By 2025, acres of habitat are increased by at least 5% from 2015 acres. By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Fire regime Connectivity among communities and ecosystems Structural diversity Native versus non-native diversity Soil and sediment deposition regime 	<ul style="list-style-type: none"> Air-borne pollutants Annual and perennial non-timber crops Climate change Commercial and industrial areas Fire and fire suppression Housing and urban areas Invasive plants/animals Roads and railroads Tourism and recreation areas 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Environmental Review Land Acquisition/ Easement/ Lease Land Use Planning Law and Policy
Coastal Lagoons	<ul style="list-style-type: none"> By 2025, area (miles/acres) with desired nutrient load (TMDL) are increased by at least 5% from 2015 area (miles/acres). By 2025, acres of lagoon habitat are increased by at least 5% from 2015 acres. By 2025, acres of connected lagoon habitat are increased by at least 5% from 2015 acres. By 2025, miles with desired level of discharge (water level) are increased by at least 5% from 2015 miles. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Native versus non-native diversity Surface water flow regime Nutrient concentrations and dynamics 	<ul style="list-style-type: none"> Agricultural and forestry effluents Annual and perennial non-timber crops Climate change Commercial and industrial areas Dams and water management/use Fire and fire suppression Garbage and solid waste Housing and urban areas Housing sewage and urban waste water Livestock farming and ranching Other ecosystem modifications Recreational activities Roads and railroads Tourism and recreation areas Wood and pulp plantations 	<ul style="list-style-type: none"> Data Collection and Analysis Direct Management Land Acquisition/ Easement/ Lease Law and Policy Training and Technical Assistance
Salt Marsh	<ul style="list-style-type: none"> By 2025, miles with desired level of water quality are increased by at least 5% from 2015 miles. By 2025, acres of habitat (salt-marsh habitat) are increased by at least 5% from 2015 acres. By 2025, acres with desired genetic connectivity are increased by at least 5% from 2015 acres. By 2025, acres with desired structural diversity are increased at least 5% from 2015 acres. By 2025, acres connected are increased by at least 5% from 2015 acres. By 2025, acres of habitat (salt-marsh habitat by providing high-tide refugia for sensitive species) are increased by at least 5% from 2015 acres. By 2025, miles with desired level of water yield (consistent with the Bay-Delta Water Quality Control Plan requirements) are increased by at least 5% from 2015 miles. By 2025, improve water quality in the San Francisco Bay Delta by meeting Total Maximum Daily Load requirements for organic and inorganic pollutants. By 2025, miles with desired level water quality are increased by at least 5% from 2015 miles. 	<ul style="list-style-type: none"> Area and extent of community Successional dynamics Structural diversity Diversity Native versus non-native diversity Soil and sediment deposition regime Pollutant concentrations and dynamics Water level fluctuations 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Commercial and industrial areas Dams and water management/use Fishing and harvesting aquatic resources Housing and urban areas Hunting and collecting terrestrial animals Invasive plants/animals Livestock farming and ranching Recreational activities Roads and railroads Shipping lanes 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Economic Incentives Land Acquisition/ Easement/ Lease Law and Policy Outreach and Education

¹ Pressures can be positive or negative depending on the intensity, timing, and duration of the action on the target habitat.

Table 4 Conservation Targets and Strategies for Central Valley and Sierra Nevada Province				
Target	Goals	Key Ecological Attributes (KEAs)	Pressures ¹	Strategy Categories
American Southwest Riparian Forest and Woodland	<ul style="list-style-type: none"> By 2025, acres of functional riparian habitat are increased by at least 5% from 2015 acres. By 2025, acres connected riparian habitat are increased by at least 5% from 2015 acres. By 2025, acres/miles with natural hydrologic regime have increased by at least 5% from 2015 acres/miles. By 2025, acres/miles with total dissolved solids (meeting TMDL) are decreased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Hydrological regime Soil and sediment deposition regime Surface water flow 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Dams and water management/use Housing and urban areas Invasive plants/animals Livestock farming and ranching Recreational activities Roads and railroads Utility and service lines 	<ul style="list-style-type: none"> Data Collection and Analysis Management Planning Direct Management Outreach and Education Land Acquisition/ Easement/ Lease Law and Policy
Chaparral Desert Transition Chaparral Montane Chaparral California Foothill and Coastal Rock Outcrop Vegetation	<ul style="list-style-type: none"> By 2025, acres of macrogroup habitat (target) are maintained or increased by at least 5% from 2015 acres. By 2025, acres where native species are dominant is increased by at least 5% from 2015 acres. By 2025, acres with desired structural diversity are increased by at least 5% from 2015 acres. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres. By 2025, acres with desired connectivity are increased by at least 5% from 2015 acres. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Fire regime Connectivity among communities and ecosystems Successional dynamics Structural diversity Native versus non-native species 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Climate change Fire and fire suppression Housing and urban areas Invasive plants/animals Renewable energy 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Land Acquisition/ Easement/ Lease
California Foothill and Valley Forests and Woodlands	<ul style="list-style-type: none"> By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres. By 2025, populations of key species (oaks) are increased by at least 5% from 2015 population. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. By 2025, miles with desired level of water yield are increased by at least 5% from 2015 miles. 	<ul style="list-style-type: none"> Fire regime Successional dynamics Key species population levels Native versus non-native species Age class heterogeneity Soil and sediment deposition regime 	<ul style="list-style-type: none"> Fire and fire suppression Invasive plants/animals Livestock farming and ranching Recreational activities 	<ul style="list-style-type: none"> Direct Management Partner Engagement Economic Incentives Land Acquisition/ Easement/ Lease Outreach and Education
North Coastal Mixed Evergreen and Montane Conifer Forests	<ul style="list-style-type: none"> By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres. By 2025, acres with desired age class heterogeneity (increase rotation age) are increased by at least 5% from 2015 acres. By 2025, acres of habitat (with increased recruitment of oaks, aspen, and shrubs) are increased by at least 5% from 2015 acres. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. By 2025, acres/miles with desired water yield are increased by at least 5% from 2015 acres/miles. 	<ul style="list-style-type: none"> Fire regime Successional dynamics Native versus non-native species Age class heterogeneity Hydrological regime 	<ul style="list-style-type: none"> Fire and fire suppression Livestock farming and ranching Logging and wood harvesting Renewable energy Utility and service lines 	<ul style="list-style-type: none"> Data Collection and Analysis Management Planning Land Acquisition/ Easement/ Lease Law and Policy Outreach and Education
Alpine Vegetation	<ul style="list-style-type: none"> By 2025, acres connected are maintained within the ecoregion from 2015 acres. By 2025, acres of macrogroup (target) are maintained within the ecoregion from 2015 acres. By 2025, acres with desired plant diversity (species richness and subgroup/alliance diversity) are maintained within the ecoregion from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Diversity 	<ul style="list-style-type: none"> Climate change Commercial and industrial areas Invasive plants/animals Livestock farming and ranching Recreational activities 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Outreach and Education Training and Technical Assistance
Pacific Northwest Subalpine Forest	<ul style="list-style-type: none"> By 2025, acres of habitat are increased by at least 5% from 2015 acres. By 2025, acres with desired structural diversity are increased by at least 5% from 2015 acres. By 2025, acres with desired age class heterogeneity are increased by at least 5% from 2015 acres. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Fire regime Successional dynamics Structural diversity Age class heterogeneity 	<ul style="list-style-type: none"> Climate change Fire and fire suppression Parasites/pathogens/diseases Recreational activities 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Economic Incentives Environmental Review Land Use Planning Training and Technical Assistance

Central Valley and Sierra Nevada Province

Table 4 Conservation Targets and Strategies for Central Valley and Sierra Nevada Province (continued)				
Target	Goals	Key Ecological Attributes (KEAs)	Pressures ¹	Strategy Categories
Fen (Peatlands)	<ul style="list-style-type: none"> By 2025, acres of habitat (meadows) are increased by at least 5% from 2015 acres. By 2025, populations of key species (hydrophilic vegetation for SGCNs) are increased by at least 5% from 2015 population. By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres. By 2025, acres/miles with a natural hydrologic regime have increased by at least 5% from acres/miles. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. By 2025, acres with suitable soil characteristics (reduced sediment input) are increased by at least 5% from 2015 acres. By 2025, miles with desired level of discharge are increased by at least 5% from 2015 miles. 	<ul style="list-style-type: none"> Area and extent of community Fire regime Connectivity among communities and ecosystems Key species population levels Endemic diversity Soil and sediment deposition regime Water level fluctuations 	<ul style="list-style-type: none"> Agricultural and forestry effluents Annual and perennial non-timber crops Dams and water management/use Fire and fire suppression Housing and urban areas Hunting and collection of terrestrial animals Industrial and military effluents Invasive plants/animals Livestock farming and ranching Logging and wood harvesting Mining and quarrying Parasites/pathogens/diseases Recreational activities Roads and railroads Tourism and recreation areas 	<ul style="list-style-type: none"> Data Collection and Analysis Management Planning Direct Management Land Acquisition/ Easement/ Lease Outreach and Education
Clear Lake Native Fish Assemblage	<ul style="list-style-type: none"> By 2025, acres of habitat (wetland) are increased by at least 5% from 2015 acres. By 2025, acres of habitat (riparian) are increased by at least 5% from 2015 acres. By 2025, populations of key species (tule perch, prickly sculpin, and Clear Lake hitch) are increased by at least 5% from 2015 population. By 2025, miles of river with native species dominant are increased by at least 5% from 2015 miles. By 2025, water flow of Adobe, Scotts, Middle, Kelsey, Cole creeks in Lake County are increased by at least 5% during spring and early summer season so that native fish species could better migrate in these creeks. By 2025, miles with desired stream stage (in Adobe, Scotts, Middle, Kelsey, Cole creeks in Lake Co. during spring and early summer season) are increased by at least 5% from 2015 miles. By 2025, miles with desired level water quality are increased by at least 5% from 2015 miles. By 2025, acres/miles with desired channel pattern are increased by at least 5% from 2015 acres/miles. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Key species population levels Structural diversity Diversity Native versus non-native species Endemic diversity Soil and sediment deposition regime Surface water flow regime Pollutant concentration and dynamics Nutrient concentrations and dynamics 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Dams and water management/use Invasive plants/animals Mining and quarrying Recreational activities 	<ul style="list-style-type: none"> Partner Engagement Direct Management Economic Incentives Land Acquisition/ Easement/ Lease Law and Policy Outreach and Education
Goose Lake Native Fish Assemblage	<ul style="list-style-type: none"> By 2025, acres connected are increased by improving access to habitat in all lake tributaries, by at least 5% from 2015 acres. By 2025, populations of key species are increased, by at least 5% from 2015 population. By 2025, miles of river in Pine and Davis Creeks with native species dominant are increased by at least 5% from 2015 miles. By 2025, miles connected between stream and lake populations during spawning and migration period are increased by at least 5% from 2015 miles. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Key species population levels Native versus non-native species Endemic diversity Soil and sediment deposition regime Surface water flow regime Water temperature and chemistry Nutrient concentrations and dynamics Water level fluctuations 	<ul style="list-style-type: none"> Dams and water management/use Introduced genetic material Invasive plants/animals Livestock farming and ranching Logging and wood harvesting Roads and railroads 	<ul style="list-style-type: none"> Direct Management Law and Policy Outreach and Education
Carson River Native Fish Assemblage	<ul style="list-style-type: none"> By 2025, miles of streams with target fish population are increased by at least 5% from 2015 miles in the Carson River basin. By 2025, miles with desired age class heterogeneity are increased by at least 5% from 2015 acres. By 2025, miles of river where native species are dominant are increased by at least 5% from 2015 miles. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. By 2025, acres/miles with desired concentrations of pollutants are increased by at least 5% from 2015 acres/miles (consistent with TMDL). By 2025, acres/miles with total dissolved solids are decreased by at least 5% from 2015 acres. By 2025, miles with desired stream stage are increased by at least 5% from 2015 miles. 	<ul style="list-style-type: none"> Area and extent of community Fire regime Native versus non-native species Age class heterogeneity Soil and sediment deposition regime Surface water flow regime Pollutant concentration and dynamics 	<ul style="list-style-type: none"> Dams and water management/use Fishing and harvesting aquatic resources Housing and urban areas Introduced genetic material Invasive plants/animals 	<ul style="list-style-type: none"> Data Collection and Analysis Management Planning Direct Management Land Acquisition/ Easement/ Lease Law and Policy Outreach and Education Training and Technical Assistance

Table 4 Conservation Targets and Strategies for Central Valley and Sierra Nevada Province (continued)				
Target	Goals	Key Ecological Attributes (KEAs)	Pressures ¹	Strategy Categories
Walker River Native Fish Assemblage	<ul style="list-style-type: none"> By 2025, miles of streams with target fish population (SGCNs) are increased by at least 5% from 2015 miles. By 2025, miles of river where native species are dominant are increased by at least 5% from 2015 miles. By 2025, miles connected (i.e., past barriers) are increased by at least 5% from 2015 miles. By 2025, miles with desired stream stage (mimics natural hydrograph) are increased by at least 5% from 2015 miles. By 2025, miles with desired level of water quality (meeting TMDL standards) are increased by at least 5% from 2015 miles. By 2025, miles with desired age class heterogeneity are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Native versus non-native diversity Hydrological regime Soil and sediment deposition regime Surface water flow regime Water quality 	<ul style="list-style-type: none"> Dams and water management/use Introduced genetic material Invasive plants/animals Livestock farming and ranching Roads and railroads 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Law and Policy Outreach and Education
San Joaquin Native Fish Assemblage	<ul style="list-style-type: none"> By 2025, miles connected native fish habitat are increased by at least 5% from 2015 miles. By 2025, miles of river where native species are dominant are increased by at least 5% from 2015 miles. By 2025, miles with desired level of water yield (flow) are increased by at least 5% from 2015 miles. By 2025, miles of streams with target fish population are increased by at least 5% from 2015 miles. By 2025, acres/miles of native fish habitat with desired temperature are increased by at least 5% from 2015 acres/miles. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Native versus non-native diversity Surface water flow regime Water temperature and chemistry 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Dams and water management/use Household sewage and urban waste water Housing and urban development Invasive plants/animals Marine and freshwater aquaculture Recreational activities 	<ul style="list-style-type: none"> Data Collection and Analysis Management Planning Direct Management Law and Policy Outreach and Education
Upper Kern River Native Fish Assemblage	<ul style="list-style-type: none"> By 2025, miles of streams with target fish population are increased by at least 5% from 2015 miles. By 2025, miles with desired age class heterogeneity are increased by at least 5% from 2015 acres. By 2025, miles of river where native species are dominant are increased by at least 5% from 2015 miles. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. By 2025, acres/miles with desired concentrations of pollutants are increased by at least 5% from 2015 acres/miles (consistent with TMDL). By 2025, acres/miles with total dissolved solids are decreased by at least 5% from 2015 acres. By 2025, miles with desired stream stage are increased by at least 5% from 2015 miles. 	<ul style="list-style-type: none"> Area and extent of community Fire regime Native versus non-native species Age class heterogeneity Soil and sediment deposition regime Surface water flow regime 	<ul style="list-style-type: none"> Housing and urban areas Introduced genetic material Invasive plants/animals Livestock farming and ranching 	<ul style="list-style-type: none"> Data Collection and Analysis Management Planning Direct Management Land Acquisition/ Easement/ Lease Outreach and Education Training and Technical Assistance

¹ Pressures can be positive or negative depending on the intensity, timing, and duration of the action on the target habitat.

Table 5 Conservation Targets and Strategies for the South Coast Province				
Target	Goals	Key Ecological Attributes (KEAs)	Pressures ¹	Strategy Categories
California Grassland and Flowerfields	<ul style="list-style-type: none"> By 2025, acres of habitat are increased by at least 5% from 2015 acres. By 2025, acres connected are increased by at least 5% from 2015 acres. By 2025, acres with desired endemic plant/animal diversity are increased by at least 5% from 2015 acres. By 2025, acres with desired structural diversity are increased by at least 5% from 2015 acres. By 2025, populations of key species are increased by at least 5% from 2015 population levels. By 2025, acres/miles with desired plant/animal diversity are increased by at least 5% from 2015 acres/miles. By 2025, acres with desired genetic connectivity are increased by at least 5% from 2015 acres. By 2025, acres/miles with natural hydrologic regime are increased by at least 5% from 2015 acres/miles. 	<ul style="list-style-type: none"> Area and extent of community Fire regime Connectivity among communities and ecosystems Successional dynamics Key species population levels Endemic diversity Native versus non-native diversity Soil and sediment deposition regimes Nutrient concentrations and dynamics 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Climate change Fire and fire suppression Housing and urban areas Invasive plants/animals Livestock farming and ranching Recreational activities 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Land Acquisition/ Easement/ Lease
American Southwest Riparian Forest and Woodland	<ul style="list-style-type: none"> By 2025, area of the community is maintained or increased by at least 5% in every watershed throughout the ecoregion. By 2025, the amount of continuous riparian habitat is increased by at least 5% from 2015 levels. By 2025, the range of more than one riparian SGCN is maintained or increased by at least 5%. By 2025, the number of stream miles that display the full range of age classes and vegetation layers (herb, shrub, subtree, trees) are increased by at least 5% from 2015 levels. By 2025, miles of surface water flows, both ephemeral and permanent, are restored to mimic historic patterns (hydrographs) of flooding and low flow patterns by at least 5% from 2015 miles. By 2025, at least 5% of riparian habitat (acres) are dominated by native species. By 2025, greater than 5% of the riparian areas display functional connectivity. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Key species population levels Structural diversity Native versus non-native diversity Hydrological regime Surface water flow regime Water level fluctuations 	<ul style="list-style-type: none"> Avalanches/landslide Dams and water management/use Fire and fire suppression Garbage and solid waste Household sewage and urban waste water Housing and urban areas Invasive plants/animals Livestock farming and ranching Mining and quarrying (no strategies) Recreational activities (no strategies) Roads and railroads (no strategies) Tourism and recreation areas 	<ul style="list-style-type: none"> Data Collection and Analysis Management Planning Direct Management Land Acquisition/ Easement/ Lease Law and Policy Outreach and Education
Native Fish Assemblage	<ul style="list-style-type: none"> By 2025, at least 5% more streams contain their historic native fish composition. By 2025, at least two more streams have improved connectivity. By 2025, increase by at least 5% the ratio of native fish to non-native fish in Big Tujunga Creek, Haines Creek, and the Santa Clara River mainstem. By 2025, all species and their life stages are present and commonly encountered during summer fish surveys within their currently known range. By 2025, suitable flows are released to maintain target populations below Big Tujunga and Cogswell dams. By 2025, maintain or increase by at least 5% a natural hydrologic regime in coastal lagoons that support target species. 	<ul style="list-style-type: none"> Connectivity among communities and ecosystems Native versus non-native diversity Age class heterogeneity Diversity Surface water flow regime Water level fluctuations 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Climate change Dams and water management/use Household sewage and urban waste water Housing and urban areas Invasive plants/animals Mining and quarrying Recreational activities 	<ul style="list-style-type: none"> Data Collection and Analysis Direct Management Land Acquisition/ Easement/ Lease Outreach and Education
South Coast Native Aquatic Herp Assemblage	<ul style="list-style-type: none"> By 2025, area occupied by assemblage is increased by at least 5% from 2015 levels. By 2025, all populations contain both juvenile (egg and tadpole) and adult life stages in adequate abundance to ensure population sustainability. By 2025, non-native invasive aquatic species will be reduced by at least 5% within sensitive amphibian habitat, and their source populations identified to aid recovery of native amphibians. By 2025, restore flow regimes to provide an increase by at least 5% in access to suitable habitat for native species. 	<ul style="list-style-type: none"> Area and extent of community Native versus non-native diversity Age class heterogeneity Surface water flow regime 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Climate change Housing and urban areas Invasive plants/animals Other ecosystem modifications Parasites/pathogens/diseases Recreational activities Roads and railroads 	<ul style="list-style-type: none"> Data Collection and Analysis Direct Management Land Acquisition/ Easement/ Lease Outreach and Education

¹ Pressures can be positive or negative depending on the intensity, timing, and duration of the action on the target habitat.

Table 6 Conservation Targets and Strategies for the Deserts Province				
Target	Goals	Key Ecological Attributes (KEAs)	Pressures ¹	Strategy Categories
Big Sagebrush Scrub	<ul style="list-style-type: none"> By 2025, acres of habitat are increased by at least 5% from 2015 acres. By 2025, acres with desired age class heterogeneity are increased by at least 5% from 2015 acres. By 2025, acres where native species is dominant are increased by at least 5% from 2015 acres. By 2025, acres with desired fire regime are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Fire regime Native versus non-native diversity Age class heterogeneity 	<ul style="list-style-type: none"> Fire and fire suppression Housing and urban areas Invasive plants/animals Parasites/pathogens/diseases 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Direct Management Economic Incentives Land Acquisition/ Easement/ Lease
Great Basin Pinyon-Juniper Woodland	<ul style="list-style-type: none"> By 2025, acres with desired native species dominance and desired structural diversity are increased by at least 5% within the presettlement range of pinyon-juniper and juniper habitats in the ecoregion. By 2025, acres of desired successional stage are increased by at least 5% from presettlement habitat area. By 2025, acres desired fire return are increased by at least 5% from 2015 levels. 	<ul style="list-style-type: none"> Fire regime Successional dynamics Structural diversity Native versus non-native diversity 	<ul style="list-style-type: none"> Climate change Fire and fire suppression Invasive plants/animals Livestock farming and ranching Other ecosystem modifications 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Direct Management
Shadscale-Saltbush Scrub	<ul style="list-style-type: none"> By 2025, at least 5% of the disturbed areas show signs of improved successional dynamics. By 2025, acres of habitat are increased by at least 5% from 2015 acres. By 2025, acres with desired endemic plant/animal diversity are increased by at least 5% from 2015 acres. By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres. By 2025, acres connected are increased by at least 5% from 2015 acres. By 2025, acres/miles with natural hydrologic regime have increased by at least 5% from acres/miles. By 2025, acres with suitable soil characteristics are increased by at least 5% from 2015 acres. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Successional dynamics Endemic diversity Native versus non-native diversity Hydrological regime Soil and sediment deposition regime 	<ul style="list-style-type: none"> Airborne pollutants Annual and perennial non-timber crops Commercial and industrial areas Housing and urban areas Industrial and military effluents Invasive plants/animals Military activities Recreational activities Renewable energy Roads and railroads Utility and service lines 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Land Acquisition/ Easement/ Lease Outreach and Education Training and Technical Assistance
Desert Wash Woodland and Scrub	<ul style="list-style-type: none"> By 2025, acres of (desert wash) habitat are increased by at least 5% from 2015 acres. By 2025, acres with desired endemic plant/animal diversity are increased at least 5% from 2015 acres. By 2025, population of key species (Couch's spadefoot) is increased by at least 5% from 2015 population levels. By 2025, acres with desired structural diversity are increased by at least 5% from 2015 acres. By 2025, miles connected (desert wash habitat) are increased by at least 5% from 2015 miles. By 2025, miles with stable bank (desert wash) are increased by at least 5% from 2015 miles. By 2025, miles with desired stream stage (water volume and flow) are increased by at least 5% from 2015 miles. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Key species population levels Structural diversity Endemic diversity Soil and sediment deposition regime Surface water flow regime 	<ul style="list-style-type: none"> Commercial and industrial areas Dams and water management/use Housing and urban areas Military activities Mining and quarrying Recreational activities Renewable energy Roads and railroads Tourism and recreation areas Utility and service lines 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Land Use Planning Outreach and Education
Sparsely Vegetated Desert Dune	<ul style="list-style-type: none"> By 2025, acres of habitat free of invasive non-native species are increased by at least 5% from 2015 acres. By 2025, acres of habitat are maintained or increased by at least 5% from 2015 acres. By 2025, acres of habitat with suitable soil characteristics regimes are increased by at least 5% from 2015 acres. By 2025, acres of habitat with desired ground water levels are increased by at least 5% from 2015 acres. By 2025, acres of habitat with desired connectivity are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Native versus non-native diversity Hydrological regime Soil and sediment deposition regime 	<ul style="list-style-type: none"> Climate change Housing and urban areas Invasive plants/animals Livestock farming and ranching Recreational activities Renewable energy 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Land Use Planning
American Southwest Riparian Forest and Woodland	<ul style="list-style-type: none"> By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres. By 2025, acres of target habitat are increased by at least 5% from 2015 acres. By 2025, miles with desired stream stage are increased by at least 5% from 2015 miles. 	<ul style="list-style-type: none"> Area and extent of community Native versus non-native diversity Surface water flow regime 	<ul style="list-style-type: none"> Invasive plants/animals Parasites/pathogens/diseases 	<ul style="list-style-type: none"> Data Collection and Analysis Direct Management Land Use Planning
High Desert Wash and "Rangeland" Scrub	<ul style="list-style-type: none"> By 2025, acres of habitat are increased by at least 5% from 2015 acres. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Successional dynamics Structural diversity Native versus non-native diversity 	<ul style="list-style-type: none"> Climate change Fire and fire suppression Invasive plants/animals Livestock farming and ranching Mining and quarrying Renewable energy 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management
Great Basin Upland Scrub	<ul style="list-style-type: none"> By 2025, acres with desired structural diversity are increased at least 5% from 2015 acres. By 2025, miles of river with native species dominant are increased by at least 5% from 2015 miles. 			

Table 6 Conservation Targets and Strategies for the Deserts Province (continued)				
Target	Goals	Key Ecological Attributes (KEAs)	Pressures ¹	Strategy Categories
Mojave and Sonoran Desert Scrub	<ul style="list-style-type: none"> By 2025, acres of habitat are increased by at least 5% from 2015 acres. By 2025, acres connected are increased by at least 5% from 2015 acres. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres. By 2025, populations of key species are increased by at least 5% from 2015 population. By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Successional dynamics Key species population levels Native versus non-native diversity Weather regime 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Housing and urban areas Invasive plants/animals Renewable energy Roads and railroads Utility and service lines 	<ul style="list-style-type: none"> Partner Engagement Management Planning Land Acquisition/ Easement/ Lease Land Use Planning Outreach and Education Training and Technical Assistance
Walker River Native Fish Assemblage	<ul style="list-style-type: none"> By 2025, miles of streams with target fish population (SGCNs) are increased by at least 5% from 2015 miles. By 2025, miles of river where native species are dominant are increased by at least 5% from 2015 miles. By 2025, miles connected (i.e., past barriers) are increased by at least 5% from 2015 miles. By 2025, miles with desired stream stage (mimics natural hydrograph) are increased by at least 5% from 2015 miles. By 2025, miles with desired level of water quality (meeting TMDL standards) are increased by at least 5% from 2015 miles. By 2025, miles with desired age class heterogeneity are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Native versus non-native diversity Hydrological regime Soil and sediment deposition regime Surface water flow regime Water quality 	<ul style="list-style-type: none"> Dams and water management/use Introduced genetic material Invasive plants/animals Livestock farming and ranching Roads and railroads 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Law and Policy Outreach and Education
Cienegas	<ul style="list-style-type: none"> By 2025, acres of cienegas habitat are increased by at least 5% from 2015 acres. By 2025, miles of river where native species are dominant are increased by at least 5% from 2015 miles. By 2025, acres with desired fire regime (frequent low-intensity fire) are increased by at least 5% from 2015 acres. By 2025, acres/miles with desired inches of groundwater (stable depth) are increased by at least 5% from 2015 acres/miles. 	<ul style="list-style-type: none"> Area and extent of community Fire regime Native versus non-native diversity Hydrological regime 	<ul style="list-style-type: none"> Annual and perennial non-timber crops Dams and water management/use Earthquakes/tsunami Fire and fire suppression Housing and urban areas Introduced genetic material Invasive plants/animals Livestock farming and ranching Parasites/pathogens/diseases Renewable energy 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Direct Management Land Acquisition/ Easement/ Lease Outreach and Education
Springs and Spring Brooks	<ul style="list-style-type: none"> By 2025, acres of habitat are increased by at least 5% from 2015 acres. By 2025, miles of river where native species are dominant are increased by at least 5% from 2015 miles. By 2025, miles connected are increased by at least 5% from 2015 miles. By 2025, acres/miles with desired inches of groundwater are increased by at least 5% from 2015 acres/miles. By 2025, acres/miles with desired water yield are increased by at least 5% from 2015 acres/miles. By 2025, acres with suitable soil characteristics are increased by 5% from 2015 acres. By 2025, acres with desired stages of succession are increased by at least 5% from 2015 acres. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Successional dynamics Native versus non-native diversity Hydrological regime Soil and sediment deposition regime Surface water flow regime Water quality 	<ul style="list-style-type: none"> Commercial and industrial areas Dams and water management/use Introduced genetic material Invasive plants/animals Livestock farming and ranching Marine and freshwater aquaculture Recreational activities Renewable energy 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Land Acquisition/ Easement/ Lease Outreach and Education
Anthropogenically Created Aquatic Features	<ul style="list-style-type: none"> By 2025, acres where native species are dominant are increased by at least 5% from 2015 acres. By 2025, acres with desired genetic connectivity are increased (between Salton Sea drains) by at least 5% from 2015 acres. By 2025, miles with stable bank are increased by at least 5% from 2015 miles. By 2025, miles with desired stream stage (mimic natural flow hydrograph) are increased by at least 5% from 2015 miles. 	<ul style="list-style-type: none"> Area and extent of community Connectivity among communities and ecosystems Native versus non-native diversity Soil and sediment deposition regime Surface water flow regime Water quality 	<ul style="list-style-type: none"> Agricultural and forestry effluents Dams and water management/use Invasive plants/animals Marine and freshwater aquaculture Recreational activities Renewable energy Roads and railroads 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Direct Management Land Use Planning Law and Policy Outreach and Education

¹ Pressures can be positive or negative depending on the intensity, timing, and duration of the action on the target habitat.

Table 7 Summary of Conservation Targets and Strategies for the Marine Province				
Target*	Goals	Key Ecological Attributes (KEAs)	Pressures ¹	Strategy Categories
Embayments Estuaries Lagoons	<ul style="list-style-type: none"> By 2025, in coordination with partners, area of target is increased by at least 5% (with 5% of this area available as buffer for sea level rise). By 2025, increase reproductive success of native shorebirds by at least 5%, increase native oyster populations by at least 5%, and reduce invasive species populations by at least 5%, as indicators of improved community structure in the embayments, estuaries, lagoons ecosystems. By 2025, protect at least 5% more shorebird habitats to secure high quality embayments, estuaries, lagoons ecosystems. By 2025, native seagrass (eelgrass) bed acreage is increased by at least 5%. (Will result in an increase in floating vegetation) By 2025, in coordination with partners, surface water flow (both ephemeral and permanent) is increased by at least 5% into embayments, estuaries, lagoons. By 2025, in coordination with State Water Boards and other partners, improve the water quality of tributaries that flow into embayments, estuaries, lagoons by meeting at least 5% of the TMDLs. By 2025, in coordination with partners, at least 5% of the embayment, estuary, and lagoon water bodies improve circulation and hydro-connectivity so that key ecological processes are restored, for example, nutrient and other chemical mixings in the water body are functioning better and improved tidal marsh evolutions are experienced throughout the target. By 2025, in coordination with State Water Boards and other partners, the water quality standards for at least 5% of embayment, estuary, and lagoon water bodies are met. By 2025, in coordination with State Water Boards and other partners, the sediment quality objectives for at least 5% of the embayment, estuary, and lagoon water bodies are met. 	<ul style="list-style-type: none"> Area and extent of community Community structure and composition (e.g., key species population levels, age class structure, biodiversity, endemic diversity, native versus non-native diversity) Connectivity among communities and ecosystems Biogenic habitat Hydrologic characteristics (e.g., flow coming into and out of target) Quantity of sediment delivered into target (sediment deposition) Circulation and connectivity within target Water quality Sediment quality 	<ul style="list-style-type: none"> Agricultural and forestry effluents Airborne pollutants Climate change Dams and water management/use Fishing, harvesting, and collecting aquatic resources Garbage and solid waste Household sewage and urban wastewater (urban runoff) Housing and urban areas, commercial and industrial areas (shoreline development) Hunting and collecting terrestrial animals Industrial and military effluents (hazardous spills) Industrial and military effluents, household sewage and urban wastewater (point discharge) Invasive plants/animals Logging and wood harvesting Marine and freshwater aquaculture Other ecosystem modifications (modification of mouth/channels, ocean/estuary water diversion/control, artificial structures) Parasites/pathogens/diseases Recreational activities Shipping lanes (ballast water) 	<ul style="list-style-type: none"> Data Collection and Analysis Partner Engagement Management Planning Direct Management Economic Incentives Environmental Review Land Acquisition/ Easement/ Lease Land Use Planning Law and Policy Outreach and Education Training and Technical Assistance

* Conservation strategies were only developed for the embayments, estuaries, lagoon target. Strategies for other marine conservation targets will be developed in the future.

¹ Pressures can be positive or negative depending on the intensity, timing, and duration of the action on the target habitat.

Table 8 Conservation Targets and Strategies for Anadromous Fish		
Geography	Conservation Target	Conservation Strategy (Implementation by 2025)
Statewide	In-river spawning and rearing habitat	<ul style="list-style-type: none"> Document range and distribution of spawning and rearing habitat. Enhance and protect key spawning and rearing habitat for each specific anadromous species. <ul style="list-style-type: none"> Promote restoration actions that focus on ecological processes and climate change resilience.
	River flow	<ul style="list-style-type: none"> Identify annual flow regimes necessary for migration, rearing, and spawning of each anadromous species. Develop water management and conservation plans necessary to conserve anadromous fishes. <ul style="list-style-type: none"> Implement water management and conservation plans.
	Wetland habitat	<ul style="list-style-type: none"> Identify current condition of riparian and marsh habitat associated with anadromous species. Restore marsh and riparian habitat to improve carrying capacity of anadromous fishes. <ul style="list-style-type: none"> Protect key areas necessary to maintain viable populations.
North Coast and North Central Coast	California Anadromous Salmonid Stronghold Watersheds	<ul style="list-style-type: none"> Establish collaborative working groups for each Stronghold (Smith, Mattole, and South Fork Eel rivers). Assess ecological and human activities conditions that are allowing for healthy fish populations. <ul style="list-style-type: none"> Establish technical, agency, and financial support to maintain and expand ecological and human conditions supporting strong salmon and steelhead populations.
	Coastal estuaries	<ul style="list-style-type: none"> Evaluate current condition and estuarine needs for coho salmon, eulachon, longfin smelt in key estuaries (i.e., Smith, Klamath, and Eel rivers and Humboldt Bay). Restore and enhance estuary habitat and processes essential for anadromous species. <ul style="list-style-type: none"> Establish estuary function and structure that will allow anadromous migration and be responsive to climate change.
	Russian River	<ul style="list-style-type: none"> Restore and enhance estuary and river habitat necessary to support viable populations of all listed anadromous fishes (i.e., Chinook salmon, coho salmon, steelhead, green sturgeon). Develop and implement water management plan to ensure Russian River fisheries and land use are compatible. <ul style="list-style-type: none"> Expand Warm Springs Hatchery complex to function as a potential regional conservation facility for coho salmon and other listed species in the North-Central Domain.
Klamath-Trinity Rivers Basin	Pacific lamprey	<ul style="list-style-type: none"> Establish standing committee to implement interstate/intertribal 2012 Pacific lamprey conservation agreement. Implement habitat restoration and monitoring programs. <ul style="list-style-type: none"> Secure funding specific for conserving Pacific lamprey in the Klamath/Trinity Rivers Basin.
	Ecological processes	<ul style="list-style-type: none"> Evaluate wood debris, gravel, and water cycling and transport mechanisms across the basins. Establish agreements and practices to ensure adequate ecological processes are maintained to support sustainable anadromous populations across the basins. <ul style="list-style-type: none"> Establish monitoring and evaluation programs to track ecological processes and functioning.
	Listed and at-risk salmonids	<ul style="list-style-type: none"> Establish standing inter-organizational team to implement federal and state recovery plans, the Trinity River Restoration Plan, and Klamath River Settlement. Integrate recovery actions with strategic hatchery management (e.g., Iron Gate and Trinity River facilities). <ul style="list-style-type: none"> Integrate sustainable river and tribal fisheries with establishing sustainable, natural populations of salmon and steelhead.
South-Central and Southern California Coasts	Steelhead trout populations	<ul style="list-style-type: none"> Establish a robust monitoring program to evaluate steelhead populations, habitat, and ecological processes. Secure additional funding necessary to pursue essential habitat recovery. <ul style="list-style-type: none"> Determine role of resident populations to recovery and sustainability of anadromous populations.
	Migration barriers	<ul style="list-style-type: none"> Remediate most downstream barriers to steelhead entering rivers and streams. Accelerate planning and remediation of rim dam barriers to key steelhead populations. <ul style="list-style-type: none"> Modify land use practices (e.g., water use, agriculture, recreation, urban and road development) to minimize effects on migration corridors.
	Water management	<ul style="list-style-type: none"> In addition to the statewide strategy, identify key streams and locations essential for over-summering juvenile and adult steelhead. Investigate ability and options to creating water banks for steelhead habitat. <ul style="list-style-type: none"> Update CDFW management and conservation plan to integrate modern water management, including drought and climate change parameters.
Central Valley	Pacific lamprey	<ul style="list-style-type: none"> Establish standing committee to implement interstate/intertribal 2012 Pacific lamprey conservation agreement. Implement habitat restoration and monitoring programs. <ul style="list-style-type: none"> Secure funding specific for conserving Pacific lamprey in the Central Valley.
	Sturgeon	<ul style="list-style-type: none"> Establish fisheries management and conservation plans for white and green sturgeon. Implement habitat restoration and monitoring programs. <ul style="list-style-type: none"> Secure funding specific for conserving sturgeon populations and fisheries in the Central Valley.
	Chinook salmon and steelhead	<ul style="list-style-type: none"> Establish biological production goals for each species, coupled with SMART ecological objectives, prioritized restoration actions, focused biotic and abiotic monitoring, and adaptive management planning framework that are developed and overseen by an established standing inter-organizational team to integrate activities of NMFS and CDFW recovery programs, Central Valley Program Improvement Act program, Bay Delta Conservation Plan, San Joaquin River Restoration program, and CDFW fisheries programs to establish sustained salmon and steelhead populations and fisheries. <ul style="list-style-type: none"> Revise and integrate hatchery practices of the six facilities in the Central Valley to maximize scientific standards, minimize effects of programs on natural spawning populations and river habitat, and promote healthy fisheries populations. Conduct rim dam re-introduction pilot projects on Yuba and Sacramento rivers and evaluate efficacy of expanding rearing and spawning habitats for recovery.

How to Use the State Wildlife Action Plan 2015 Update

SWAP 2015 provides an ecosystem approach for the conservation of California's fish and wildlife resources through the identification of strategies intended to address stresses experienced by SGCN and the habitats upon which they depend. The conservation strategies developed in this plan are designed to enhance or maintain the KEAs that define the natural qualities of conservation targets by reducing the pressures that cause ecosystem stresses. CDFW designed SWAP 2015 to guide resource managers, conservation partners, and the public in understanding how they can directly and indirectly participate in conserving California's precious natural heritage. The following guidance is offered in the use of SWAP 2015.

For resource managers, conservation partners, and members of the public who wish to more deeply investigate the data and biologist input behind the SWAP 2015 assessments and conservation strategies, the database files used to compile and evaluate ecological data and management information can be accessed at: <http://www.dfg.ca.gov/SWAP/>.

SWAP 2015 is organized as follows:

- **Chapter 1** provides an introduction to SWAP 2015. The challenge, CDFW responsibility, and vision for California wildlife conservation are described. Chapter 1 also explains the requirements for updating SWAP and summarizes major changes through the update, including the analytical approach used in the update.
- **Chapter 2** describes California's natural diversity, identifies SGCN and the criteria used to evaluate species and habitat conditions, and addresses major pressures and stresses currently affecting the SGCN and their habitats.
- **Chapter 3** describes the existing conservation approaches in the state, including the major regulations protecting natural resources, CDFW planning tools, and major conservation programs.
- **Chapter 4** presents the statewide goals for SWAP 2015 and broad, state-level conservation strategies that will be implemented to achieve the desired conservation outcomes.
- **Chapter 5** is divided into seven sections that describe, at a province level, the conservation targets, SGCN and other focal species, KEAs, stresses, pressures, and conservation strategies including goals and objectives for the provinces.
- **Chapter 6** focuses on conservation strategies developed for anadromous fishes in California.
- **Chapter 7** describes how SWAP 2015 will be integrated with other programs and coordinated with partners for the implementation, including through companion plans.
- **Chapter 8** describes the monitoring plan for the conservation strategies, including the mandate for CDFW to use monitoring and adaptive management. It also presents a

Executive Summary

summary of the effectiveness evaluation of how SWAP 2005 was implemented. The chapter describes how the recommendations from the SWAP 2005 evaluation have been integrated into SWAP 2015. Rationales for selecting conservation strategies presented in SWAP 2015 and a framework for monitoring the effectiveness of the strategies are also described.

- ▲ **Chapter 9** provides the list of preparers of SWAP 2015.
- ▲ **Chapter 10** provides bibliographic references used in each chapter.
- ▲ **Chapter 11** provides a glossary of major terms used in SWAP 2015.
- ▲ **Several appendices** accompany SWAP 2015 to provide more detailed information and extensive tables that support the document.

Figure 1 below provides a “roadmap” to the document illustrating how SWAP 2015 is organized.

If questions arise regarding the use of SWAP 2015, please email SWAP@wildlife.ca.gov.

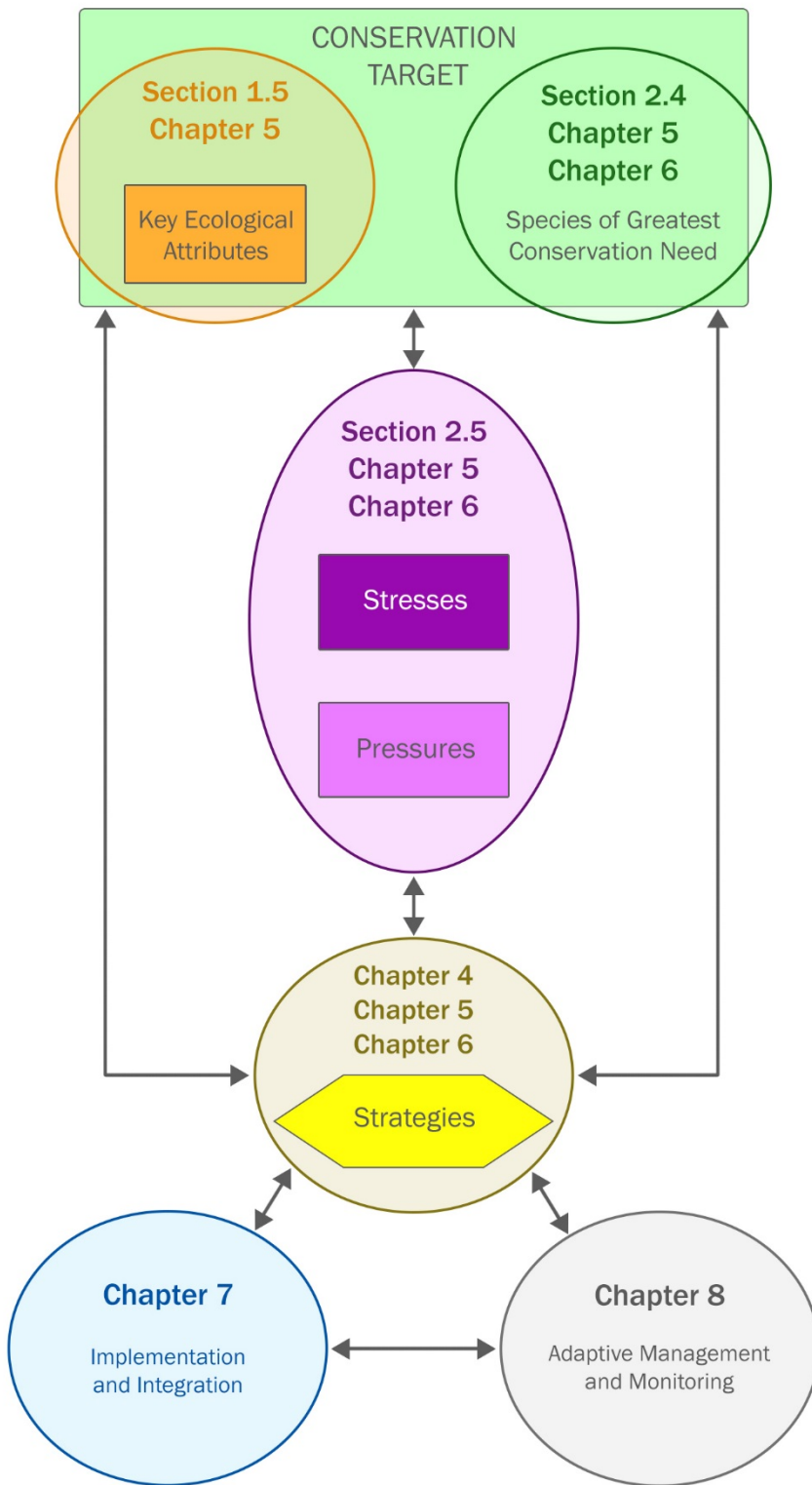


Figure 1 SWAP 2015 Organizational Roadmap