



DRAFT AGRICULTURE COMPANION PLAN

Fall 2015



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Left:

Fields near Greenfield, California

Date: 18 April 2008

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Right:

Almond Tree Agriculture California

Date: 14 July 2004

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Prepared by Blue Earth Consultants, LLC



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Disclaimer:

While we have made every effort to ensure that the information contained in this report accurately reflects SWAP 2015 companion plan development team discussions shared through web-based platforms, e-mails, and phone calls, Blue Earth Consultants, LLC makes no guarantee of the completeness and accuracy of information provided by all project sources. SWAP 2015 and associated companion plans are non-regulatory documents. The information shared is not legally binding nor does it reflect a change in the laws guiding wildlife and ecosystem conservation in the State. In addition, mention of organizations or entities in this report as potential partners does not indicate a willingness and/or commitment on behalf of these organizations or entities to partner, fund, or provide support for implementation of this plan or SWAP 2015.

The consultant team developed companion plans for multiple audiences, both with and without jurisdictional authority for implementing strategies and conservation activities described in SWAP 2015 and associated companion plans. These audiences include, but are not limited to, California Department of Fish and Wildlife leadership team and staff, California Fish and Game Commission, cooperating State, Federal, and local government agencies and organizations, California Tribes and tribal governments, and partners (such as non-governmental organizations, academic, research institutions, and citizen scientists).



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Acronyms and Abbreviations

AB	Assembly Bill
ACEP	Agricultural Conservation Easement Program
AWMP	Agricultural Water Management Plan
AFWA	Association of Fish and Wildlife Agencies
APHIS	Animal and Plant Health Inspection Service
BMP	Best Management Practice
BLM	U.S. Bureau of Land Management
Blue Earth	Blue Earth Consultants, LLC
CBC	California Biodiversity Council
CDFA	California Department of Food and Agriculture
CDFW/the Department	California Department of Fish and Wildlife
CFAITC	California Foundation for Agriculture in the Classroom
Ch.	Chapter
CIG	Conservation Innovation Grants
CPUC	California Public Utilities Commission
CSP	Conservation Stewardship Program
DRECP	Desert Renewable Energy Conservation Plan
DOD	U.S. Department of Defense
DWR	California Department of Water Resources
EQIP	Environmental Quality Incentives Program (EQIP)
HCP	Habitat Conservation Plan
KEA	Key Ecological Attribute
LCC	Landscape Conservation Cooperative
NCCP	Natural Community Conservation Planning
NERR	National Estuarine Research Reserve
NGO	Non-Governmental Organization
NRCS	Natural Resources Conservation Service
NWRC	National Wildlife Research Center
RAMP	Regional Advance Mitigation Planning
RCD	Resource Conservation District
RCPP	Regional Conservation Partnership Program
RUCS	Rural-Urban Connections Strategy
SCAPOSD	Sonoma County Agricultural and Open Space Preservation District
SGC	Strategic Growth Council
SGCN	Species of Greatest Conservation Need
SWAP	State Wildlife Action Plan
SWG	State and Tribal Wildlife Grants
SWRCB	State Water Resources Control Board
TNC	The Nature Conservancy
UCCE	University of California Cooperative Extension



USDA

USFS

USFWS

WCB

WHEP

U.S. Department of Agriculture

U.S. Forest Service

U.S. Fish and Wildlife Service

Wildlife Conservation Board

Waterbird Habitat Enhancement Program



1. Introduction

The California State Wildlife Action Plan 2015 Update (SWAP 2015) provides a vision and a framework for conserving California’s diverse natural heritage. SWAP 2015 also recognizes the need and calls for developing a collaborative framework to manage ecosystems sustainably across the State in balance with human uses of the natural resources. To address the need for a collaborative framework, California Department of Fish and Wildlife (CDFW), Blue Earth Consultants, LLC (Blue Earth), and partner agencies and organizations began preparation of sector-specific companion plans. While this document reports on the progress made thus far on collaboration, the intent is to set a stage for achieving the State’s conservation priorities through continued partnership and by mutually managing and conserving the State’s natural and cultural resources. Text box 2 highlights important definitions to SWAP 2015 and the companion plan process (CDFW, 2015c; Chapter [Ch.] 1.5.4).

Text Box 1. What is a State Wildlife Action Plan?

In 2000, Congress enacted the State and Tribal Wildlife Grants (SWG) program to support state programs that broadly benefit wildlife and habitats, but particularly “Species of Greatest Conservation Need” (SGCN) defined by the individual states. Congress mandated each state and territory to develop a SWAP that outlined a comprehensive wildlife conservation strategy to receive federal funds through the SWG program. From 2005 through 2014, CDFW received approximately \$37 million through the SWG program in matched with approximately \$19 million in State government support for the wildlife conservation activities. The SWG program requires SWAP updates at least every 10 years. CDFW prepared and submitted SWAP 2015, the first comprehensive update of the California SWAP 2005, to the U.S. Fish and Wildlife Service (USFWS) on 10/1/2015. The update allows CDFW to expand and improve the recommended conservation activities addressed in the original plan by integrating new knowledge acquired since 2005.¹

¹ For more information see: CDFW, “California State Wildlife Action Plan (SWAP),” 2015, 27 Oct. 2015. <https://www.wildlife.ca.gov/SWAP>.

Text Box 2. Definitions Important to SWAP 2015

Conservation Target: An element of biodiversity at a project site, which can be a species, habitat/ecological system, or ecological process on which a project has chosen to focus.

Goal: A formal statement detailing a desired outcome of a conservation project, such as a desired future status of a target. The scope of a goal is to improve or maintain *key ecological attributes* (defined below).

Key Ecological Attribute (KEA): Aspects of a target’s biology or ecology that, if present, define a healthy target and, if missing or altered, would lead to the outright loss or extreme degradation of the target over time.

Objective: A formal statement detailing a desired outcome of a conservation project, such as reducing the negative impacts of a critical *pressure* (defined below). The scope of an objective is broader than that of a goal because it may address positive impacts not related to ecological entities (such as getting better ecological data or developing conservation plans) that would be important for the project. The set of objectives developed for a conservation project are intended, as a whole, to lead to the achievement of a goal or goals, that is, improvements of key ecological attributes.

Pressure: An anthropogenic (human-induced) or natural driver that could result in changing the ecological conditions of the target. Pressures can be positive or negative depending on intensity, timing, and duration. Negative or positive, the influence of a pressure to the target is likely to be significant.

Species of Greatest Conservation Need (SGCN): All state and federally listed and candidate species, species for which there is a conservation concern, or species identified as being vulnerable to climate change.

Strategy: A group of actions with a common focus that work together to reduce pressures, capitalize on opportunities, or restore natural systems. A set of strategies identified under a project are intended, as a whole, to achieve goals, objectives, and other key results addressed under the project.

Stress: A degraded ecological condition of a target that resulted directly or indirectly from negative impacts of pressures (e.g., habitat fragmentation).

(CDFW, 2015c; Ch. 1.5.4)



1.1 SWAP 2015 Statewide Goals

SWAP 2015 has three statewide conservation goals with 12 sub-goals, under which individual regional goals are organized (CDFW, 2015c; Ch. 4.1). These statewide goals set the context for the companion plans and SWAP 2015 implementation.

Goal 1 - Abundance and Richness: Maintain and increase ecosystem and native species distributions in California while sustaining and enhancing species abundance and richness.

Goal 2 - Enhance Ecosystem Conditions: Maintain and improve ecological conditions vital for sustaining ecosystems in California.

Goal 3 - Enhance Ecosystem Functions and Processes: Maintain and improve ecosystem functions and processes vital for sustaining ecosystems in California.

1.2 SWAP 2015 Companion Plans

Need for Partnerships

The state of California supports tremendous biodiversity. However, the State also has a large and growing human population and faces many challenges, such as climate change, which affects biodiversity and natural resources in general. To balance growing human activities with conservation needs for sustaining the State’s ecosystems, collaboratively managing and conserving fragile natural resources is a necessity. As many desirable conservation actions identified under SWAP 2015 are beyond CDFW’s jurisdiction, the Department determined that more detailed coordination plans are needed in line with and beyond the recommendations presented in SWAP 2015. Called “companion plans,” these sector-specific plans (Text Box 3) were created collaboratively with partners and will be instrumental in implementing SWAP 2015 (See Appendix D for a list of partners that informed development of this companion plan).

Text Box 3. Companion Plan Sectors:

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

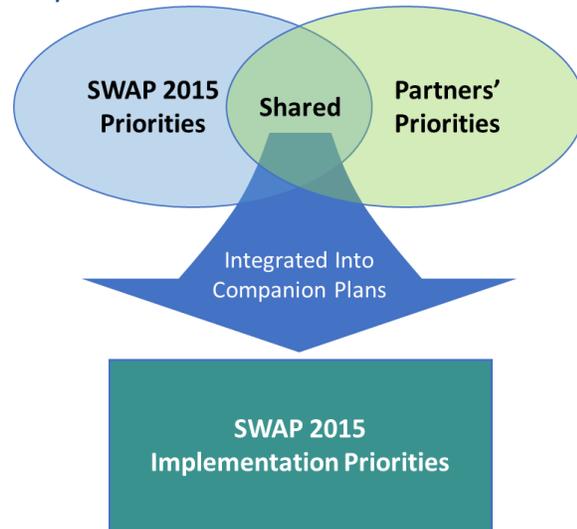
Companion Plan Purpose and Sector Selection

Companion plans present shared priorities identified among SWAP 2015 and partners involved in the companion plan development. Figure 1 illustrates how, through collaboration with partner organizations, priorities for SWAP 2015 have come together in the companion plan and will be elevated as high implementation priorities for SWAP 2015.

The companion plans respond to feedback from many sources, including CDFW staff and partners who support natural resources management and conservation. This includes the California Biodiversity Council (CBC), under which a resolution to promote interagency alignment within the State was signed

in 2013. The companion plans also fulfill the strong suggestion from the Association of Fish & Wildlife Agencies (AFWA) and the National Fish, Wildlife, and Plants Climate Adaptation Strategy¹ to incorporate increased partner engagement as a best practice in wildlife conservation planning. This effort also directly helps CDFW comply with recently added provisions to the Fish and Game Code under Assembly Bill (AB) 2402, specifically under Section 703.5(b), which states that CDFW shall “seek to create, foster, and actively participate in effective partnerships and collaborations with other agencies and stakeholders to achieve shared goals and to better integrate fish and wildlife resource conservation and management with the natural resource management responsibilities of other agencies” (California Fish and Game Code, 2015).

Figure 1: Alignment of SWAP 2015 and Partner Priorities in Companion Plans



CDFW selected sector categories based on the needs for the Department as well as the themes and subjects identified in other existing plans including the California Climate Adaptation Strategy,² 2014 update to the Safeguarding California: Reducing Climate Risk,³ The President’s Climate Action Plan,⁴ and the National Fish, Wildlife, and Plants Climate Adaptation Strategy.⁵

Because each companion plan focused on teamwork during its development phase, they inherently help set a stage for implementing SWAP 2015 through future collaborations. Together, SWAP 2015 and associated companion plans describe the context and strategic direction of integrated planning and management efforts that will help sustain California’s ecosystems.

Companion Plan Development

The SWAP 2015 companion plan **management team** (see Appendix C for a list of members), comprised of CDFW staff with support from Blue Earth staff, provided general direction to the **development team** (see Appendix D for a list of members). Blue Earth facilitated sector-specific discussions among the CDFW staff and development team members, who represented a cross section of sector interests and

¹ For more information, see: USFWS and National Oceanic Atmospheric Administration (NOAA), “National Fish, Wildlife, and Plants Adaptation Strategy,” 2012. Web. 27 Oct. 2015. <http://www.wildlifeadaptationstrategy.gov/>.

² For more information, see: California Natural Resources Agency (CNRA), “Climate Adaptation Strategy,” 2009. Web. 27 Oct. 2015. http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf.

³ For more information, see: CNRA, “Safeguarding California: Reducing Climate Risk – Update,” 2014. Web. 27 Oct. 2015. http://resources.ca.gov/docs/climate/Final_Safeguarding_CA_Plan_July_31_2014.pdf.

⁴ For more information, see: Executive Office of the President, “The President’s Climate Action Plan,” 2013. Web. 27 Oct. 2015. <https://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf>.

⁵ For more information, see: USFWS and NOAA, “National Fish, Wildlife, and Plants Adaptation Strategy,” 2012.



mandates. Team members were selected based on their positive response to outreach efforts by CDFW to seek participation and representation from public and private partners heavily involved in the conservation and management of the State’s natural resources.⁶

Beginning in early 2015, a series of four planning and collaboration meetings were held for each sector. The meetings consisted of an initial kickoff session with participation from all sectors followed by three sector-specific meetings. During these meetings, development team participants discussed their ongoing and potential future efforts that would benefit wildlife and habitat conservation in the State. The development teams and CDFW then identified collaboration opportunities and joint priorities or overlaps among SWAP 2015 and partners’ strategies and actions. Blue Earth and CDFW organized the feedback from the facilitated development team discussions into nine companion plan documents. In addition, the management team led a review process between CDFW and development team partners, along with a subsequent public review phase for the nine companion plan documents.

Companion Plan Content

Each companion plan addresses:

- SWAP 2015 priorities - statewide goals and strategies;
- companion plan overview - approach, purpose, development process, and content;
- description of the sector;
- common themes across the sectors;
- common priority pressures and strategies across the sectors;
- SWAP 2015 components that best align with the priorities of the participants’ organizations under each sector;
- collaboration opportunities identified for joint priorities under each sector – alignment opportunity and potential resources by jurisdiction, locality, and strategy;
- considerations for evaluating future collaboration efforts and desired outcomes/outputs; and
- next steps relevant to the sector.

2. Agriculture Sector

2.1 *Agriculture in California*

For more than 50 years, California has led the nation in agricultural food production. Agriculture includes cultivation/horticulture, silviculture, and animal husbandry. California produces over 400 agricultural commodities including fruits, tree nuts, vegetables, milk, horticulture crops, and wine (California Department of Food and Agriculture [CDFA], 2013). The State also leads the nation in the number of organic farms, organic production land, and organic sales. Two-thirds of the State’s organic sales are from produce, one-fourth from livestock, and the remainder from field crops (Klonsky, 2010).

⁶ Disclaimer: Although the management team sought to engage a broad range of partners in the development team process, CDFW recognizes that there are many other partners that will play important roles in implementing SWAP 2015 and companion plan.



In addition to residents and communities who depend on the State’s agricultural and food production resources, the sector boosts the State’s economy through job creation and revenues. California’s 77,900 farms and ranches received approximately \$46.4 billion for their crop production in 2013 (CDFA, 2013). In the same year, the State’s agricultural exports were valued at \$21.24 billion, a 15% increase from 2012 (CDFA, 2013). Almonds, dairy, and wine were California’s top export crops in 2013 (CDFA, 2013). A portion of this revenue stems from California leading the nation in dairy commodities. California has over 1.75 million dairy cows and more than 19 million laying-aged hens, which produce over 5.3 billion eggs annually (United States Department of Agriculture [USDA], 2014). Of the 25.5 million acres of agricultural lands supporting farm operations, more than 60% of the State’s farms are less than 50 acres in size. This size class indicates there could be potential farm acreage growth for specialty crop operations such as fruits, vegetables, and nursery crops (USDA, 2014); California Foundation for Agriculture in the Classroom [CFAITC], 2014). In addition to the multitude of different agricultural and food production resources, California also is the sole national commercial producer of several specialty crops. These crops include almonds, artichokes, dates, figs, raisins, kiwifruit, olives, clingstone peaches, pistachios, dried plums, pomegranates, sweet rice, ladino clover seed, and walnuts (USDA, 2014).

With this statewide availability of agricultural commodities, many programs and communities encourage eating “local.” For example, California Farm to Table is an online resource that supplies information on farmer’s markets, gardening, restaurants, and cooking with local and California-grown agricultural resources (California Farm to Table, 2014). Another example promoting local California agriculture is the “Local Foods Wheel” project. The Local Foods Wheel helps the public identify foods grown in California, as well as which crops are in season throughout the year (The Local Foods Wheel, 2015). Furthermore, eating local California-grown food also reduces food transport miles and associated reduction of infrastructure usage while increasing awareness of local environmental issues from farmers who derive most or all of their sales from their local communities.

The agricultural sector has a unique similarity to the plant and animal species of concern for management and protection, in that both depend on California’s diverse landscape and habitats, and many of these mutually beneficial landscapes are under development pressure for conversion to other land uses. Many cultivation practices also provide ecosystem services for wildlife, including pollinator services, habitat and riparian floodplain protection, lower greenhouse gas levels on farmland compared to urban land, and permeable land and groundwater recharge.

However, agricultural development efforts can also affect wildlife. With California’s current and future water demands, it is important to consider wildlife impacts when balancing agricultural water uses. For example, in many areas of the State, particularly in the Central Valley, the same water systems that have led to California’s agricultural productivity have also created landscape-scale changes in water placement and distribution that have had significant impacts to wildlife (California Department of Water Resources [DWR], 2010). While the past few decades have seen significant improvements in managing these water resource systems to minimize such impacts, the State still faces risks from declines in species and habitats. Agencies and partner organizations will need to work together to assure this infrastructure functions as best as it can to balance water supply with flood control and recreation, as well as food production and environmental sustainability (DWR, 2014). With the vast agricultural



environment and with existing and potential future planning and partnering efforts, there are opportunities for organizations in multiple sectors (e.g. wildlife and agricultural sectors) to work together to restore and preserve California’s natural and wildlife resources alongside agricultural food production.

2.2 Current Agriculture Management and Conservation in California

The agriculture sector, with its many interactions with natural habitats, has a shared interest with many State partners that focus on the conservation of California’s natural and wildlife resources as a program component. CDFW, with its mission to “manage California’s diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public,” often works with other partners to host and promote agricultural activities (CDFW, 2015a). For example, CDFW partnered with CFAITC for the 2015 California Invasive Species Action Week. This effort aimed to combat invasive species and their impacts on the State’s natural resources (CDFW, 2015b).

CDFA’s mission is to “serve the citizens of California by promoting and protecting a safe, healthy food supply, and enhancing local and global agricultural trade, through efficient management, innovation and sound science, with a commitment to environmental stewardship” (CDFA, 2015a). CDFA engages farmers and ranchers by promoting environmental stewardship through several initiatives including the Healthy Soils Initiative, Dairy Digester Research and Development Program, and State Water Efficiency and Enhancement Program (CDFA, 2015b). These are just a few examples of other ecosystem service efforts in the agriculture sector supporting conservation and restoration of California’s natural and wildlife resources.⁷

SWAP 2015 goals include maintaining and increasing native species distribution, abundance and richness, and enhancing ecosystem conditions, functions, and processes (CDFW, 2015c; Ch. 4.1). In a state like California, where much of the land is privately-owned, landscape scale conservation relies on strong partnerships between private landowners, industry, non-governmental organizations (NGOs), and government agencies. SWAP 2015 supports this approach by highlighting the need to integrate wildlife conservation with working landscapes and environments through partnership on efforts such as modifying agricultural land use practices to minimize effects on migration corridors. A current partnership example is between CDFA and CDFW on the Voluntary Local Programs, which encourages landowners to voluntarily enhance habitat for listed species such as the California tiger salamander, tri-color blackbird, Swainson’s hawk, and burrowing owl (CDFW, 2012). In addition, SWAP 2015 recognizes the economic and ecological values of agricultural lands in the State (CDFW, 2015c; Executive Summary). For example, the USDA Animal and Plant Health Inspection Service (APHIS) supports partnership on natural resource planning and conservation through a number of programs including the National Wildlife Research Center. APHIS’s Strategic Plan 2015-2019 goal 3 seeks to “protect forests, urban landscapes, rangelands and other natural resources, as well as private working lands from harmful pests and diseases,” with a strong focus on partnership and collaboration (USDA, 2015a; 8). In addition,

⁷ For more information, see: California Department of Food and Agriculture (CDFA), “What are Ecosystem Services?” 2012. Web. 27 Oct. 2015. <https://www.cdfa.ca.gov/EnvironmentalStewardship/EcosystemServices.html>.



California received \$22 million from USDA in 2014 through the Agricultural Conservation Easement Program (ACEP) to protect critical wetland habitats and encourage producers to keep agricultural lands in farming and ranching by working with State partners (CDFA, 2014). NGOs also provide support in partnering farmers with beneficial practices for wildlife. For example, one partnership-focused organization is Sustainable Conservation, which aims to unite farmers to solve the toughest challenges facing land, air, and water and to help California thrive best management practices (BMPs) such as managing nutrients like organic and synthetic fertilizers more effectively through balanced rates and timing during harvest season (Sustainable Conservation, 2015). Furthermore, The Nature Conservancy (TNC) and the California Rice Commission work with rice farmers through the “BirdReturns” program, which provides farmers with incentives for maintaining flooded fields for shorebirds. Over 40 rice farms participated in 2014 and provided nearly 10,000 acres of habitat for shorebirds (TNC, 2014). As a final example, DWR prepared a “Guidebook to Assist Water Suppliers to Prepare a 2015 Agricultural Water Management Plan” that helps agricultural water suppliers understand and more effectively comply with regulations (e.g., Water Conservation Act, Agricultural Water Management Planning Act, Agricultural Water Measurement Regulation, and Executive Order B-29-15), and assists them with developing an Agricultural Water Management Plan (AWMP) (DWR, 2015). By continuing to enhance agricultural development, CDFW in partnership with others can work together to protect and conserve the State’s current natural and wildlife resources in conjunction with working lands and the agriculture sector.

Text Box 4. Collaborative Conservation Effort Examples in the Agriculture Sector

There are numerous collaborative conservation and management efforts found in California. Below we share three examples related to agriculture in the State. These examples demonstrate existing conservation efforts that aligned with SWAP 2015. The partners addressed in each description are indicated in **bold**.

- *Protecting the Threatened Tricolored Blackbird*: To enhance habitat protection for the threatened Tricolored Blackbird, the **USDA Natural Resources Conservation Service (NRCS)** partnered with **Audubon California, Western United Dairymen, Dairy Cares, California Farm Bureau Federation, and Sustainable Conservation** to support efforts that will balance the challenges of dairy farmers and the conservation needs of Tricolored Blackbirds. Due to declines in available habitat, the blackbirds have begun to nest in large colonies of triticale, a crop dairymen grow to feed their cows. Triticale harvest season coincides with blackbird nesting season; thus, harvesting can lead to loss of eggs and nestlings. The \$1.1 million project will use working land programs and wetland easements to protect and increase habitat for this species and educate dairy farmers of actions they can take to protect populations in the San Joaquin valley (USDA, 2015b).
- *Designing Solutions for Bird-Friendly Farming*: In 2008, the **NRCS, Audubon California, Point Blue Conservation Science, The Nature Conservancy, California Rice Commission, and rice growers** began collaborating on solutions for simultaneously maintaining rice farms and improving bird habitat. Collaborative research and pilot projects evaluating on-farm management practices led to the establishment of the **NRCS's** Waterbird Habitat Enhancement Program (WHEP), which provides funding to enhance habitat on California ricelands. WHEP supports short-term habitat enhancement efforts and offers a low-cost solution for increasing protection. WHEP has resulted in the protection of approximately 100,000 acres of bird habitat. This project exemplifies the ways in which diverse partners can come together to implement meaningful conservation practices while protecting working lands (California Rice, 2014).
- *Restoring Habitat in the Yolo Bypass*: The Yolo Bypass Wildlife Area protects approximately 16,700 acres of habitat, including agricultural areas for rice, crops, and ranching that provide wildlife habitat benefits, large-scale flood protection, and income for Wildlife Area operations. The Management Plan specifically outlines how agricultural lands within the Wildlife Area can be used to improve and expand wildlife habitat and generate income, through practices such as weed control and rice farming. The Yolo Bypass Management Plan was completed in 2008 through collaboration between **CDFW** and the **Yolo Basin Foundation**, as well as extensive public comment. Continued collaboration occurs through the Yolo Bypass Working Group, which meets every few months to discuss management and decision-making processes affecting the area. The group includes participants from **State and Federal agencies** (e.g., **CDFW, DWR, USFWS, USDA**), as well as local **landowners and users** (e.g., **farmers and ranchers**) (CDFW, 2008).



3. Common Themes across Nine Sectors

Equally important to discussion topics unique to each sector is the common themes considered across all sectors. This section shares overarching themes identified through the development of the nine companion plans within the scope of SWAP 2015. As described below, the top two most commonly discussed topics were: 1) climate change and 2) integrated regional planning.

3.1 *Climate Change Related Issues*

All sectors highlighted the potential far-reaching effects on California's natural resources induced or exacerbated by climate change as a major issue. The negative impacts to the State's ecosystems described in SWAP 2015 may increase in their magnitude and severity by the compounding effects of climate change (CDFW, 2015c; Ch. 2.5.3). The implications of climate change are likely to be profound and influence many facets of the State's natural resources. Therefore, development teams considered collaboration across sectors related to natural resource management and conservation essential to assist ecosystem adaptation effectively and minimize negative effects from the shifting climate.

The suggested collaborative activities under various sector discussions that relate to climate change include a comprehensive assessment of the State's climate change vulnerability and implementation of appropriate adaptation actions (CDFW, 2015c; Ch. 2.5.3). Detailed activities addressed during the discussions include, but are not limited to: establishing a sustainable habitat reserve system to reduce other habitat threats and increase habitat resilience to climate change; incorporating climate change impacts (e.g., habitat shifts and sea level rise) into the management of watersheds, habitats, and vulnerable species; improving regulation of greenhouse gas emissions; developing comprehensive research guidelines to evaluate climate change effects; and engaging in education and outreach activities to raise awareness of climate change.

3.2 *Integrated Regional Planning*

California hosts a landscape that is ecologically, socio-economically, and politically intricate. The current status of the State's ecosystems reflects the synergistic interactions among ecological conditions and processes, as well as diverse human activities and conflicting needs and the regulations imposed on those activities.

The concept of integrated regional planning arises from the recognition that addressing only one aspect of such a multi-faceted, dynamic human and natural system would not be sustainable. Integrated regional planning in the context of SWAP 2015, paraphrased from the definition in the California Water Plan, is an approach to prepare for effective management, including conservation activities, while concurrently achieving social, environmental, and economic objectives to deliver multiple benefits across the region and jurisdictional boundaries (DWR, 2014). The expected outcomes of adopting an integrated regional planning approach are to 1) maximize limited resources to provide for increased public well-being, and 2) receive broader support for natural resource conservation beyond the conservation community while systematically improving ecosystem conditions that sustain the ecological integrity of the region.



Integrated regional planning begins with the acceptance of diverse natural resource management priorities associated with the region and the accompanying activities necessary to pursue those interests. Based on this understanding and philosophy, attempts by natural resource management agencies to integrate activities often include negotiations during regional planning processes. Expected efforts under integrated regional planning processes include: planning to reduce conflicts among priorities and activities; minimizing overlapping efforts by aligning similar activities; streamlining and integrating needed processes across the priorities; and collaborating to complement efforts and pursue mutual priorities and interests. As an example, integrated planning could occur by zoning larger planning regions, coordinating multiple needs for the region, and limiting activities within each zone to avoid incompatible activities, or at least reduce unintended negative consequences of isolated but interactive activities. In sum, integrated regional planning requires open-mindedness, transparency, patience, and comprehensive and strategic planning between natural resource management priorities and regional and/or local jurisdictions through coordination.

In developing the companion plans, all sectors considered an integrated regional planning framework as one of the State's top priorities. The needs and tasks related to integrated regional planning and expressed through the discussion among the sector groups were: preparing, approving, and implementing regional- and landscape-level conservation plans; pursuing necessary resources systematically for conservation strategy implementation; coordinating effective partnerships; adapting to emerging issues; and reviewing and revising the plans. Existing efforts recognized for supporting integrated regional planning include Natural Community Conservation Plans (NCCPs), Habitat Conservation Plans (HCPs), Habitat Connectivity Planning for Fish and Wildlife,⁸ the Master Plan for Marine Protected Areas, and individual species management plans. SWAP 2015 also addresses those activities and plans.

In addition, SWAP 2015 highlights where partners can potentially integrate SWAP with other agency conservation programs, including the efforts by California Wildlife Conservation Board (WCB), identified and discussed among the companion plan development teams.

4. Commonly Prioritized Pressures and Strategy Categories across Sectors

Below is an overview of pressures and strategy categories considered important across the nine sector teams. SWAP 2015 adopted the Open Standards for the Practice of Conservation⁹ process and applied it to each targeted ecosystem to identify strategies that could influence key ecosystem pressures (CDFW, 2015c; Ch. 1.5.4). During development team meetings, CDFW shared lists of those identified pressures and strategy categories that are considered relevant to each sector. Through voting, each development team prioritized the pressures and strategy categories by the importance to the sector. The commonly prioritized pressure and strategy categories described below were identified by synthesizing overarching

⁸ For more information, see: CDFW, "Habitat Connectivity Planning for Fish and Wildlife," 2015. Web. 27 Oct. 2015. www.wildlife.ca.gov/Conservation/Planning/Connectivity.

⁹ For more information on the Open Standards for the Practice of Conservation, see: Conservation Measure Partnership, "The Open Standards," 2015. Web. 28 Oct. 2015. <http://www.conservationmeasures.org/>.



discussion themes (for pressures) and by counting the frequency of the prioritization (for strategy categories) across the sectors.

4.1 Pressures across Sectors

A pressure, as defined in SWAP 2015, is “an anthropogenic (human-induced) or natural driver that could result in impacts to the target (i.e., ecosystem) by changing the ecological conditions” (CDFW, 2015c; Ch. 1.5.4, 26). Pressures can have either positive or negative effects depending on their intensity, timing, and duration, but they are all recognized to have strong influences on the well-being of ecosystems (CDFW, 2015c; Ch. 1.5.4). Table 1 lists the 29 standard pressures addressed under SWAP 2015 (CDFW, 2015c; Ch. 1.5.4).

Table 1. SWAP 2015 Pressures

<ul style="list-style-type: none"> • Agricultural and forestry effluents • Air-borne pollutants • Annual and perennial non-timber crops • Catastrophic geological events • Climate change • Commercial and industrial areas² • Dams and water management/use • Fire and fire suppression • Fishing and harvesting aquatic resources • Garbage and solid waste • Household sewage and urban waste water^{3,4} • Housing and urban areas² • Industrial and military effluents^{4, 5} • Introduced genetic material • Invasive plants/animals 	<ul style="list-style-type: none"> • Livestock, farming, and ranching • Logging and wood harvesting • Marine and freshwater aquaculture • Military activities • Mining and quarrying • Other ecosystem modifications⁶ • Parasites/pathogens/diseases • Recreational activities • Renewable energy • Roads and railroads • Shipping lanes⁷ • Tourism and recreation areas • Utility and service lines • Wood and pulp plantations
<p>Pressures include the following:</p> <ul style="list-style-type: none"> ¹ Volcano eruption, earthquake, tsunami, avalanche, landslide, and subsidence ² Shoreline development ³ Urban runoff (e.g., landscape watering) ⁴ Point discharges ⁵ Hazardous spills ⁶ Modification of mouth/channels; ocean/estuary water diversion/control; and artificial structures ⁷ Ballast water 	

(CDFW, 2015c; Ch. 1.5.4)

As described under Section 3.1, the climate change pressure was one of the common themes discussed across the sectors. There were no other standardized pressures listed under Table 1 that were commonly prioritized across all sectors. For more information on pressures prioritized for the agriculture sector, please refer to Section 5.1 below.



4.2 Strategy Categories across Sectors

SWAP 2015 outlines 11 categories of statewide conservation strategies under which regional strategies are organized, similar to the manner in which the regional goals are tiered under the statewide conservation goals (CDFW, 2015c; Ch. 4.2). The statewide and regional strategies are meant to work synergistically to achieve the statewide goals and priorities. Table 2 lists the 11 standardized statewide strategy categories addressed under SWAP 2015 (CDFW, 2015c; Ch. 4.2).

Table 2. SWAP 2015 Conservation Strategy Categories

<ul style="list-style-type: none"> • Data Collection and Analysis • Direct Management • Economic Incentives • Environmental Review • Land Acquisition, Easement, and Lease • Land Use Planning 	<ul style="list-style-type: none"> • Law and Policy • Management Planning • Partner Engagement • Outreach and Education • Training and Technical Assistance
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(CDFW, 2015c; Ch. 4.2)

Of these 11 strategies, the three most commonly prioritized strategy categories across the nine sectors were: **Data Collection and Analysis** (78% or 7 sectors prioritized this strategy), **Management Planning** (78% or 7 sectors), and **Partner Engagement** (56% or 5 sectors). The strategy categories identified as most relevant to the agriculture sector are described in Section 5.2 below.

5. Agriculture Priority Pressures and Strategy Categories

The agriculture sector faces many challenges to address the conservation and management of California’s natural and wildlife resources that include airborne pollutants, conversion of land use to urban or suburban development and/or crop-to-crop, and water supply (CDFW, 2015c; Ch. 2.5.2). As identified in SWAP 2015, pressures such as invasive plants/animals and livestock farming and ranching (e.g., crop production), could also positively or negatively affect the ecosystem (CDFW, 2015c; Ch. 2.5.2). Likewise, stresses related to each of these pressures such as changes in succession processes and ecosystem development, changes in sediment erosion-deposition regime, and habitat fragmentation can drive the need for conservation activities within this sector. Although key challenges exist, each can be seen as future opportunities and recommendations to support, improve, and enhance the implementation of SWAP 2015. Activities and strategies to address these pressures and stresses may include land acquisition and protection, research and data collection, and water use management.

During companion plan development meetings held in early 2015, the top pressures and strategies (described below in Section 5.1) were prioritized through ranking and voting by the development teams. The list drew upon efforts undertaken between 2013 and 2014 to identify province- and state-scale pressures and strategies for SWAP 2015 (CDFW, 2015c; Ch. 1.5). Through facilitated discussions, the development team prioritized pressures and strategies based on member knowledge and involvement in the sector. Below is a list of the prioritized pressures and strategies.



5.1 Priority Pressures

Invasive plants/animals – Introduction of invasive species can harm wildlife by disrupting and outcompeting native plant and animal communities for habitats and resources. This includes harmful plants and animals not originally found within the ecosystem(s) in question and directly or indirectly introduced and spread into native habitats by human activities. This includes Yellow Starthistle, Gypsy Moth, Asian Longhorn Beetle, Light Brown Apple Moth, *Arundo donax* (Giant Reed), and introduction of species for biocontrol.

Livestock farming and ranching – Agricultural practices can have a range of direct and indirect ecosystem impacts, both positive and negative, in horticulture, animal husbandry, and silviculture.

5.2 Priority Strategy Categories

Highlighted below are the top five strategy categories the development team prioritized in alphabetical order – **Data Collection and Analysis; Direct Management; Economic Incentives; Land Acquisition, Easement, and Lease;** and **Outreach and Education**. The information below is combined into a more comprehensive table shared in Section 6. *Collaboration Opportunities and Potential Resources by Strategy Category* (Table 3). The strategy category definitions described below include information from SWAP 2015 with additional insights gathered during the sector development team meetings (CDFW, 2015c; Ch. 4.2). The example strategies and conservation activities were prioritized by development team members early in the companion plan process.

Data Collection and Analysis – Data collection and analysis is the utilization of robust data and thorough analysis to facilitate more effective implementation of conservation strategies under other categories.

- Example strategies include: conducting research; collecting data on SGCN; and gathering and analyzing data on impacts of water management and water use on native species.
- Conservation activities include: long-term monitoring of weather and water quality; stream maintenance; and utilization of existing data collections.

Direct Management – Direct management is the participation in and implementation of activities that support stewardship of habitats and natural processes to maintain, enhance, and restore species population and ecological functions/conditions.

- Example strategies include: controlling and managing invasive species; enhancing habitat such as riparian buffers and pollinator habitat; and managing water use (e.g., drain water) through programs such as the Voluntary Local Program.
- Conservation activities include: restoring native grasslands; using water and fertilizer efficiently; monitoring groundwater levels using sensors to improve management; enhancing riparian habitat; and improving floodwater management for groundwater recharge.

Economic Incentives – Economic incentives are available and deployable resources for private landowners and other stakeholders to implement responsible stewardship and enhancement of landscapes, ecological conditions, and species.



- Example strategies include: developing and providing economic incentives and assurances and seeking funding through grants; cooperating with other agencies and other opportunities as sources for economic incentives; and streamlining costly permitting processes to encourage growers to complete work.
- Conservation activities include: rewarding programs for good stewardship; leveraging partner funds; reducing regulatory burdens for conservation activities; and engaging in cap-and-trade programs.

Land Acquisition, Easement, and Lease – Land acquisition, easement, and lease are types of transactions and agreements that help set aside or obtain land or water rights, which support conservation of the land, water, or habitat that species depend upon.

- Example strategies focus more on lease and easement and include: voluntary easements for grasslands and riparian areas; protecting land through water rights acquisitions; and preventing habitat fragmentation and valuing ecosystem services provided through protection of agricultural zoning in critical areas.
- Conservation activities include: land stewardship practices that reduce or sequester carbon while improving the ecosystem (e.g., weed suppression through flooding rather than burning provides waterfowl habitat along the Pacific Flyway); enhancing agriculture food production and ecosystem services; and engaging in partnerships that support easement and lease implementation.

Outreach and Education – Outreach and education is the involvement of social science to reach out to specific groups, communities, resource users, policymakers, stakeholders, and/or the public with information to improve awareness, knowledge, attitudes, and behaviors regarding natural resource conservation.

- Example strategies include: working with partners to promote water conservation measures to benefit wildlife and developing/implementing an outreach program (e.g., invasive species impacts).
- Conservation activities include: supporting outreach to Resource Conservation Districts (RCDs); undertaking outreach efforts for sustainable groundwater management; and utilizing online social media and press releases to provide outreach.

Text Box 5. Identified Pressures and Strategies for Future Consideration

SWAP 2015 describes the 29 major pressures (Table 1) on the State’s ecosystems (CDFW, 2015c; Ch. 2.5.2). The list below provides additional pressures and strategies the development team identified as important for this sector that should be considered during future SWAP updates. These pressures and strategies were not highlighted as top priorities for the agriculture sector under the main SWAP 2015.¹

Pressures

- Crop conversion of agricultural land (e.g., from agriculture to housing, monocultures) and loss of wildlife habitat
- Food safety and wildlife conflicts
- Habitat fragmentation and urban encroachment
- Pesticide use and environmental safety
- Sea level rise impacts to coastal farms (e.g., salt water intrusion)
- Water supply changes as a result of drought

Strategies

- Prevent fragmentation and focus on ecosystem services provided by critical agricultural real estate
- Sustain lands with working land values, ecosystem service values, and critical keystone properties
- Engage in multi-benefit projects that support sustainable agriculture, flood control, and habitat conservation (e.g., projects that protect and enhance environmental and cultural resources, and support economic growth)
- Enhance temporary or annual habitat on productive agricultural land
- Share specific actions from SWAP 2015 and companion plan with farmers through existing farmer educational platforms, such as regional University of California Cooperative Extension (UCCE) meetings and RCD and NRCS staff
- Develop system to assess risks and inform decision making for protection of low elevation coastal agricultural areas

¹Note: Some additional pressures identified by development teams may already be addressed in SWAP 2015.

6. Collaboration Opportunities for Joint Priorities

This section describes the potential alignment opportunities for SWAP 2015 with existing plans and strategies from other sector agencies and organizations that development team members have identified. Section 6.1 introduces the four categories that are used to organize such opportunities; they are based on jurisdiction and locality of plans and strategies. Following Section 6.1, collaboration opportunities and resources identified by each strategy category are shared in Table 3, *Collaboration*



Opportunities and Potential Resources by Strategy Category. For a more extensive list of plans, strategies, and documents identified through the companion plan development process, please see Appendix B.¹⁰ SWAP 2015 integration with other partners' programs is an integral part of balancing the needs of wildlife with the needs of society and is explored in SWAP 2015 (CDFW, 2015c; Ch. 7.1.2).

6.1 Alignment Opportunities by Jurisdiction and Locality

The section below describes four categories of locality and jurisdiction broadly where potential alignment opportunities typically fit: Federal, State, Regional and Multi-partner, and Non-governmental. These categories are based on jurisdiction and locality of the management and conservation efforts. Example opportunities for each category are also provided here.

Federal

Plans identified at this scale typically draw upon national guidance reflecting the goals and strategies of Federal agencies and organizations. For example, the USDA APHIS Wildlife Services has several types of conservation and management plans such as the *2011 Wildlife Services Research Needs Assessment* and the *Wildlife Services Strategic Plan 2013-17*. Although these plans guide Federal agency interventions, they also play a key role in how these agencies engage in partnership with states and other partners.

State

Plans identified at this scale reflect numerous State agency priorities, strategies, and conservation actions of California. These plans and strategies guide decision-making, resources allocation, and implementation priorities of the State agencies. Examples of key statewide plans and strategies include, but are not limited to, the joint strategy guidelines developed by the California Department of Conservation and Strategic Growth Council (SGC), *California Sustainable Agricultural Land Conservation Program Grant Guidelines & Request for Grant Applications*, as well as DWR's *Final California Water Plan Update 2013* and the California State Assembly Select Committee on Sea Level Rise and the California Economy's *Sea Level Rise: A Slow-Moving Emergency*, which highlights predicted impacts of sea level rise on coastal agricultural areas in the State.

Regional and Multi-partner

Numerous regional and multi-partner entities and plans help guide conservation efforts across the State at small to large regional scales. These plans, like those at the Federal and State scale describe strategies and activities that align with this companion plan and SWAP 2015. At a regional level, NCCPs and HCPs can be used to inform a wide array of conservation planning efforts. Many of the large-scale, multispecies HCPs and NCCPs are habitat-based plans that encourage future development to occur in already developed areas, while setting up a system of large contiguous protected lands based on a comprehensive landscape-level conservation strategy designed for the planning area. Planning at this scale provides regional protection for plants, animals, and their habitats, while allowing compatible and appropriate economic activity. In addition, many of the Joint Ventures and resource conservation RCDs based in California develop plans that describe regional conservation interventions such as the Central

¹⁰ This is not an exhaustive list of sector plans and strategies in alignment with SWAP 2015 goals.



Valley Joint Venture’s *Implementation Plan* and Alameda County Resource Conservation District’s *Managing Rangelands to Benefit California Red-Legged Frogs & California Tiger Salamanders*.

Non-governmental

Like the plans described above, private landowners and NGOs also play a key role in wildlife conservation and have plans that describe their desired future conservation outcomes and management priorities compatible with those of SWAP 2015. For example, TNC of California’s *Safe and Sustainable: Co-Managing for Food Safety and Ecological Health in California’s Central Coast Region* report, produced in collaboration with Georgetown University’s Produce Safety Department, highlights BMPs for farm food safety.

6.2 Collaboration Opportunities and Potential Resources by Strategy Category¹¹

For each prioritized strategy category described in Section 5 above, Table 3 below shares example conservation activities that are, will, or might be implemented in the next 5-10 years. These conservation activities are listed adjacent to example potential partners and financial resources that development team members identified. Although the table below shares examples of potential activities where partnerships could occur at different spatial scales (statewide, regional, and local/site-specific), other activities addressing priority strategies should be considered as this is not a comprehensive list.¹² Similarly, while the identified example conservation activities could apply across many spatial scales and jurisdictions, the current table highlights the most relevant scale of implementation. As described earlier in this document, Table 3 does not indicate a willingness and/or commitment on behalf of these organizations or entities to partner, fund, or provide support for the strategy implementation.

¹¹ Disclaimer: Please note this is not an exhaustive list of potential partners and financial resources. The organizations listed in Table 3 were identified through this companion plan process, but their identification here does not indicate agreement to partner and/or provide financial resources for the conservation activities.

¹² **Statewide** indicates actions occurring across the state. **Regional** indicates efforts that occur at a smaller than statewide scale and across more than one locality or site. **Local/Site-specific** indicates activities occurring at a specific location (e.g., city or park unit) or site (e.g., Morro Bay Estuary or Mojave Desert).



Table 3. Collaboration Opportunities and Potential Resources by Strategy Category

Example Conservation Activities	Example Potential Partners	Example Potential Financial Resources
Priority Strategy: Data Collection and Analysis		
<p>Statewide</p> <ul style="list-style-type: none"> • Create monitoring inventory tool so that CDFW may more effectively annually review required monitoring reports, especially for CDFW permitted conservation banks • Monitor CDFW conservation easements for compliance • Research comparative economic impacts of agriculture versus specific wildlife benefits in California to inform future SWAP updates • Utilize existing data collection efforts to create an integrated data management system <p>Regional</p> <ul style="list-style-type: none"> • Look at agricultural trends in context of more wildlife-friendly practices such as planting cover crops • Research food safety/ and effectiveness of current programs including impact on wildlife (e.g., practice effectiveness of wildlife control/exclusion and outcomes in food safety) • Understand the role of surrounding agricultural lands in supporting wildlife populations on protected lands <p>Local/Site-specific</p> <ul style="list-style-type: none"> • Better understand nutrient and irrigation efficiency for priority crops to develop BMPs to enhance wildlife (e.g., saving water for fish) • Collect and collate data about wildlife corridor use (e.g., roadkill, radio tracking, genetics) in and around agricultural areas to ascertain management and other protection measures to ensure or enhance such uses • Conduct long-term research and monitoring of weather and water quality with sustainable metrics • Conduct nutrient analysis on pollution inflows to enhance wildlife (e.g., monitoring water quality for fish) • Continue research into the role of wetlands in the methylation of mercury • Design monitoring tools that could be applied to all North American estuaries (e.g., water quality) • Develop methods to prevent damage to agriculture food production by wildlife, yet minimize impacts to target and non-target wildlife and ecosystems 	<p>Federal</p> <ul style="list-style-type: none"> • NRCS – Conservation Technical Assistance Program • USDA – National Wildlife Research Center (NWRC) <p>State</p> <ul style="list-style-type: none"> • Almond Board of CA • CDFW • DWR • Farmland Mapping and Monitoring Program <p>Local/County</p> <ul style="list-style-type: none"> • Elkhorn Slough National Estuarine Research Reserve (NERR) • UC Cooperative Extension (UCCE) • University of CA, Davis – Small Farm Program • Western Institute for Food Safety and Security <p>NGO/Foundation</p> <ul style="list-style-type: none"> • Audubon CA • Central Valley Joint Venture • Point Blue Conservation Science • Society for Range Management – CA Pacific Section • TNC 	<p>Federal</p> <ul style="list-style-type: none"> • Department of Homeland Security • NRCS • USDA Foundation for Food and Agriculture Research • USFWS <p>State</p> <ul style="list-style-type: none"> • Almond Board of CA • Department of Conservation • SGC

Example Conservation Activities	Example Potential Partners	Example Potential Financial Resources
<ul style="list-style-type: none"> • Evaluate and integrate into BMPs specific conservation objectives through experimentation and then sharing these BMPs through professional development workshops • Examine rice field benefits, including the economic and social benefits to shorebirds and other waterfowl during all seasons, including the critical summer migration period • Focus on adaptive management¹³ through spot surveys to enhance wildlife (e.g., soil health, ecosystem services) • Learn more about how treatment wetlands can improve poor water quality found in agricultural drainage • Monitor and work with farmers to research agricultural practices to maximize wildlife benefits • Remove invasive plants through stream maintenance programs • Research effects of poison bait used for agricultural pest control on wildlife • Research food safety – risk assessment of pathogen origin from wildlife on leafy greens • Research salt marsh loss and various abiotic and biotic components (e.g., fish, birds, marine mammals, and invertebrates) • Study impacts and benefits of livestock on restoring native grasslands • Work with NRCS or universities to ensure landowner protections and confidentiality when monitoring and where wildlife benefits are included 		
Priority Strategy: Direct Management		
<p>Statewide</p> <ul style="list-style-type: none"> • Enhance, support and fund the Voluntary Local Program for the protection of wildlife on working lands throughout the State <p>Regional</p> <ul style="list-style-type: none"> • Develop a flood plain set back strategy for the Salinas River system to provide wildlife habitat and decrease risk for adjacent farmers <p>Local/Site-specific</p> <ul style="list-style-type: none"> • Catch sediment and tailwater on site • Conduct controlled burns • Control invasive species 	<p>Federal</p> <ul style="list-style-type: none"> • NRCS – Conservation Technical Assistance Program • U.S. Bureau of Reclamation • USFWS <p>State</p> <ul style="list-style-type: none"> • Almond Board of CA • CA Association of Resource Conservation Districts • CA State Parks 	<p>Federal</p> <ul style="list-style-type: none"> • NRCS • Voluntary Local Programs <p>State</p> <ul style="list-style-type: none"> • Almond Board of CA • Other State funding programs (e.g., Proposition 1, CDFA, DWR)

¹³ Adaptive management is process to continually monitor and assess the environment as well as the effect and effectiveness of conservation strategies and to adjust the plan when improvement is needed to achieve the desired outcomes (CDFW, 2015c; Ch. 8).



Example Conservation Activities	Example Potential Partners	Example Potential Financial Resources
<ul style="list-style-type: none"> • Create secondary channels to improve flow and remove overcrowded vegetation from river channels • Develop buffers and protect/restore floodplain function • Enhance fish passage habitat • Foster voluntary conversion of nonproductive farm areas to wildlife habitat • Implement carbon sequestration practices for improvement in soil organic matter and wildlife benefits • Implement new and compatible integrated management activities with co-benefits (e.g., food production, ecosystem services, and wildlife) • Implement rice management techniques to benefit shorebirds and other waterfowl during all seasons, including the critical summer migration period • Improve habitat with farmers through cooperative agreements • Increase use of treatment wetlands to clean up agricultural drainage water. • Inform those with CDFW easements about their obligations • Manage dams and barriers for both agriculture food production and fish and wildlife resources • Plant vegetation that benefits pollinators • Restoration of salt marsh near coastal agricultural fields for carbon sequestration. • Utilize effective techniques (e.g., non-lethal tools) to exclude predators from cattle operations • Utilize vegetative buffer strips to reduce runoff 	<ul style="list-style-type: none"> • CDFW • DWR <p>Local/County</p> <ul style="list-style-type: none"> • Central Coast Rangeland Coalition • Elkhorn Slough NERR • RCDs <p>NGO/Foundation</p> <ul style="list-style-type: none"> • Audubon CA • Point Blue Conservation Science • TNC 	
Priority Strategy: Economic Incentives		
<p>Statewide</p> <ul style="list-style-type: none"> • Leverage funds with Federal funding in the Regional Conservation Partnership Program • Support programs that provide economic incentives for conservation plans with Farm Bill renewals • Utilize the NRCS Environmental Quality Incentives Program (EQIP) to fund pastureland and cropland • Incorporate knowledge of stock pond management for amphibians into NRCS incentive programs • Support agricultural land conservation planning grants to optimize and inform future local and state investments <p>Regional</p>	<p>Federal</p> <ul style="list-style-type: none"> • USDA NRCS – Agriculture Conservation Easement Program, Regional Conservation Partnership Program (RCPP), Conservation Technical Assistance Program, EQIP <p>State</p> <ul style="list-style-type: none"> • CA Department of Conservation • CDFA • CDFW <p>Local/County</p>	<p>Federal</p> <ul style="list-style-type: none"> • NRCS – RCPP, Agriculture Conservation Easement Program, Wetland Reserve Easements Program, Conservation Stewardship Program (CSP), EQIP, Farm Bill <p>State</p> <ul style="list-style-type: none"> • AB 32 cap and trade funding • CA Department of Conservation • CDFA State Water Efficiency Enhancement Program Grant



Example Conservation Activities	Example Potential Partners	Example Potential Financial Resources
<ul style="list-style-type: none"> • Work with District Attorney offices to increase application of fees collected for Public Resources Code violations to benefit wildlife <p>Local/Site-specific</p> <ul style="list-style-type: none"> • Conduct research on value of ecological services (and the economic value) to human activity (agriculture) • Find new market-based mechanisms, strategies and opportunities on how to best implement multiple benefit practices • Focus on avoiding, reducing, or sequestering carbon emissions with multi-benefit outcomes in land acquisitions and easements • Fund research on micro-irrigation and BMPs • Incentivize farmers to implement practices for wildlife friendly farming • Invest in improving water efficiency • Provide economic incentives for on-farm ecosystem services for carbon sequestration • Sell credits for carbon sequestration • Use regulatory flexibility for projects to benefit wildlife • Utilize cap and trade programs, especially to reduce tilling/type conversion of rangelands 	<ul style="list-style-type: none"> • Central Valley Habitat Exchange <p>NGO/Foundation</p> <ul style="list-style-type: none"> • TNC (e.g., BirdReturns Program) 	<ul style="list-style-type: none"> • Mitigation banks or funding opportunities
<p>Priority Strategy: Land Acquisition, Easement, and Lease</p>		
<p>Regional</p> <ul style="list-style-type: none"> • Expand agricultural easement programs <p>Local/Site-specific</p> <ul style="list-style-type: none"> • Promote easements and leases rather than acquisition, unless it is a targeted acquisition • Protect agricultural compatibility and wildlife type functions • Provide incentives to reduce steep slope farming practices in highly erodible soils 	<p>Federal</p> <ul style="list-style-type: none"> • NRCS – Conservation Technical Assistance Program • USFWS <p>State</p> <ul style="list-style-type: none"> • CA Department of Conservation • CA Public Utilities Commission (CPUC) • CA State Conservancies • CDFW • DWR • WCB <p>NGO/Foundation</p> <ul style="list-style-type: none"> • American Farmland Trust 	<p>Federal</p> <ul style="list-style-type: none"> • NRCS • USFWS <p>State</p> <ul style="list-style-type: none"> • CA cap and trade funding • CA Department of Conservation • CDFW • Mitigation banks or funding opportunities • State Conservancies • WCB
<p>Priority Strategy: Outreach and Education</p>		
<p>Statewide</p> <ul style="list-style-type: none"> • Inform food buyers, auditors, contractors, and farmers to practice co-management practices related to food safety under the Federal Food 	<p>Federal</p> <ul style="list-style-type: none"> • NRCS – Conservation Technical Assistance Program 	<p>Federal</p> <ul style="list-style-type: none"> • NRCS <p>State</p>



Example Conservation Activities	Example Potential Partners	Example Potential Financial Resources
<p>Safety Modernization Act (e.g., ensure buyers are setting standards that are aligned with State wildlife and water quality regulations)</p> <p>Regional</p> <ul style="list-style-type: none"> • Create programs in all counties to enhance wildlife education and outreach (e.g., AgKnowlege) • Engage community leaders in leadership programs (e.g., Monterey County AgKnowledge) • Support outreach to RCDs • Use social media and television to reach more of California’s public about the interactions between agriculture and wildlife benefits and challenges <p>Local/Site-specific</p> <ul style="list-style-type: none"> • Create an online newsletter that lists education and outreach opportunities • Distribute information to growers • Encourage farmers to engage in agricultural activities and voluntarily enhance and maintain habitat for wildlife (e.g., Voluntary Local Programs) • Encourage growers to use better advanced technology systems to increase sustainable practices • Promote water quality report cards and water quality workshops • Provide input to management plans • Provide outreach on conservation planning and practice implementation through social media and press releases • Recognize any positive impact farming and growing (and associated irrigation systems) have had on the natural landscape • Reward wildlife friendly farming practices with product labeling • Show proactive efforts on farm adaptive management though outreach methods (e.g., website) • Undertake outreach efforts on sustainable groundwater management to enhance wildlife resources • Work with Pesticide Applicators Permit system to improve understanding of wildlife impacts 	<ul style="list-style-type: none"> • USDA - NWRC <p>State</p> <ul style="list-style-type: none"> • Almond Board of CA • CA Department of Conservation • CA Farm Bureau Federation • CDFW Office of Training and Development and Office of Communication, Education and Outreach <p>Local/County</p> <ul style="list-style-type: none"> • Elkhorn Slough NERR • Monterey County AgKnowledge • RCDs <p>NGO/Foundation</p> <ul style="list-style-type: none"> • Audubon CA • Point Blue Conservation Science • TNC 	<ul style="list-style-type: none"> • CA Department of Conservation



6.3 Potential Financial Resources for Joint Implementation

The list below provides additional potential financial resources identified for implementing sector conservation activities addressed under SWAP 2015 and the companion plans. The list is similar to the third column of Table 3, but the funding could be applied to more than one strategy category considered under the sector discussion.

Development team participants suggested a range of potential funding sources; however, this information is intended to serve as a starting point for outreach and potential engagement and does not represent a comprehensive list of all potential funding sources.

Federal Funding Programs

- NRCS
 - Conservation Innovation Grants (CIG)
 - CSP
 - EQIP
 - RCPP

State Funding Programs

- CDFA State Water Efficiency and Enhancement Program
- Department of Conservation
 - Planning strategy grants
 - Agricultural easement related programs
 - On-farm carbon sequestration, ecosystem services, and wildlife co-benefit incentives and technical assistance
 - Watershed grants program

7. Evaluating Future Collaboration Efforts

Implementation of SWAP and its nine companion plans is a complex undertaking. The first section below describes the desired outcomes and outputs of the agriculture companion plan implementation identified through the development team discussions. A desired outcome is an improved (and intended) future state of a conservation factor due to implementation of actions or strategies (CDFW, 2015c; Ch. 11). Through the companion plan process, the management team defined a desired output as a deliverable that can be measured by the activities and processes that will contribute to accomplishing the desired outcomes and goals. The list of desired outcomes and outputs in the sub-section below is followed by a high-level description emphasizing the importance of adaptive management to SWAP 2015 and the companion plans, and how their implementation effectiveness would be evaluated by applying the adaptive process addressed under the main document.

7.1 Desired Outcomes and Outputs

Participants were asked what the sector's top desired outcomes and outputs are in the next 5-10 years, based on the development team discussions, their knowledge of the sector, and within the context of



SWAP 2015. The identified outcomes and outputs for each strategy category, not listed in order of priority, are provided below.

Data Collection and Analysis

- Demonstrated improvements in areas such as water quality, regional scaling implementation, and food safety, resulting from research into and implementation of BMPs.
- Reduced impacts of rodent control and pesticide treatment on wildlife populations achieved through targeted application of BMPs and new enhancements in pesticide development.
- Greater understanding of pathogen origins (e.g., wildlife or domestic) achieved through risk assessments.
- Monitoring implemented to assess effectiveness of pre- and post-invasive species management implementation.
- Monitoring protocol developed to assess the implementation of activities that address SWAP goals and status of implementation reported.

Direct Management

- Wildlife values on agricultural lands enhanced to achieve co-benefits (e.g., efforts implemented that enhance value of working agricultural lands such as the California Citrus State Historic Park, Martial Cottle State Park in Santa Clara Valley, and Colonel Allensworth State Park).

Economic Incentives

- Economic incentives developed that recognize and integrate wildlife benefits from agriculture practices (e.g., stock pond management to provide water for livestock and habitat for red-legged frog).
- Increased actions by local landowners to conserve and protect wildlife habitat (e.g., through Voluntary Local Program).
- Streamlining permitting processes that result in habitat enhancement or restoration.

Land Acquisition, Easement, and Lease

- Enhanced identification and implementation of effective conservation metrics in land acquisition, easement, and lease by incorporating climate change considerations in selection of land (e.g., rank land that has low elevation and likely susceptible to impacts of sea level rise lower than lands that will have reduced impacts from climate change related impacts).

Outreach and Education

- Effective and tested BMPs addressing agricultural stressors shared with the agricultural sector through workshops and technical assistance support.
- Agricultural sector informed and engaged in achieving multiple climate and carbon sequestration benefits through conserving agriculture land.

7.2 Evaluating Implementation Efforts

SWAP 2015 sets a stage for adaptive management, including implementation evaluation, by developing the plan based on the Open Standards for the Practices of Conservation (CDFW, 2015c; Ch. 1.5.4). SWAP



2015 implementation will be monitored over time in concert with other conservation activities conducted by CDFW and its partners. SWAP 2015 recognizes three types of monitoring (CDFW, 2015c; Ch. 8.3):

1. Status monitoring, which tracks conditions of species, ecosystems, and other conservation factors (including negative impacts to ecosystems) through time
2. Effectiveness monitoring, which determines if conservation strategies are having their intended results and identifies ways to improve actions that are less effective (i.e., adaptive management)
3. Effect monitoring, which addresses if and how the target conditions are being influenced by strategy implementation

Monitoring the SWAP and companion plan implementation and evaluating the monitoring results are critical steps for CDFW and partners to demonstrate and account for the overall progress and success achieved by SWAP 2015. By incorporating lessons learned through monitoring and evaluation into future actions, CDFW and its partners have opportunities to improve performance on coordination and collaboration and to adapt emerging needs that were not considered during the time of the plan development into future actions. Similarly, monitoring and the evaluation results could help inform stakeholders, including decision-makers, partners, and funders, about the status of the plan implementation, as well as where to best deploy resources to achieve desired outcomes and outputs effectively.

SWAP 2015 developed performance measures for each strategy category (CDFW, 2015c; Ch. 8.3). These measures are critical in helping guide the Department and partners in assessing the effects and effectiveness of SWAP 2015 and the companion plans, as well as the level of the companion plan's contribution to the conservation of California's ecosystem.

8. Next Steps

During the third and final companion plan development team meeting, participants were asked to identify key next steps to ensure successful implementation of the companion plan, ideally within the next one to five years. The feedback fell into four categories, which were used to organize the information: Partnership and Collaboration; Human and Financial Resources; Communication and Outreach; and Monitoring and Evaluation. Suggestions outside of these categories are listed under "Additional Next Steps." Participants also recognized the importance of pilot projects that help communicate the values of collaborative conservation approaches.

Partnership and Collaboration

- Build upon the CBC and SGC efforts focused on large-scale planning/integrated regional planning for resource management (e.g., DRECP and high speed rail planning) and build upon and/or engage in partner activities.
- Bolster collaboration between government and non-governmental/private sector partners to implement conservation activities and achieve conservation goals and outcomes including groups such as the WCB and the Association of RCDs.



- Improve consistency with the application of exemptions and encourage better cooperation with the California Environmental Quality Act process.
- Work with the California Farm Bureau Federation to improve effective communication and collaboration between the agriculture industry, government agencies, and NGOs.

Human and Financial Resources:

- Work with partners to include SWAP 2015 and companion plan priorities in funding opportunities and as part of project evaluation.

Communications and Outreach:

- Design improved mechanisms for sharing information with agriculture partners and industry organizations (e.g., coordinate efforts with groups such as the NRCS, UCCE, and RCDs to share information with agriculture partners and industry organizations).
- Work with a communications group to identify target audiences, develop audience-specific messaging, and create a strategy to share information with each audience.
- Work with and educate community leaders about SWAP 2015 and this companion plan to identify opportunities for collaboration and incorporate companion plan information in meetings or trainings with farmers (e.g., continuing education credit courses for certified crop advisors).
- Seek opportunities to educate agriculture partners on BMPs and success stories of wildlife-friendly practices (e.g., Ag Knowledge, Focus Agriculture).
- Develop a scorecard or dashboard to share progress on activities and the companion plan visually when implementing monitoring and evaluation efforts.
- Provide information verbally rather than via paper documentation.

Monitoring and Evaluation:

- Develop monitoring and evaluation approaches and protocol to assess successful implementation of companion plan.

Additional Next Steps

- Have professional groups review the companion plan and provide additional input to bolster the plan and help develop work plans moving forward.

9. Closing

This companion plan was developed in collaboration with many partners who deserve special recognition for their time and commitment (please see Appendix D for a list of development team members). As an initial step towards building a collaborative approach for implementation of SWAP 2015 and the nine sector-focused companion plans, CDFW will develop a work plan that describes actions to implement the plans and address the next steps identified.



Appendices

Appendix A: List of Potential Partners and Coordination Bodies

Disclaimer: Please note this is not an exhaustive list of potential partners. The organizations listed in here were identified through this companion plan process, but their identification here does not indicate agreement to partner and/or provide financial resources for the conservation activities. Furthermore, the strategy categories checked off for each organization were completed to the best knowledge of the development team members; some organizations' efforts were unknown (blank cells).

Potential Partners/Coordination Bodies	Data Collection and Analysis	Direct Management	Economic Incentives	Land Acquisition, Easement, and Lease	Outreach and Education
Almond Board of CA	✓	✓			✓
American Farmland Trust				✓	
Audubon CA	✓	✓	✓		✓
CA Agricultural Commissioners					
CA Association of Resource Conservation Districts (RCDs)		✓			✓
CA Biodiversity Council	✓				✓
CA Climate and Agriculture Network					
CA County Agricultural Commissioners					
CA Department of Conservation	✓		✓	✓	✓
CA Department of Fish and Wildlife (CDFW)	✓	✓	✓	✓	✓
CA Department of Water Resources (DWR)	✓	✓	✓	✓	✓
CA Dept. of Food & Agriculture (CDFA) <ul style="list-style-type: none"> • Healthy Soils Initiative 			✓		
CA Farm Bureau Federation					✓
CA Public Utilities Commission (CPUC)				✓	
CA Rangeland Trust					
CA State Conservancies				✓	
CA State Parks		✓			✓
Central Coast Rangeland Coalition		✓			✓
Central Valley Flood Protection Board					
Central Valley Habitat Exchange			✓		
Central Valley Joint Venture	✓	✓			✓
Central Valley Migratory Bird Partnership	✓				
Desert Managers Group					
Elkhorn Slough National Estuarine Research Reserve (NERR)	✓	✓			✓
Farmland Mapping and Monitoring Program	✓				
Landscape Conservation Cooperatives (LCC) <ul style="list-style-type: none"> • California 					

Potential Partners/Coordination Bodies	Data Collection and Analysis	Direct Management	Economic Incentives	Land Acquisition, Easement, and Lease	Outreach and Education
<ul style="list-style-type: none"> • Desert • Northern 					
Monterey County AgKnowledge					✓
National Parks Service					
Natural Resources Conservation Service (NRCS) <ul style="list-style-type: none"> • Agricultural Land Easements • Agriculture Conservation Easement Program • Conservation Technical Assistance Program • Environmental Quality Incentives Program (EQIP) • Regional Conservation Partnership Program • Wetland Reserve Easements 	✓	✓	✓	✓	✓
Pacific Fisheries Management Council					
Point Blue Conservation Science	✓	✓	✓		✓
Rural-Urban Connections Strategy (RUCS) - Federal and State EPA					
Sacramento Area Council of Governments					
Sacramento Cultural and Urban Conservation Strategy					
Society for Range Management – CA Pacific Section	✓				
Sonoma County Agricultural and Open Space Preservation District (SCAPOSD)					
State Water Resources Control Board (SWRCB)					
The Nature Conservancy (TNC)	✓	✓	✓	✓	✓
University of CA Cooperative Extension (UCCE)	✓				
University of CA, Davis <ul style="list-style-type: none"> • Food Safety Program • Rangeland Management Program • Small Farm Program 	✓				✓
U.S. Bureau of Land Management (BLM)					
U.S. Bureau of Reclamation		✓			
U.S. Department of Agriculture (USDA) <ul style="list-style-type: none"> • Animal and Plant Health Inspection Service (APHIS) • Farm Bill 	✓		✓		✓

Potential Partners/Coordination Bodies	Data Collection and Analysis	Direct Management	Economic Incentives	Land Acquisition, Easement, and Lease	Outreach and Education
<ul style="list-style-type: none"> National Wildlife Research Center (NWRC) (See also NRCS above) 					
U.S. Department of Defense (DOD)					
U.S. Fish & Wildlife Service (USFWS)		✓		✓	
U.S. Forest Service (USFS)					
Vertebrate Pest Council					
Western Association of Fish and Wildlife Agencies	✓		✓		✓
Western Governors Association	✓		✓		✓
Western Institute for Food Safety and Security	✓				
Western Regional Partnership					
Wildlife Conservation Board (WCB)				✓	



Appendix B: Plans, Strategies, and Documents Identified by the Development Team

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Appendix C: CDFW Companion Plan Management Team

Name	Title
Armand Gonzales	SWAP 2015 Project Lead
Junko Hoshi	SWAP 2015 Assistant Project Lead
Kurt Malchow	SWAP 2015 Companion Plan Development Lead



Appendix D: Agriculture Companion Plan Development Team Members and Affiliations

Affiliation	Participant
Audubon California	Meghan Hertel
California Almond Board	Gabriele Ludwig
California Cattlemen’s Association	Kirk Wilbur
California Department of Conservation	Bruce Gwynne
California Department of Fish and Wildlife	Dave Feliz Tim Hermansen
California Department of Food and Agriculture	Amrith Gunasekara Laura Petro
California Department of Water Resources	Katherine Spanos Michael Perrone
California Rice Commission	Paul Buttner
California Farm Bureau Federation	Noelle Cremers
Rio Farms	Jocelyn Bridson
U.S. Department of Agriculture - Natural Resources Conservation Service	Luana Kiger Tom Hedt Thomas Moore
U.S. Department of Agriculture - National Wildlife Research Center	Larry Clark
U.S. Fish and Wildlife Service	Greg Yarris



Appendix E: Glossary

Most terms in this section originate from the glossary in the Conservation Measures Partnership’s Open Standards for the Practice of Conservation (Version 2.0). These definitions are based on current usage by many Conservation Measures Partnership members, other conservation organizations, and planners in other disciplines. Some terms have been added or refined to clarify how CDFW uses them.

activity: a task needed to implement a strategy, and to achieve the objectives and the desirable outcomes of the strategy.

biodiversity: the full array of living things.

conservation: the use of natural resources in ways such that they may remain viable for future generations. Compare with preservation.

distribution: the pattern of occurrences for a species or habitat throughout the state; generally more precise than range.

driver: a synonym for factor.

ecosystem function: the operational role of ecosystem components, structure, and processes.

ecosystem health: the degree to which a biological community and its nonliving environmental surroundings function within a normal range of variability; the capacity to maintain ecosystems structures, functions, and capabilities to provide for human need.

ecosystem processes: the flow or cycling of energy, materials, and nutrients through space and time.

ecosystem: a natural unit defined by both its living and non-living components; a balanced system for the exchange of nutrients and energy. Compare with habitat.

fragmentation: the process by which a contiguous land cover, vegetative community, or habitat is broken into smaller patches within a mosaic of other forms of land use/land cover; e.g., islands of an older forest age class immersed within areas of younger-aged forest, or patches of oak woodlands surrounded by housing development.

goal: a formal statement detailing a desired outcome of a conservation project, such as a desired future status of a target. The scope of a goal is to improve or maintain key ecological attributes. A good goal meets the criteria of being linked to targets, impact oriented, measurable, time limited, and specific.

habitat: where a given plant or animal species meets its requirements for food, cover, and water in both space and time. May or may not coincide with a single macrogroup, i.e., vegetated condition or aquatic condition. Compare with ecosystem.

impact: the desired future state of a conservation target. A goal is a formal statement of the desired impact.



landscape: the traits, patterns, and structure of a specific geographic area, including its biological composition, its physical environment, and its anthropogenic or social patterns. An area where interacting ecosystems are grouped and repeated in similar form.

monitoring: the periodic collection and evaluation of data relative to stated project goals and objectives. Many people often also refer to this process as monitoring and evaluation (abbreviated M&E).

native: naturally occurring in a specified geographic region.

outcome: an improved (and intended) future state of a conservation factor due to implementation of actions or strategies. An objective is a formal statement of the desired outcome.

output: a deliverable that can be measured by the activities and processes that will contribute to accomplishing the desired outcomes and goals.

population: the number of individuals of a particular taxon in a defined area.

preservation: generally, the nonuse of natural resources. Compare with conservation.

pressure: an anthropogenic (human-induced) or natural driver that could result in impacts to the target by changing the ecological conditions. Pressures can be positive or negative depending on intensity, timing, and duration. See also direct pressure and indirect pressure.

private land: lands not publicly owned, including private conservancy lands.

program: a group of projects which together aim to achieve a common broad vision. In the interest of simplicity, this document uses the term “project” to represent both projects and programs since these standards of practice are designed to apply equally well to both.

project: a set of actions undertaken by a defined group of practitioners – including managers, researchers, community members, or other stakeholders – to achieve defined goals and objectives. The basic unit of conservation work. Compare with program.

public: lands owned by local, state, or federal government or special districts.

rangelands: any expanse of land not fertilized, cultivated, or irrigated that is suitable and predominately used for grazing domestic livestock and wildlife

richness: a measure of diversity; the total number of plant taxa, animal species, or vegetation types in a given area.

riparian: relating to rivers or streams.

Species of Greatest Conservation Need (SGCN): all state and federally listed and candidate species, species for which there is a conservation concern, or species identified as being highly vulnerable to climate change.



stakeholder: any individual, group, or institution that has a vested interest in the natural resources of the project area and/or that potentially will be affected by project activities and have something to gain or lose if conditions change or stay the same. Stakeholders are all those who need to be considered in achieving project goals and whose participation and support are crucial to its success.

strategy: a group of actions with a common focus that work together to reduce pressures, capitalize on opportunities, or restore natural systems. A set of strategies identified under a project is intended, as a whole, to achieve goals, objectives, and other key results addressed under the project.

stress: a degraded ecological condition of a target that resulted directly or indirectly from pressures defined above (e.g., habitat fragmentation).

wetland: a general term referring to the transitional zone between aquatic and upland areas. Some wetlands are flooded or saturated only during certain seasons of the year. Vernal pools are one example of a seasonal wetland.

wildlife: all species of free-ranging animals, including but not limited to mammals, birds, fishes, reptiles, amphibians, and invertebrates.



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