

CALIFORNIA
CENTRAL
COAST
JOINT
VENTURE

IMPLEMENTATION PLAN



IMPLEMENTATION PLAN

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Cover Photo by Dave Keeling

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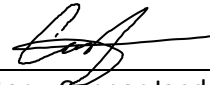
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I. MANAGEMENT BOARD ENDORSEMENT

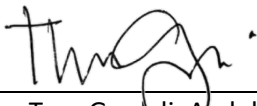
The Management Board of the California Central Coast Joint Venture (C3JV) adopts this Implementation Plan under USFWS Policy 721 FW 6.5 C: "An Implementation plan which the management board develops or adopts, guides joint venture conservation actions. The management board identifies the biological planning, conservation implementation and evaluation process that will guide the work of the joint venture." This Plan provides the C3JV partnership guidance for developing the knowledge, initiatives, strategies and projects to address bird conservation on the Central Coast of California and incorporates direction found in the continental plans of the four major North American Bird Conservation Partnerships, the California State Wildlife Action Plan and other regional planning efforts.

Shawn D. Milar

Board Chair – Shawn Milar, WSFR Grants Management Specialist,
US Fish and Wildlife Service



Coordinator – Connor Jandreau, C3JV Staff



Vice Chair – Tom Gardali, Audubon Canyon Ranch

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CHRISTOPHER BARR

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Chris Barr, USFWS Refuges




Secretary – Laura Riege, The Nature Conservancy



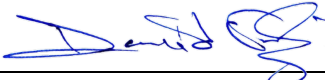
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Teresa Romero, Environmental Office of the Santa
Ynez Band of Chumash Indians

Kelly Sorenson

Kelly Sorenson, Ventana Wildlife Society

Bill Standley

William (Bill) Standley, Bureau of Land Management



Andrew Johnson, Defenders of Wildlife



David Younkman, American Bird Conservancy,
Retired



II. EXECUTIVE SUMMARY

California's Central Coast boasts superlative ecological diversity, ranging from old-growth coniferous forests, diverse oak woodlands and rich coastal prairies, to maritime chaparral mosaics, lush riparian bosque, rare and dynamic dune ecosystems, and iconic bays and estuaries. Offshore, the California Current supplies nutrient-rich waters to some of the world's most productive marine ecosystems. The rich complexion of soil regimes, geophysical variation and climatic factors, combined with millennia of human land uses, have resulted in this complexity of natural communities, high biodiversity and recurrent endemism.

The California Central Coast Joint Venture (C3JV) Implementation Plan is the first step in provisioning a socio-ecological foundation for the activities of the C3JV and its partners. The Plan identifies habitat and human wellbeing goals, priority avian species and conservation strategies that will guide the C3JV staff, Board and committees in our approach to *all bird* and habitat conservation. It also provides a [blueprint](#) for solidifying the Joint Venture as an informed, adaptive, inclusive, and effective partnership as we address the many factors driving species declines and the increasingly frayed connections between society and the biodiversity and ecosystems we depend upon. Ultimately, this Plan highlights the need to fill a void in Joint Venture coordination and the resources necessary to advance conservation activities for birds, other wildlife and the people of the Central Coast.

The C3JV planning geography encompasses both terrestrial and marine biomes, including a portion of the nearshore and pelagic waters of the Eastern Pacific off California's coast, and terrestrially, all or portions of San Mateo, Santa Cruz, San Benito, Santa Clara, Monterey, San Luis Obispo, Santa Barbara and Ventura counties. Prime agricultural lands dominate the bottomlands of many watersheds, and upper watersheds are in rugged national forest lands. The area ranges climatically from the extremely wet Santa Cruz Mountains to the very arid Carrizo Plain. Important marine resources have been afforded protection through the National Marine Sanctuary and National Estuary Programs.

With some of the highest [ecoregional variation](#) in the United States, and over 500 bird species recorded in the C3JV, conservation design will address this diversity at multiple scales as appropriate to the habitat and priority species. The C3JV is divided into six socio-ecological systems, each composed of unique habitats, birds, and conservation concerns. Each system, or target, is discussed separately as a [sub-chapter](#) of this Plan. Focal bird species are identified, including those listed as Conservation Concern at state or national levels, C3JV Stewardship Responsibility (i.e., species for which the region represents a significant portion of a species' national population), as well as those that offer important indicators for key ecological or cultural processes. In addition, the Plan calls for future research, monitoring and conservation planning needs to aid in the prioritization of geographic focal areas, species, and continually adaptive conservation strategies. The goals, objectives, and metrics for measuring the efficacy of program delivery will necessarily adapt and change as we learn more about the conservation and wellbeing needs of the central coast.

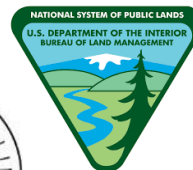
Numerous pressures act on the Central Coast's socio-ecological systems and intersect with rapidly changing climatic conditions, including a growing population with an increased demand for water, housing and infrastructure; vibrant, nationally renowned and busy commercial and recreation ports and coastal economies; emerging onshore and offshore renewable energy development; a growing viticulture industry and associated land uses; active military and space missions; and nationally significant agricultural operations. These pressures and vulnerabilities require greater attention, coordination, resources and collaboration across a suite of sectors, agencies, industries and communities to protect the region's socio-ecological integrity. The C3JV is eager to be part of that effort.

III. ACKNOWLEDGMENTS

On behalf of the California Central Coast Joint Venture Management Board, we extend our appreciation to those who provided valuable time and expertise in support of the launch of the Joint Venture and the preparation of this Plan. A special thanks goes to the Implementation Plan Task Force, including Andrew Bridges, David Younkman, Hannah Nevins, Linnea Hall, Tim Bean, Tom Gardali, Kyra Golike and Shawn Milar for their commitment and guidance in building the foundation for our approach, in addition to the valuable contributions to the content and strengthening of the plan. We Thank the current and past C3JV Management Board members, including those already named, as well as Dave Feliz, Trish Chapman, Teresa Romero, Clint Francis, Chris Barr, Blanca Alverez Stransky, Devin Best, Jen Davis, Kelly Sorenson, Laura Riege, Bill Standley and Scott McFarlin, for their steadfast guidance, support, confidence and contributions during the development of this document and the early governance of the Joint Venture. Insights and contributions from collaborators, advisors and plan reviewers, including Andrea Jones, Andy Johnson, Ashley McConnell, Blake Barbaree, Bob Ford, Cara Joos, Dave Gordon, Dan Robinette, Daniel Karp, Elissa Olimpi, Ellen Sanders-Raigosa, Greg Smith, Jennifer Moonjian, Jesse Beck, Josh Adams, Junko Hoshi, Justyn Foth, Kevin O'Connor, Laird Henkel, Lindsey Adrean, Matt Timmer, Naamal De Silva, Neil Clipperton, River Gates, Ross Clark, Ryan Carle, Samantha Marcum, Sara Evans-Peters, external reviewers from Partners in Flight, the Pacific Flyway Council, the North American Waterfowl

Management Plan (NAWMP) Science Support Team, the U.S. Shorebird Conservation Plan Partnership and the Service's 3 Billion Bird Shorebird Team, as well as DBHC staff and others whom I may have mistakenly omitted, all of whom strengthened the content of the document and its relevance to existing conservation efforts. We thank the Joint Venture community, and in particular Jennie Duberstein, Adam Hannuksela, Aimee Roberson, Todd Fearer, Jane Fitzgerald, Monica Iglecia, Jim Cogswell, Greg Yarris, Dave Smith and Sandra Scoggin, for guidance and steadfast support to this Joint Venture and its greenhorn coordinator. A particular thanks is merited for those who have envisioned the C3JV concept from the start, including Renee Spence, Mary Root and the late David Pashley, and to Jenny Marek and the Ventura Office of the Fish and Wildlife Service for the behind-the-scenes championship. An additional nod must go to Shawn Milar, who has shown the utmost tenacity and steadfast commitment to the flourishing of the C3JV from its earliest beginnings and has continued as a voice of leadership, confidence and encouragement throughout. A special thanks to photographers Dave Keeling and Jim Dougherty, who generously donated valuable time and an extensive catalog of artistry to the C3JV. Finally, we thank the American Bird Conservancy, the United States Fish and Wildlife Service, the Bureau of Land Management, the California Polytechnic State University, the Department of Defense's Legacy Resource Management Program, the Land Trust of Santa Cruz County, the Big Sur Land Trust and the Network for Landscape Conservation for the financial commitment that enabled our launch as a new partnership on the Central Coast.

Connor Jandreau and the C3JV Implementation Task Force



UPPER SALINAS-LAS TABLAS
RESOURCE
CONSERVATION DISTRICT



CAL POLY



Point Blue
Conservation
Science

California's Central Coast is an abundant place, flush with biodiversity and vibrant human communities. Over millennia, this richness was cultivated in part by the human hand, producing a dazzling array of heterogeneity and vegetative texture, sown by intention and facilitated by the stability of climatic conditions. And yet, the threads weaving this tapestry have loosened their stitch. With the erasure of thousands of Indigenous people, be it through callous indifference or outright genocide, vast knowledge and cultural wealth have been lost on the Central Coast. The cascading effects from this loss remain stained on a landscape seeking revitalization and renewed leadership from voices silenced in the past.

Indigenous ways of knowing have long spoken of the critical importance of a healthy human-land pathway, a reciprocal relationship of respect, rejuvenation and reverence (Cajete 1994). As we partake in the recordation of our Earth's sixth mass extinction event and our society grapples with its painful history of violent occupation and injustice, attention to these relationships is long overdue. As an emerging landscape-based partnership of people, the California Central Coast Joint Venture will embark on a journey of conservation that is reflective, inclusive, reciprocal and restorative.

What are known today as San Mateo, San Benito, Santa Clara, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara and Ventura Counties remain the ancestral homelands of Indigenous Chumash, Salinan, Esselen, Ohlone, Costanoan, Rumsen, Mutsun, Yokut and Tataviam Nations, Tribes, Bands and Communities. These Original Stewards continue a generational commitment to the lands and waters of the Central Coast. For those of us who are guests, we recognize our work and our lives take place within the unceded, sacred homelands of these First Stewards, who have inhabited the Central Coast for thousands of years.

While political and social systems and structures continue to sever Indigenous people from their homelands, the land and seascapes of the Central Coast suffer from this disconnection. And yet, through sheer and steadfast resilience, Indigenous stewards continue to thrive along with stories and knowledge re-awakening in our midst. Within this context, the C3JV is intent on 1) embracing, as opposed to incorporating, and protecting Indigenous and Traditional Knowledge Systems; 2) cultivating a culturally intelligent space in pursuit of environmental and social justice; 3) empowering Indigenous land stewards to be leaders in conservation and building partnerships to guide our work; and 4) championing efforts that strengthen the sovereignty and self-determination of California's Indigenous people and communities. In short, the C3JV represents a regional conservation partnership that will strive, with humility, to become an *inter-national* partnership on California's Central Coast.

1. SETTING AND CONSERVATION NEED

1.1 INTRODUCTION

Though bookended by the population-dense and urbanized San Francisco Bay Area and the Los Angeles Basin, the Central Coast is a region largely characterized by small population centers, pockets of concentrated agriculture, expansive rangelands, relic old-growth forests and a significant conservation legacy. In fact, over 45% of the Central Coast coastline has some measure of conservation status, the most protected extent along the entire California coastline (Morris et al. 2018). The area is dominated by a mild, summer-dry Mediterranean climate and includes the agriculturally developed Salinas and Pajaro Valleys, considered some of the most fertile and economically productive land in the world (Fellows 2009). Just offshore, extremely deep waters in the Monterey submarine canyon, regionally significant sea mounts and a sharp continental shelf coordinate with the [California Current](#) to produce nutrient-rich upwelling areas forming the foundation of the region's highly productive marine ecosystems.

The approximately 7.2-million-acre terrestrial planning region of the C3JV (Figure 1.2) exhibits a high degree of habitat diversity relative to its size, driven partially by large latitudinal and elevational differences. Spanning the temperate latitudes from south San Mateo County near Pescadero Marsh to Carpentaria Marsh along Santa Barbara's south coast, terrestrial elevations exceed 2,600 meters, and nearshore marine depths surpass 3,000 meters below sea level. From the rugged slopes

of California's Coastal Ranges to sweeping interior valleys, the Central Coast is a patchwork of coniferous and old-growth forests, oak woodlands and mixed hardwoods, coastal prairie and flower fields, and chaparral and coastal scrub, all stitched together by valley and montane riparian corridors, creeks, rivers and estuaries. It should come as no surprise that the region's avian diversity, enhanced by its centrality along the [Pacific Flyway](#), reflects this habitat richness (See Figure 1.1). With wintering, breeding, migratory and resident populations of waterfowl, shorebirds, seabirds and landbirds, the Central Coast regularly supports over 350 bird species, though species diversity exceeds [500](#) when visitors are included. The Central Coast also provides core habitat for a number of endemic species, including the Yellow-billed Magpie and [Tricolored Blackbird](#), both of significant conservation concern and part of the C3JV's national stewardship responsibility. What's more, the Central Coast hosts one of the most important and well-known recovery stories in the history of conservation; the steady, though fragile, return of the [California Condor](#). With its diversity of ecosystems, habitats and species and the pressures associated with diverse land uses, historical and ongoing habitat impacts, and the growing uncertainty and instability introduced by climate change, the Central Coast is ripe with needs and opportunities for protection, restoration and stewardship for birds and communities.

Bixby Bridge
Big Sur, CA

Figure 1.1a

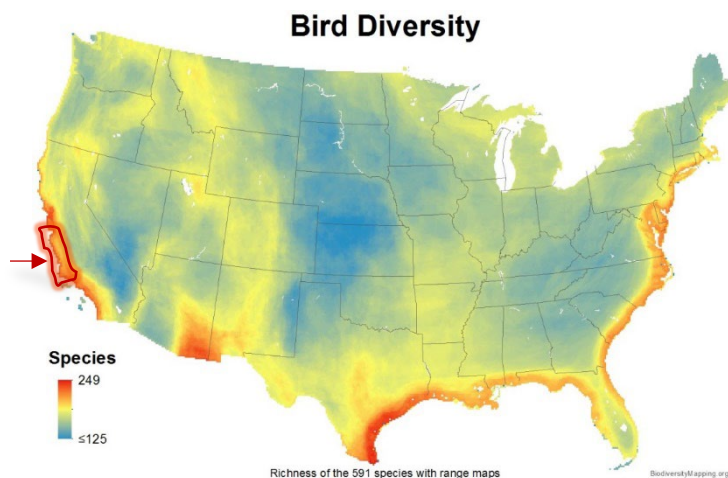


Figure 1.1b

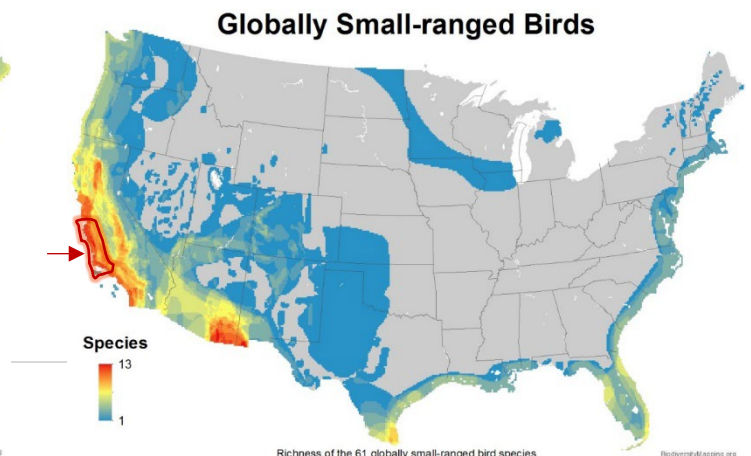


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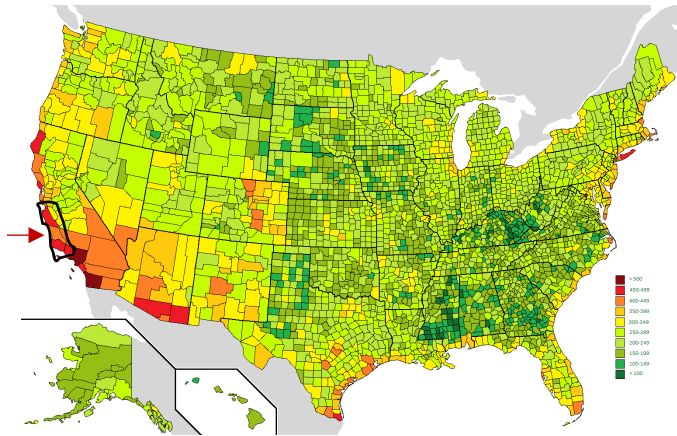


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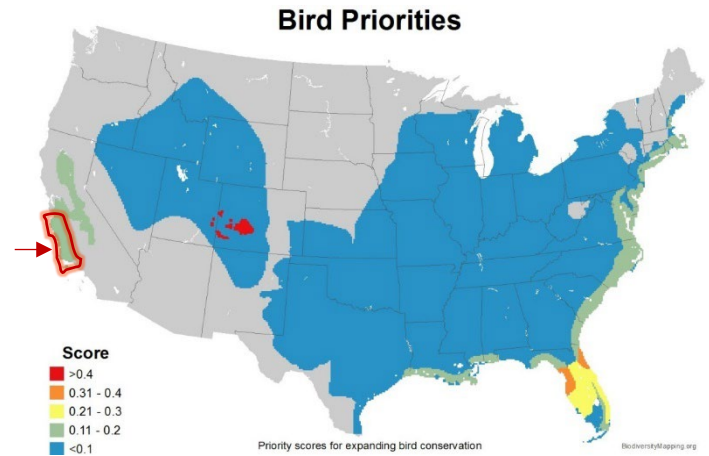


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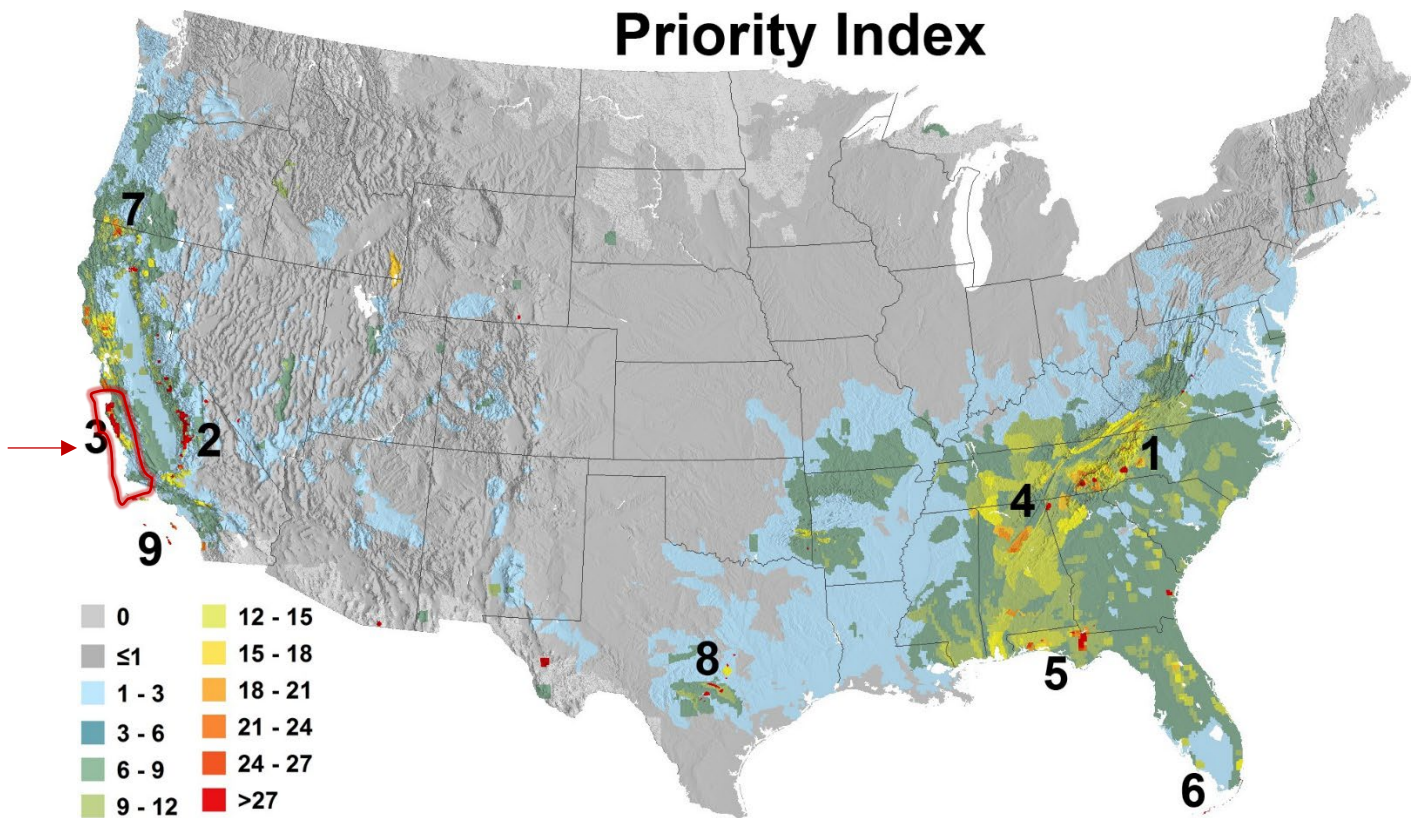


Figure 1.1: The maps above highlight the importance of the Central Coast for bird species richness, endemism and conservation need, in accordance with an analysis by Jenkins et al. (2015). Figure 1.1.a shows overall bird species diversity in the United States. Figure 1.1.b shows bird species with small global ranges. Figure 1.1.c, ranks US counties by the number of species as measured by eBird records (Boone 2018). Figure 1.1.d ranks areas of the United States with insufficient conservation attention for birds. The Priority Index Map, Figure 1.1.e, illustrates high-priority regions for expansion of conservation in the United States to protect the nation’s unique endemism, based on a diverse taxonomic analysis that includes a composite index of amphibians, mammals, birds, freshwater fish, reptiles and trees. Priority Index 3, which encompasses California Coast Ranges, falls squarely within the C3JV geography and showcases the area’s importance not just for birds but also for other endemics, including trees, amphibians and mammals. Map Source: www.BiodiversityMapping.org, with acknowledgment of BirdLife International, International Union for the Conservation of Nature (IUCN), NatureServe and United States Geological Survey (USGS).

1.2 SOCIO-ECOLOGICAL INTERSECTION

While the biophysical attributes inherent to a maritime, Mediterranean and topologically diverse region have in part driven the biological richness of the Central Coast, this heterogeneous landscape has also coevolved with the imprint of humanity over millennia in association with Indigenous land practices in part facilitating abundant wildlife and plant richness (Anderson 2005). Disturbance by fire, hunting pressure, harvest and seed dispersal, the landscapes have long been coaxed and, in many ways, cultivated by human resource stewardship over thousands of years (Blackburn and Anderson 1993). The socio-ecological system of the Central Coast has for most of the last 10,000 years or more been an engine of richness and productivity, resulting in dense plantings of acorn-producing oaks; productive perennial coastal prairies attractive to elk, bear and granivorous birds; patchy thickets and early successional meadows facilitating black-tailed deer, rabbits and quail; and riparian gardens supporting salmon, abundant tubers, berry crops and the basketry famous among California's Indigenous peoples (Mensing 2006). California's abundance promoted population growth and cultural diversity prior to the arrival of Europeans, with [about 300,000 people](#) speaking over 100 distinct languages and 300 dialects. For thorough accounts, see Akins and Bauer 2021, Dunbar-Ortiz 2014, Hackel 2005, Anderson 2005, Madley 2017, Miranda 2013, Milliken 1995, and Margolin 1989.

Through a succession of [Spanish, Mexican and American](#) colonial enterprises, an erosion of the socio-ecological relationships built over thousands of years occurred in rapid sequence. Through this short and tumultuous period, as much as 90% or more of California's Indigenous population perished through disease, state-sanctioned genocide or other means (Jackson and Castillo 1995). These population collapses were mirrored among wildlife species, including most infamously, the now extinct California grizzly bear (circa ~1924), the gray wolf (~1924), the wolverine (~1922), the southern sea otter (~1911), the Eastern Pacific gray whale (mid 1800s) and the Pacific sardine (~1940s). More than 250 plant and animal species are at risk of extinction in the state today, second only to Hawai'i in the number of listed species among U.S. states ([CNDDDB 2022](#)).

Climate forecasts for the Central Coast indicate an overall increase in temperature and precipitation, greater variation in weather patterns relative to historic conditions, and uncertainty regarding coastal fog dynamics, among other trends (Langridge 2018). Coastal mountain ranges are predicted to experience higher rainfall accumulation, while inland precipitation will likely be reduced, and an overall increase in the variability of **precipitation** is widely expected. Even if rainfall does increase, however, rates of evapotranspiration due to higher temperatures and increasing variability and sporadic nature of rainfall events may mute these increases, resulting in higher water deficits overall. Throughout the C3JV region, extremely wet and dry years are anticipated to become more severe, with marginal surpluses and deficits as wide as 35% by 2070 relative to current conditions, resulting in more intense flooding and severe drought events. Predicted changes in **temperature** vary depending on the distance from the coast, with coastal temperatures being lower and less variable than inland temperatures. However, maximum and minimum temperatures will continue to increase, with an annual maximum increase of 4-5°F anticipated across the entire region. This acceleration of climate impacts being felt today poses a particularly significant threat to the regions' coastal communities as **sea level rise** is expected to inundate as much as two-thirds of the beaches over the next century (Johnson 2020). With projected increases in the frequency of large **wildfires**, coastal and inland flooding, drought severity, heat extremes, and uncertainty in the California Current and coastal fog dynamics, climate change is a key driver in the long-term suitability of habitats for birds, other wildlife and people on the Central Coast.

The inevitabilities and uncertainties that characterize climate change necessitate a conservation approach cognizant of plant and wildlife movements, of acute disparities in existing socio-ecological systems and their vulnerability to climate forecasts, and of project design elements that can account for and accommodate for changes in biophysical factors undergoing rapid change.

The C3JV Implementation Plan necessarily positions climate change as a core element in evaluating, ranking and ultimately advancing strategies to meet our conservation and wellbeing goals.

C3JV QUICK FACTS

The land and seascapes of the Central Coast are iconic, including some of the most visited and photographed in North America. Though efforts to protect these places have been extensive and tireless, much remains in ensuring these ecosystems continue to sustain birds, other wildlife and people.

- ✘ **More than 500 species of birds occur within the C3JV geography, over 350 regularly.**
- ✘ **Over 20 Audubon Important Bird Areas fall within the C3JV geography, including 11 Global Priority regions.**
- ✘ **Of the approximately 3,500 miles of linear coastline in California, the greatest concentrations of *highly conserved lands* exist in the Central Coast.**
- ✘ **34 Marine Protected Areas (MPAs) exist within the C3JV region. This network of MPAs encompasses some 204 square miles or about 18% of California State waters.**
- ✘ **Statewide planning efforts by Audubon and others have elevated the Central Coast as critical climate refugia for California Rangelands and ecosystems.**
- ✘ **Approximately 28% of the terrestrial landscape has some form of protected area status. Oak woodlands and grasslands remain one of the least protected, conifer habitats among the most.**
- ✘ **Over 25% of the world's wild population of California Condors fly the Central Coast**
- ✘ **More USFWS Birds of Conservation Concern occur here than any other BCR in North America**
- ✘ **The C3JV hosts an estimated 20% or more of the North American population of 10 bird species, playing an important stewardship role.**
- ✘ **Calls for the creation of the California Central Coast Joint Venture are included in other conservation plans including the California Watershed Plan, Waterbird Plan for BCR 32 and South Pacific Shorebird Plan, among others.**

The evolution of habitat and species exploitation through the colonial periods, be it whaling, fisheries, shellfish, timber, fur, mining, charcoal, seabird eggs among other exploits continue to persist as expressions of diminished wildlife populations in the Central Coast (Gingrich 2019, Storer and Tevis 1955) These historic exploitations continue to evolve, interact with and amplify impacts of land uses persistent today, together influencing the conditions of habitats in the C3JV region (Mooney and Zavaleta 2016). The Central Coast's perennial grasslands have largely naturalized to non-native annuals, and the majority of formerly wide ribbons of extensive old-growth riparian sycamore and cottonwood forests have been lost to intensive agriculture. The riparian, freshwater and saltwater wetland habitats that remain are greatly reduced in size and function because of drainage and diversions, port development, siltation and over-exploitation, among other drivers (Mooney and Zavaleta 2016). Ultimately, intense development pressure continues to fragment remaining strongholds of chaparral, oak woodlands and savannah. The overall degradation of ecosystem function through past exploitations, increased dominance of invasive species, ever-expanding conversion and simplification of habitats, absence of fire, high inputs of environmental contaminants and growing confluence of climate change factors provide sufficient justification to increase synergy, coordination and collaboration in stewardship and conservation actions on the Central Coast.

While these histories continue to play out today, either in the signatures of diminished wildlife populations or the erasure of Indigenous people within ancestral homelands, the Central Coast is also a landscape of hope and opportunity for birds, other wildlife and people. The conservation legacy is evident in the scale of highly conserved habitat protection along the coast, the network of [Marine Protected Areas](#) within state and federal waters and the recovery stories of iconic birds like the California Condor, Bald Eagle and Peregrine Falcon. This conservation legacy, uniquely combined with retained ecological integrity and burgeoning conservation need, positions the C3JV as an important convener in advancing conservation efforts over the coming decades.

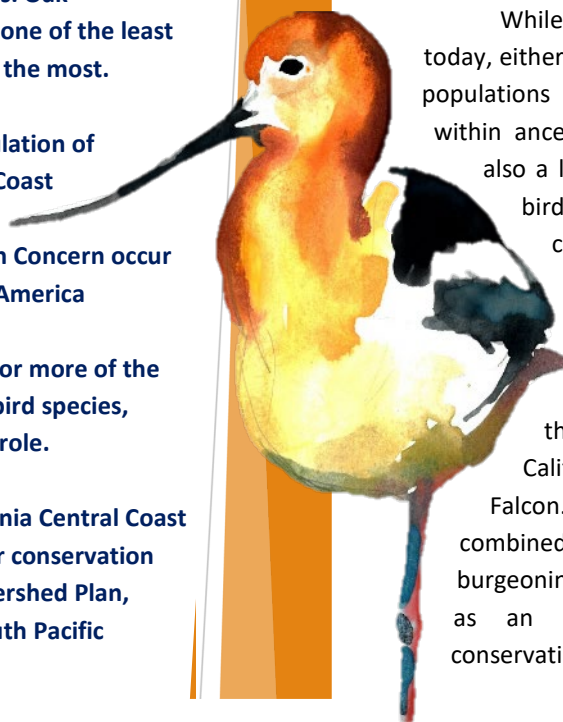
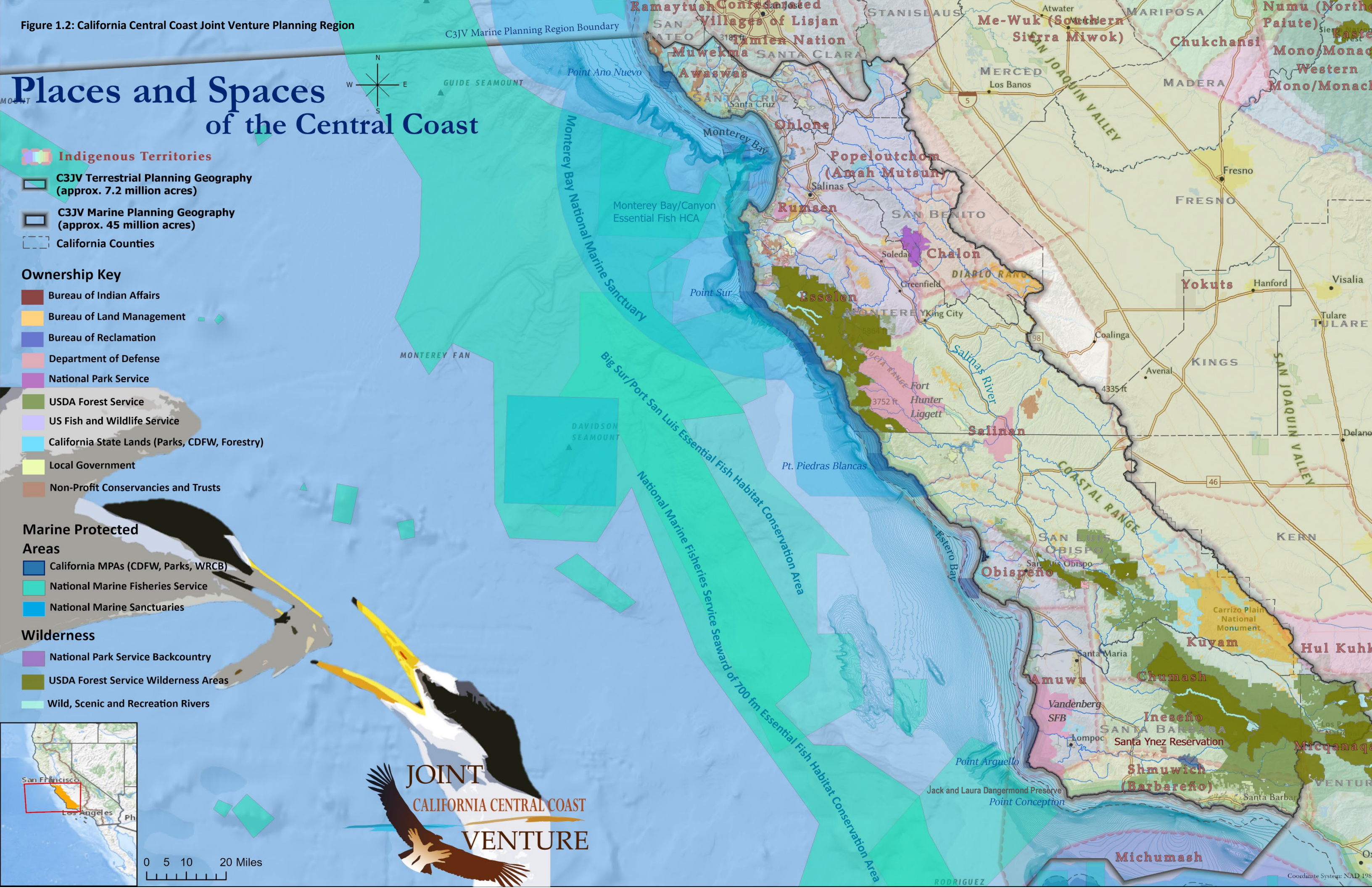


Figure 1.2: California Central Coast Joint Venture Planning Region



2. VISION AND PLANNING

2.1 THE C3JV VISION AND MISSION

The California Central Coast Joint Venture (C3JV) is a partnership founded to coordinate and implement conservation actions at landscape scales in the Central Coast Region of California, representing portions of the Coastal California Bird Conservation Region 32 and the California Current Marine Bird Conservation Region 17 ([Bird Studies Canada and NABCI 2014](#)). The C3JV geography spans all or portions of eight California counties, from the southern corner of San Mateo County near Pescadero Marsh, south to the redwood forests of Santa Cruz County, east to portions of the interior counties of

Santa Clara and San Benito bounded by the Diablo Range, southward through Monterey, San Luis Obispo, and Santa Barbara Counties to the far northeastern corner of Ventura County. While terrestrially, the C3JV is one of the smallest Joint Venture geographies in North America, the inclusion of portions of the California Current MBCR increases the JV six-fold. Based on avian richness, habitat diversity, endemism, and conservation need, the C3JV region ranks among some of the most important geographies north of the Mexican border. It is with this in mind the partners of the C3JV share our collective vision:

Vision: The many partners that together form the California Central Coast Joint Venture collectively imagine the future of the Central Coast as ***a thriving community where our lands and waters are shared among birds, other wildlife and people in a relationship of mutual wellbeing.***

This vision is and must be an attainable future forged through successful conservation implementation, but also through the strengthening of relationships between people, the lands and the waters upon which our livelihoods and communities depend. In the first steps toward attaining this vision, the C3JV, together with the support of its partners, intend to:

- ✎ Meet the expectations outlined in the USFWS Policy 721 FW 6.5 C for Migratory Bird Joint Ventures.
- ✎ Successfully leverage funding opportunities pertinent to this C3JV Implementation Plan priorities and partner relevancy;

- ✎ Maintain and strengthen the engagement of Management Board members who together represent the diversity of community interests;
- ✎ Implement a model of strategic conservation that is inclusive, adaptive, reflective and transformative; founded upon the principles of the Conservation Standards for the Practice of Conservation, the Strategic Habitat Conservation Model and other partner-led modalities;
- ✎ Champion collaborative efforts that link socio-ecological systems for the strengthened viability of vulnerable avian populations and the myriad multiple-benefits that stem from holistic conservation programming.

Our vision is attainable through the work of building strong relationships and extending the space of what constitutes bird conservation. By highlighting habitats and inclusivity, our mission statement, below,

prioritizes the backbones of successful collaboration—identifying unity of purpose across diverse communities to conserve, enhance, and restore habitats essential for birds, other wildlife and people.

The *mission* of the California Central

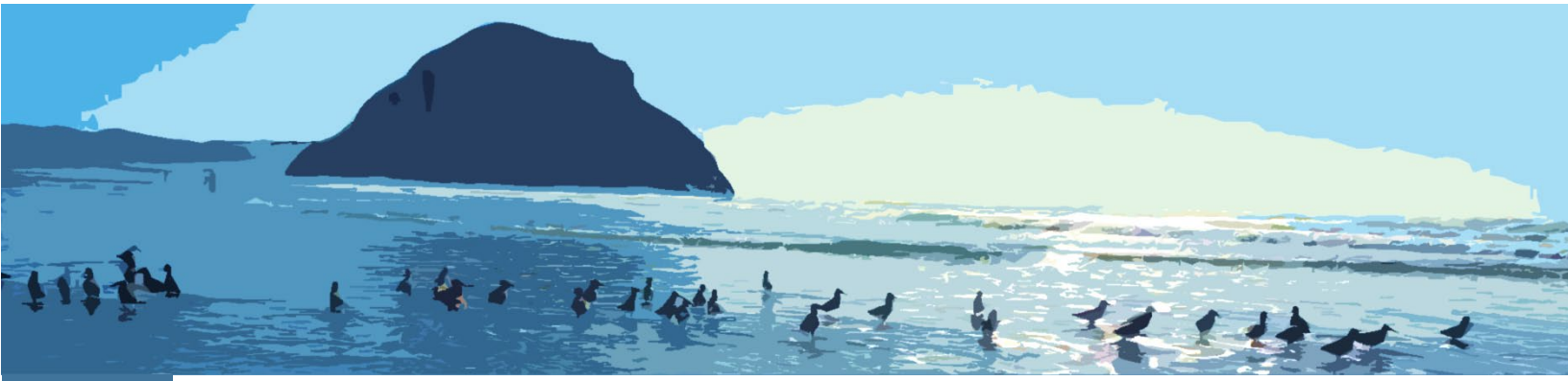
Coast Joint Venture is to work through inclusive partnerships to steward healthy and resilient habitats for birds, other wildlife and people.



The C3JV adopts the following guiding principles in efforts to implement our mission:

1. Work with, and honor, diverse **knowledge**, including Western, Indigenous, and Local, to advance conservation actions in landscapes with the greatest potential to support thriving bird populations and the multi-benefit outcomes that coincide.
2. Embrace the **responsibility** of implementing regional, national and international conservation plans as an important part of a connected, cross-jurisdictional flyway;
3. Continually strive to build **capacity** within the partnership to strengthen outcomes for migratory bird and other wildlife habitat conservation and human wellbeing priorities within the C3JV geography.
4. Maintain **accountability** to, consistency with, and respect of the Management Board, including the wide spectrum of perspectives, histories, priorities, and interests that together form a representative and transformative body.
5. Sieve all conservation projects, actions and initiatives through the goals and objectives of this implementation plan, as adopted by the Management Board, and which is principled on the concepts of socio-ecological systems, [multi-benefit conservation](#), and transformative collaboration.
6. Build **monitoring**, reflection, adaptation, flexibility and humility into conservation implementation.
7. Foster **relationships** built on trust, respect, reciprocity, and the celebration and recognition of others' accomplishments and contributions.
8. Embody the principle that **wellbeing** of humans, birds and all life are inseparable, intersectional and wholly interdependent.
9. In recognizing conservation has shared in the roots of injustice for centuries, the partnership will strive to be cognizant, transparent, and committed to advancing **social, environmental and climate justice** within its spheres of influence.
10. Acknowledge our work takes place within unceded territories of Indigenous people and recognize our supportive role in the repairing of relationships between and among people, as well as the land.





2.2 C3JV ADMINISTRATION AND PLAN PURPOSE

Widely celebrated as an effective model of collaborative conservation in North America, Joint Ventures emerged from the 1986 North American Waterfowl Management Plan tasked with regional implementation of habitat conservation to reverse waterfowl declines. The California Central Coast Joint Venture styles after [25 habitat and species](#) Joint Ventures operating today, working to build strategic, coordinated and collaborative conservation efforts among federal and state agencies, Tribal nations, non-governmental organizations, academic institutions, businesses, and individuals, together embracing our responsibility for implementing national and international bird conservation within the C3JV geographic area (FIGURE 1.2).

Under the direction of our [Bylaws](#), the C3JV is governed by a Management Board whose members share the responsibilities of directing and advancing the activities of the partnership as well as in sharing the mission, vision and goals within respective agencies, organizations and communities. The Management Board provides guidance with input and recommendations from four standing committees, working groups and ad hoc committees. The Management Board is composed of representatives from fourteen (and growing) partner organizations, including federal and state agencies, a Tribal Environmental Office, non-governmental organizations, and one academic institution working collectively to advance the vision and mission of the Joint Venture. The C3JV is staffed by a Conservation Coordinator, and fiscally sponsored by American Bird Conservancy (ABC).

The development of this plan is intended to:



- Provide guidance to the Management Board for developing programs that deliver integrated outcomes for birds, habitats and human wellbeing.;
- Identify priorities and strategies that overlap across regional, national and international bird plans to deliver habitat for shorebirds, waterbirds, landbirds, waterfowl and seabirds;
- Support and connect with other plans and priorities such as the California State Wildlife Action Plan;
- Incorporate the Functional Elements (duties) of a Joint Venture including delivering bird habitat;
- Deliver guidance toward the development of a long-term JV monitoring and evaluation strategy and research agenda;
- Address USFWS Policy 721 FW 6.5 C for Migratory Bird Joint Ventures;
- Provide a mechanism for communicating the vision and goals of the C3JV to expand opportunities for outreach and education;
- Attract additional resources and funding in support of the above.



3. CONSERVATION APPROACH

While Joint Venture Implementation planning approaches differ across partnerships, the [Strategic Habitat Conservation \(SHC\) Model](#) adopted by the United States Fish and Wildlife Service underpins many planning efforts by Joint Ventures to date. While essential tenants of this model are interwoven here, the C3JV partners also leaned heavily on the Conservation Standards for the Practice of Conservation, or simply [Conservation Standards](#) (CS), as a platform for strategic planning. While adaptation, learning and evaluation are at the heart of both methods, CS is a decision-support framework that is used internationally across federal (e.g., [Atlantic Coast Joint Venture's Saltmarsh Bird Conservation Plan](#)), state (e.g., [California State Wildlife Action Plan](#)) and non-governmental organizations ([Pacific Americas Shorebird Conservation Strategy](#)), provides tools and features for visual representation, including linkages to virtual modalities ([Miradi](#)). The CS framework employs a community of practice beyond the scope of a single agency to enhance potential partner engagement and integration. Both the SHC and CS are complementary in their goals to approach conservation through an integrated, landscape-scale lens, one that inherently recognizes complexity, dynamism, and interrelated nature of ecosystems (Schwartz et al. 2012). The CS, though still admittedly constrained in this realm, also further strengthens planners' ability to consider non-biological objectives, such as human wellbeing.

Recognizing the iterative nature of CS's adaptive planning framework, this plan takes the first step toward a strategic, outcome-based roadmap guiding our conservation approach. Organized under a

[Charter](#) and composed of a voluntary selection of C3JV Management Board Members and Advisors, our C3JV Implementation Plan Task Force participated in a series of nine virtual, facilitated workshops, each approximately three hours in length, to create the structure and framework for this plan. Employing [Mural](#) as our virtual collaborative platform, each workshop was designed to both develop the Task Force Members' skills, knowledge and ability to work with and apply the CS approach, while simultaneously advancing development of the plan foundation.

In the first two workshops, we collectively developed our purpose, scope and vision and selected our conservation targets, all of which were vetted and approved by the Management Board. Using one conservation target as our model, we gathered over the next six workshops to determine the target's viability (including key attributes and indicators), critical threats/pressures, our draft situation model framework (Figure 3.2), and strategies and results chains aimed at addressing those pressures. We then developed benchmark goals to measure progress in addressing pressures. With this toolkit and procedural understanding in hand, we replicated this process for each of the remaining conservation targets. A final workshop was dedicated exclusively to determining the wellbeing domains the partnership would elevate in the plan.

3.1 TARGETS AND VIABILITY

Six conservation targets and three human wellbeing domains¹ were identified that together represent a comprehensive coverage of habitats, the avifauna dependent upon them, and prioritized wellbeing needs within the C3JV region. Each conservation target represents a system, or web, of interrelated habitat types, largely organized by dominant cover or land use, that together support a common suite of birds, in ways similar to the organization of the [California Partners in Flight Bird Conservation Plans](#). Habitat types are treated as sub-targets, with more provided in Chapter 5. Using the CS's viability assessment process, we then: 1) selected [key attributes](#) (KAs) that define the health of each target (i.e., important ecological processes like fire, or biotic interactions like predator-prey dynamics); 2) identified the indicators used to measure target conditions based on the KAs (e.g., % non-native cover); and 3) evaluated, qualitatively, the relative current condition of each attribute using a course scale (Poor, Fair, Good, Very Good) that provides a baseline benchmark to be refined overtime. These conditions were vetted by the Task Force, Management Board and key advisors, and forms the basis for the eventual refinement of specific restoration, protection and enhancement habitat objectives.

3.2 PRESSURES

Identifying and evaluating pressures (or threats in CS lexicon) is a core element to planning and forms the basis for prioritizing the main strategies selected. Following CS methodology, we completed a *threats assessment* to identify activities, actions or processes that directly degrade or reduce a target's viability. We identified and labeled pressures based on a standard taxonomy (Conservation Measures Partnership [2016](#)), but where appropriate, further refined them to more accurately reflect the role they play within the C3JV geography. We then rated each pressure on a four-point scale by assessing its impact on a given target in accordance with its scope (portion of the target impacted), severity (within the scope, a

¹ We use the term 'Domain', rather than 'Target', to denote the potentially problematic notion of identifying people as targets,

measure of the scale of impact) and irreversibility (plausibility of reversing the effects of a given pressure). Ratings are useful to assist in decisions about where to focus efforts when resources are limited (see [Appendix C](#)).

3.3 STRATEGIES

We completed situation analyses for each target and domain ([Appendix B](#)) to help identify implementation strategies (See [Chapter 5](#)). These analyses are being developed into Situation Models linking our targets/domains with direct and indirect pressures, opportunities, contributing factors, strategies and, in Miradi, which will enable continual refinement and adaptation over time. Following CS guidelines, we developed an initial set of conservation strategies offering points of intersection to address some of the most important threats to each target and/or domain. Emphasizing the iterative nature of situational assessments, and the importance of ongoing participation in defining pressures and strategies, this Implementation plan is not intended to explicitly prescribe nor necessarily exclude specific strategies that C3JV partners may choose to employ to address the conservation and human wellbeing goals outlined in our approach. At this stage in the development of our partnership, greater emphasis has been placed on the breadth of approaches, both existing and novel, that may advance our vision while simultaneously building a method of evaluating which initiatives are predicted to work best for multiple objectives, including overlapping both conservation and wellbeing outcomes. We identified criteria for evaluating different strategies, including: urgency (conservation need), strength of relevance to human wellbeing domain(s), degree of partner Interest, effectiveness (strength of predicted impact on target and probability of success), climate robustness (a strategy's resilience to anticipated climate change impacts), and relevance to multiple conservation targets. An example of this strategy ranking process follows:

similar to the preference of the choice 'pressure' instead of 'threat' in the Threats Assessment discussion.

	Urgency*	Human wellbeing*	Partner Interest	Effectiveness	Climate Robustness	Multiple Conservation Targets	Total Score	Qualitative Ranking
Strategy 1	6	2	2	3	3	3	19	HIGH
Strategy 2	2	2	3	2	2	3	14	MED
Strategy 3	6	6	3	3	3	3	24	HIGH
Strategy 4	2	1	2	2	1	1	9	LOW
Strategy 5	2	2	2	2	2	2	12	MED

*Weighted Scores are scored between 1-3, then doubled
 - **General key:** 3 = high, 2 = in between, 1 = less
 - **Human wellbeing (HW) key:** 3 = HW target is part of the strategy, 2 = indirectly (i.e., through ecosystem services), 1= no linkages to HW known
 - **Partner Interest key:** 3 = many partners identified, 2 = at least 1, 1= none identified

3.4 BENCHMARK GOALS

Benchmark Goals were identified for each of the six habitat targets and three wellbeing domains, representing formal statements denoting the ultimate impacts we aim to achieve as well as measure our progress against. Goal statements strove to be as 'SMART' as possible given the stage of our planning efforts: Specific, Measurable, Achievable, Results-oriented, and Time-limited. Benchmark Goals were derived from the key attributes of each target or domain and reflect input from IP Task Force and plan contributors. Thematically, our benchmark goals center on maintaining the **extent** of the target habitat,

strengthening habitat **conditions**, reversing avian focal species **declines**, and maintain/increase **avian diversity**. Our human wellbeing goals highlight considerations of **land stewardship, water/ environmental quality, and human health** among others (see [Chapter 5.1](#)). As noted in Figure 3.1, goals are achieved through the suite of Implementation Strategies identified through the situation analyzes. While outside the scope of this plan narrative, as strategies are further prioritized, results chains (or theories of change) are being developed to identify concrete objectives and actions needed to implement these strategies to achieve our goals.

Figure 3.1: C3JV conceptual relationship between goals and strategies.

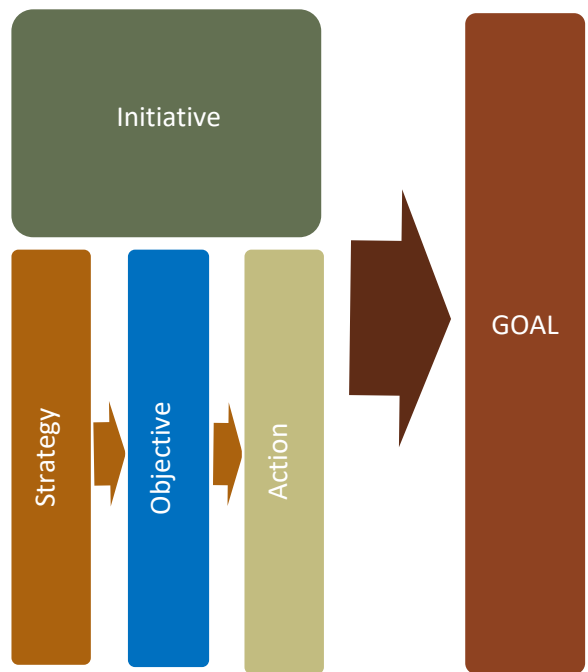
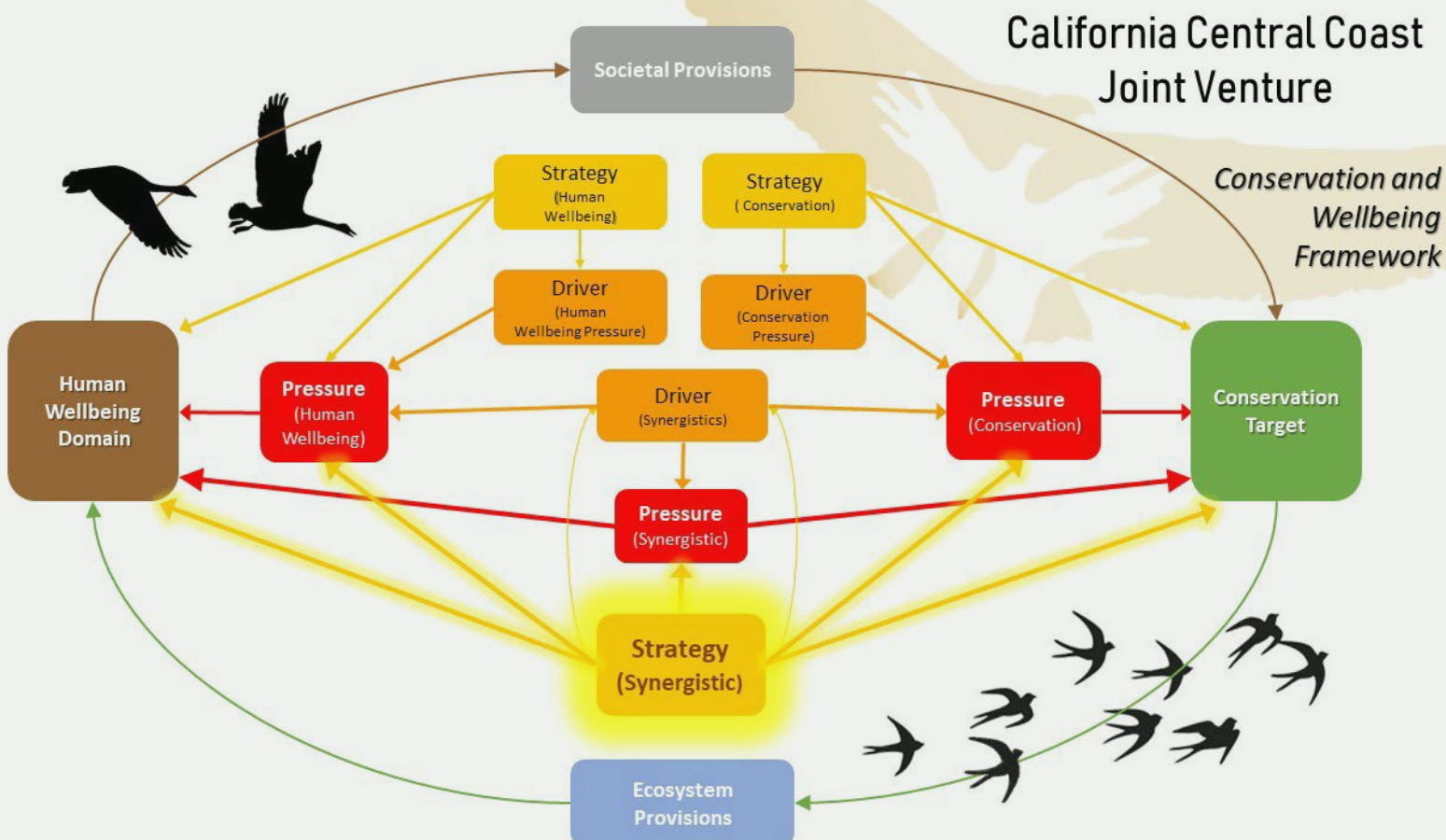


Figure 3.2. Conservation and Wellbeing Framework guiding the California Central Coast Joint Venture's Implementation Approach.

This diagram helps visualize the framework at the heart of the C3JV approach to advancing conservation. **Synergistic strategies** highlight potential, and essential, intersections between addressing the conservation needs (**Targets**) of birds and other wildlife while furthering explicit **human wellbeing** goals. This framework considers the design of multi-benefit projects (Gardali et al. 2021) that address common **pressures** or threats, recognizes trade-offs (e.g., when conservation and wellbeing strategies conflict), root out drivers of key pressures, and link networks of key partners and collaborators to bring synergy. The framework will be used to develop theories of change that enable the partnership to anticipate, measure, evaluate and adapt strategies that better reflect the complexities inherent to socio-ecological systems.



3.5 FOCAL SPECIES APPROACH

Avian focal species occupy a core element in the C3JV planning approach, in part due to their qualities as strong channels for conservation intervention. Birds are ubiquitous across habitats and ecosystems, comparatively easy to observe and measure resulting in some of the most extensive observational datasets of any taxa, and offer charisma as a means of engagement with people. As focal species, some play keystone roles (e.g., woodpeckers) or offer umbrella qualities (e.g., species with large minimum habitat requirements, such as grasshopper sparrow) that are essential to the health and maintenance of an ecosystem. Others are important indicators of key processes due to a heightened sensitivity to environmental change (i.e., cormorants and prey availability), are flagship species playing iconic roles in social arenas such as policy discourse, (California Condor), and still others share sentinel, or early-warning roles (e.g., aerial insectivores and pesticides) (See Chase and Geupel 2005). In general, “focal species” provide barometers to help define and track changes and interventions across spatial scales, habitat characteristics and stewardship practices. Underlying the focal species approach is the assumption that stewardship actions designed to meet focal species’ needs will inadvertently address a suite of other species needs, including humans (Lambeck 1997). Testing this assumption to refine and modify our focal species lists will in part be addressed through the monitoring of avian, ecosystem and human wellbeing responses (See [Chapter 6](#)).

With parsimony as an underlying intent, focal species were chosen through the combined efforts of key regional expertise and the employment of a selection criteria that among other elements, considers species’ conservation urgency (including climate vulnerability, see Gardali et al 2012), endemism, ecological role, extent of our knowledge of the species, measurability, habitat association, and sensitivity to environmental change, among others (See [Appendix E](#)). With these criteria, three focal species ‘categories’ or types were identified;

1) Conservation Priority Species, which includes species occurring within the C3JV geography

and protected as threatened or endangered under State and/or Federal Endangered Species Act legislation, or are at-risk species identified by other conservation lists, in particular [PIF/ACAD](#), [California State Bird Species of Special Concern](#), [2021 USFWS Bird Conservation Concern](#), [Road to Recovery Priority Species](#), and National Bird Conservation plans *and* which have a heightened importance to the C3JV region either due to endemism or restricted range or are of significant importance to regional partners. In most cases, Conservation Priority Species are also C3JV Stewardship Species with acute and urgent conservation needs elevating their prioritization.

2) Stewardship Species include birds for which the Central Coast represents at least 5% of the national (and sometimes global) population of the species, according to population estimates by Partners in Flight (not all species population estimates are available). Stewardship species, in other words, are those species where the C3JV geography plays an elevated role in the maintenance or recovery of the species.

3) Indicator Species, include a suite of birds representing diverse habitat associations or elements, species guilds, degrees of specialization, and otherwise provide important indicator, keystone, umbrella, flagship or sentinel roles within each conservation target. In some cases, this category may include a species of conservation concern that, while not a Stewardship Species and therefore not included as a conservation priority species, nonetheless requires heightened attention, for example the Mountain Plover.



Black
Oystercatcher

Combined, each conservation target avian focal species list is designed with the goal of arriving at a *suite of focal species whose habitat associations capture the range of variation needed to support a functioning and diverse habitat system, and which represents the urgency needed to protect it.* Unfortunately, the majority (>66%) of C3JV focal species are declining, underscoring the scale of the challenge in addressing the conservation of birds in the region.

Cursory estimates of the C3JV *area of importance* for the species were developed by stepping down Bird Conservation Region 32 [PIF population estimates](#) in combination with publicly available ebird observational data. Rather than simply estimating

populations by the percentage of BCR 32 included in our C3JV planning region, we employed Program R to convert [eBird status and trends data](#) into raster files to create a heatmap of relative abundance in ArcGIS Pro, predicting species seasonal and year-round abundance. These maps were then used to adjust the percentage of a species' occurrence within BCR32 that falls within the C3JV region in accordance with spatially-derived abundance models. While refining our baseline population estimates is an important goal and part of our enabling strategy (see [Chapter 6](#)), these first steps provide a starting point in highlighting the importance of the C3JV for select resident and migratory birds.



FIGURE 3.3 HONING POPULATION OBJECTIVES

[BCR 32](#), Coastal California, hosts the most USFWS BCC species of any BCR in the U.S., and, perhaps fitting, also hosts the most Joint Ventures in North America. Six JVs compose BCR 32, showcasing the complexity of both habitats, and partnerships within this ecologically rich and at-risk ecosystem.

As a core tenant of the JV model, setting population and habitat objectives is a core priority for the C3JV. While bird population estimates are available at the BCR level, stepping those down can be challenging. For this plan, our current population objectives are largely directional goals rather than explicit targets (see [definitions here](#)). In most cases, more information is needed to determine a biologically relevant objective (coded as *Determine Status*), though for some species recovery plans are in place that provide specificity. As part of our enabling strategies, the C3JV will embark on a refinement of these objectives (see [Chapter 6](#)).

California Thrasher offers an example of how the BCR scale is not a uniform measure of species occupancy or abundance. While we have taken the first steps in estimating the proportion of species abundance falling within the C3JV region and using that to convert the PIF global population estimates to C3JV population estimates, next steps will be to quantify a population objective based on historical trends as well as determine acreage targets based on habitat suitability in relation to historic densities (PIF 2022).

In the preparation of this plan, the contents of more than 30 watershed, county, basin, state, national and international conservation and implementation plans were reviewed in the aid of selecting conservation and wellbeing targets, choosing focal species, identifying threats and pressures, and ultimately aligning priority strategies necessary to conserve birds in the Pacific Flyway. [Appendix A](#) provides links to some of these plans and documents. Plans of particular influence include the [California Partners in Flight Bird Conservation Plans](#),

which were instrumental in habitat relationships and correlated focal species, and in part informed our conservation target selections among other influences. The [California State Wildlife Action Plan](#) shaped our scope, Conservation Standards framework and Situation Diagram, focal species, as well as threats/pressures analysis. National and Flyway-scale conservation plans were key to identifying priority species and habitat needs, conservation pressures and strategies. Finally, neighboring Joint Venture Implementation plans (e.g., [Central Valley, Sonoran](#)) were also reviewed and informed the content of this plan.

Figure 4.1: The C3JV Planning Region is an ecologically informed landscape that follows the contours of the USGS Central Coastal Hydrological Unit, encapsulating key watersheds including the Santa Ynez, Santa Maria, Salinas, and Pajaro systems. This geography recognizes the incredibly important transition zone at Point Conception where the Transverse Range demarcates an ecological shift terrestrially, this shift mirrored by the Southern California Bight in the marine context. Jurisdictionally, the C3JV Planning geography includes the currently *unaffiliated* JV space representing the official C3JV terrestrial geographic boundary (shaded in red here), at the margins of the San Francisco Bay JV to the North, the Central Valley JV to the East, and the Sonoran JV to the South. The planning geography *also* includes two Joint Venture “Alliance Regions,” as noted in this Figure in orange and purple, collectively summing to the C3JV geographic scope. The C3JV also includes a marine planning geography, elaborated in subsequent chapters. The three Alliance Members, C3JV, CVJV, and SJV, are committed to advancing conservation efforts within these overlapping spaces of interest to further our common goals of conservation that work for birds and people in landscapes currently under-represented by Joint Ventures.

4. GEOGRAPHIC SCOPE





Figure 4.2
C3JV Ecoregions

While largely dominated by the Central California Foothills and Coastal Mountains Ecoregion (EPA III: 6), the intrusion to the north by the Coast Range (1), and the Southern California Mountains (8) and Southern California/Northern Baja Coast (85) to the south showcases the latitudinal breadth of habitats captured by the JV region. Of all the Level III regions in the United States, the Central California Foothills and Coastal Mountains region contains the most Level IV ecoregions by a significant margin (20%), underlining the heterogeneity of this relatively small landscape. Key regions within the C3JV include the mesic Santa Cruz Mountains (1n) with redwood, Douglas-fir and tanoak cover; the Monterey Bay Plains and Terraces (6w), marine influenced, aquatic lowlands; the dry, rounded mountains of the Diablo Range (6z); the Salinas Valley (6af), a rich, gentle alluvial plain dominated by croplands; the Santa Lucia Range (6ag, 6ah, 6ai, 6aj), spanning foggy coastal redwood forests to steep, landslide prone coniferous slopes to xeric chaparral and coastal prairie; the Carrizo Plain (6an), an arid desert-like region of alkali soils and San Joaquin fauna; the Western Transverse Range (8a, 8b), an oak, chaparral and pine transitional landscape to 7,500 in elevation; the piñon-juniper association of the Northern Transverse Range (8g), and the urbanized terraces, and beaches and Santa Ynez foothills of the Santa Barbara Coastal Plain and Terraces (85a).

Ecoregions of the Central Coast



- | | | |
|---|---|---|
| <p>EPA Eco Region Level III: Central California Foothills and Coastal Mountains</p> <ul style="list-style-type: none"> 6aa Eastern Hills 6ac Temblor Range/Elk Hills 6ad Grapevine Transition 6af Salinas Valley 6ag Northern Santa Lucia Range 6ah Santa Lucia Coastal Forest and Woodland 6ai Interior Santa Lucia Range 6aj Southern Santa Lucia Range 6ak Paso Robles Hills and Valleys 6al Salinas-Cholame Hills 6am Cuyama Valley | <ul style="list-style-type: none"> 6an Carrizo Plain 6ao Caliente Range 6ap Solomon-Purisima-Santa Ynez Hills 6aq Santa Maria/Santa Ynez Valleys 6r East Bay Hills/Western Diablo Range 6v Upper Santa Clara Valley 6w Monterey Bay Plains and Terraces 6x Leeward Hills 6y Gabilan Range 6z Diablo Range <p>EPA Eco Region Level III: Coastal Range</p> <ul style="list-style-type: none"> 1n Santa Cruz Mountains 1o San Mateo Coastal Hills | <p>EPA Eco Region Level III: Southern California/Northern Baja Coast</p> <ul style="list-style-type: none"> 8a Western Transverse Range Lower Montane Shrub and Woodland 8b Western Transverse Range Montane Forest 8f Southern California Montane Conifer Forest 8g Northern Transverse Range <p>EPA Eco Region Level III: Southern California/Northern Baja Coast</p> <ul style="list-style-type: none"> 85a Santa Barbara Coastal Plain and Terraces 85c Venturan-Angeleno Coastal Hills |
|---|---|---|

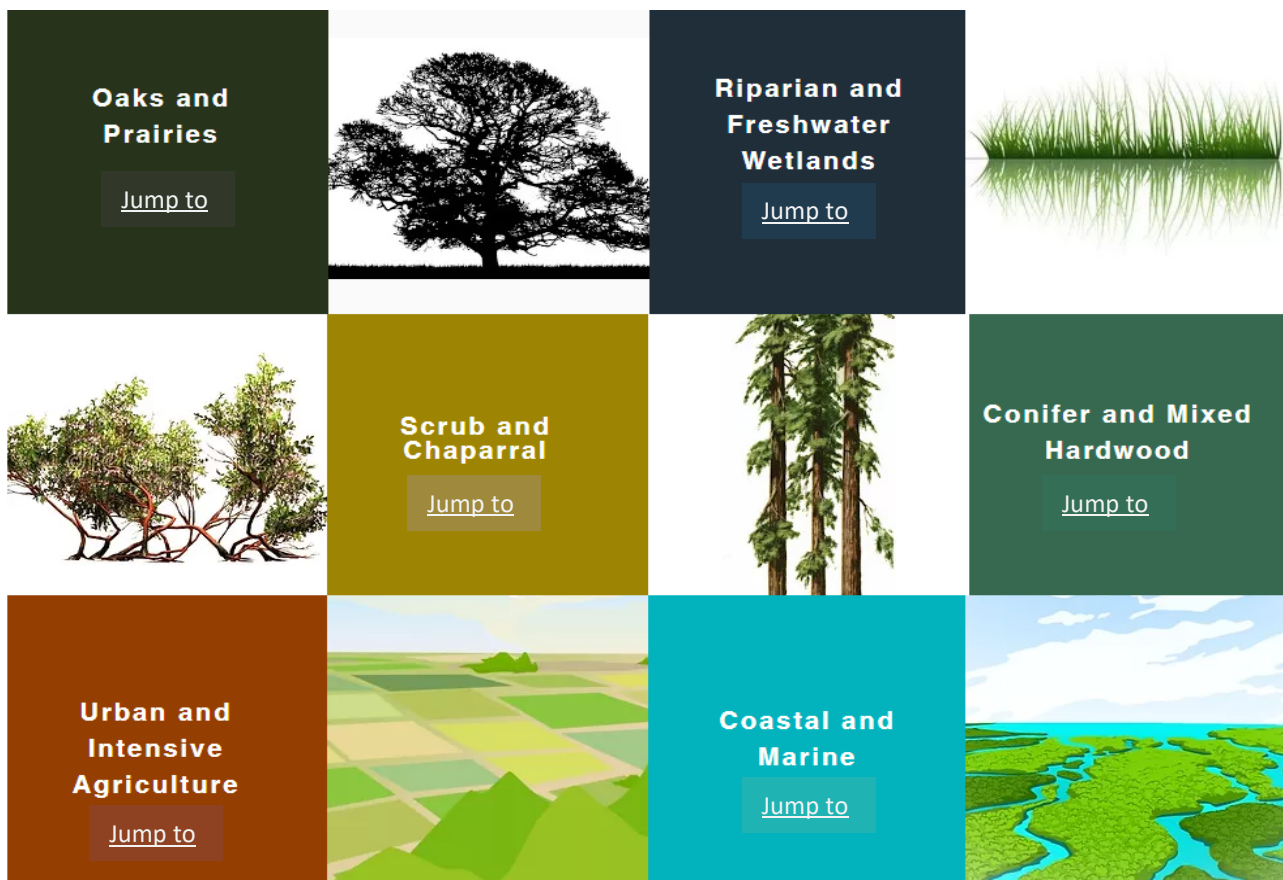
4.1 HABITATS

A defining tenant of the Central Coast region is the patchiness of microclimates created in part by topography, aspect, slope, soil diversity and proximity to the Pacific Ocean (Tietje et al. 2019). While this results in an abundance of niches driving biodiversity, it also results in abrupt spatial transitions between forest types, and between forests, chaparral, and grasslands. In fact, the Central Coast is defined by transition. The southernmost extent of coastal redwoods and moist forests characteristic of Northern California occur here, flora and fauna representative of the Mojave find their northern limits here, and some of the most intact relics of unique Joaquin Valley communities are within the JV geography. Where the Transverse Range confronts the Coast Range, unique convergent zones facilitate prominent phylogeographic distinctions, a meeting of unique wildlife assemblages (Chatzimanolis and Caterino 2007). Of course, Point Conception represents a definitive dividing line on the coast, where the California Current and Southern California Bight form ecotones in the marine environs as well.

In helping to understand such complexity, this plan utilizes the [California Wildlife Habitat Relationships](#) model (CWHR) as the basis for its conservation

planning. The CWHR model provides coarser vegetative associations than do other plant community classification systems, typical for wildlife-plant community dynamics. The model is also designed to predict bird and other terrestrial vertebrate distribution by dominant vegetation types, providing a spatial baseline of predictive occupancy. As the CWHR also forms the basis of the California State Wildlife Action Plan (CDFW 2015), commonality between this plan and other statewide and regional planning efforts will persist. Finally, in employing the CWHR system, we are also aided in identifying the distribution, acreage, ownership, and protection status of a given wildlife-habitat association using the GAP analysis for California.

Six major habitat systems in the C3JV region were identified for conservation planning purposes, representing a comprehensive overview of 36 wildlife-habitat associations in addition to several marine habitats excluded from the terrestrially based CWHR Model (Table 4.3). These systems constitute the C3JV Conservation Targets, each treated individually in this plan and further described in subsequent sub-chapters.



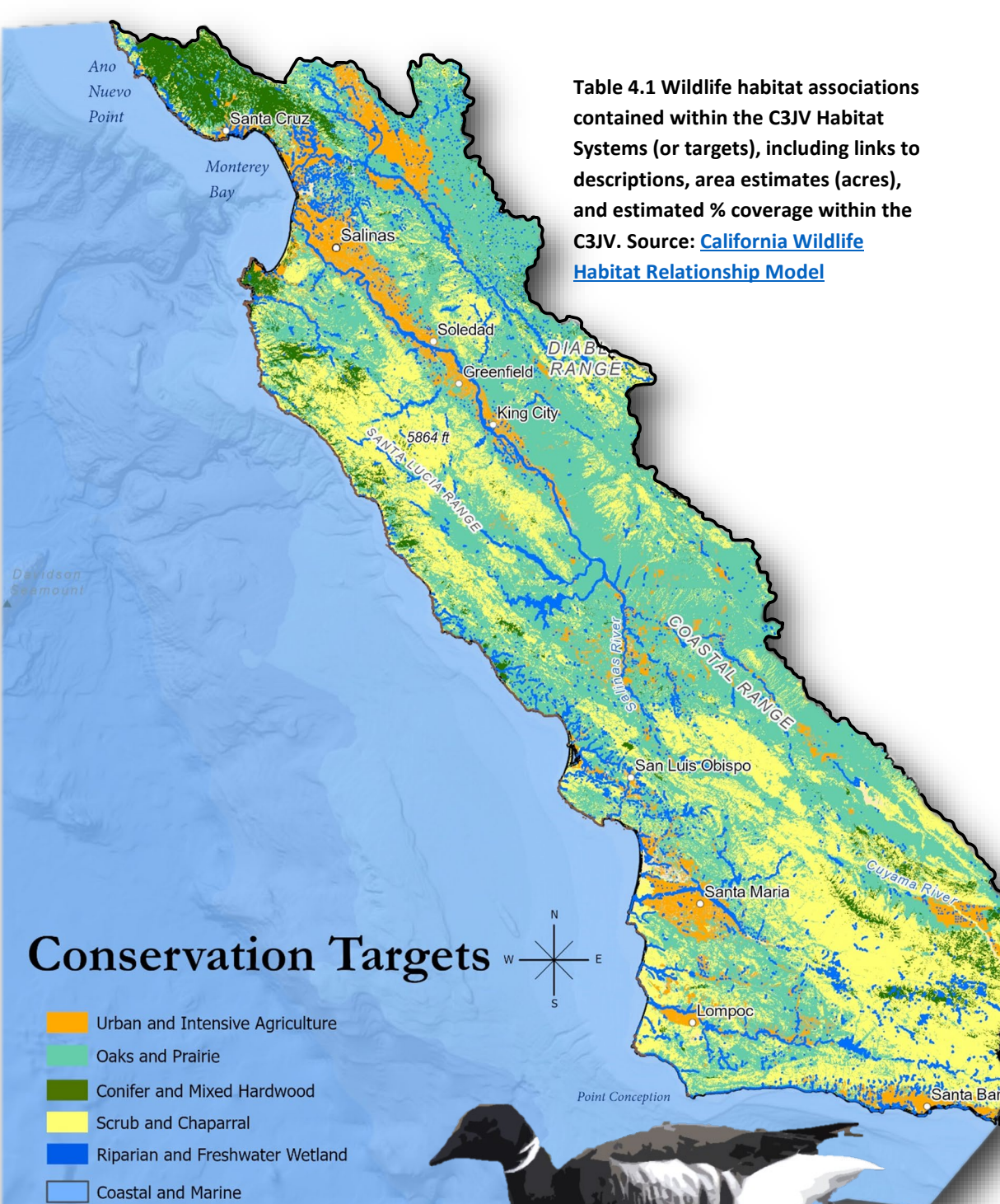


Table 4.1 Wildlife habitat associations contained within the C3JV Habitat Systems (or targets), including links to descriptions, area estimates (acres), and estimated % coverage within the C3JV. Source: [California Wildlife Habitat Relationship Model](#)

Conservation Targets and their Habitats	~Area (acres)	~% of C3JV Terrestrial or Marine Region
Riparian and Freshwater Wetland	85,500	1.5%
Valley Foothill Riparian , Montane Riparian , Desert Riparian	53,000	0.7%
Freshwater Emergent	2,400	<0.1%
Riverine , Lacustrine	30,000	0.3%
Vernal Pools	40,000**	0.5%
Scrub and Chaparral	2,275,000	32%
Coastal Scrub	608,400	8%
Mixed Chaparral	1,236,800	17%
Chamise-Redshank Chaparral	349,000	4.8%
Alkali Desert Scrub	68,300	1%
Sagebrush	12,500	<1%
Oaks and Prairies	3,560,000	50%
Coastal Oak Woodland , Valley Oak Woodland , Blue Oak Woodland , Blue Oak-Foothill Pine	1,232,000	17%
Annual and Perennial Grasslands	2,175,000	30%
Vineyard	155,600	2%
Conifer and Mixed Hardwoods	510,000	7%
Sierran Mixed Conifer , Ponderosa and Jeffrey Pines	19,250	<1%
Redwood	107,000	1.5%
Montane Hardwood	225,360	3%
Closed-Cone Pine-Cypress	28,400	<1%
Piñon-Juniper	129,600	1.8%
Coastal and Marine	27,600	>0.5%
Inner Continental Shelf, Nearshore Marine	1,000,000	2% *
Outer Continental Shelf/Pelagic	44,000,000	98% *
Saline Emergent Wetland , Estuarine	5,600	<0.1%
Rocky Intertidal and Coastal Bluffs	1,000	<0.1%
Coastal Dunes and Sandy Beaches	20,000	<0.3%
Urban and Intensive Agriculture	720,000	~10%
Urban	225,000	3%
Pasture , Hay and Grain	350,000	4.8%
Irrigated Row and Field Crops and Cropland	100,000	1.3%
Evergreen and Deciduous Orchard	45,000	<1%

Conservation Targets

- Urban and Intensive Agriculture
- Oaks and Prairie
- Conifer and Mixed Hardwood
- Scrub and Chaparral
- Riparian and Freshwater Wetland
- Coastal and Marine



Black Brant

* Blue shade= Marine Planning Region Geography

4.2 FOCAL SPECIES

Birds are undergoing precipitous and [dramatic declines](#) throughout the United States, including in California. Though drivers of decline are myriad, it has never been clearer or more urgent to embrace birds as key indicators of overall environmental health, both for the sake of protecting biodiversity, but also for the wellbeing of our own communities. In addition to hosting more U.S. Fish and Wildlife Service Bird Species of Conservation Concern than any other region in the United States, the Central Coastal California region also supports 16 Federal and State ESA-listed species and over 30 State Bird Species of Special Concern (Shuford and Gardali 2008). This portion of the Pacific Flyway supports critical stopover, wintering and nonbreeding habitats for thousands and often tens or hundreds of thousands of shorebirds, sea ducks, seabirds and neotropical migrants. Birds that spend their summers in the elevations of the

Sierra Nevada and Intermountain West, such as the Yellow-rumped Warbler and Hermit Thrush, descend here in wintertime to forage in the milder climates along the coast. With the selection of **28 Conservation Priority Species**, **25 Stewardship Species**, and **51 indicator species**, the C3JV has aimed to capture the breadth of breeding, nonbreeding, wintering, and migrant species that together represents the avian species diversity to which the Joint Venture is accountable for on the Central Coast. The focal species of the C3JV are presented on the following page (plus the California Condor, not pictured), with greater details provided in Chapter 5.



Acorn Woodpecker



American Kestrel



Killdeer



Western Bluebird

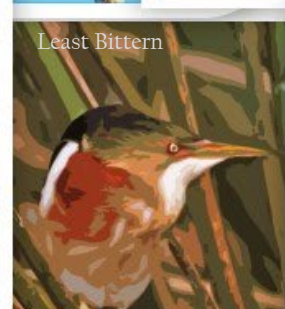


Original photography by
Dave Keeling

Ash-throated Flycatcher



Red-necked Phalarope



Least Bittern



Black Brant

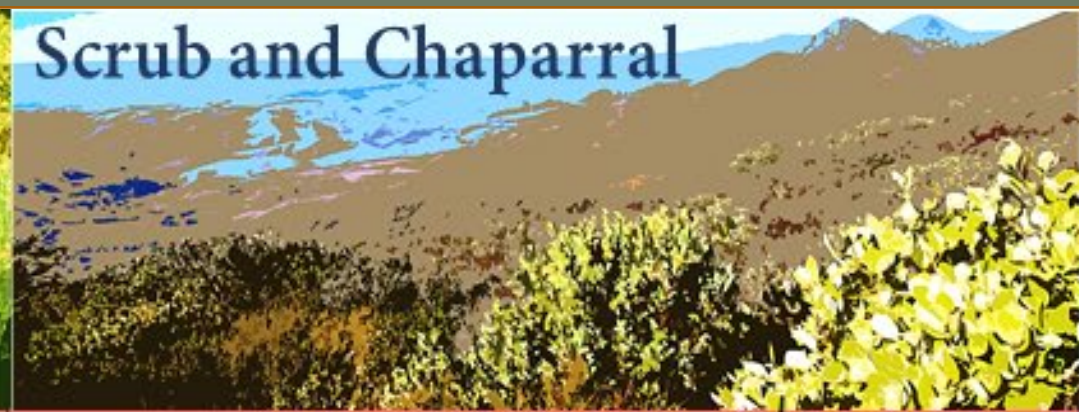


Western Grebes



Riparian and Freshwater Wetlands

Conservation Priority	Black Swift Ticolored Blackbird	Least Bell's Vireo Bank Swallow	Willow Flycatcher
Stewardship		Western Flycatcher	
Indicator	Bald Eagle Common Yellowthroat Swainson's Thrush Yellow Warbler	Black-headed Grosbeak Long-eared Owl (Western) Yellow-billed Cuckoo Yellow-breasted Chat	Least Bittern Purple Martin Great Blue Heron



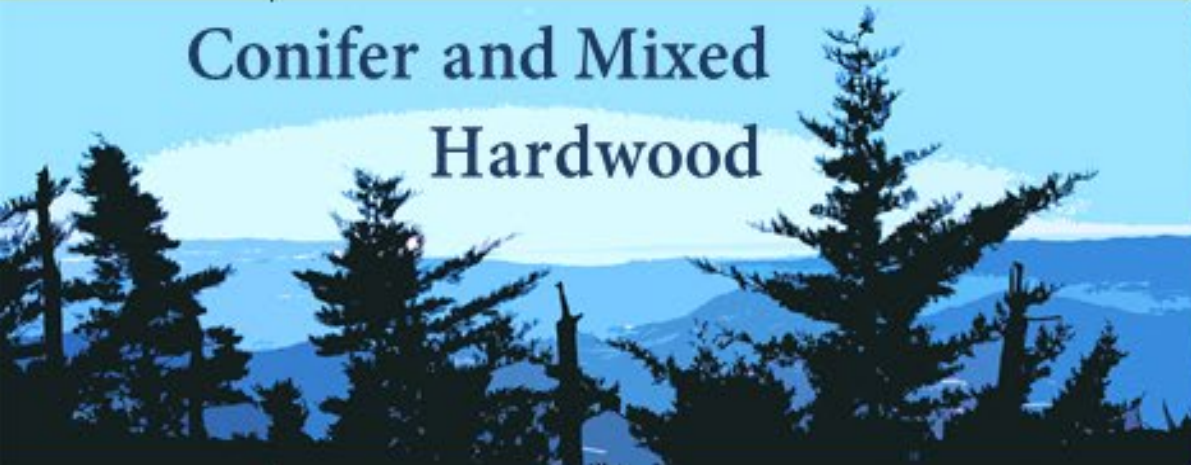
Scrub and Chaparral

Allen's Hummingbird Le Conte's Thrasher	Black-chinned sparrow Wrentit	California Thrasher
Bell's Sparrow Costa's Hummingbird	California Quail Mountain Quail	California Towhee
Common Poorwill Phainopepla Spotted Towhee	Greater Roadrunner Rufous-crowned Sparrow	



Oaks and Prairie

Yellow-billed Magpie Oak Titmouse	Lawrence's Goldfinch Mountain Plover	
Acorn Woodpecker Hutton's Vireo White-tailed Kite	Band-tailed Pigeon Nuttall's Woodpecker Western Bluebird	California Scrub Jay White-breasted Nuthatch Ash-throated Flycatcher
Burrowing Owl Lark Sparrow	European Starling Loggerhead Shrike	Grasshopper Sparrow Western Screech-owl



Conifer and Mixed Hardwood

Conservation Priority	Marbled Murrelet California Spotted Owl	
Stewardship	Steller's Jay	
Indicator	Black-throated Gray Warbler Chestnut-backed Chickadee Flammulated Owl Olive-sided Flycatcher Pygmy Nuthatch Western Tanager	Brown Creeper Dark-eyed Junco Golden-crowned Kinglet Purple Finch Vaux's Swift



Coastal and Marine

Ashy Storm-Petrel Brandt's Cormorant California Black Rail Savanna Sparrow	Brant (Pacific) California Least Tern Ridgeway's Rail	Black Oystercatcher Snowy Plover Light-footed Ridgeway's Rail
California Brown Pelican Western Gull	Western Grebe Long-billed Curlew	
Black-footed Albatross Common Murre Pigeon Guillemot Sanderling Surf Scoter	Cassin's Auklet Pacific Loon Red-necked Phalarope Sooty Shearwater Western Sandpiper	



Urban and Intensive Agriculture

Brewer's Blackbird Northern Harrier	Swainson's Hawk American Kestrel	
Anna's Hummingbird Lesser Goldfinch	Bushtit Red-shouldered Hawk	Black Phoebe
Barn Owl Bullock's Oriole Brown-headed Cowbird American Robin	Barn Swallow White-crowned Sparrow Killdeer	

5. CONSERVATION TARGETS AND HUMAN WELLBEING DOMAINS



In conceptualizing the C3JV region as nested socio-ecological systems, our aim is to explicitly recognize linkages and relationships between socio-political, cultural, biophysical and ecological interactions that characterize the complexity of human-nature relationships. While this approach is certainly not new, it is nevertheless underrepresented in conservation applications. The concept of ecosystem services (ES), a commonly cited project design element, shares similarities to this approach in its attempt to link ecological processes and the direct impacts and outcomes of importance to humans. And while debate continues regarding ES as a concept and application, an *inclusive conservation* approach such that the C3JV seeks to employ, aims to overcome perceived shortcomings of the ES model.

Fundamentally, ES applied in conservation often considers the outcomes for people as secondary, auxiliary or passive benefits delivered through successful conservation implementation. While it is true that protection, restoration and enhancement efforts designed to address a conservation need will often result in ecosystem services beneficial for people, this approach rarely positions outcomes for people as an explicit objective from the start or recognizes

or measures the tradeoffs for communities that may result from a conservation action. Managers seldom design conservation projects to address coupled socio-ecological needs; thus, they perpetuate the nature-people dichotomy that has characterized natural resource management for the last several centuries. In worst-case scenarios, this negation risks the perpetuation of social harms, including social and environmental injustice.

The following chapter presents our three wellbeing domains and seven conservation targets that provide the space of engagement for advancing conservation efforts designed to address social *and* ecological needs. As each subchapter shows, birds can and do play instrumental roles as a medium for addressing the overlapping and intersectional crises facing not only avifauna, but also the habitats that wildlife and people depend upon. Beginning with Human Wellbeing ([Chapter 5.1](#)), followed by each conservation target from Riparian and Freshwater Wetlands ([Chapter 5.2](#)) to Urban and Intensive Agriculture ([Chapter 5.7](#)), we provide greater details on the key attributes of each target/domain, the focal species selected to help measure our stewardship responsibility and efforts over time, and our goals and strategies that will guide our approach and inform our partnership programs to come.

5.1 HUMAN WELLBEING DOMAINS

Human wellbeing is a vast and subjective concept, functioning at different scales and encompassing innumerable factors across material, social, emotional and physical domains, among others. Wellbeing often begins with secure livelihoods that fashion food, shelter and access to basic needs at *all* times. Wellbeing is also a measure of health, including physical and psycho-social wellness. Wellbeing is also about strong social relations, including social cohesion, networks of support, and the ability to provide for future generations. Wellbeing is furthermore, about security; including secure access to nature's provisions, safety of person and possessions, and living in an environment free from harm, including natural and human-made disasters, discrimination and exclusion. While incomplete, this simplified collection of elements begins to define the concept of wellbeing. The C3JV recognizes human and ecological wellbeing as inextricably linked. Climate change, environmental contaminants, social conflicts and the legacy of injustice; the challenges facing our social systems, and limitations to wellbeing, are interwoven with those facing the natural world, for indeed these are one in the same.

In attempts to erode the artifice of human-nature duality, **Inclusive Conservation** is one lens that may be useful in bridging human and ecological wellbeing. Inclusive Conservation is treated here as a modality of conservation that invites, enables, and indeed champions new spaces of interaction (e.g., urban), additional ways of knowing (e.g., Indigenous) and novel approaches (e.g., social justice) to expand the sphere of addressing biodiversity

loss. For the C3JV, initial efforts to identify key priority needs unique to the Central Coast have resulted in three Wellbeing Domains that will help guide our approach to building inclusive conservation, including 1: *Supporting Indigenous Sovereignty*; 2: *Environmental and Social Justice in Agriculture*; and 3: *Re-cultivating Human-Nature Relationships*. These domains have been elevated relative to a myriad of other wellbeing needs due to several factors, including the historic role conservation itself has played in the manifestation of injustices, the urgency and need to act in support of these most underserved communities, and the proximity of these priorities to conservation 'spaces of interaction', among other drivers. While these domains have been prioritized, we recognize through further listening and relationship-building, specific initiatives within these domains, and the domains themselves, will necessarily change to reflect goals, needs and aspirations derived from voices on the ground. Our intention in developing human wellbeing domains is in part simply to protect the space necessary to pair conservation efforts with human wellbeing outcomes, demanding attention to the socio-political, cultural and spiritual considerations that underpin our relationship with lands, waters and other forms of life. This chapter elaborates further on each of our three domains including some of their essential elements or key attributes, pressures acting upon them and initial strategies to advance their progress as our partnership cements a commitment to strengthening the interconnections between conservation and wellbeing.



Morro Rock taken Dec 16, 1939 by Carl Thelander



Morro Rock taken Dec 10, 2021 by Connor Jandreau

Morro Rock, circa late 1930's (top), and 2021 (bottom), has long been a landmark on the Central Coast, including as a conservation icon in the recovery of Peregrine Falcons and the aftermath of DDT. To the Northern Chumash and Salinan peoples, the volcanic plug, known as Lisamu to the Chumash, Le'samo to the T'epot'aha'l (or Salinan peoples), is one of many sacred places embedded with spiritual, cultural and ecological significance. It is also emblematic of scores of sacred places throughout the Central Coast that have been severed from Indigenous stewardship and/or access. Supporting the renewal of Indigenous stewardship of sacred places is highlighted as a key element in strengthening human and ecological wellbeing.

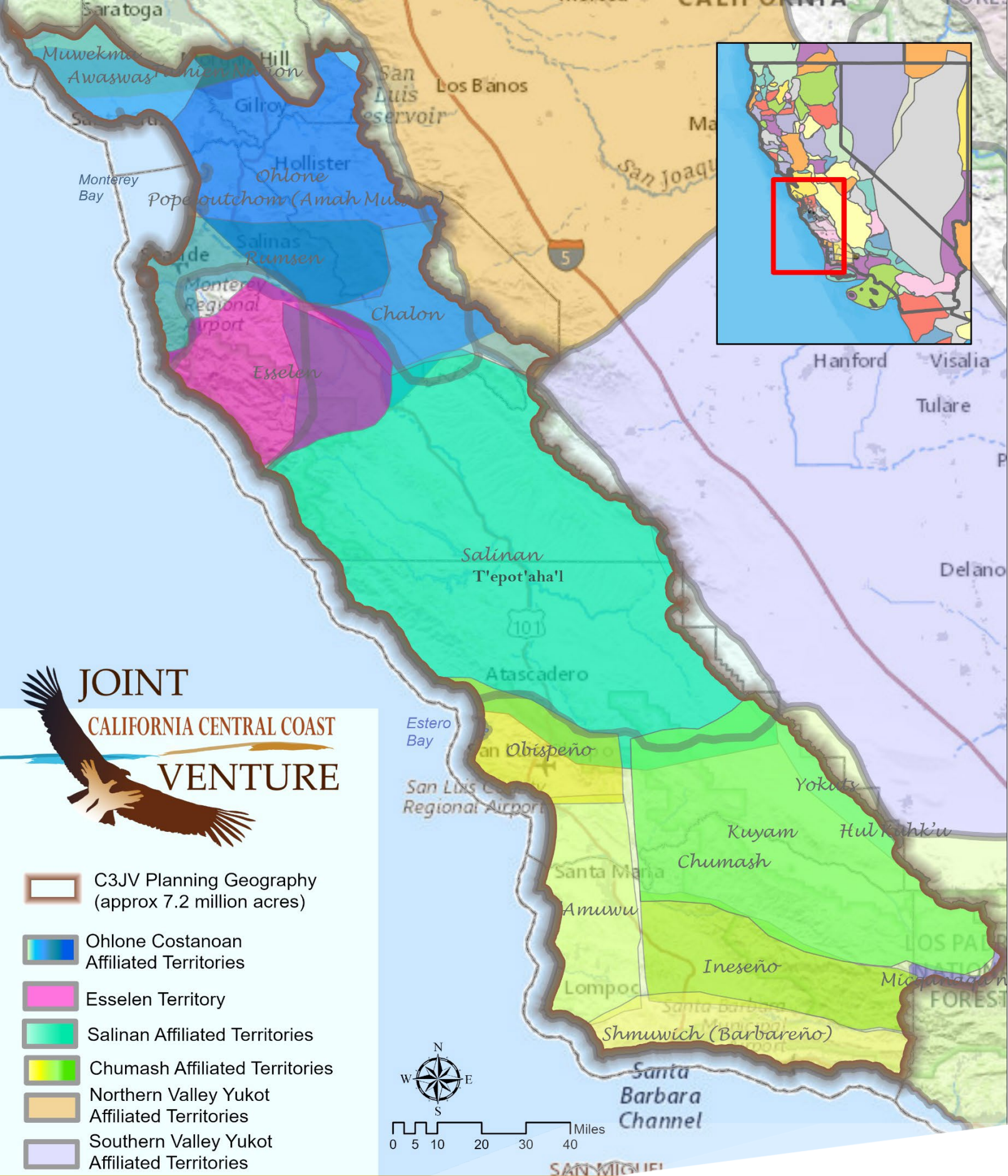


Figure 5.1.1: Indigenous Territories superseding the C3JV geography.

The complexities of overlap shown here among Indigenous territories only begins to represent the relationships between and among Native cultures via trade, shared resources and kinship ties present on the Central Coast. While dispossession and the erasure of people, histories, place names and the generational accumulation of knowledge and relationships has been thorough since Spanish occupation, the peoples Indigenous to the Central Coast, and the places they have stewarded for millennia remain. Source: www.native-land.ca

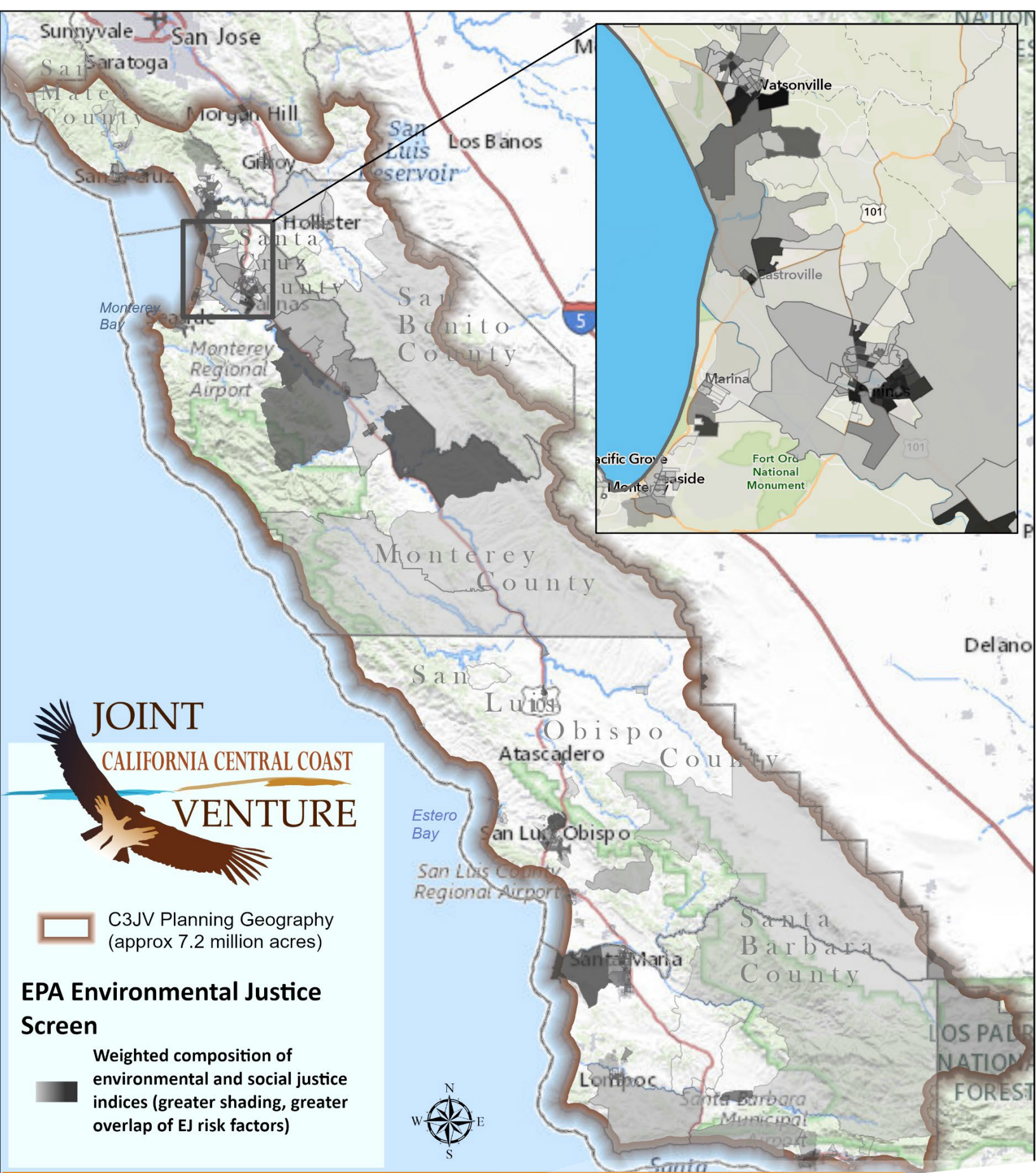
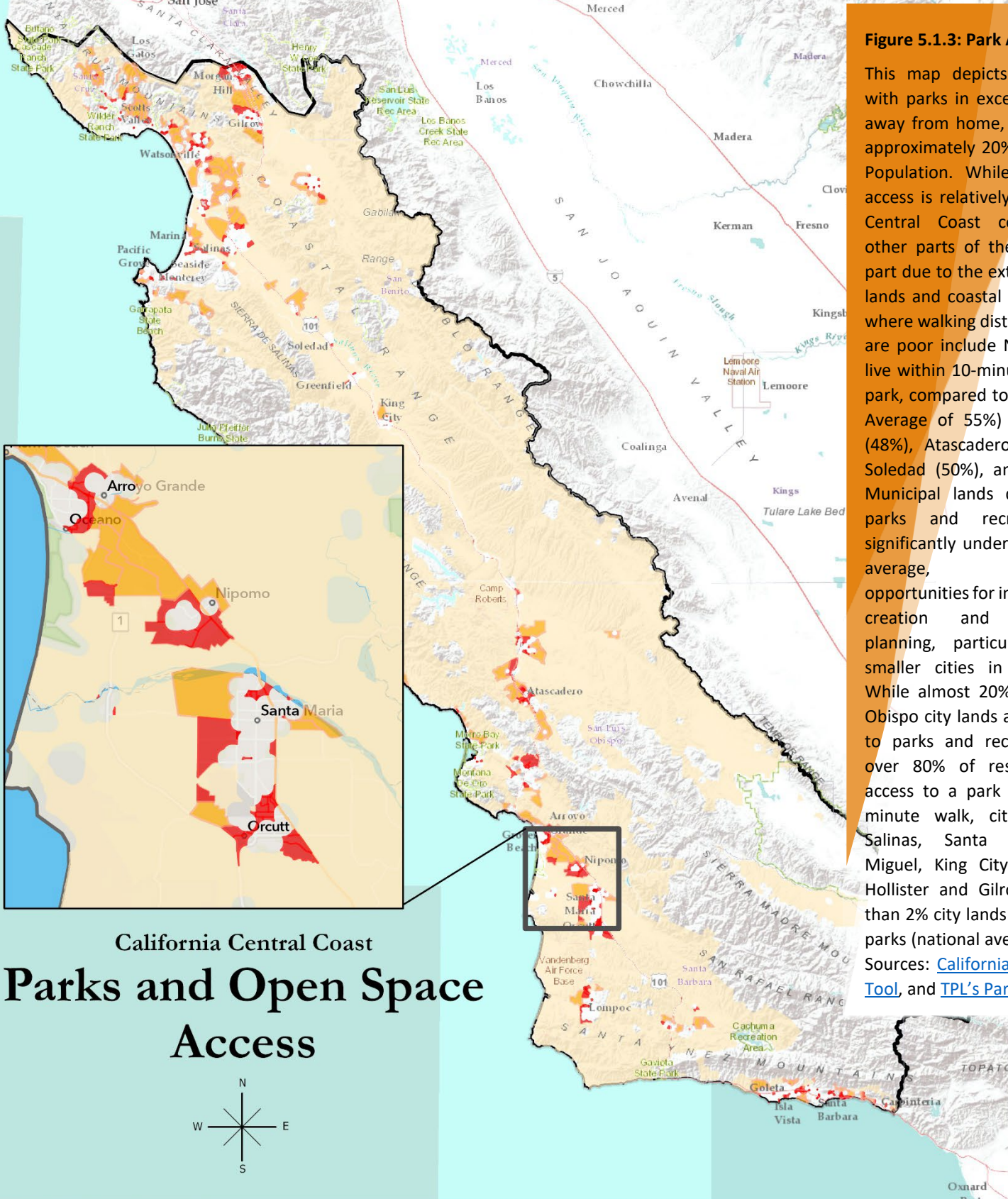


Figure 5.1.2: Regions with elevated risk factors for environmental and social injustice.

Socio-political, cultural, demographic and socio-ethnic factors converge with environmental factors in ways that influence individual and community wellbeing on the Central Coast. Air and water contamination, proximity to industrial waste, dense traffic and agricultural runoff intersect with immigration status, poverty and labor inequalities, housing and food insecurity, cultural isolation and other contributing factors layering vulnerabilities that translate to social and environmental injustice. Some of these hotspots include the Salinas and Watsonville communities, the middle reaches of the Salinas Valley, northern San Luis Obispo County and Santa Maria. Source: [EPA's EJ Screening Tool](#)

Figure 5.1.3: Park Access.

This map depicts populations with parks in excess of ½ mile away from home, representing approximately 20% of the C3JV Population. While greenspace access is relatively good in the Central Coast compared to other parts of the country, in part due to the extent of public lands and coastal access, areas where walking distance to parks are poor include Nipomo (20% live within 10-minute walk of a park, compared to the National Average of 55%) Paso Robles (48%), Atascadero (27%), and Soledad (50%), among others. Municipal lands dedicated to parks and recreation are significantly under the national average, indicating opportunities for increased park creation and greenspace planning, particularly among smaller cities in the region. While almost 20% of San Luis Obispo city lands are dedicated to parks and recreation (and over 80% of residents have access to a park within a 10-minute walk, cities such as Salinas, Santa Maria, San Miguel, King City, Castroville, Hollister and Gilroy have less than 2% city lands dedicated to parks (national average is 15%). Sources: [California Park Access Tool](#), and [TPL's Park Score Tool](#)



California Central Coast Parks and Open Space Access



- C3JV Terrestrial Planning Geography (approx. 7.2 million acres)
- People living more than 1/2 mile from parks and public open space**
- >1,000 people/sq mile
- 200-1,000 people/sq mile
- <200 people/sq mile



Table 5.1.1: Three Priority Domains in advancing Human Wellbeing in the C3JV region.

Wellbeing Domains	Description
<i>Supporting Indigenous Sovereignty</i>	<p>The Central Coast is composed of at least five distinct language families or cultural affiliations, within which more than twenty different Indigenous Nations, Bands, and Communities represent unbroken lineage-to-place for thousands of years. These include the Association of Ramaytush Ohlone, Amah Mutsun Tribal Band, Amah Mutsun Tribal Band of San Juan Bautista, Costanoan Rumsen Carmel Tribe, Santa Ynez Band of Chumash Indians, Esselen Tribe of Monterey County, Ohlone/Costanoan-Esselen Nation, Salinan (T'epot'aha'l) Tribe of Monterey, San Benito, and San Luis Obispo Counties, Muwekma Ohlone Tribe, Xolon-Salinan Tribe, Salinan T'rowt'raahl, Costanoan Ohlone Indian Council, Owl Clan, Salinan-Chumash Nation, Indian Canyon Band of Costanoan/Mutsun Indians, Costanoan Tribe of Santa Cruz and San Juan Bautista Missions, yak tit'yu tit'yu yak ti'hini - Northern Chumash Tribe, Barbareño/Ventureño Band of Mission Indians, Chukchansi Tribe, Tachi-Yokuts Tribe, Tejon Indian Tribe, Northern Chumash Tribal Council, Coastal Band of the Chumash Nation, among others which may be mistakenly omitted here. For over two hundred years, the actions of settler colonial policies against Indigenous peoples in the Central Coast has resulted in, among other atrocities, the severing of relationships between Indigenous people and the lands for which they have stewarded for generations. In recognizing the loss, erasure and diminishment of Indigenous voices in land, water, and wildlife stewardship, the C3JV is committed to: 1) Building self-knowledge and capacity, invitation, and active engagement with the Indigenous conceptualization of Right Relations (Gram-Hanssen et al. 2022), both between Indigenous and non-indigenous peoples, as well as between humans and nonhuman beings; 2) Advancing opportunities for restored stewardship responsibility by Indigenous communities, including through land protection and Indigenous-led stewardship of landscapes and sacred places; and 3) Elevating Indigenous knowledge and Ways of Knowing in conservation, restoration and stewardship. The C3JV is committed to supporting the rematriation² of lands, access to and cultivation of Indigenous food systems and rights to hunt, grow, gather and collect, elevating Indigenous voices in decision-making and conservation planning and ultimately, listening to the ways in which our partnership can support the goals of Indigenous sovereignty.</p>
<i>Environmental and Social Justice in Agriculture</i>	<p>Supporting a vibrant agricultural economy integral to the cultural heritage of many Central Coast communities, farmworkers and their families remain some of the most underserved in the region, many experiencing severe social and environmental consequences. Poverty rates in agricultural centers such as Watsonville, Salinas, King City, Soledad, Santa Maria and others rank among the highest in the United States (CAUSE 2008). Life expectancy is extremely low among farmworkers relative to other occupations, health insurance is typically out of reach, food insecurity is ubiquitous, housing conditions are commonly overcrowded and unsafe, and vulnerability to sexual assault is highest among farm working women, to name but a selection of environmental and social justice indices. Monterey County has the highest percentage of residents without legal status in California, adding to exceptional labor vulnerabilities inherent in the agricultural sector, not to mention the language and cultural isolation experienced by migrant Indigenous Mixteco, Zapoteco or Triqui speakers, who account for nearly one third of farmworkers in the region (NCFH 2022). The Central Coast, in fact, represents the highest concentration of Indigenous migrant farmworkers in California, if not the United States. As impacts of climate change continue to mount, these communities face some of the gravest repercussions; from drinking water contamination and coastal flooding in lower estuary communities, to heatwaves, wildfire-inflicted smoke inhalation and loss of economic opportunities with the ever-increasing vulnerability of agriculture. With these concerns layered upon already existing and aforementioned environmental and social injustices, the C3JV recognizes a responsibility and opportunity to design conservation strategies that marry sustainable agriculture, healthy working lands and the communities they support, and the myriad of avian and wildlife species dependent upon agricultural landscapes. The C3JV seeks to develop partnerships that support preparedness and adaptation for climate change impacts, minimize the harmful externalities of agricultural production for both people and wildlife, and cultivate an agricultural economy built on the recognition of socio-ecological wellbeing.</p>
<i>Re-cultivating Human-Nature relationships</i>	<p>Ultimately, in centering human wellbeing as inseparable from a vibrant and flourishing natural world, rekindling our connections to, respect of, and knowledge about the environments on which we depend becomes an essential domain for the C3JV. In the United States, people spend more than 93% of their lives inside (Klepeis et al. 2001). The health benefits of being in the outdoors speak for themselves, but the loss of interactions, interest, knowledge and exchange with nonhuman spheres are too pivotal to the long-term stewardship of wildlife and human communities alike. Whether it is fostering opportunities for place-based, outdoor and environmental learning, supporting community-based stewardship or a myriad of other forms, the goal is to revitalize a collective sense of responsibility and honor in caring for the lands, waters, animals and communities for which we are part. With a rapidly changing climate, a biodiversity crisis, and continued marginalization experienced by so many within our communities, let conservation be a project that seeks remedy across biophysical, ecological and socio-cultural spheres. The C3JV is eager to pursue, support and partner with efforts that champion young naturalists, open doors to conservation for those that find them shut, reimagine urban greenspaces for socio-ecological renewal, and accentuate connections between community resilience and healthy landscapes.</p>

² The Indigenous concept of [Rematriation](#), distinct from repatriation, refers to reclaiming of ancestral remains, spirituality, culture, knowledge and resources. See also <http://ili.nativeweb.org/perspect.html>

5.1.1 KEY ATTRIBUTES OF PRIORITY HUMAN WELLBEING DOMAINS

Using the Conservation Standard’s Viability Assessment framework discussed in **Chapter 3**, a selection of Key Attributes, or the factors, interactions and/or elements that enable the target to persist, were identified along with potential indicators used to measure the status and trend of each attribute, presented in Table 5.1.2. The table identifies each key attribute, a summary description of its meaning and importance as a measure of

functionality of our Human Wellbeing Domains, identifies a suite of indicators the JV may use to quantify and monitor the attribute, and finally provides a conditional status rating of each indicator. The current conditional status code was derived from knowledge and consensus among Implementation Task Force members and advisors, but does not represent a quantitative measure. Instead, it is a qualitative, and relative, conditional statement that will be refined as information and monitoring systems develop, and it allows for an initial and comparative snapshot of the indicators perceived to be more or less compromised today.

Table 5.1.2: Key attributes identified for Human Wellbeing Domains that are essential to the functioning of each domain.

Domain	Key Attributes and Indicators	Attributes' Current Status	Status Notes
Supporting Indigenous Sovereignty	<p><i>1. Awareness, education and self-knowledge</i> One of the most important roles the C3JV must consider in supporting Indigenous sovereignty is facilitating continued learning within partner agencies and organizations with regard to historic and present harms, colonial legacies, current obstacles and challenges, and individual/collective self-awareness as elements necessary for reconciliation and Indigenous empowerment. Indicators may include: Institutional narrative change, partner acknowledgements and commitments, cultural sensitivity trainings, personal storytelling.</p>		Acknowledgements and commitments have been made, but much remains translating these to practice.
	<p><i>2. Trust</i> Strengthening relationships and trust-building at the individual level is paramount in working toward supporting Indigenous communities and their respective and unique sovereignty goals. By participating as invited guests within Indigenous spaces, by convening spaces of trust-building and learning, but working to seek commonality of vision, and by demonstrating commitments that extend overtime, trust-building is the backbone to reconciliation and healing within conservation circles. Indicators may include: meetings, site visits and other engagement activities attended; # invitations received.</p>		The absence of trust still defines much of the relationships between Indigenous communities, the state, non-Indigenous organizations, and the public.
	<p><i>3. Indigenous Capacity</i> With or without Federal recognition, Indigenous Tribes, Bands, and Communities are often underfunded, understaffed and representatives often juggling full-time jobs on top of duties to their tribal memberships. The C3JV can support Indigenous sovereignty goals by strengthening capacity through grant funding, travel and stipend costs for regional planning and engagements, fellowships, honoraria, and where invited, technical support with grants, proposals and project deliverables. Indicators may include: project metrics and funding implemented by Indigenous-led efforts; supported travel, honoraria, etc.</p>		Awareness is growing in public/private funder arenas, but obstacles remain (match requirements, cumbersome grant applications, and exclusion of non-recognized Tribes

<p>4. Stewardship and Rematriation Indigenous communities in the Central Coast have lost access to all or large portions of their homelands, including sacred places and harvesting grounds. While a growing number of examples of rematriation of lands through fee title transfer and other mechanisms are occurring in the Central Coast, the C3JV recognizes decolonization of lands and management authority are key attributes to supporting Indigenous sovereignty. Supporting title transfers, gifting, exchanges, easements (including cultural) and co-management arrangements are all mechanisms supporting increased Indigenous stewardship of lands. Indicators may include: acres, nautical miles, or acre-feet under Indigenous tenure, stewardship and/or co-management.</p>		Most Central Coast Indigenous Tribes remain without a recognized land base and continue to struggle to access sacred places.
<p>5. Elevating Indigenous Knowledge and Voices Indigenous representation/leadership in conservation domains is often absent or peripheral at best. While the standards of free, prior and informed consent may be stronger in California than other states, too often decision-making tables exclude Indigenous voices. Rather, Tribes are included as but one more stakeholder group to be consulted during project approval processes. The elevation of Indigenous voices, leadership and knowledge in research, project design, policy development and overall land-use decision-making is a key attribute in advancing Indigenous sovereignty and strengthening the stewardship of birds, other wildlife and the habitats we all depend upon. Indicators may include: elevating board leadership, establishing C3JV Indigenous Advisory Council, etc.</p>		While the Central Coast has powerful leadership among Indigenous Communities, much remains in the way of empowering nation-to-nation and nation-to-state relationships.
<p>1. Pesticides in Agriculture If one element overlaps most prominently with bird conservation and human health, pesticides (including herbicides, rodenticides, and insecticides) is perhaps most obvious. In 2018, for which the latest figures are available, approximately 18 million lbs. of pesticides were applied in the Central Coast, accounting for just under 10% of state application totals (CDPR 2018). Farmworkers, more than 80% of which identify as non-white, are the most exposed to pesticides in the United States. While deleterious health effects for birds and people remains understudied, evidence for short and long-term impacts to both continue to mount (Nebel et al. 2010, Li et al. 2020, Damalas and Koutroubas 2016). As the linkages between pesticides and metabolic, endocrine and neurological diseases in people grows clearer, the intersectionality of these with other risk factors particularly acute in farmworkers such as hypertension, elevated cholesterol, musculoskeletal injuries, and upper respiratory diseases remain unclear. Similar linkages between declining birds (including hummingbirds), pollinators and other insect populations are also being illuminated, highlighting the urgency to address pesticide use for both social and ecological reasons. Indicators may include: measured reduction in pesticide applications, partnership development with Pesticide Action Network affiliates, expansion of organic, regenerative, Indigenous and alternative farming techniques, reduction in pesticide-impaired waterways, research linking health and farm practices, etc.</p>		Strong contingent of organic agriculture expanding, and Monterey County reduced pesticide use by ~1 million lbs. (10%) from 2017 to 2018. Growing push by reduce pesticide use in Farm bill NRCS programming.
<p>2. Water quality Water contamination from nitrates, pesticides, pathogens and coliforms from agricultural, urban and stormwater runoff, as well as siltation, salt water intrusion, industrial effluence and other contaminants have impacted numerous surface and groundwater systems in the C3JV region. In fact, the C3JV region has the highest number of highly toxic waters in the state, with acute concerns in the greater Monterey Bay basin, Morro Bay/Los Osos, and Santa Maria centers (Anderson et al. 2010, Drevno 2016). This is exacerbated by growing water scarcity, over-exploitation of ground and surface water sources, the combination of which impacts disadvantaged communities, particularly in Pajaro, Watsonville, Salinas, Chualar, Gonzales, Guadalupe and Santa Maria.</p>		Robust water monitoring programs exist throughout the Central Coast. Projects need to scale up to address watersheds as a whole.
<p>3. Food security and mental health Food insecurity is high among agricultural workers, as high as 60% among Indigenous migrant workers in the Central Coast (Mines et al. 2010). Exploring the nexus between regenerative agriculture, access to land, community gardens, opportunities strengthening Indigenous foodways (i.e. Milpa cultivation) and access to land and tenure for immigrant farmworkers.</p>		

1. Place-based and interdisciplinary outdoor education

K-12 public education remains overwhelmingly indoors, driven largely by highly standardized curriculum derived at state or national levels, and often compartmentalized by subjects and disciplines. At both the policy and applied levels, the expansion of curricula that bring classrooms outdoors, expands hands-on learning with environmental interactions and strengthens the integration of literature, science, history, mathematics, and other modules delivered holistically are key attributes of place-based educational models. These forms of instruction strengthen student knowledge of the places they live within, helps to erode the disconnect between food production, environmental stewardship and community health, strengthens observation and analytical skills, and has the potential to address social and environmental injustices. **Indicators may include: number of outdoor classrooms per district, expansion of existing environmental education programs, expansion of school farms, greenspace and/or parks, adaptation/adoption of interdisciplinary or cross-curricular programs which incorporate nature-based, hands-on learning of multiple subjects.**

Successful models exist in the Central Coast, largely developed by watershed groups, eNGOs and foundations (e.g. Tomkat Ranch). Progress needs to happen at the State and School District level, including revisiting standards, providing teacher trainings, improved funding access, etc.

2. Access

Building a sense of place and connection to the lands, waters, wildlife and people around us is in part determined by curiosity and interest, mentorship and enthusiasm, awareness and education, as well as access and opportunity. As an imperative component to re-imagining ways public education is delivered, expanding the accessibility to and increased opportunities for engagement and relationship-building within environments, both urban and rural, become key. **Indicators may include: expanded access and facilities within walking proximity to schools, strengthened parks, community spaces and river revitalization programs as vehicles for community-building.**

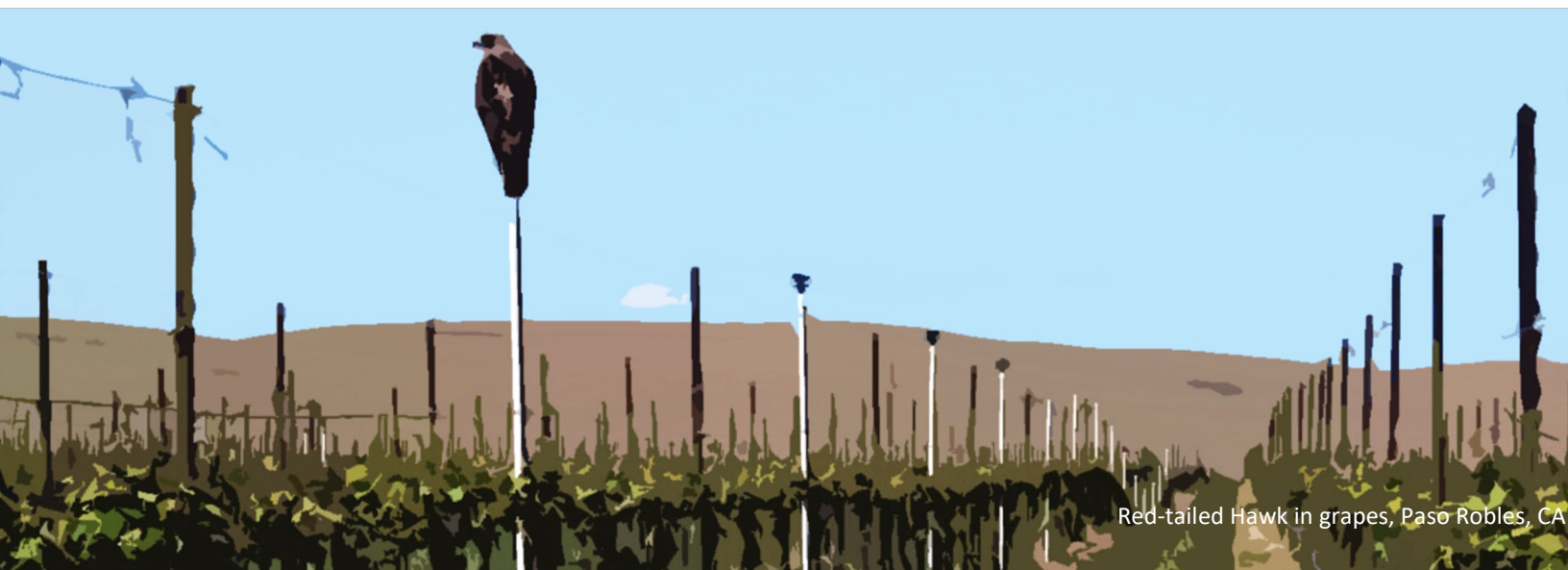
While access is relatively good across the region, opportunities to integrate access and place-based education particularly in underserved communities, is greatly needed.

3. Nature-based Livelihoods and community stewardship

Expanding the scale, pace and magnitude of restoration, conservation, and stewardship efforts will demand the expansion of opportunities for livelihood creation. These fields must expand if we are to respond to the urgency facing our communities and our ecosystems. Building off the strength of programs like the California Conservation Corps, Conservation Fire Camps, the potential to build career pipelines in restoration, conservation and stewardship is a key attribute to re-cultivating deeper relationship with ecosystems. **Indicators may include: measuring expansion of a restoration economy (jobs, enterprises), development of community stewards' programs.**

A real need for improved stewardship of public spaces, coupled with goals to strengthen small, local economies favors a strengthened restoration economy.

Red = poor, orange = fair, green = good, dark green = excellent.



Red-tailed Hawk in grapes, Paso Robles, CA

Synthetic insecticides such as neonicotinoids, are used extensively in seed coating, foliage spray and soil drench applications in agricultural and residential areas. These chemicals are leading to the direct [decline of bird species](#) in the United States, including in California. While health impacts to humans are [not well understood](#), human exposure is [ubiquitous](#) and [concerning](#), particularly for children and agricultural workers.

5.1.2 FOCAL SPECIES OF HUMAN WELLBEING

The ubiquitous colloquial expression, a ‘canary in the coal mine’, denoting an early warning of pending calamity, offers a poignant illustration of the role birds can and do play at the intersection of socio-ecological health and wellbeing. Birds are effective bridging agents, as indicators of ecosystem function or malfunction, as collaborators in integrated pest management in agriculture, as powerful beings embedded with cultural and spiritual meaning and value, and as vehicles to engagement of children and the spark of nature-based observation that can translate into a lifelong passion for and interest in the environments within and around us. In each subsequent Conservation Target Chapter, Avian Focal Species have been identified that offer these intersectional qualities, representing species of critical conservation concern, diverse habitat elements, species of key cultural significance, and good indicators for monitoring management interventions and ecosystem function among other

factors. While social and cultural considerations informed focal species selection, it may also be true that additional species need to be elevated to more effectively represent the socio-cultural values of birds in concert with our priority human wellbeing domains. For example, among Indigenous Communities in the Central Coast, species including the **Red-tailed Hawk, Common Raven, Golden Eagle, Great-horned Owl, Bald Eagle, and Peregrine Falcon** in various ways possess cultural and spiritual significance and other expressions of reverence that may point to heightened relevance as a focal species. Here we identify one species, the *California Condor*, which represents a flagship species across cultures, is revered among Indigenous and settler communities, and offers power as a storyteller in conservation and stewardship. Ultimately, it will be through relationship-building that any additional human wellbeing avian focal species are forwarded by and with the explicit acknowledgment of the communities we are working with to strengthen human and ecological wellbeing.

Common Name	Scientific Name	Primary Habitat Association	Trend and PIF Score	Listed Status	Limiting factors	C3JV Importance	Population Objective
California Condor	<i>Gymnogyps californianus</i>	Diverse, including scrub, beaches, bluffs, and grasslands	Increasing 20	FE, red watch list	Lead poisoning, marine toxins, wildfire, energy development, nesting sites	~27% of wild population	150 birds (at least 15 breeding pairs)

Notes

Table 5.1.3 The California Condor is an iconic, flagship species of the Central Coast. As the largest bird in North America, the story of recovery has been long and arduous. As recovery continues, the C3JV recognizes the role Condors play as an indicator of environmental health (e.g., heavy metal toxicity in land and sea life), ecological function (e.g., keystone scavenger), as well as its role in society (e.g., the [return of the condor](#), and the role it has played in [conservation](#)).



5.1.3 PRESSURES ON HUMAN WELLBEING DOMAINS

Garnering a deep and reflective understanding of wellbeing at individual and community levels necessitates extensive participatory research, engagement and trust-building cultivated through long standing, place-based collaborative learning exchanges, a continuing process which has *not* been done with sufficiency in the preparation of this Plan. The pressures presented in Table 5.1.4 have been gleaned from existing regional planning documents, conversations with local knowledge holders, social justice advocate organizational strategic plans and representatives among other sources, but is not intended to be comprehensive, nor to claim inclusion

of all perspectives from all impacted communities. While this chapter is a first step in identifying some of the potential pressures acting upon prioritized wellbeing domains, investments in transformational collaboration, rather than transactional, will ultimately refine and prioritize the key stressors that inhibit true wellbeing among Indigenous and farmworker communities and next-generation stewards. Only through collaborative models that seek to co-create efforts that are transformational in their impacts to partners will we see the unification of social justice, conservation and socio-ecological wellbeing. Two of the pressures are highlighted following Table 5.1.4.

Table 5.1.4. Selection of pressures inhibiting C3JV Human Wellbeing Domains

Pressure
Loss of access to sacred lands, traditional territories and Indigenous foodways
Erasure and dismissal of Indigenous knowledge and stewardship practices
Water quality/availability (e.g. nitrification, salinization, storm runoff, aquifer mining) **
Natural disasters (wildfire, drought, flooding) **
Air toxins (wildfire smoke, diesel particulates, etc.) **
Greenspace access, Nature-deficit and Nature-Culture dichotomy
Language/ethno-cultural isolation
On-farm exposures (e.g. heat, chemicals/toxins) **
Farm and labor policies
Land values, cost of living and housing affordability

* Ratings are derived from a qualitative index whereby a given pressure is evaluated based on its scope (i.e., scale impact), severity (within the scope, how severe is the potential destruction/degradation), and irreversibility (whether the impact can be reversed, and anticipated length of recovery). **Very High** equates to a large scope, severe impacts and a low likelihood of reversibility within 100 years, whereas **Low** equates to a small scope, relatively insignificant degradation, and restoration of the impact easily achievable/likely.

** Indicates intersectional impacts with climate change-induced pressures, including drought, temperature increases, sea-level rise, increased flooding and precipitation volatility, wildfire/smoke exposure, etc.

Access to sacred lands, territories and foodways: Of the approximately 7.2 million acres of land within the C3JV geography, less than 0.001%³ is under Indigenous title today. While a growing percentage of ancestral homelands are in-part stewarded by and with

Indigenous partners under co-management arrangements or through cultural easements, near complete dispossession of land well describes the status of Indigenous land tenure in the Central Coast under current property law. Most Central Coast

³ Including the [Santa Ynez Reservation](#) of the Santa Ynez Band of Chumash Indians, and the Esselen Tribe's recent [Little Sur River acquisition](#).

Indigenous Tribes and Bands do not have any Federally or State recognized present-day tribal land base. While the history of this dispossession is treated elsewhere (Ferrel et al. 2021, [NACH](#)), the colonial chapters that unfolded through the Mission, Mexican and American periods continue today in the legacy of dispossession of lands, waters, hunting grounds, and sacred places; the obscuration of Indigenous knowledge systems and ways of knowing built over generations; displacement of Indigenous communities to other parts of California and the United States due to forced relocation and more recently, inaccessible cost-of-living; the continued erasure by-way-of federal recognition and termination policies, including institutional barriers to building political, social and financial capital; all in addition to the erasure, through genocide, disease, and on-going settler colonialism, of as much as 90% of California Indigenous people (NAHC, Madley 2016).

Greenspace, Nature deficit and Nature-Culture Dichotomy: Unsurprisingly, Empirical Science ⁴ has begun to document and measure the health ramifications of a cultural disassociation with the environments around us, manifested in obesity, behavioral changes, and other illnesses (Sandifer et al. 2015). While the concept of [Nature-Deficit-Disorder \(NDD\)](#)⁵ tends to concentrate on the physical, social, emotional and ultimately cultural implications to generations growing up seemingly untethered from the places and ecosystems supporting them, the terminology is another manifestation of the nature-culture dichotomy (Fletcher 2017). A dichotomy that defines dominant cultural narratives, and which in part underpins the biodiversity and climate crises we face today. While NDD highlights drivers such as urban and suburban planning, dominant educational paradigms, the emergence of indoor leisure activities (i.e., television) in the 1950s and continued exponential dominance of technology in everyday life today, concerns for child safety, among other manifestations (Louv 2005), overcoming the duality of nature and culture will require attention to deeper underpinnings, such as social and environmental injustice, cultural alienation, racism and structural inequalities, human-

⁴ Also termed Western Science

⁵Coined in 2005 by Richard Louv in his treatise: Last Child in the Woods

superiority complex and overconsumption (Dickinson 2013).

Conservation and Justice

Conservation in the United States, an approach which has been exported worldwide, has from [its earliest beginnings](#) struggled with its relationship to people (Adams and Hutton 2007). Often used as a tool of dispossession, exclusion, and justification for injustice, one need not look too far for [evidence](#) that the settler colonial project has intersected with biodiversity conservation, past and present. While the history of conservation has dark chapters, the essentialism of alignment between addressing social and environmental crises is now. [Decolonization](#) of conservation, for instance, places Indigenous-led efforts at the center of conservation, supports the rematriation of lands and waters, and advances the sovereignty of Tribes, First Nations, and Indigenous Communities long usurped by broken or nascent treaty responsibilities. Linking social justice with conservation efforts embodies the recognition of a legacy of inequity in resource allocation that stems from racial, class, and wealth disparities rooted in the dispossession of land and tenure. While conservation, and conservationists, [must first learn, acknowledge](#) and claim responsibility for harms and the perpetuation of inequities today, conservation practitioners must [also be ready](#) to embrace a reimagination of what conservation is and means for them, individually, and as a community of practice.

This reimagination includes *who* is doing the reimagining.

5.1.4 IMPLEMENTATION ACTIONS

Advancing the vision of thriving populations of birds, other wildlife, and people in the Central Coast will demand approaching conservation efforts in a more holistic and integrated framework, one that positions community resilience, Indigenous sovereignty, labor policies and other socio-cultural tenants as central to the conservation mission.

While these goals and strategies will necessarily change over time through refinement and redefinition by partners, the efforts of the JV to advance human wellbeing and conservation will be, in part, guided and evaluated by the achievement of the following goals:

HUMAN WELLBING BENCHMARK GOALS

- By 2035, the C3JV partnership has supported Indigenous-led efforts to rematriate lands and waters, consisting of at least 25% of all conservation delivery acres. *
- By 2035, at least 25% of all C3JV-associated conservation and restoration efforts have measurable linkages to the water quality and quantity of the Salinas, Pajaro, Santa Ynez and Santa Maria Communities and associated surface and subsurface basins.
- By 2035, use of pesticides in agriculture has reduced by at least 25% in the Central Coast from 2022.
- By 2035, the C3JV and partners have introduced at least one outdoor, experiential and place-based curriculum to every School District within the Central Coast.

* acres counted include acquired by fee title or easement held by an Indigenous-led land trust, co-managed, or with improved access to sacred sites, hunting/gathering grounds, or socio-cultural uses by Indigenous people. Co-managed lands/waters will be included toward goal *only* if identified as true co-management by Indigenous partner(s).

Table 5.1.5 offers a suite of potential Implementation Strategies identified and rated in accordance with the C3JV Strategy Ranking Criteria ([Appendix F](#)). These initiatives and strategies shall in part inform the *synergistic strategies* identified in other chapters, where human wellbeing goals and conservation actions explicitly overlap. It should be noted synergistic strategies, although prioritized, will not necessarily exclude implementation of other strategies depending on partner goals, conservation urgency and other factors.

Here, strategies are organized under broader Initiatives based on thematic commonality, and while specific strategies will necessarily adapt over time, these Initiatives offer continuity as overarching approaches the JV will take to address contributing factors and reduce key pressures to achieve desired wellbeing indicators. The strategies in Table 5.1.5 will in turn form the basis for our annual operating plans that build specificity to short, midterm and long-term objectives and the explicit actions and outcomes.



Table 5.1.5: C3JV Human Wellbeing Implementation Strategies

Strategies	Description	Rating*
Initiative 1: Central Coast Community Engagement and Trust-building		
1.1 Outreach, engagement and relationship-building with Indigenous Communities.	<ul style="list-style-type: none"> -Through a <i>Convening of Indigenous Voices</i>, listen and learn from perspectives of individual voices of diverse Indigenous communities of the Central Coast to explore pathways of collaboration built on humility, respect, trust and common ground. -Elevate and center Indigenous Voices and involvement in conservation planning and delivery, including the C3JV Green/Blue Print Priority landscape planning. -Work with Conservation and Justice Fellows, bridging agents, and other path makers to open doorways for dialogue. -Attend Indigenous-led events <i>where invited</i>, building trust and relationships on-the-ground and in-place. 	VERY HIGH
1.2 Partnership-building with farm labor and social justice efforts in priority watersheds.	-Building linkages between social and environmental efforts starts with engaging in conversations with both elements in the room. Strengthen partnerships with 4C, CEC, CAUSE , Milpa , CAFE , MICOP , UFW , National Center for Farmworker Health: Indigenous Mexicans in California Agriculture among others to strengthen program alignment that can build multi-benefit outcomes for agricultural workers and their families and the working lands that support wildlife and food systems.	HIGH
1.3 Outreach, engagement and partnership building with school districts, educators and outdoor educational providers.	- Conduct a District Road Trip: building relationships with administrators, educators and policy makers to understand their needs, explore barriers, and identify potential C3JV partner roles and opportunities for expansion of and/or modelling of existing programs such as Edible School Yard, Promise of Place , Return of the Natives , Watsonville Wetlands Watch , Learning Among the Oaks , and other programming.	HIGH
Initiative 2: Strengthen and support Indigenous leadership in conservation of public and private lands		
2.1 Support repatriation of Indigenous homelands	<ul style="list-style-type: none"> - Develop and/or support mechanisms for Indigenous land-transfer and/or stewardship arrangements in coordination with Federal and State Initiatives and funding opportunities. -Support expansion of Cultural easements and Co-management arrangements on and with federal, state and private lands, including with the Chumash Heritage National Marine Sanctuary. - Assist Tribes and Indigenous Communities in accessing State funds for ancestral land access. 	VERY HIGH
2.2 Support Indigenous-led efforts through funding, policy advocacy, and technical assistance at invitation	<ul style="list-style-type: none"> -Provide technical assistance for grant funding/applications -Develop Indigenous fellowship opportunities within C3JV and partner organizations. - Co-develop grant applications and funding proposals with Indigenous partners. -Build relationships with funding entities to expand support for Indigenous-led efforts. See First Nations Development Institute’s California Tribal Fund and Native Americans in Philanthropy. 	HIGH
2.4 Embed justice into conservation ethos through staff and partner	- Attend, facilitate, support and host trainings on conservation and justice topics of intersection within and outside C3JV partner organizations, including cultural sensitivity trainings and workshops	HIGH

training, workshops, listening sessions, etc.	strengthening knowledge of trust-building, allyship and cultural awareness. - Develop a speaker series and/or facilitated conversations/workgroups - Develop a conservation and justice C3JV technical committee - Develop conservation and justice course at Cal Poly with guest lecturers, course-embedded research, and partner engagement.	
Initiative 3: Conservation, climate and social justice integration on the farm		
3.1 Birds, People and Pesticides	- In partnership with agricultural producers, farmworker and consumer advocates, research entities and others (ABC's pesticides program), advance policy reform, mitigation efforts (treatment wetlands and bioreactors), Integrated Pest Management and other tools to reduce pesticide use in agricultural landscapes. See Chapter 5.7	HIGH
3.2 Water quality, quantity and watershed health	- Prioritize intersection of watershed and riparian health with water quality and availability within the Salinas, Pajaro, Santa Maria and Santa Ynez watersheds. See Chapters 5.2 and 5.7	HIGH
3.3 Integrating sustainable agriculture with food safety, food sovereignty and food security	- Work with, and support partners including the Slow Food Network , Native American Food Sovereignty Alliance , Indigenous Seed Keepers Network, the Cultural Conservancy and others to expand initiatives linking agroecology, food sovereignty, and sustainable agriculture on the Central Coast. See also Chapter 5.7	MED
Initiative 4: Community Stewardship and Conservation-based livelihoods		
4.1 Advancing place-based, outdoor, interdisciplinary education opportunities and policy	- Support the strengthening and expansion of educational models that bring learning outside, informed by place. Existing models abound (LAO , VWS , Watsonville Wetlands Watch), and new opportunities include: western deployment of Motus in schools, community science platforms (eBird, avicaching, iNaturalist). In partnership with state and federal programs, in cooperation with the California Children's Outdoor Bill of Rights , and in concert with existing policy guides , environmental literacy plans, and guiding principles , develop an adaptable, Central Coast place-based educational curricula.	MED
4.2 Community Stewards Incubator Program	- Pilot a community stewards program modeled from existing examples , developing pipeline for at-risk/underserved students/early career individuals into Coastal Community Steward positions throughout the Central Coast. Includes training courses, engagement with place-based education through linkages with schools (see strategy 4.1), social and ecological monitoring, and community awareness campaigns. Program expansion in partnership with the Respect Wildlife Campaign, Bird Cities Program and other urban conservation programs. Explore the intersection with the Tribal Marine Stewards Network .	HIGH

* Ratings provide a measure of effectiveness for each strategy based on a number of criteria including its expected impact on a pressure or conservation threat, whether the strategy is resilient to climate change, and if the strategy is feasible, etc. Low = not effective, Med = less effective, High = effective, Very High = very effective.

5.2 RIPARIAN AND FRESHWATER SYSTEMS

Though composing a small fraction of the C3JV geography (Figure 5.2.1), riparian and freshwater wetland systems of the Central Coast can be characterized as perhaps the most important habitat for landbirds relative to their extent (RHJV 2004). Oak, scrub, conifer, agricultural and coastal dwelling birds all occur in riparian systems, and in fact most are dependent upon riparian habitats for at least part of their annual lifecycles (Krueper 1993). While riparian systems intersect all other terrestrial conservation targets, by elevating riparian and freshwater wetlands as a conservation target itself, attention is called to both the importance and significant conservation need these habitats command. As critical breeding and wintering grounds, migration stopovers, and corridors for dispersal, the C3JV has an important role to play in ensuring efforts in this significant reach of the Pacific Flyway continue to restore, enhance and protect these most essential habitats.

Riparian habitats occur on the margins of freshwater features, embodying the transition zone between riverine, lacustrine and upland ecosystems. Highly productive, riparian systems play an outsized role on the landscape, particularly in semi-arid landscapes that characterize much of the C3JV region. While riparian communities vary depending on elevation, rainfall gradients and other factors, characteristic canopy species common across the JV include western sycamore (*Platanus racemose*), Fremont's cottonwood (*Populus fremontii*), California bay (*Umbellularia californica*), arroyo (*Salix lasiolepis*) and Pacific (*Salix laevigata*) willows and red (*Alnus rubra*) and white (*Alnus rhombifolia*) alders. The microclimates afforded by moist soil regimes tend to accommodate a well-developed understory of shrubs along riparian corridors, including poison oak (*Toxicodendron diversilobum*), California blackberry (*Rubus ursinus*), redberry (*Rhamnus crocea*), and blue elderberry (*Sambucus nigra caerulea*). In intact riparian habitats, an equally robust herbaceous community exists, often composing 50% of vegetative diversity (Mayer and Laudenslayer 1988).

Freshwater wetlands considered in this target include a diverse array of landscape features including rivers and streams, lakes (including natural and artificial), vernal pools, swamps, ponds, sloughs, and freshwater marshes.

Importantly, coastal estuaries, lagoons, brackish and saltwater marshes are included in the Coastal and Marine Conservation Target (see [Chapter 5.6](#)). Major waterways include the Salinas, Santa Ynez, Pajaro, San Benito, Carmel and Santa Maria rivers, while hundreds of smaller perennial and thousands of intermittent streams further comprise the surface hydrology of the region. Perennial streams are typical to the coastal slopes draining into the Pacific, while interior and eastern drainages are more commonly intermittent. Most larger watercourses are dammed, and aside from a few natural waterbodies (for example Soda Lake on the Carrizo Plain), inland lakes tend to be artificial reservoirs, including Lakes San Antonio, Nacimiento, Cachuma, Lopez, and Santa Margarita.

Historic destruction of riparian areas and draining of freshwater wetlands has resulted in significant fragmentation of what are already naturally heterogenous and patchy habitats (USLTRCD 2004). Remaining intact riparian communities are often proximate to highly degraded systems, are further influenced and limited by upstream dynamics and disturbed hydrology, and are often invaded by non-native flora and fauna that further impair function. Particularly for neotropical migrants such as wood warblers (*Setophaga spp*), the loss and degradation of riparian habitats is pointed to as the single most impactful cause of population declines in the west, and conversely, may be the most critical habitat to prioritize for conservation efforts (RHJV 2004, Nur et al. 2008). In California, in addition to the significant role other Joint Ventures have played in advancing riparian habitat restoration (e.g., see [SFBJV](#) or [CVJV](#)), efforts have been made to establish a California [Riparian Habitat Joint Venture](#) in recognition of the unique role these systems play for biodiversity. The C3JV aims to build upon these efforts, committing to support the restoration, enhancement, and protection of functioning riparian and wetland habitats in the Central Coast to support the long-term viability of birds, other wildlife and the communities inextricably linked to increasingly limited freshwater resources. The following chapter elaborates the attributes, pressures, strategies and goals helping to orient the C3JV's approach to conservation of Riparian and Freshwater Wetlands in the Central Coast.






Figure 5.2.1: Geographic extent of the C3JV Riparian and Freshwater Wetland Conservation Target



California Central Coast Joint Venture

Riparian and Freshwater Wetlands Conservation Target



-  C3JV Terrestrial Planning Geography (approx. 7.2 million acres)
-  Lakes and Rivers (approx 30,000 acres)
-  Riparian (approx. 53,000 acres)
-  Vernal Pool Complexes (approx. 40,000 acres)
-  Other wetland types (approx. 2,400 acres)

0 12.5 25 Mi



Table 5.2.1: Habitat Types Characteristic of the Riparian and Freshwater Wetlands Conservation Target.

Habitat Types	Description	~ Extent (acres)	~ % of C3JV	~ % Protected
Riparian Woodlands	The Central Coast’s riparian habitats are classified principally as either Montane or Valley Foothill Riparian, though isolated pockets of Desert Riparian woodlands exist in the driest portions of the geography. The Valley Foothill Riparian type predominates, occurring on gently sloping plains in the region’s sweeping valley bottoms bordered by sloping alluvial fans as well as on lower foothills and coastal plains. Often in sharp juxtaposition with agriculture and human development, this is the quintessential riparian community, characterized by a dominant overstory of western sycamore (<i>Platanus racemose</i>), valley oak (<i>Quercus lobata</i>) and Fremont cottonwood (<i>Populus fremontii</i>) and in some locales, black cottonwood (<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>). Subcanopy trees include white alder (<i>Alnus rhombifolia</i>), Pacific willow (<i>Salix lasiandra</i>) and southern California black walnut (<i>Juglans californica</i>). Typical understory shrub species include wild grape (<i>Vitis californica</i>), wild rose (<i>Rosa californica</i>), California blackberry (<i>Rubus ursinus</i>), blue elderberry (<i>Sambucus nigra</i>), and arroyo willow (<i>Salix lasiolepis</i>), with sedges, rushes, grasses, miner’s lettuce (<i>Claytonia perfoliata</i>), Douglas sagewort (<i>Artemisia douglasiana</i>), hemlock (<i>Cicuta</i> sp), and hoary nettle (<i>Urtica dioica</i>) in part composing the herbaceous layer. Montane riparian settings tend to be more variable, often with significant components of bigleaf maple (<i>Acer macrophyllum</i>) and California bay laurel (<i>Umbellularia californica</i>), as well as coast redwood (<i>Sequoia sempervirens</i>) and Douglas fir (<i>Pseudotsuga menziesii</i>) in the Big Sur and Santa Cruz portions of the geography, though narrow ribbons of alder and willow may also dominate. The vegetative and structural diversity inherent to riparian woodlands not only hosts high avian species diversity, but also offers important movement corridors for wildlife particularly in human dominated ecosystems such as cities and agricultural valleys. Characteristic bird species include the resident Long-eared Owl and Spotted Towhee, and the migrant Purple Martin, Yellow-breasted Chat and Yellow Warbler.	53,000	0.7%	25%
Rivers, Lakes and Reservoirs	Riverine and lacustrine habitats include perennial rivers and streams, lakes, reservoirs, and ponds. Over 100 lakes freckle the C3JV region, the largest being Lake Nacimiento approaching eight (8) square miles, while another 250 smaller waterbodies sum to the nearly 25,000 acres of lacustrine habitats found in the geography. While significant and detrimental impacts have resulted from the development of reservoirs and artificial waterbodies, these novel habitats now support a suite of breeding and nonbreeding waterfowl, waterbirds, shorebirds, and indeed sustain riparian habitats and emergent wetlands along their margins. Of course, they are further instrumental to meeting the Central Coast’s agricultural and domestic water demands, function as flood-abatement mechanisms, enhance ground water recharge, and provide recreational opportunities for resident communities and tourism-related economies. Many of the perennial rivers and streams are highly altered and often extensively compromised by surface diversion and groundwater withdrawal, stream channelization, excessive sedimentation, and pollution (Mackenzie et al. 2011), though free-flowing and intact rivers and streams exist in northern Santa Cruz County, along the Big Sur Coastline and other pockets throughout the region. Characteristic bird species include Mallard, Common Merganser, Double-crested Cormorant, Belted Kingfisher, Western Grebe, and Spotted Sandpiper among many others.	30,000	0.3%	34%
Vernal Pools and other rare freshwater habitats	Vernal Pools, areas of depression where a hardpan soil layer enables seasonal catchment of rainwater, are an intermittent wetland-type of Mediterranean climates and glaciated regions of the East. Emerging with winter rains, vernal pools in California provide a flush of annual vegetative production that supports a unique assemblage of adapted insect, crustacean and amphibian species. This late winter/spring productivity in turn attracts waterfowl and shorebirds, playing an important role in the Pacific Flyway’s matrix of wetland connectivity (Silveira 1996). By early summer, most vernal pools have dried and it may be years before sufficient rains resurrect the wetland. While vernal pools are scattered throughout the C3JV geography, two Vernal Pool Regions are identified (Keeler-Wolf et al. 1998). The Central Coast Vernal Pool Region, from San Mateo to San Luis Obispo and inland to Santa Clara Counties, exhibit vernal pools typically occurring in isolation of each other and generally governed by geologic structural basins associated with fault lines. The Carrizo Vernal Pool Region occurs almost entirely within San Luis Obispo County, and includes the large dry interior basin of the Carrizo Plain. Given limited data that exists, need exists to strengthen the delineation of vernal pools that exist today to inform potential for restoration of this key habitat. In addition to vernal pools, isolated pockets of rare aquatic and semi-aquatic habitats persist in the C3JV region and are worth highlighting for their unique importance to birds and other wildlife. Emergent wetlands and wet meadows offer critical, albeit isolated, habitat for resident and migrant birds and a suite of other vertebrate, invertebrate and plant diversity. Though fresh emergent wetlands are found throughout California, their extent has dramatically decreased since the turn of the century, principally due to agricultural conversion (Gilmer et al. 1982). While losses are most acute in the Central Valley, emergent wetlands have too been lost on the Central Coast, and today, the habitat type is rare. Dominant plant species include cattail (<i>Typha latifolia</i>), bulrush (<i>Schoenoplectus californicus</i>), sedges (<i>Carex</i> sp) and rushes (<i>Juncus</i> sp). Fresh emergent wetlands are an extension of many riparian areas, often grading into land with nonhydryc soils. Characteristic bird species include Marsh Wren, Sora, Red-winged Blackbird, Least Bittern and American Coot.	Vernal Pool Complexes 40,000** Other freshwater habitats 2,400	<.1%	Further analysis needed 50%
TOTAL		85,400	1.2%	36%

** This acreage figure represents vernal pool complex’s, not wetland delineated acreages, and therefore is not included in the overall acreage count for the Riparian and Freshwater Wetlands Target (source: <https://map.dfg.ca.gov/metadata/ds0948.html?5.96.99>). Most vernal pool complexes occur within the Riparian and Freshwater Wetlands Conservation Target (approximately 68%), though significant portions also occur in the Urban and Intensive Agriculture Conservation Target (8%) or scattered throughout other targets. Further efforts are needed to accurately estimate Vernal Pool extent in the C3JV region.

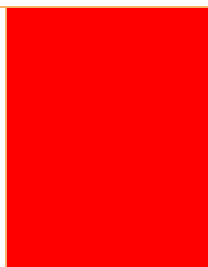





5.2.1 KEY ATTRIBUTES OF RIPARIAN AND FRESHWATER WETLANDS

Using the Conservation Standard’s Viability Assessment framework discussed in [Chapter 3](#), a selection of Key Attributes (factors, interactions and/or elements that enable the target to persist), were identified along with indicators used to measure the status and trend of each attribute. These are presented in Table 5.2.2. The Table identifies each key attribute, a summary description of its meaning and importance as a measure of functionality of the

riparian and wetland ecosystems of the Central Coast, identifies the indicators the JV will use to quantify and monitor the attribute, and finally provides a conditional status rating of each indicator. The current conditional status code was derived from knowledge and consensus among Implementation Task Force members and advisors, but does not represent a quantitative measure. Instead, it is a qualitative, and relative, conditional statement that will be refined as information and monitoring systems develop, and it allows for an initial and comparative snapshot of the indicators perceived to be more or less compromised today.

Table 5.2.2: Key attributes identified for the Riparian and Freshwater Wetlands Conservation Target

Key Attributes	Description	Indicators	Attribute’s Current Status	Status Notes
Hydrology	Hydrology and fluvial geomorphology inform the movement, distribution and management of surface and subsurface waters, fundamental to the condition of freshwater habitats. The nearly ubiquitous alteration of California’s waterways continues to shape the current extent and future capacity of freshwater habitat restoration. Though much remains unknown regarding the impacts alteration of natural hydrologic regimes have on bird communities in the Central Coast, plant community response to these alterations are often significant and invariably impact riparian vegetation-dependent wildlife. The importance of energy transfer, floodplain access, as well as water quality and quantity cannot be overstated, not just for birds, but for aquatic and terrestrial wildlife and our communities wholly dependent upon functioning hydrological systems. The impacts of climate change-induced stresses (i.e., drought and flood) further elevates the importance of measuring these indicators as we implement and evaluate conservation strategies.	1. Soil/sediment erosion/deposition regime (i.e., floodplain access)	Yellow	Critical forces of scouring, for instance, have been significantly lost due to hydrologic modifications
		3. Surface water flow and recharge regime	Red	Significant de-watering of most perennial systems and overutilization of groundwater basins, exacerbated by climate change.
		4. Water quality metrics (temp, pollutants)	Red	Leaching of agricultural effluence, intrusion of salt water in aquifers, etc.
Avian Focal Species	Focal species were selected as representatives of diverse habitat elements, species of weighted importance to the Central Coast relative to their range-wide distribution (e.g., endemics), and species which represent good indicators for monitoring management interventions and ecosystem functions, among other criteria. Further description of the focal species can be found below. High levels of brood parasitism by Brown-headed Cowbirds and artificially elevated	1. Focal species occupancy	Red	Extirpation of key focal species evident.
		2. Focal Species population trends and relative abundances	Yellow	Significant concern across most focal species

	<p>predation rates by native and nonnative predators significantly reduce the reproductive success of many species of birds in riparian habitats, and is a key factor in achieving conservation goals for this target.</p>	<p>3. Priority Conservation Focal Species demographic information (productivity, survivorship and dispersal rates of the bird community.)</p>		<p>Significant concern across priority species.</p>
<p>Habitat quality and quantity</p>	<p>Given the significant pressures acting on the viability of both quality and quantity of riparian and freshwater wetland habitats, the C3JV is committed to monitoring the status of these key attributes, including measuring changes in habitat extent (both historic and ongoing), the degree of connectivity between often disconnected habitat blocks, and the extent of native species dominance in the landscape. In particular, invasion of plants (e.g., giant reed), vertebrates (e.g., starlings, sport fish), and bivalves are all of significant concern for riparian and wetland systems. Furthermore, the structure and diversity of riparian vegetation heavily influence species occupancy as well as population demographics, influenced by hydrological modifications and the alteration of historic fire regimes (see Chapters 5.3 and 5.4 for more discussion on fire). Riparian habitats are often instrumental to the movement of wildlife, both aquatic and terrestrial, and will likely play a key role in enabling adaptation with climate change.</p>	<p>1. Area of habitat (acres of habitat change)</p>		<p>Significant historic loss of habitat, and though trend appears stabilizing, losses acute in agricultural margins.</p>
		<p>2. Avian species richness (number of species present in a given sample site)</p>		<p>Can include secretive marsh and colonial waterbird surveys.</p>
		<p>3. Habitat connectivity (to uplands and along riparian corridors)</p>		<p>Disconnect due to agricultural and urban land use</p>
		<p>4. Species composition (extent of invasive vs native species)</p>		<p>High degree of non-native intrusion in riparian and wetland sites.</p>
		<p>5. Vegetative Structure and successional dynamics (canopy, shrub and herbaceous characteristics)</p>		<p>Concerns include regeneration of sycamore in lowland areas, and lack of deciduous understory.</p>

Red= poor, orange= fair, green= good, dark green= excellent.



original photo by Jim Dougherty

The Coastal Branch of the California Aqueduct, pictured here, supplies Northern California and Sierra Madre waters to the coastal cities of San Luis Obispo, Santa Maria and Santa Barbara, terminating at Lake Cachuma. The California Aqueduct serves 35 million people and 5.7 million acres of farmland in the state. It is also part of a system of dams, canals, pipelines, pump stations and other infrastructure that has transformed most of California's wetlands and river corridors into agriculture.

5.5.2 FOCAL SPECIES OF RIPARIAN AND FRESHWATER WETLANDS

Following the Focal Species Selection Method described in Chapter 3, 17 species were selected as “Avian Focal Species” of the Riparian and Freshwater Wetlands Conservation Target, representing species of critical conservation concern, diverse habitat elements (Table 5.2.4), species with an outsized dependence on the C3JV region during all or a portion of their annual lifecycle (Stewardship Species), species of key cultural significance, and good indicators for monitoring management interventions and ecosystem function among other factors. Table 5.2.3 shows the Riparian and Freshwater Wetland Focal Bird Species, including their principle habitat associations, limiting factors (if known), population trends, and species-specific directional population objectives. Of the focal species, three (3) are Federally listed, six (6) are State Listed, and seven (7) are listed as California Species of Special Conservation Concern given steep population declines, vulnerability to climate change and other threats. As further described in Chapter 3, focal species are organized into three categories; 1) **Conservation Priority Species**; 2) **C3JV Stewardship Species**; and 3) **Indicator Species**. While there are fewer Stewardship Species in the Riparian and Wetland System relative to other Targets, most focal species are declining and several are near extirpation in the region (if not so already), highlighting the severe conservation concern for the habitat overall. The Central Coast has the potential to support the expansion and recolonization of historic ranges of many focal species with sufficient at-scale investments in the revitalization of riparian and wetland habitats. Links to species profiles for individual focal species, where available, can be found in [Appendix I](#) of this plan.

A Canary in the proverbial.....



Photo: Dave Keeling

The status of the [Tricolored Blackbird](#) along the Central Coast appears increasingly grim. Though the 2020-2021 statewide survey was postponed due to the COVID-19 Pandemic, the 2017 survey indicated a perilous decline (2022 survey data are not available at the time of publication). Aside from key colonies in Monterey County, the majority of coastal colonies in the C3JV region show a continuing trend heading toward potential extirpation of the species. While recent declines along the Central Coast likely resulted from severe drought conditions that reduced viable nesting habitats, permanent landscape changes, such as conversions of coastal scrub and grassland foraging areas to vineyards, continue to erode the suitability of the area for breeding *Tricolors*. Stemming the loss of emergent wetlands, intact rangelands and other native habitats and compatible agriculture will be critical to reversing long-term population decline (Meese 2017).

Table 5.2.3: C3JV Riparian and Freshwater Wetlands Conservation Target Avian Focal Species. Focal Species are organized by type: (red)- Conservation Priority, (orange)- C3JV Stewardship, (green)- Indicator

	Common Name	Scientific Name	Primary Habitat Association	Trend and PIF Score*	Listed Status* *	Limiting factors	C3JV Importance	Population Objective ***	Notes
Conservation Priority Species	Black Swift	<i>Cypseloides niger</i>	Cliffs associated with waterfalls	Declining 15	3 rd Priority BSCC, BCC, R2R	Suitable nesting habitats, prey dynamics		Determine Status	At risk of extirpation in the region, limited to cliff sites near or behind permanent or semi-permanent waterfalls, mostly in select coastal San Mateo, Santa Cruz, Monterey and San Luis Obispo County sites. USFWS 2021 BCR 32 Species of Conservation Concern and R2R species of Very High Urgency.
	Least Bell's Vireo	<i>Vireo bellii pusillus</i>	Early successional riparian	Increasing 12++	FE/SE	Restricted range, quality habitat conditions (breeding and nonbreeding), cowbirds		Determine Status	Once widespread, largely extirpated from much of the C3JV region. Significant potential for recolonization in many drainages including the Santa Ynez, Santa Maria and Salinas Rivers through habitat delivery and cowbird management efforts (see Farmer 1999).
	Willow Flycatcher	<i>Empidonax traillii</i>	Dense, riparian deciduous scrub	Declining 11++	SE/FE (<i>E.t. extimus only</i>)	Quality breeding and overwintering habitat conditions		Determine Status	Two subspecies likely breeding in the region, the C3JV represents the northwestern extent of the <i>E.t. extimus</i> subspecies range, with designated critical habitat along the Santa Ynez River. There remains unknown potential for range expansion within and beyond the Santa Ynez watershed, and unknown status of other subspecies across the region, defining a research and monitoring priority of the C3JV.
	Tricolored Blackbird	<i>Agelaius tricolor</i>	Freshwater marsh, dense bulrushes/cattails and nettles	Declining 18	ST, 1 st Priority BSCC, BCC, R2R	Extent of freshwater emergent wetlands and associated foraging habitats, both vastly reduced throughout its range.	<5%	Double	A key indicator of freshwater emergent wetland, <i>Tricolors</i> have declined dramatically in the Central Coast, likely due to losses of both breeding and foraging habitat with increased vineyard development combined with the impacts of drought. Remaining breeding populations are under monitored, represented by small, isolated populations vulnerable to predators and disturbance. The C3JV region appears to be an important wintering area for the population as a whole. USFWS 2021 BCR 32 Species of Conservation Concern.
	Bank Swallow	<i>Riparia riparia</i>	Cut banks, bluffs, active floodplains	Declining 11	ST	Suitable colony sites, forage and roosting habitat loss		Determine Status	In the Central Coast, only a few known colonies remain. 2021 State Census will aid in determining key sites for monitoring, However, as a key indicator of functioning fluvial geomorphological processes such as erosion, deposition, and meandering, managing for Bank Swallows will greatly benefit other fish and wildlife associated with these ecosystem processes.
C3JV Stewardship Species	Pacific-slope Flycatcher	<i>Empidonax difficilis</i>	Closed, shaded riparian thickets	Stable 11			+5%	Maintain	A C3JV stewardship species, abundant bird in the summer, breeding in cool, shaded riparian habitats within oak, conifer and montane woodlands.
Indicator Species	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Lakes, reservoirs, rivers	Increasing 9	SE			Maintain	Extensive recovery efforts over the last thirty years have quickened the return of breeding birds in the Central Coast. Increasingly common winter migrant, favoring Cachuma, Nacimiento, San Antonio reservoirs.
	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	Early, mid-successional riparian	Stable to Increasing 9			>2%	Maintain	Vulnerable to loss of riparian habitat for nesting. Highest quality territories have lower densities of Scrub-jays. Responds quickly to restoration efforts, providing possible early indicator of avian response.

Indicator Species	Common Yellowthroat	<i>Geothlypis trichas</i>	Freshwater emergent wetland and wet meadow	Declining 9		Tall herbaceous emergent vegetation and thick tangles in fresh and brackish wetlands.		Maintain/ Determine Status	Resident in the C3JV, likely supporting winter migrants along the coastal lowlands as well.
	Least Bittern	<i>Ixobrychus exilis</i>	Freshwater emergent wetland	Not well known 12	2 nd Priority BSCC	Significant (large) stands of dense, emergent vegetation and woody debris paired with open water		Determine Status	Currently limited habitat availability in the C3JV. Representative of a suite of other marsh birds and an indicator of water quality and overall wetland condition. Could be part of a larger secretive marsh bird survey instrument (i.e., North American Marsh Bird Protocol) for the C3JV.
	Long-eared Owl	<i>Asio otus</i>	Dense cottonwood/oak and willow woodland and associated edge	Declining 13	3 rd Priority BSCC	Requires riparian habitats for breeding, dependent on nests of other birds		Determine Status	Indicative of prey base and riparian-upland connectivity. Source of population declines largely unknown, but riparian habitat (nesting) and associated foraging habitat loss suspected as remaining riparian habitats are increasingly severed from intact grassland and quality foraging habitats. USFWS 2021 BCR 32 Species of Conservation Concern.
	Purple Martin	<i>Progne subis</i>	Old-growth riparian and redwood woodlands	Declining 9	2 nd Priority BSCC	Nest-site availability, selective habitat conditions		Determine Status	A species relatively tolerant of human activities and disturbance, which can benefit from large crown fires with appropriate post-fire harvesting techniques, but which suffers substantially from starling competition. Mostly absent from lowland oak and riparian forests due to unavailability of suitable nesting sites.
	Swainson's Thrush	<i>Catharus ustulatus</i>	Riparian woodland with dense understory and relatively high canopy closure	Declining 10		Habitat specificity, breeding sensitivity, collisions		Determine Status	During breeding seasons, coastal riparian woodland specialist in the C3JV, particularly in intact riparian habitats along western drainages of the Coast Range. California populations appear to be declining more significantly than elsewhere. Short breeding season may render it sensitive to disturbance, including grazing, development, human activity, and nonnative plants.
	Western Yellow-billed Cuckoo	<i>Coccyzus americanus</i> (western distinct population segment)	Large, intact riparian willow/cottonwood woodlands	Declining 12++	FT/SE	Large patches of riparian forest with high canopy closure, active succession, and high prey availability		Establish a subpopulation (min of 25 breeding pairs)	Likely extirpated from the Central Coast, scattered reports in the Salinas watershed. Critically endangered through the State. Though pockets of suitable habitat remain on the Central Coast (e.g. Santa Ynez, San Antonio, Carmel, San Benito, Upper Salinas), large-scale restoration efforts coupled with assessment of prey conditions (including drivers of decline in large-bodied insects, including the role of pesticides) are called for in support of cuckoo recovery in the C3JV region.
	Yellow-breasted Chat	<i>Icteria virens</i>	Prefers dense, shrubby riparian habitat and marsh margins, typically early successional.	Declining 9	3 rd Priority BSCC	Intact riparian reaches with well-developed dense shrub layer, breeding areas absent cowbirds		Determine Status	Apparent widespread decline in California, and in the Central Coast specifically, with important populations near Lopez Lake, San Antonio River, upper Salinas River, and Santa Ynez River. Removal of vegetation for fire-abatement detrimental to species, as is cowbird parasitism (site specific monitoring needed to determine parasitism threat). Sensitive to grazing, providing possible indicator of grazing management regimes.
	Yellow Warbler	<i>Setophaga petechia</i>	Riparian generalists, primarily found in wet areas with early successional riparian communities	Declining 10	2 nd Priority BSCC	Cowbird parasitism, grazing practices, loss of grasslands		Determine Status	Local breeder in the Central Coast, though appears to be declining throughout much of the region. Understudied, but habitat loss and degradation due to grazing and dewatering, nest parasitism and nest predation appear to be drivers. Appears to respond quickly to habitat management, and as a habitat generalist perhaps a useful indicator of riparian health overall. Santa Ynez River riparian corridor may be a population stronghold of the species in the Central Coast.
	Great Blue Heron	<i>Ardea herodias</i>	Riverine and lacustrine margins, coastal wetlands, grasslands	Increasing 8		Wetland loss, disturbance at nesting colonies, contaminants		Determine Status	As a common colonial-nesting waterbird, the Great Blue Heron is an indicator of freshwater aquatic community health. They are also accessible and provide opportunities for engagement with people in urban and rural landscapes. Populations appear to be declining in California.

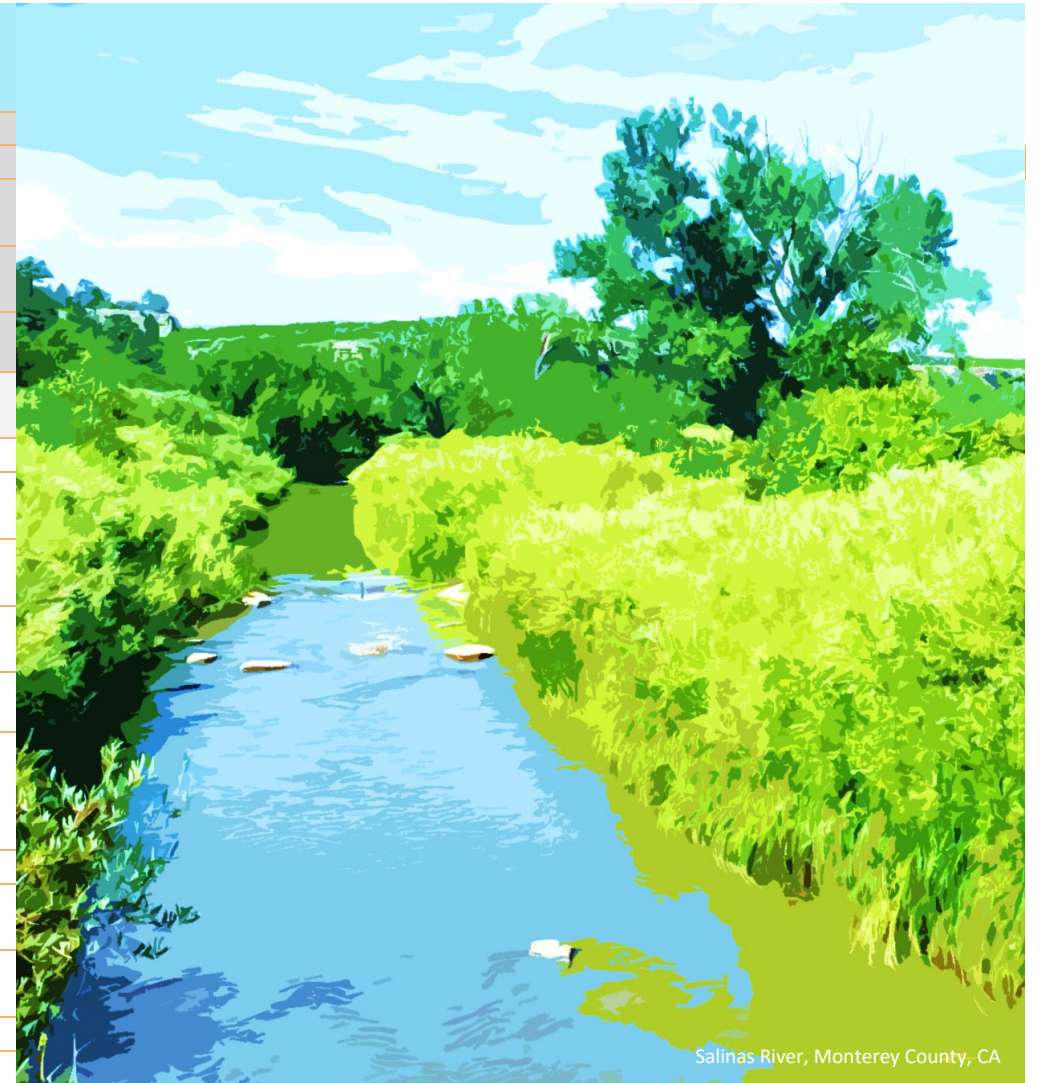
* PIF Score: Partners in Flight (PIF) scores the relative vulnerability of all landbirds according to the following six factors: population size, breeding distribution, non-breeding distribution, threats to breeding, threats to non-breeding, and population trend. Refer to the [Avian Conservation Assessment Database Handbook](#) for specific methodology. ++ PIF score denotes species as a whole, not subspecies.

** Status codes: FE: Federally Listed - Endangered, FT: Federally Listed – Threatened, SE: State Listed – Endangered, ST: State Listed – Threatened; 1st, 2nd and 3rd Priority birds included in California Bird Species of Special Concern, representing regionally specific species of conservation need (<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=84247&inline>).

*** Population Objectives offer directional goals based on regional population trends (trends derived from PIF assessments, CDFW species accounts and/or expert opinion of trend if actual trends are not known). Population objectives will be modified as JV-regional population measures/monitoring systems are developed.

Table 5.2.4: Essential Habitat Elements for C3JV Riparian and Freshwater Wetlands Conservation Target avian focal species

Common Name	Emergent Vegetation	Open Water	Cavities	Trees	Shrubs	Grass / herb	Snags	Common Cowbird host	Unique Element(s)
Black Swift				?					waterfalls
Least Bell's Vireo					X			X	
Southwest Willow Flycatcher				X	X	X		X	
Tricolored Blackbird	X	X				X			
Bank Swallow			X						Soft Cut banks
Pacific-slope Flycatcher				X	X				
Bald Eagle		X		X	X				
Black-headed Grosbeak				X	X				
Common Yellowthroat	X					X		X	
Least Bittern	X				X	X			
Long-eared Owl				X		X			Relies on old raptor/corvid nests
Purple Martin			X	X			X		
Swainson's Thrush				X	X		X	?	
Western Yellow-billed Cuckoo				X		X			
Yellow-breasted Chat					X				
Yellow Warbler				X					
Great Blue Heron	X			X					Colonial nester



Salinas River, Monterey County, CA

5.2.3 PRESSURES ON RIPARIAN AND FRESHWATER WETLANDS

Riparian habitats, though relatively resilient and responsive to restoration efforts, continue to confront a range of pressures that often limit and/or degrade their ecological function. Playing an outsized importance to birds, the loss of riparian function has and will continue to have dramatic results for both neotropical migrants and resident birds, not to mention the suite of aquatic, semi-aquatic and terrestrial plants and animals equally dependent on these vegetation regimes (Hoverman and Johnson 2012). Freshwater wetlands, typically more sensitive to environmental changes and already reduced extensively from their historic extent, largely face similar pressures linked to the riparian habitats they support. Historic impacts from livestock grazing, timber harvesting, water pollution, the introduction of non-native species, gravel and gold mining, and clearing for agricultural and domestic uses have all contributed to the loss of riparian habitats and the degradation of linked riverine, lacustrine and wetland habitats (Mooney and Zavaleta 2016, Knopf et al. 1988). Historic activities have also resulted in the creation of wetland systems, whether through diversions and canal development, stock-water impoundments, and reservoir-building, though these wetlands tend to be simplified, artificially controlled, and less diverse than natural waterbodies.

While acknowledging this historic legacy of wetland and riparian alterations, today’s principal challenges can be characterized by changes in natural communities, altered surface hydrology, and changes in climate. Riparian, marsh and other freshwater-dependent vegetation communities face conversion, fragmentation and degradation from agricultural and competing land-uses, heightened competition with invasive species, and an altered fire regime. River hydrology includes altered flow from diversions and dams. And as sea levels rise, droughts intensify, and patterns of rainfall and summer fog change, freshwater systems are acutely vulnerable to changing climate.

In short, the severity of interrelated pressures acting on Riparian and Freshwater systems remain high. Table 5.2.5 identifies these major pressures, derived through the Threats Assessment methodology described in Chapter 3. While hydrological manipulations and diversions underly much of the continued risk to these systems, encroachment of agriculture, invasive species, and climate change-induced pressures also rank high. Pressures are further elaborated below.

Table 5.2.5. Summary of overall pressure ratings perceived to be acting on the Riparian and Freshwater Wetlands Conservation Target in California’s Central Coast.

Pressure	Rating*
Dams, levees, diversions and aquifer depletion	Very High
Agricultural conversion and/or induced habitat loss	Very High
Invasive and problematic species (e.g., <i>Arundo donax</i> , brown-headed cowbird**)	Very High
Severe fire and fire suppression***	High
Drought and changes in precipitation regime ***	High
Effluence (agricultural, household, urban, commercial/industrial)	Medium
Residential development (urban/exurban and associated infrastructure)	Medium
Incompatible livestock and ranching practices	Medium
Roads and related infrastructure development	Medium
Recreation, tourism and related human disturbance	Medium
Unauthorized Activities (dumping, OHV, cannabis)	Medium
Renewable energy development (e.g., solar arrays and transmission)	Low

* Ratings are derived from a qualitative index whereby a given pressure is evaluated based on its scope (i.e., scale impact), severity (within the scope, how severe is the potential destruction/degradation), and irreversibility (whether the impact can be reversed, and anticipated length of recovery). **Very High** equates to a large scope, severe impacts and a low likelihood of reversibility within 100 years, whereas **Low** equates to a small scope, relatively insignificant degradation, and restoration of the impact easily achievable/likely.

** Cowbird measures should be site-specific, noting that cowbird control has negative effects on non-target birds as well and should be used with caution and confidence.

*** denotes a climate change-induced pressure, where the C3JV may have limited capacity to address the direct cause. Given that climate change-induced drought has a relationship with fire and fire suppression, overlapping strategies may be developed to address or mitigate impacts from both pressures

Dams, levees, diversions and aquifer depletion: The ecological legacy of dams and diversions are treated extensively elsewhere (Arthington 2012, Willis et al. 2021), but suffice to say, the major river systems of the Central Coast were significantly and for-the-most⁶ part permanently altered in the mid 1900's with the construction of numerous large dams. The near collapse of the Central Coast Steelhead, for instance, can in large part be attributed to dam-building on the Nacimiento River, which dramatically reduced surface flows in the entire Salinas Watershed, and severed access to some of the most productive headwater habitats, among other impacts (USLTRCD 2004). Dams, diversions and other altered hydrological processes significantly influence riparian vegetation regeneration, where artificial flow regulation prevents seed dispersal and germination, and development of levees and channelization prevent floodplain access and reduce riparian footprints (Ohmart 1994, Hunter et al. 1999). Compounding these modifications, increased subsurface withdrawal for municipal and agricultural use strains water availability, both for surface wetlands as well as riparian vegetation (Scanlon et al 2012). Water tables have dropped by hundreds of feet in many places in the Central Coast, and though state legislation and county/municipal ordinances has implemented new rules on groundwater use and monitoring, continued growth of agriculture and domestic demands coupled with climate change means the challenge of balancing recharge with consumptive use will likely intensify (Wilson et al. 2020).

Agricultural Conversion and Development: As a bedrock land use in the Central Coast supporting a multibillion-dollar industry, agriculture has often flourished at the cost of riparian and freshwater wetlands. Prior to intensification of agriculture and the development of flood control measures, a chain of freshwater lakes and wetlands dotted the watershed between Salinas and Moss Landing, now drained for agriculture. The riparian woodlands along the lower Salinas River likely measured a mile wide in sections, with extensive marsh and wetlands occupying former river channels, supporting many now extirpated species including the Yellow-billed Cuckoo (Beller et al 2009). Today, the riparian margin has for the most part been

converted to cultivated lands, utilizing millennia of alluvial deposition events and an abundant aquifer resulting in some of the most productive agriculture in the world. Similar losses of 90% or more of riparian vegetation in the upper watershed indicate the ubiquitous scale of habitat loss in the Central Coast's largest river (Beller et al 2009). What riparian habitat that remains, it is estimated over 75% is considered disturbed or degraded (Roberson and Tenney 1993), earning it the title of most degraded river in Central Coast and underscoring the need for restoration. More recently, with deadly bacterial outbreaks, food safety practices have increased pressures on remnant or rejuvenating riparian habitats, resulting in a second wave of habitat loss that continues today, among a cascade of other socio-ecological impacts (Olimpi et al. 2019). Remnant intact riparian and wetland habitat patches on the Salinas can be found and are important for the restoration and recolonization potential they provide for lowland forests and associated species, including some of the last known potential breeding areas of the Least Bell's Vireo. In particular, multi-storied mature riparian habitats dominated by native species are increasingly rare but are critical to the long-term viability for species of conservation concern in the JV.

Invasive and problematic species: While largely indicative of disrupted ecological processes including altered hydrology and habitat fragmentation, invasive and problematic species are increasingly important drivers of degradation within the conservation target. Exotic plants, including giant reed (*Arundo donax*), tamarisk, and cape-ivy develop into monocultured stands that supplant native vegetation, reduce habitat complexity and biodiversity, alter soil and water chemistry and water temperatures, and increase the probability of fire, among other impacts. Vertebrate species including European Starlings, Brown-headed Cowbirds, domestic cats, opossum and other meso-predators reduce avian population viability through nest parasitism, nest competition and predation, in some instances leading to riparian habitats acting as population sinks for regional bird populations. Restoring habitat conditions that consider not just vegetative

⁶ A dam was removed on the Carmel River in 2015, marking the rejuvenation of an important watershed and perhaps a nod to the

future restoration of other watersheds in a post-dam era. <https://www.sanclementedamremoval.org/>

composition and heterogeneity, but also landscape configuration, connectivity, and the socio-ecological context will be important building blocks for recovery of priority conservation focal species (RHJV 2004).

Drought and changes in precipitation regime:

Ecologically, vegetative communities of the Central Coast’s Mediterranean climate are well adapted to drought, utilizing unique traits such as drought deciduous dormancy, sclerophyllic leaves, or near-surface fibrous rooting systems that absorb moisture from summer fog (Nardini et al. 2014). Most riparian vegetation is tapped into shallow, below ground flows as surface water retreats in summer months. However, with increasing human-demands coupled with climate change, drought-related mortality, and vegetative-shifts away from hydrophilic communities are impacting riparian and wetland habitats across the JV region. In

extreme drought events, such as the 2012-2019 drought, the most severe in California’s paleoclimatic record, riparian and wetland habitats experienced die-offs as shallow, alluvial groundwater drops (Kibler et al. 2021). Over time, with narrowing drought intervals as an expected outcome of climate change, what are one-time mortality events may result in whole-community vegetative shifts with long-term consequences for riparian and wetland habitats and the birds and wildlife they support. Lush, dense willow thickets preferred by Least Bell’s Vireo, for instance, disappear with increased depth-to-groundwater, effectively preventing restoration of the site. Consideration of water policy, management and the long-term viability of restoration projects in the context of climate change are essential lenses when considering restoration and protection of riparian and wetland habitats.

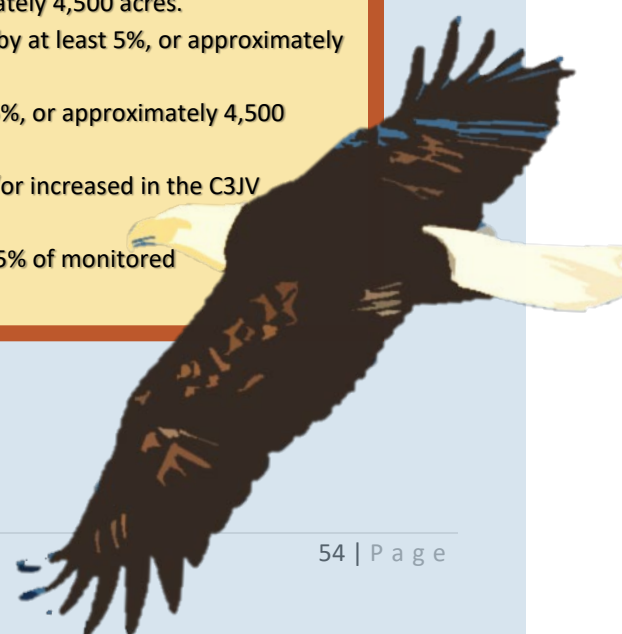
5.2.4 IMPLEMENTATION ACTIONS

Achieving our vision of resilient Riparian and Freshwater Systems shared by thriving populations of birds, other wildlife, and people will in part depend on effective implementation, adaptation and modification of several key initiatives. As strategies are further developed and adjusted over time, the efforts of the JV to advance riparian and wetland conservation will be guided and evaluated by the achievement of the following benchmark goals:

RIPARIAN AND FRESHWATER WETLAND BENCHMARK GOALS

- By 2035, riparian and freshwater habitats increased by at least 5%, or approximately 4,500 acres.
- By 2035, riparian and freshwater habitats with high-quality markers* increased by at least 5%, or approximately 4,500 acres.
- By 2035, riparian and freshwater habitats protected have increased by at least 5%, or approximately 4,500 acres.
- By 2040, all Conservation Priority focal species’ populations have stabilized and/or increased in the C3JV geography (noting importance of wintering ground efforts).
- By 2040, 90% of focal species (with expectation of occurrence) are present on 75% of monitored riparian and wetland sites.

* Age class and structural heterogeneity, native species dominance, reduced or normalized parasitism/predation rates (across multiple sites), reduced effluents, etc.



Employing the Strategy Development method further described in Chapter 3, Table 5.2.6 offers a description of possible Implementation Strategies identified and rated in accordance with the C3JV Strategy Ranking Criteria ([Appendix F](#)). Among these, a sub-set of strategies was identified as having potential for high-impact value strengthening the viability of the Riparian and Freshwater Wetlands Conservation Target *and* in addressing one or more human wellbeing domains (refer to Chapter 5.1). These *synergistic strategies* are outlined in [green in Table 5.2.6](#).

Synergistic strategies, although prioritized, will not necessarily exclude implementation of other strategies

depending on partner goals, conservation urgency and other factors.

Here, strategies are organized under broader Initiatives based on thematic commonality, and while specific strategies will necessarily adapt over time, these Initiatives offer continuity as overarching approaches the JV will take to address contributing factors, reduce key pressures, and decrease biophysical stresses to achieve desired Riparian and Freshwater Wetland habitat conditions. The strategies in Table 5.2.6 will in turn form the basis for our annual operating plans that build specificity to short, midterm and long-term objectives and the explicit conservation actions that deliver conservation outcomes.

Table 5.2.6: C3JV Riparian and Freshwater Wetlands Conservation Target Implementation Strategies

Strategies	Description	Rating*
Initiative 1: Strengthen and Expand Conservation on Public and Private Lands		
1.1 Introduce the North American Wetland Conservation Act (NAWCA) to the Central Coast, building on and supporting existing land protection and restoration efforts.	<ul style="list-style-type: none"> - Increase the scale and pace of land conservation through actions identified in other conservation target chapters, in addition to: - Employing NAWCA, NRCS Farm Bill, utility-public works funding, and other programs, identify high-quality riparian and wetland habitats⁷ at risk of conversion, establishing mechanisms for protection through mitigation banking, county-level transfer taxes, fee and easement acquisitions, and Indigenous land transfer. Potential priority watersheds could include reaches of Pescadero Creek, Scott Creek, Uvas Creek, lower Salinas River, Arroyo Seco, Nacimiento River, upper San Benito River, Big Sur River, Arroyo de la Cruz, San Simeon Creek, San Antonio Creek and Santa Ynez River, among others. 	VERY HIGH
1.2 Increase scale, pace and connectivity of key/existing habitat delivery efforts	<ul style="list-style-type: none"> - Working with existing regional planning efforts (including IRWMP, Stormwater and Groundwater planning and implementation), advance enhancement and restoration of wetland and riparian habitats at watershed scales with multi-benefit actions. Focus efforts on existing priorities within the Salinas, Pajaro, Santa Ynez and Santa Maria Rivers and their tributaries. - Convene technical capacity for large-scale, cross-boundary conservation planning efforts and for project-by-project planning and implementation that include best recommendations for focal bird species.⁸ - Restoration priorities should include watershed-scale management of invasive species (particularly <i>Arundo</i>), wetland creation (See Beaver Brigade), and implementation of Cats Indoors programming among other priorities. 	VERY HIGH

⁷ As part of the Greenprint “Enabling Strategy” further described in Chapter 6, protection and restoration sites should be prioritized in accordance with their proximity to intact, high quality habitat blocks, sites with intact upland habitats, sites with intact hydrology or the potential to restore natural processes, and where surrounding land uses are favorable or enable the inclusion of significant habitat buffers.

⁸ Refer to the CALPIF Riparian Bird Conservation Plan and other restoration ‘handbook’ resources, but generally, restoration projects should consider structural diversity, volume of understory, attention to successional dynamics, and width of riparian corridors as key elements to any planned actions.

1.3 Launch a “Return to the River” Program

- Initiate an adaptable and scalable model for County, City or Watershed-scale rejuvenation of riparian and wetland corridors as the centerpiece of community action, identity, learning, and revitalization. Revisit a [“Turn the Town Around”](#)⁹ mentality to bring funding, planning, vision and community-action partnerships toward the revitalization of rivers and streams embedded in human communities, engaging Indigenous Knowledge and leadership, climate and environmental justice goals, and sense-of-place making in advancing conservation outcomes.

HIGH

Initiative 2: Address Conservation Priority Focal Species Conservation Needs

2.1 Increase populations of focal species and stabilize populations of declining species

- Partner with land managers to implement site-specific habitat actions designed to increase populations of priority focal species. This includes identification of source and sink populations.

- Develop JV geography-specific recovery and monitoring programs for all conservation priority focal species, including establishing working groups where absent, prioritizing assessment of reproductive success and survival rates, and conducting limiting factor research to inform recovery efforts.

- Advance Monitoring Network, See Chapter 6) built on existing monitoring efforts already extant¹⁰ with particular emphasis on stopover habitats, cowbird interactions, and factors influencing nest success for riparian birds.

-Employ, develop (where absent) and/or support existing efforts (including discovery surveys) to determine habitat suitability and occupancy for Bank Swallow, Western Yellow-billed Cuckoo and other indicator species with the potential for recovery.

VERY HIGH

2.2. Wintering Grounds

- Identify winter range, habitat, and possible overwintering conservation issues for Neotropical migrants, including Western Yellow-billed Cuckoo and Least Bell’s Vireo as part of a [Full Annual Cycle Conservation Approach](#).

HIGH

Initiative 3: Strengthen knowledge and awareness of riparian and wetland habitats

3.1 Strengthen understanding of current extent, conditions, and historic loss of wetland and riparian habitats (as part of C3JV Enabling Strategy).

- Building from and in support of existing programs,¹¹ expand the known status and trends of riparian wetland habitat extent and distribution and condition assessments, including for vernal pools. Build comparisons to historical wetland data, to inform priority watersheds with the most opportunities for restoration. As part of the C3JV Enabling Strategy, these tools will inform tracking of gains and losses associated with land use change, restoration, and management actions, as well as enable the establishment of more refined acreage objectives.

MED

3.2 Strengthen implementation of bird-

- Through partnerships with NRCS, agricultural researchers, producer-organizations others, expand educational tools, outreach and cost-share opportunities to landowners, managers and land stewards to steer

MED

⁹ Urban and agricultural landscapes in the Central Coast often orient development with its ‘back to the river’, resulting in historic neglect of the riparian corridor, both physically and socio-culturally (USLTRCD 2004).

¹⁰ For example, extant Banding Stations include Fort Hunter Liggett, Fort Ord, and Los Osos among others

¹¹ see www.EcoAtlas.org, <https://www.sfei.org/projects/ripzet>, and <https://mlml.sjsu.edu/ccwg/ripram/>

sensitive land management	management activities that consider: timing of activities, maintenance of herbaceous and shrub layers, tree/scrub recruitment, agriculture-riparian interactions, invasive species control, return of natural disturbance regimes, soft-edge habitat development, cowbird buffer zones, grazing management and breeding seasonality, among other factors.	
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Initiative 4: Surface and groundwater management and policy

4.1 Develop and Support Water Policy, Legislation and Enforcement	<ul style="list-style-type: none"> -Develop and/or support in-stream flow legislation - Strengthen enforcement of ground water harvesting rules/regulation - Provide guidance for a statewide riparian policy to more fully protect riparian habitat. Assist local governments in establishing riparian buffer zones to protect riparian habitat and associated surrounding uplands from development and disturbance, through mechanisms such as zoning ordinances and/or general plan provisions. 	MED
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* Ratings provide a measure of effectiveness for each strategy based on a number of criteria including its expected impact on a pressure or conservation threat, whether the strategy is resilient to climate change, and if the strategy is feasible, etc. Low= not effective, Med=less effective, High= effective, Very High= very effective.



Tricolored Blackbirds at a cattail marsh, Northern San Luis Obispo County. Artwork by C. Jandreau



5.3 SCRUB AND CHAPARRAL SYSTEMS

Comprising nearly one third of the terrestrial landscape of the C3JV, shrublands are an iconic, largely endemic, and often misrepresented community responsible for much of California’s floristic and faunal diversity (Keeley and Davis 2007). Shrub communities flourish under varying moisture, temperature, nutrient and disturbance gradients within the region’s Mediterranean climatic regime, resulting in a mosaic of scrub and chaparral compositions (Tietje et al. 2019). This mosaic can sharply intersect with other Conservation Targets, principally oak woodlands and savannah and conifer-hardwood habitats, often with distinct allelopathy-derived edge conditions. Of course, as with other habitat assemblages in the Central Coast, ethnographic and historical ecology research has illuminated the role Indigenous land stewardship has played in the development of heterogeneity within shrublands (Safford et al. 2018). In efforts to enhance scrub and chaparral as rich sources of food, medicines, and technologies, Indigenous tribes supplemented the natural fire regime with burning practices designed to, for example, spur annual and perennial herbs, encourage conditions for basketry wares, and improve hunting conditions (Timbrook et al 1982). Through the establishment of successional mosaics, the resulting diversity of structural, successional, and biotic conditions were more variable than would occur without anthropogenic influences, and which signature remains today (Anderson and Keeley 2018).

Chaparral, the most extensive shrub-dominated community in the JV geography, is often further classified floristically by a dominant species combination (e.g., Chamise-Redshank Chaparral), unique edaphic-influenced conditions (e.g., Serpentine and Dune Chaparral), elevational gradients (e.g., Montane Chaparral), and climate variation (Maritime Chaparral) (see Table 5.3.1). For the purposes of this plan,

which employs the CWHR model, Mixed Chaparral and Chamise-Redshank Chaparral are defined, representing collectively over 20% of the terrestrial landscape of the Joint Venture, with particular hotspots in the Santa Lucia, Sierra Madre and Santa Ynez Mountain ranges.

Coastal Scrub, sometimes referred to as soft-chaparral due to a tendency of soft-leaved shrubs such as black sage (*Salvia mellifera*) to dominate, is perhaps the most critically threatened of shrub communities in the C3JV, and certainly across the state (Beltran et al. 2014). Though faring better in the Central Coast relative to other parts of California (see Diffendorfer et al. 2002, Riordan and Rundel 2009). Coastal Sage Scrub and Maritime Chaparral habitats have historically been the most impacted, and least protected habitat, with coastal development having converted much of the habitat to the south of the C3JV region (Rundel 2007). In the Central Coast, significant sage scrub habitats have been converted to urban and agricultural uses, particularly along the Santa Barbara coast, lower Santa Maria River Valley and the coastal communities of Pismo and Arroyo Grande.

Other more limited shrub communities such as alkali desert scrub and sagebrush are relegated to the arid pockets of the C3JV region within the San Joaquin ecosystem and elevated slopes of Mount Pinos in Ventura County. These rarer shrub habitats are largely confined to federally managed lands, and though at lesser risk of loss due to development, remain vulnerable to climate change and other factors. Refer to Table 5.3.1 for greater elaboration on habitat assemblages found in the Scrub and Chaparral Conservation Target. The following chapter elaborates the attributes, pressures, strategies and goals helping to orient the C3JV’s approach to conservation of Scrub and Chaparral habitats in the Central Coast.

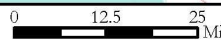
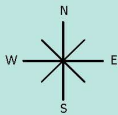








Birds and Habitats of the Scrub and Chaparral Conservation Target: Top: Coastal Scrub and Maritime Chaparral, Montaña de Oro State Park; Middle: Coastal Development in San Luis Obispo County, landscape photos by Jim Dougherty; Bottom Left: Allen's Hummingbird; Bottom Right: California Quail. Bird photos by Dave Keeling.

Figure 5.3.1: Geographic extent of the C3JV Scrub and Chaparral Conservation Target



California Central Coast Joint Venture
Scrub and Chaparral
 Conservation Target



-  C3JV Terrestrial Planning Geography (approx. 7.2 million acres)
-  Mixed Chaparral (approx. 1.2 million acres)
-  Coastal Scrub (approx. 608,000 acres)
-  Chamise-Redshank (approx. 350,000 acres)
-  Desert Scrub (approx. 68,000 acres)
-  Sagebrush (approx. 12,500 acres)



Coordinate System: NAD 1983 Al

Table 5.3.1: Habitat Types Characteristic of the Scrub and Chaparral Conservation Target.

Habitat Types	Description	~ Extent (acres)	~ % of C3JV	~ % Protected
<p>Mixed Chaparral</p>	<p>A floristically diverse habitat assemblage, Mixed Chaparral (MC) supports hundreds of woody plant species statewide, including numerous endemics in the Central Coast. Some, such as Little Sur (<i>Arctostaphylos edmundsi</i>), Santa Margarita (<i>A. pilosula</i>), and Santa Lucia (<i>A. luciana</i>) manzanitas, have limited ranges and, given their sensitivity to large fires, are vulnerable to local extirpation or extinction (USDA 2005). While specious, MC can appear homogenous structurally, dominated by a thick canopy of cutinized, evergreen-leaved shrubs. At maturity, canopies can be impenetrable thickets dominated by scrub oak, chaparral oak, ceanothus and manzanita, and a combination of other associated species, including chamise (<i>Adenostoma fasciculatum</i>), birchleaf mountain mahogany (<i>Cercocarpus betuloides</i>), silk-tassel (<i>Garrya elliptica</i>), Toyon (<i>Heteromeles arbutifolia</i>), yerba santa (<i>Eriodictyon californicum</i>), poison oak (<i>Toxicodendron diversilobum</i>), California buckthorn (<i>Frangula californica</i>), hollyleaf cherry (<i>Prunus ilicifolia</i>), and California fremontia (<i>Fremontodendron californicum</i>). In serpentine soils relatively common to the Central Coast, knobcone (<i>Pinus attenuata</i>), Coulter (<i>Pinus coulteri</i>) and foothill (<i>Pinus sabiniana</i>) pines, as well as cypress species such as Sargent cypress (<i>Cupressus sargentii</i>), occur within chaparral stands along with many serpentine endemics (Tietje et al. 2019). Fire plays a key role in MC community succession, occurring relatively infrequently (as much as 150 years), but typically under high intensity, stand replacing conditions (USDA 2018). Concerns of unsustainable (shortened) return intervals influenced by management and climate change factors are increasing in the region. MC occurs throughout the transverse, peninsular, and central coast ranges. While having some unique characteristics, approximately 4,000 acres of classified Montane Chaparral is included in the Mixed Chaparral landcover of the C3JV. While no bird species are exclusive to Mixed Chaparral, scrub specialists and understory generalists find habitat strongholds in this habitat, including California Thrasher, Wrentit, Spotted and California Towhees, and California Quail.</p>	1,236,800	17%	67%
<p>Coastal Sage Scrub</p>	<p>Often referred to as Soft Chaparral given the dominance of deciduous, soft-leaved and stemmed shrubs, Coastal Sage Scrub or Coastal Scrub habitats host the vast majority of California’s human population, resulting in a much-reduced extent of this habitat across the state. While occurring across the entire coast of the C3JV region, interrupted by the redwood and mixed conifer communities of Big Sur, Coastal Sage Scrub is not confined to the coast; and in fact, it occurs throughout the JV interior. In contrast to Mixed Chaparral, Coastal Scrub is often shallow rooted (often a product of shallow soils), summer-deciduous and associated with significant herbaceous diversity and cover. Dominant and common plants include California sagebrush (<i>Artemisia californica</i>); cliff buckwheat or California Buckwheat (<i>Eriogonum parvifolium</i> or <i>Eriogonum fasciculatum</i>); California aster (<i>Corethrogyne filaginifolia</i>); goldenbush (<i>Isocoma menziesii</i>); coyote brush (<i>Baccharis pilularis</i>); California brittlebush (<i>Encelia californica</i>); black, purple, or white sage (<i>Salvia mellifera</i>, <i>S. leucophylla</i>, or <i>S. apiana</i>); fuchsia-flowered gooseberry (<i>Ribes speciosum</i>); and monkey flower (<i>Mimulus aurantiacus</i>). Chaparral yucca (<i>Hesperoyucca whipplei</i>) grows on rocky and infertile slopes with serpentinitic soils. Coastal Bluff Scrub is another unique and highly specialized habitat characterized by low-growing, salt-tolerant woody plants, and which occurs along the coast on the immediate ocean edge where salt spray is continual. Like chaparral, coastal scrub is highly influenced by, and adapted to, fire. Tolerant of shorter return intervals than Mixed Chaparral, Coastal Scrub species typically resprout vegetatively at the crown, and it has been suggested that Coastal Sage Scrub is successional to Mixed Chaparral under certain conditions (Baker 2019, Malanson 1985). However, with too frequent fire, scrub habitats undergo type-conversion to annual grassland, and evidence suggests much of the C3JV coastal prairie and grasslands are likely a product of Indigenous burning practices, which reduced scrub cover in some locations in favor of increased grass and forb diversity to enhanced food resources (Marks-Block et al. 2021).</p>	608,400	8%	30%
	<p>Functionally similar to Mixed Chaparral, Mature Chamise-Redshank Chaparral is single layered, often impenetrable canopy of interwoven branches with thick leaf litter and undeveloped herbaceous ground cover. Chamise-Redshank Chaparral may consist of nearly pure stands of chamise or redshank (<i>Adenostoma sparsifolium</i>), a mixture of both, or with other shrubs such as Toyon, sugar sumac (<i>Rhus ovata</i>), poison oak, redberry (<i>Rhamnus sp</i>), and California buckthorn particularly in wetter sites. The purest stands of chamise occur on dry, south-facing slopes. Given the relative subjectivity of interpretation between Mixed Chaparral and Chamise-Redshank, (largely a product of burn interval and chamise dominance), the C3JV adopts the classification provided by the CWHR model,</p>			

Chamise-Redshank Chaparral	which notes that “[a] stand of brush is classified as Chamise-Redshank Chaparral, as opposed to Mixed Chaparral, if any of the following criteria are fulfilled. 1. Any stand with greater than 60 percent relative shrub cover by chamise and redshank. 2. Young stands recovering from fire with greater than 20 percent absolute shrub cover by chamise and redshank, and greater than 75 percent relative shrub cover by these species and relatively short-lived subshrubs such as yerba santa. 3. Any stand with at least 50 percent relative shrub cover by chamise and redshank and greater than 75 percent relative shrub cover by these species and shrubs of intermediate life span such as several species of ceanothus.” ¹²	349,000	4.8%	38%
Desert Scrub	<p>The dramatic confluence of ecosystems in the Central Coast is on fine display in the desert regions of the geography. In the far eastern and southern portions of the C3JV, the San Joaquin Desert ecosystem extends into the Central Coast bioregion while Mojave/Sonoran Desert influences seeps up the Cuyama Valley to intersect with Central Valley and coastal influences. While annual grasslands and flowerfields occur throughout, Alkali Desert Scrub maintains a significant foothold in the Carrizo Plain and California Valley. In much of the Southern San Joaquin Valley, agriculture, flood control, groundwater pumping, and grazing have extirpated extensive expanses of desert scrub assemblages, heightening the importance of the C3JV-CVJV Alliance Region as a key remaining stronghold for Valley Sink Scrub, Valley Saltbush Scrub, and Interior Coast Range Saltbush Scrub (Vaghti and Greco 2007). The alkali desert scrubs are variably open and interspersed in mosaics with similarly adapted herbaceous vegetation (Heady 1988). Characteristic subshrub species of the alkaline associations include iodine bush (<i>Allenrolfea occidentalis</i>) and rusty molly (<i>Kochia californica</i>).</p> <p>Above the poorly drained, alkali soils of desert valley bottoms and dry lake beds, unique examples of Desert Scrub occupy elevational gradients between annual grassland, Tucker oak and California juniper woodlands, with particular hotspots along the slopes of the Temblor Range, Panorama Hills, and Caliente Range (Twisselmann 1956). While creosote, the quintessential Desert Scrub flagship species, is lacking here, instead the Desert Scrub plant community of the C3JV consists of a combination of grasses (relatively sparse) and scattered shrubs, including California ephedra (<i>Ephedra californica</i>), winter fat (<i>Krashennikovia lanata</i>), California sagebrush (<i>Artemisia californica</i>), bladderpod (<i>Isomeris arborea</i>), saltbush (<i>Atriplex polycarpa</i>) and California buckwheat (<i>Eriogonum fasciculatum</i>) (Holland 1986, Heady 1988). While classified as Desert Scrub by the CWHR, this habitat is perhaps better described as Upper Sonoran Subshrub Scrub, given the significance of subshrubs, or perennial plants that are woody only at the base, such as California buckwheat, matchweed (<i>Gutierrezia californica</i>), narrowleaf goldenbush (<i>Haplopappus linearifolius</i>) and spiny goldenbush (<i>Isocoma menziesii</i>) (Vinson and Oster 2003). California jewelflower (<i>Caulanthus californicus</i>) is a federally endangered plant found only within these habitat types in decreasing frequency in the Central Coast.</p> <p>While perhaps the most iconic bird of the desert scrub habitats is the LeConte’s Thrasher, other birds of note include breeding Prairie Falcon, Greater Roadrunner, the <i>canescens</i> race of Bell’s Sparrow, plus wintering Sage Thrasher, Mountain Bluebird, and both Vesper and Brewer’s sparrows.</p>	<p>Desert Scrub 49,300</p> <p>Alkali Desert Scrub 17,500</p> <p>Desert Wash 1,500</p> <p>Total 68,300</p>	1%	80%
Sagebrush	Big Basin sagebrush (<i>Artemisia tridentate ssp. tridentata</i>), an interior West icon, is largely relegated to the slopes of Mount Pinos, San Emigdio and Southern Sierra Madre Mountains at the intersection of Ventura, Santa Barbara and Kern Counties, though it can be found more sparsely in other transmontane locations including the Caliente Range. While Big Basin sagebrush often occurs in monotypic stands, it also intermixes (particularly at the edge of its range) with rabbitbrush (<i>Chrysothamnus sp.</i>), horsebrush (<i>Tetradymia sp.</i>), gooseberry (<i>Ribes sp.</i>), western chokecherry (<i>Prunus virginiana</i>), curl leaf mountain mahogany and bitterbrush, and in drier sites, Tucker oak (<i>Quercus john-tuckeri</i>) and California buckwheat (<i>Eriogonum fasciculatum</i>). While not a significant vegetation type for the C3JV, its occurrence demonstrates once again the intersection of biomes within this relatively small landscape, where the confluence of Big Basin, Mojave, Sonoran, Central Valley, and Coastal Mediterranean influences merge. Of note, unlike chaparral or coastal sage scrub, stable sagebrush habitats with little herbaceous understory are relatively fire resistant, but when fire does occur, big sagebrush does not resprout. This can result in a slow return of sagebrush over decades, dominated in the interim by rabbitbrush and grasses, or in some instances a community shift dominated by annual grasses and forbs.	12,500	<1%	77%
TOTAL		2,275,000	32%	53%

¹² California Wildlife Habitat Relationships System, CDFW California Interagency Wildlife Task Force. See <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=67372> for habitat description

5.3.1 KEY ATTRIBUTES OF SCRUB AND CHAPARRAL

Using the Conservation Standard’s Viability Assessment framework discussed in [Chapter 3](#), a selection of Key Attributes, or the factors, interactions and/or elements that enable the target to persist, were identified along with indicators used to measure the status and trend of each attribute. These are presented in Table 5.3.2. The Table identifies each key attribute, a summary description of its meaning and importance as a measure of

functionality of the scrub and chaparral ecosystems of the Central Coast, identifies the indicators the JV will use to quantify and monitor the attribute, and finally provides a conditional status rating of each indicator. The current conditional status code was derived from knowledge and consensus among Implementation Task Force members and advisors but does not represent a quantitative measure. Instead, it is a qualitative, and relative, conditional statement that will be refined as information and monitoring systems develop, and it allows for an initial and comparative snapshot of the indicators perceived to be compromised today.

Table 5.3.2: Key attributes identified for the Scrub and Chaparral Conservation Target

Key Attributes	Description	Indicators	Attribute’s Current Status	Status Notes
Fire Regime	The Central Coast of California has a relatively fire-prone Mediterranean climate, and together with the influence of Indigenous peoples over many thousands of years, much of the scrub and chaparral systems of the C3JV region have coevolved with disturbance by fire. While fire suppression efforts have altered much of the conifer and oak woodland-dominated landscapes of California, including within the C3JV geography, changes to the fire regime within scrub and chaparral habitats have been impacted more by grazing, invasive species, human behavior, development and increasingly, climate change. In contrast to savannah and conifer systems, chaparral habitats have seen an overall increase in fire return intervals relative to pre-colonial times, particularly in Southern California, resulting in the diminishment of fire-sensitive species and diversity loss, loss of old-growth conditions, type-conversions to invasive grasslands, and an overall decrease in shrub canopies (CALPIF 2004). Given the high-intensity character of fire in scrub habitats, which are often adjacent to human infrastructure, fire and the fear of catastrophic blazes drives management of shrub communities, often resulting in their diminishment overtime. In short, the management of fire plays a vital role in the long-term functionality of the Scrub and Chaparral Conservation Target. See also Keeley and Fotheringham 2006, Keeley et al 2001, Holmes et al. 2006 and Purcell and Stephens 2005 for further discussions of fire in chaparral.	1. Timing (seasonality)	Yellow	Fire-prone months increasing, and prescribed fire often occurs at peak biological sensitivity.
		2. Duration (length of incident period)	Yellow	Fire events burn longer relative to historic condition
		3. Frequency (interval between events)	Red	Too high frequency in many chaparral habitats.
		4. Extent (scale of burned area)	Red	Singular events larger relative to historic condition.
		5. Intensity (extent of high-severity fire)	Red	Fire intensity elevated relative to historic condition
		6. Source (prescribed, cultural-fire, lightning, accidental, arson)	Red	Elevated accidental ignitions

Avian Focal Species	Focal species were selected as representatives of diverse habitat elements, species of weighted importance to the Central Coast relative to their range-wide distribution (e.g., endemics), and species which represent good indicators for monitoring management interventions and ecosystem functions, among other criteria. Further description of the focal species can be found below. With increased habitat fragmentation, continued shifts in fire regimes and climate change, having the tools to track and understand long-term declines of shrub birds will only grow more paramount.	1. Focal species occupancy		
		2. Focal Species population trends and relative abundances		Significant concern across most focal species
		3. Priority Conservation Focal Species demographic information (productivity, survivorship and dispersal rates of the bird community.)		Significant concern across priority species.
Habitat quality and quantity	Given the significant pressures acting on the viability of both quality and quantity of Scrub and Chaparral habitats, the C3JV is committed to monitoring the status of these key attributes, including measuring changes in habitat extent (both historic and ongoing), the degree of connectivity between often disconnected habitat blocks, and the extent of native species dominance in the landscape. In particular, invasion of plants (e.g., annual grasses) is of significant concern for chaparral and scrub habitats. Furthermore, the structure and diversity of shrub vegetation heavily influences species occupancy as well as population demographics.	1. Area of habitat (acres of habitat change)		Significant historic loss of
		2. Avian species richness (number of species present in a given sample site)		
		3. Habitat connectivity		
		4. Species composition (extent of invasive vs native species)		Relatively high non-native intrusion in riparian and wetland sites.
		5. Vegetative Structure and successional dynamics (i.e., shrub density)		Concerns for type-conversion to annual grassland, loss of old-growth conditions

Red= poor, orange= fair, green= good, dark green= excellent.

5.3.2 FOCAL SPECIES OF SCRUB AND CHAPARRAL

Following the Focal Species Selection Method described in [Chapter 3](#), 16 species were selected as “Avian Focal Species” of the Scrub and Chaparral Conservation Target, representing species of critical conservation concern, diverse habitat elements (Table 5.3.4), species with an outsized dependence on the C3JV region during all or a portion of their annual lifecycle (Stewardship Species), species of key cultural significance, and good indicators for monitoring management interventions and ecosystem function among other factors. Table 5.3.3 shows the Scrub and Chaparral Focal Bird Species, including their principal habitat associations, limiting factors (if known), population trends, and species-specific directional population objectives. While no focal species are listed as threatened or endangered under either federal or state protections, one (1) is designated a 1st Priority California Species of Special Conservation Concern, while five (5) occur on the USFWS’s 2021 Birds of Conservation Concern for BCR32, given steep population declines, vulnerability to climate change and other threats. As further described in Chapter 3, focal species are organized into three categories; 1) **Conservation Priority Species**; 2) **C3JV Stewardship Species**; and 3) **Indicator Species**. Due in part to the prevalence and biological distinctiveness of scrub habitats, the number of Stewardship Species in the Scrub and Chaparral Conservation Target is high compared to other targets, and yet unfortunately, most (12 of 16) focal species are experiencing

apparent population declines. The Central Coast retains significant scrub and chaparral habitats, providing a key stronghold for breeding and wintering birds dependent on our

Mediterranean shrublands. Links to species profiles for individual focal species, where available, can be found in [Appendix I](#) of this plan.

Fire, Chaparral and Birds

Though fire as a disturbance regime is nuanced, complicated and imperfectly understood (Halsey and Syphard 2015), it nonetheless plays a vital role in maintaining the heterogeneity and complexity of C3JV’s terrestrial habitats, including the fire-influenced scrub and chaparral communities of the Central Coast. For birds, preferred habitats vary widely by species, demanding a mosaic of succession that provides a range of essential habitat elements. Some species require rich, abundant leaf litter under closed canopies (i.e., California Thrasher), conditions found in old-growth chaparral produced by longer fire-return intervals under suppression. Other species, such as Lazuli Bunting and Rufous-Crowned Sparrow, prefer an open canopy and herbaceous understory of flowering forbs and graminoids that flourish after fire, conditions that diminish as shrubs mature. Still other species, such as LeConte’s Thrasher, select habitats of sparse, desert vegetation highly sensitive to *any* fire. In short, fire facilitates some species at the detriment of others, demanding a coordinated, well-monitored and collaborative approach to landscape conservation if our aim is to address the myriad needs of not just all birds, but the overall biodiversity of the Central Coast.



Greater Roadrunner, original photo by Bill Haas

Table 5.3.3: C3JV Scrub and Chaparral Conservation Target Avian Focal Species. Focal Species are organized by type: (red)- Conservation Priority, (orange)- C3JV Stewardship, (green)- Indicator

	Common Name	Scientific Name	Primary Habitat Association	Trend and PIF Score*	Listed Status **	Limiting factors	C3JV Importance	Population Objective ***	Notes
Conservation Priority Species	Allen's Hummingbird	<i>Selasphorus sasin</i>	Scrub, chaparral and mixed forests in close proximity to the coast	Declining 16	BCC, R2R	Not fully known, but may include nectar availability, condition of intact coastal scrub, and range expansion of Anna's Hummingbird	+/-10%	Determine Status	A summer breeder and migrant in the C3JV, populations have undergone steep and continuing declines since 1970, with some estimates of over 80% population loss. The species is a PIF Yellow Watch List, USFWS 2021 BCR 32 Species of Conservation Concern and has been identified as a R2R Bird of Very High Urgency. Though poorly understood, coastal habitat loss, urban effects (e.g., collisions and cats), and plant community changes are likely driving declines.
	Black-chinned sparrow	<i>Spizella atrogularis</i>	Scrub specialist of Mixed Chaparral on moderate to steep slopes	Declining 15	BCC, R2R	Further research needed, including wintering grounds, fire and grazing impacts, and breeding habitat needs	+/-3%	Determine Status	Uncommon but widespread breeder throughout the C3JV region, though more common in the San Rafael Range of Santa Barbara County. Identified as a R2R Species of High Urgency given its sensitivity to fragmentation and declining population trend. While much of its range in the JV geography falls within USFS lands, little is known about the species including basic life history, distribution, response to fire and wintering habitat conditions. Considered sensitive to fragmentation and disturbance.
	California Thrasher	<i>Toxostoma redivivum</i>	Moderate to dense chaparral and sage scrub	Declining 15	BCC	Requires thick, understory litter under mature (old-growth) shrub canopies.	+/-25%	Determine Status	A flagship species of California chaparral and of the C3JV which hosts a significant portion of its global population. Given its restricted range, the thrasher is a Yellow-listed species on PIF, and with continued population declines, is listed as a Species of Conservation Concern by USFWS. Though relatively tolerant of small patch sizes, the species is sensitive to vegetation disturbance, increased urbanization and feral cat predation.
	Le Conte's Thrasher	<i>Toxostoma lecontei</i> (San Joaquin Valley Population)	Sparse, desert scrub (common and spiny saltbush and desert tea) and wash	Declining 17	1 st Priority BCC R2R	Large, unfragmented saltbush habitats, increasingly lost to agriculture, livestock use and development. Competition with California Thrasher may also limit populations.	?	Determine Status	USFWS Species of Conservation Concern, R2R High Urgency and a Red Watch List species with PIF. Prefers dense sites (i.e., washes) for nesting. Energy development, rangeland grazing, and aquifer-fed irrigated agriculture appear to be the drivers of habitat loss, and while much of its habitat in the C3JV region is protected, restoring degraded saltbush/alkali scrub habitats may improve the viability of habitat for the species. Elkhorn Plain, the southern end of Carrizo Plain and Cuyama Valley contain remaining known populations in the C3JV region. See Recovery plan
	Wrentit	<i>Chamaea fasciata</i>	Dense shrublands, including coastal scrub, mixed chaparral as well as native, riparian understory	Declining 14	BCC	Dispersal rates and gene flow limited by habitat connectivity	+/-15%	Determine Status	A sedentary species found almost exclusively in California and Oregon, the Wrentit is a model species for exploring habitat fragmentation and degradation impacts to avifauna in scrub habitats. Still relatively common, though declining trends are noted, the Wrentit is a C3JV stewardship species, and given its restricted range and population trends, also of conservation concern.
C3JV Stewardship Species	Bell's Sparrow	<i>Artemisiospiza belli</i> (both subspecies <i>belli</i> and <i>canescens</i>)	Early successional, open scrub/chaparral and alkali desert scrub specialist	Declining 13		Extensive, semi-open habitats with evenly spaced shrubs 1-2 meters high. Highly sensitive to fragmentation	+/-10%	Maintain	Bell's Sparrow depends on relatively open shrubland communities often maintained by natural fire regimes. Increased urban development in coastal scrub and chaparral habitats has invariably reduced populations in California and in the Central Coast. The <i>canescens</i> subspecies nests in low desert scrub of saltbush, rabbitbrush and some goldenhead desert scrub (Martin and Carlson 1998), whereas the <i>Belli</i> subspecies requires extensive, low coastal sage scrub and dry chaparral.
	California Quail	<i>Callipepla californica</i>	Generalist of broken chaparral, coastal scrub, and woodland/shrubland edge. Increasingly tolerant of suburbia	Stable 8		Dependent on protective, brushy escape cover, dependable water sources, and rich availability of herbaceous vegetation	~15%	Maintain	Still highly regarded as a gamebird, with an average harvest of approximately 200,000 in BCR 32 annually (Zornes and Bishop 2009), the California quail has adapted relatively well to human-dominated ecosystems and appears to be resilient to current hunting pressure. Habitat fragmentation, distorted fire regimes (edge-effects favor quail), decreased water availability, riparian habitat loss, introduced grasses and grazing impacts are cited as concerns for quail in the Central Coast.
	California Towhee	<i>Melospiza crissalis</i>	Open chaparral, brushland patches in woodlands and urban environments	Stable/Increasing 10			~15%	Maintain	Adapted to increasing habitat edge/fragmentation resulting from urban and rural development, and has therefore responded well to logging, agriculture and moderate urbanization.

	Costa's Hummingbird	<i>Calypte costae</i>	Coastal sage and desert scrub	Declining 13		Not fully known, but may include nectar availability, presence of intact coastal scrub with nesting substrate, and range expansion of Anna's Hummingbird	~5%	Determine Status	Costa's Hummingbird, similar to Allen's, has exhibited sensitivity to fragmentation, particularly in desert scrub and coastal sage scrub habitats of southern California and into the Central Coast. The species was formerly listed as a PIF Watch List Species in 2004 and a USFWS 2008 BCC, though not listed in the 2016 and 2021 updates. Fire may play a key role in habitat conditions for Costa's and Allen's Hummingbirds, though more research is needed.
	Mountain Quail	<i>Oreortyx pictus</i>	Prefers tall, dense, early successional shrub-dominated and mixed evergreen communities, often on slopes	Declining 14	Yellow Watch	Dependent on dense protective shrubby cover and dependable water sources, avian predators appear to drive mortality. May be sensitive to fragmentation and human presence	~6-8%	Maintain/Determine Status	As a game species, mid-2000s' estimates of harvest within BCR 32 averaged approximately 17,000 birds (Zornes and Bishop 2009). While variation in trends exist across disjunction populations, the Mountain Quail is a PIF Yellow Watch Species, experiencing apparent sharp declines in recent decades, rates as high as 4.3% annually. Quail require vast, undisturbed, unfragmented shrubland-woodland forest mosaics that enable (unique to quail) seasonal movements. Due to the small covey size, secretive nature, and remote habitat preferences, abundance estimates are difficult and monitoring is challenging.
Indicator Species	Common Poorwill	<i>Phalaenoptilus nuttallii</i>	Open, arid, shrublands (often rocky)	Declining 10		Not well known. As a ground dweller, poorwills are sensitive to habitat loss, and edge effects including car strikes and cat predation.	1-2%	Determine Status	Prefers desert scrub and desert wash, as well as sagebrush and bitterbrush habitats, but also found in open stages of piñon-juniper and other coniferous forests. Winter distribution not well understood, complicated by its unique torpor behavior. Species likely overwinters in the C3JV geography. Significant declines detected over the last 50 years, perhaps due to reduced habitat in the southwest, but trends poorly understood due to inadequate sampling.
	Greater Roadrunner	<i>Geococcyx californianus</i>	Semi-open chaparral with sparsely vegetated grassland, desert scrub and wash, and coastal sage scrub	Declining 9		Large territories of preferred habitat, sensitive to development, intensified land uses and edge effects.		Determine Status	A species of arid and semi-arid shrubby habitats, roadrunners select open, flat to gently sloping habitats with scattered brush and chaparral edge for foraging. In contrast, nests are typically sited in secluded thickets with high canopy cover. Range-wide, roadrunner populations appear to be stable, but in California, declines and range reduction have been reported. Though relatively tolerant of human presence, intensification of agricultural and development is detrimental to the species. Given its elusive nature, monitoring efforts are needed to improve understanding of population trends beyond existing survey efforts.
	Phainopepla	<i>Phainopepla nitens</i>	Desert scrub, dry washes, chaparral, oak/sycamore woodland	Declining 10		Availability of berries, particularly mistletoe of desert shrubs, cottonwood and oaks, as well as juniper, elderberry and introduced peppertree.	3-4%	Determine Status	Uncommon to locally common in inner Coast Ranges and foothills among a range of habitats including desert scrub and wash, blue oak woodlands and riparian habitats, though occurrence is irregular given reliance on fruiting trees and shrubs. A small but measurable decline over the past fifty years, possibly associated with habitat loss from conversion of desert riparian areas for agricultural use leading to reductions in breeding and wintering populations.
	Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>	Open hillside slopes with scattered sage, open chaparral, and scrub oak	Declining 11		Large intact tracts of open shrubs, sensitive to edge effects, and habitat loss due to fire suppression, agricultural development, and grassland conversion.	3-4%	Determine Status	Nicknamed the Rock Sparrow due to preferential selection of open shrublands on rocky slopes, this sparrow is most common in coastal sage scrub dominated by California sagebrush, but also occur in coastal bluff scrub, serpentine chaparral and transitional edges of Mixed Chaparral. Sparrows are positively correlated with open, moderately disturbed habitats, though fragmentation appears to limit occupancy (Thorngate and Parsons 2005). Successional mosaics created by fire or moderate grazing facilitate the species. The subspecies <i>A. r. ruficeps</i> is a year-round resident.
	Spotted Towhee	<i>Pipilo maculatus</i>	Understory generalist of dry thickets, dense chaparral, riparian shrubs and edges	Stable 8		Requires thick understory with abundant leaf litter	4%	Maintain	An abundant bird of diverse, shrubby habitats, Spotted Towhees are indicative of dense, mature chaparral, scrub and mixed forest-shrub associations with well-developed understory. Given their abundance, Towhees provide an accessible indicator of nest success, restoration and management effects, and habitat conditions important to other species.

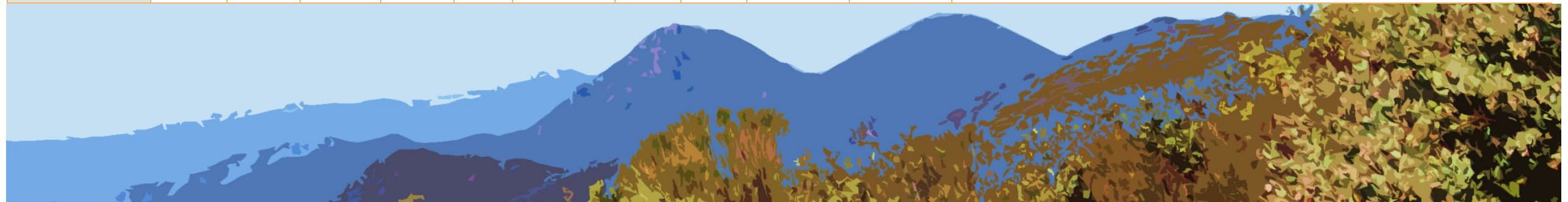
* PIF Score: Partners in Flight (PIF) scores the relative vulnerability of all landbirds according to the following six factors: population size, breeding distribution, non-breeding distribution, threats to breeding, threats to non-breeding, and population trend. Refer to the [Avian Conservation Assessment Database Handbook](#) for specific methodology. ++ PIF score denotes species as a whole, not subspecies.

** Status codes: FE: Federally Listed - Endangered, FT: Federally Listed – Threatened, SE: State Listed – Endangered, ST: State Listed – Threatened; 1st, 2nd and 3rd Priority birds included in California Bird Species of Special Concern, representing regionally specific species of conservation need (<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=84247&inline>).

*** Population Objectives offer directional goals based on regional population trends (trends derived from PIF assessments, CDFW species accounts and/or expert opinion of trend if actual trends are not known). Population objectives will be modified as JV-regional population measures/monitoring systems are developed.

Table 5.3.4: Essential Habitat Elements for C3JV Scrub and Chaparral Conservation Target avian focal species

Common Name	Dense canopy	Open canopy	Desert/Alkali Scrub	Coastal Scrub	Trees	Grass/Herb understory	Slopes	Leaf Litter	Large habitat blocks	Nest site	Notes
Allen's Hummingbird				X	X					Shrub or Tree	Associated with relatively narrow immediate coastal strip across the entire length of the C3JV geography.
Black-chinned sparrow							X		X	Low Shrub	Habitat elements not well understood. Apparent preference for moderate canopy closure, produced by relatively recent fire (within 10 years). Habitat blocks of less than 400 acres typically unoccupied (PRBO species account)
California Thrasher	X							X		Shrub	Ground forager almost exclusively, under continuous dense chaparral canopy.
Le Conte's Thrasher		X	X					X	X	Shrub	Selects habitats dominated by saltbush. Le Conte's intersect California Thrashers wherever patches of willow and/or big saltbush are found, and along the foothills of the Temblor Mountains where slope increases and where goldenbush species begin to dominate on north-facing slopes. California Thrashers tend to occupy moister and shadier locations.
Wrentit	X			X						Shrub	Some of the highest densities of Wrentits can be expected in the Central Coast, (CalPIF 2004), but populations need vigilant monitoring given their restricted range. Riparian deciduous canopies are also utilized by the species, particularly within inland habitats.
Bell's Sparrow		X	X	X					X	Low Shrub	Poorly monitored species sensitive to fragmentation, altered fire regimes, and habitat disturbance, a priority species for understanding population trends and demographics. -
California Quail	X	X		X		X		X		Ground	Primarily a seedeater, quail can adapt to suburban habitats with sufficient cover availability.
California Towhee	X	X								Shrub or Tree	Though prefers Coastal Scrub, towhees are habitat generalists of open edge and dense brush.
Costa's Hummingbird			X	X						Shrub	Extent of importance in the C3JV region not well understood but may provide critical post-breeding refugia.
Mountain Quail	X				X		X		X	Ground	Always found near cover and requires free water. Rainfall a determinant of fecundity, vulnerable to climate change in the Central Coast portion of its range.
Common Poorwill		X	X							Ground	Primarily nocturnal and poorly sampled, expanding survey methods a priority for the species.
Greater Roadrunner		X				X			X	Dense Shrub/Tree	As a good scrub indicator given its need for large, relatively intact habitats, and overall poor understanding of life history in California, this species is a good candidate for monitoring.
Phainopepla			X		X					Tree or mistletoe	Eruptive and unpredictable local occurrence dependent upon the availability of fruit sources. Common in San Luis Obispo County in winter among deciduous oaks/cottonwoods with mistletoe
Rufous-crowned Sparrow		X					X		X	Ground	A good indicator species given sensitivities to habitat fragmentation and disturbance, and poor coverage by existing survey efforts.
Spotted Towhee	X					X		X		Ground/Low Shrub	Often found in riparian shrub thickets in addition to drier upland chaparral and mixed woodland-scrub.



5.3.3 PRESSURES ON SCRUB AND CHAPARRAL

The C3JV geography offers refugia as a landscape of relatively intact, and protected, shrublands compared to other parts of the state. With persistence of extensive rangelands, large swaths of federally, state and privately protected landscapes, and relatively contained coastal development, the Central Coast is an important stronghold for unfragmented shrubland communities. However, the region is experiencing significant population growth, expanding urban/residential development, reduced viability of extensive rangeland production systems, and conversion to vineyards, orchard and other intensive agricultural land uses. Combined with fire suppression, mitigation and management activities, conversion of shrublands to annual grassland, and compounding impacts of climate change, shrubland ecosystems are under growing pressures (see Table 5.3.5) on the Central Coast, with implications to bird

populations, the myriad of other flora and fauna these scrub and chaparral habitats support, and the growing human communities at the edge of our iconic Mediterranean shrublands.

While conversion of shrublands to other land types poses the most immediate and long-lasting pressure, fire management, invasive species, and climate change-induced pressures are also key drivers of change within scrub and chaparral habitats. The interactions among residential development, roads and other infrastructure, human-sourced fire ignitions, and non-native grasses together makes fire management and mitigation a complex endeavor. However, land use planning accountable to the drivers of land conversion and sprawl may offer opportunities to address these complex forces simultaneously.

Table 5.3.5. Summary of overall pressure ratings perceived to be acting on the Scrub and Chaparral Conservation Target in California’s Central Coast.

Pressure	Rating*
Residential development (urban/exurban and associated infrastructure)	Very High
Fire frequency, severity** and suppression	High
Agricultural conversion and/or induced habitat loss	High
Drought and changes in precipitation regime **	High
Invasive and problematic species (e.g., brown-headed cowbird)	High
Effluence (agricultural, household, urban, commercial/industrial)	Medium
Incompatible livestock and ranching practices	Medium
Roads and related infrastructure development	Medium
Recreation, tourism and related human disturbance	Medium
Unauthorized Activities (dumping, OHV, cannabis)	Medium
Renewable energy development (e.g., solar arrays and transmission)	Medium

* Ratings are derived from a qualitative index whereby a given pressure is evaluated based on its scope (i.e., scale impact), severity (within the scope, how severe is the potential destruction/degradation), and irreversibility (whether the impact can be reversed, and anticipated length of recovery). **Very High** equates to a large scope, severe impacts and a low likelihood of reversibility within 100 years, whereas **Low** equates to a small scope, relatively insignificant degradation, and restoration of the impact easily achievable/likely.

** denotes a climate change-induced pressure, where the C3JV may have limited capacity to address the direct cause. Given that climate change-induced drought has a relationship with fire and fire suppression, overlapping strategies could be developed to address or mitigate impacts from both pressures.

Residential Development: Urban and ex-urban residential housing and associated development has resulted in significant loss of scrub and chaparral habitats to date. Statewide, as much 90% of coastal scrub acreage has been lost to development (see CALPIF 2004). In the Central Coast, these losses have been less acute, partly due to a legacy of protected area establishment and federal ownership prevalence including Department of Defense installations. It also may be the case that most urban and agricultural development has principally occurred in mildly sloped prairie-dominated habitats formerly inhabited and cultivated by Indigenous communities such as the Chumash and Salinan peoples along what is today coastal Santa Barbara, San Luis Obispo and Monterey Counties, preserving intact shrublands on sloped margins (Anderson and Keeley 2018). However, with population growth rates of four and five percent in the southern reaches of the C3JV geography, and as high as 16% in interior counties like San Benito, land conversion remains a persistent pressure on shrub communities (US Census Bureau 2021). Furthermore, low profitability, high management costs, and high opportunity costs associated with competing uses (e.g., vineyard development) continues to drive ranchland sales and conversion (Sulak and Huntsinger 2007, Cheatum et al. 2011).

Severe fire and fire suppression: The conservation target is generally well-adapted to fire, having evolved with the disturbance over millennia, in concert with Indigenous burning practices (Blackburn and Anderson 1993, Kay 1995).¹³ Many at-risk species, and the habitat conditions they depend on, cannot be sustained or recovered without disturbance caused by landscape-scale fire (Sugihara et al. 2006). Recognizing the complex and contested relationships between shrub communities and fire¹⁴ and its thorough treatment elsewhere (Conard 1991, Newman et al. 2018, Vale 2002, Quinn and Keeley 2006), sensitivity to fire-return intervals are integral to scrub and chaparral community dynamics, with too frequent fire driving type-conversion to annual grasslands. Indigenous land management practices likely employed this strategy to facilitate type-

conversions to foster a grassland-shrubland mosaic across the Central Coast, facilitating shorter fire-return intervals along coastal terraces and valley bottoms of the C3JV region where village centers and food resources were concentrated (Anderson and Keeley 2018). During the Colonial Period, this type-conversion was likely expanded to facilitate livestock grazing; and today, continues as a management tool to reduce fuels, protect human infrastructure, and increase rangeland production. With expanding urban and rural development, increased human-sourced ignitions and the growing extent of nonnative grassland can lead to a positive feedback cycle where annual grasses facilitates fire and shortens the fire-return interval, leading to the loss of shrub species (Syphard et al. 2018). While the balance of fire-return intervals differs across shrub community types, careful consideration of suppression, mitigation and prescribed fire efforts is required to protect old-growth chaparral, preserve seed banks and protect floral and faunal diversity while addressing catastrophic wildfire dangers, forest encroachment and rangeland production needs.

Invasive and problematic species: Development, fire and invasive species are interrelated and cumulative in their direct and indirect impacts to scrub and chaparral habitats. Urban and ex-urban development increases soil disturbance, road development and vehicle emissions, all of which are conducive to establishment of invasive plant and animal species. Development is also linked to elevated incidents of fire, furthering the grass-fire cycle, a positive feedback loop between fires and annual, nonnative grass expansion. Encroachment of now-ubiquitous European annuals like wild oats (*Avena* spp.), soft chess (*Bromus hordeaceus*), ripgut grass (*Bromus diandrus*), and medusa-head (*Elymus caput-medusae*), along with invasive fountain grass (*Pennisetum setaceum*), barbed goatgrass (*Aegilops triuncialis*), gorse (*Ulex europaea*), and yellow starthistle (*Centaurea solstitialis*) have and continue to drive type-conversions across throughout the JV geography (Menke 1992).

¹³ See Purcell and Stephens 2005 for further description of fire history in California

¹⁴ See, for instance, [California Chaparral Institute](#)



Spotted Towhee, Original Photo by Dave Keeling.

5.3.4 IMPLEMENTATION ACTIONS

Achieving our vision of resilient Scrub and Chaparral Systems shared by thriving populations of birds, other wildlife, and people will in part depend on effective implementation, adaptation and modification of several key initiatives. As strategies are further developed and adjusted over time, the efforts of the JV to advance shrub community conservation will be guided and evaluated by the achievement of the following benchmark goals:

Scrub and Chaparral BENCHMARK GOALS

- By 2035, Coastal Sage Scrub habitats with protected status have increased by at least 5%, or approximately 30,000 acres, of which at least 25% are under Indigenous-led stewardship.
- By 2035, scrub and chaparral habitats with high quality markers* increased by at least 5%, or approximately 100,000 acres, of which at least 25% are under Indigenous-led stewardship.
- By 2040, all Conservation Priority focal species' populations have stabilized and/or increased in the C3JV geography.
- By 2040, 90% of focal species (with expectation of occurrence) are present on 75% of monitored scrub and chaparral sites.

* Age class and structural heterogeneity, reduced fire intervals, native species dominance, reduced or normalized parasitism/predation rates, species-specific habitat characteristics

Table 5.3.6 offers a description of possible Implementation Strategies identified and rated in accordance with the C3JV Strategy Ranking Criteria (Appendix F). Among these, a sub-set of strategies was identified as having potential for high-impact value strengthening the viability of the Scrub and Chaparral Conservation Target *and* in addressing one or more human wellbeing domains (refer to Chapter 5.1). These *synergistic strategies* are outlined in **green** in Table 5.3.6.

Synergistic strategies, although prioritized, will not necessarily exclude implementation of other strategies depending on partner goals, conservation urgency and other factors.

Here, strategies are organized under broader Initiatives based on thematic commonality, and while specific strategies will necessarily adapt over time, these Initiatives offer continuity as overarching approaches the JV will take to address contributing factors, reduce key pressures, and decrease biophysical stresses to achieve desired Scrub and Chaparral habitat conditions. The strategies in Table 5.3.6 will in turn form the basis for our annual operating plans that build specificity to short, midterm and long-term objectives and the explicit conservation actions that deliver conservation outcomes.

Table 5.3.6: C3JV Scrub and Chaparral Conservation Target Implementation Strategies

Strategies	Description	Rating*
Initiative 1: Strengthen and expand conservation on Public and Private lands		
1.1 Advance existing easement programs through funding, capacity, planning and targeted outreach	Increase the scale and pace of land conservation through actions, including: <ul style="list-style-type: none"> - Support establishment of regional clearinghouse to satisfy easement holder and landowner data needs in partnership with the California Council of Land Trusts and regional partners. - Identify and support trusted entities to expand easement programs in underserved/apprehensive regions or communities - Engage in state and federal programs to lobby for additional easement funding and cutting ‘green tape’. 	HIGH
1.2 Engage, support and participate in State and Federal 30x30 initiatives in the Central Coast to steer and/or lead regional implementation	<ul style="list-style-type: none"> - Work with Partners to prioritize easement and fee acquisitions at high risk of conversion and corresponding high conservation value. - Emphasize protected lands establishment with equity goals - Develop and/or support mechanisms for Indigenous land-transfer and/or co-management arrangements 	VERY HIGH
1.3 Increase scale and pace of restoration and habitat delivery	<ul style="list-style-type: none"> -Through partnerships with NRCS, agricultural researchers, producer-organizations, expand educational tools, outreach and cost-share opportunities to landowners, managers and land stewards to steer management activities that consider: timing of activities, maintenance of herbaceous and shrub layers, tree/scrub recruitment, agriculture-riparian interactions, invasive species control, return of natural disturbance regimes, soft-edge habitat development, cowbird buffer zones, grazing management and breeding seasonality, among other factors. - Prioritize restoration and protection efforts with landscape variables such as patch size and connectivity in mind. 	HIGH

Initiative 2: Address focal priority species conservation needs		
2.1 Increase populations of priority focal species and stabilize populations of declining species	<p>Partner with land managers to implement site-specific habitat actions designed to increase populations of priority focal species. This includes identification of source and sink populations.</p> <ul style="list-style-type: none"> - Develop JV geography-specific recovery and monitoring programs for all conservation priority focal species, including establishing working groups where absent, prioritizing assessment of reproductive success and survival rates, assessing Full Annual Cycle conservation actions and needs, and conducting limiting factor research to inform recovery efforts. - Advance Central Coast Avian Monitoring Network (see Chapter 6). Emphasis should include monitoring of key refuge sites, sites that could inform urban/suburban edge impacts, fire management impacts, factors influencing nest success for scrub and chaparral focal species, and changes in distribution due to climate change. 	HIGH
Initiative 3: Inform fire management, mitigation and policy		
3.1 Develop fire BMPs for land stewards that strengthen habitat outcomes within the Wildland-Urban Interface (WUI).	-Provide land stewards guidance on wildlife-friendly practices for fuel-load reduction and fire mitigation, to improve bird and wildlife habitat, mitigate habitat loss, and strengthen fire preparedness.	HIGH
3.2 Partner with public utilities, local governments and insurance companies to help inform development patterns and policy	<ul style="list-style-type: none"> -Establish high-fire danger zones to discourage back country development; create funding for fire-safe housing and ignition zone management (relates to Initiative 3). - Create natural buffers to protect urban areas from wildfire 	HIGH
3.3 Work with County Supervisors to address zoning and development policies	<ul style="list-style-type: none"> -Taxation Policy for 2nd+ home development -Evaluate climate change mitigation planning for assumed migration from coastal to inland communities -Engage in robust planning for rural areas, including scaling of programs like Save Open Space and Agricultural Resources "SOAR" implemented in Ventura County. -Limit lot size reductions, subdivisions and encourage infill in developed areas. 	HIGH
Initiative 4: Strengthen knowledge and awareness of scrub and chaparral		
4.1 Strengthen understanding of fragmentation and disturbance, including from suburban edge, fire prevention and post-fire management.	<ul style="list-style-type: none"> -Improve knowledge on edge effects from urban, suburban and agricultural development, including habitat configuration and connectivity, predation rates, invasive species incursions and pollution. -Strengthen understanding of fire, including effects of prescribed fire on shrub communities, reseeding practices in post-fire recovery, effectiveness of fire mitigation techniques on fire preparedness and corresponding impacts to avian communities, and optimized fire-return intervals for focal species. 	MED

* Ratings provide a measure of effectiveness for each strategy based on a number of criteria including its expected impact on a pressure or conservation threat, whether the strategy is resilient to climate change, and if the strategy is feasible, etc. Low= not effective, Med=less effective, High= effective, Very High= very effective.



5.4 OAK AND PRAIRIE SYSTEMS

No terrestrial habitat in California hosts greater vertebrate species richness than oak woodlands, alone supporting more than 330 species, including as many as 110 breeding birds (Verner 1980; Barrett 1980; Block and Morrison 1997). With the addition of hardwood rangeland and grassland components archetypal of the Oak and Prairie landscapes of the Central Coast, vertebrate species richness exceeds 450 species (Bartolome et al. 2014). This diversity, at least in part, is attributable to the habitat heterogeneity and productivity in oak and grassland systems, where the production of acorns drives significant avian species richness, while forb and grassland endemics characteristic of the Mediterranean hardwood rangelands support diverse species assemblages driven by dynamic disturbance (CalPIF 2002). As a significant component of the California Floristic Province,¹⁵ diversity in the C3JV region is augmented by endemism, exemplified by the occurrence of six of the seven California endemic oak species among a total of fifteen oak species present on the Central Coast (Tietje et al. 2019).

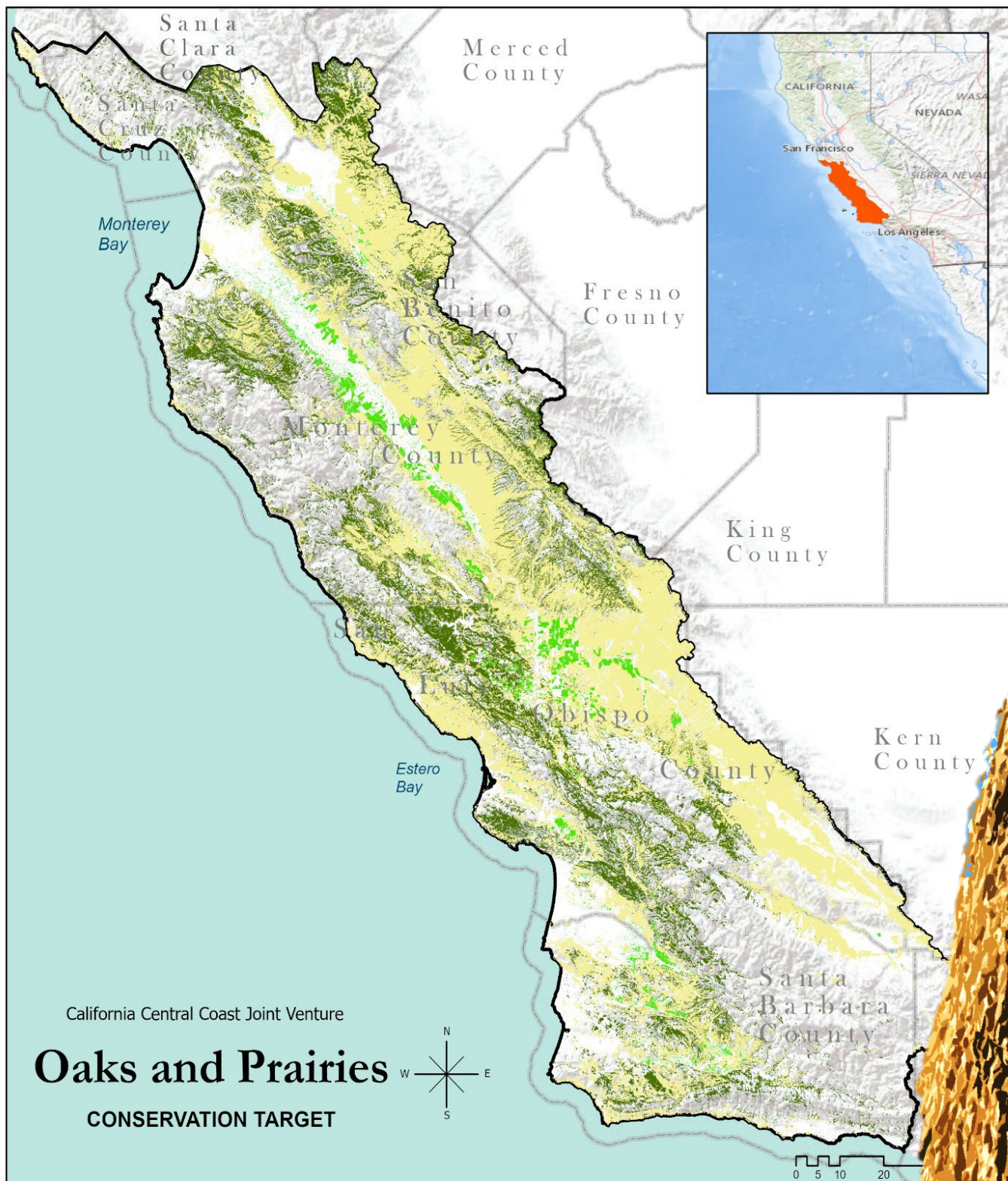
Oaks and Prairies represent the most extensive vegetation community in the C3JV region, consisting of nearly 50% of the JV's terrestrial geography (see Figure 5.4.1). In response to physical factors such as aspect, slope, soil, proximity to the coast, and frequency of fog, Central Coast Oak and Prairie communities range from closed canopy coast live oak woodlands such as found along the north-facing and mesic slopes of the Coast Range, to open, nearly treeless annual grasslands in interior valleys such as the upper Salinas and San Juan watersheds. Within this spectrum, blue oak (*Quercus douglasii*) and foothill pine (*Pinus sabiniana*) woodlands occur, often in association with codominant interior live oak (*Quercus wislizeni*). These canopies are complimented by a prominent scrub

component and/or nonnative annual grassland understory with specific species assemblage's dependent on historic land-use and disturbance, slope, aspect and soils (Mayer and Laudenslayer 1988). In the rare uncultivated valley bottoms where deep and fertile floodplain soils occur, valley oak (*Quercus lobata*) savannahs are typified by old-growth trees interspersed within annual grassland and flower fields. Both valley bottom margins, and the gentler sloping oak-dominated hills of the Central Coast are experiencing conversion to vineyards, a novel habitat-type in the Oaks and Prairies. Refer to Table 5.4.1 for greater elaboration on habitat assemblages found in the C3JV Oaks and Prairies Conservation Target.

While many oak-associated bird species occur across this wide spectrum of habitats, important and unique assemblages of species are also relegated to specific habitat conditions; for example, Purple Finch in more closed oak forest canopies, and Grasshopper Sparrow in large contiguous blocks of open grassland. Most of the Oaks and Prairies in the region are managed as rangeland with approximately 83% of the target privately owned (Huntsinger et al. 2007). This influences both the challenges and opportunities of building partnerships across a diverse array of users in Oaks and Prairies. As the Partner Map illustrates in Figure 5.4.2, identifying the many interests, relationships and potential opportunities for engagement is a core strategy (refer to Chapter 6). The following chapter elaborates the attributes, pressures, strategies and goals orienting the C3JV's approach to conservation in the Oaks and Prairies of the Central Coast.

¹⁵ The California Floristic Province spans much of California and is an internationally recognized biodiversity hotspot, one of only 25 in the world. For more details, refer to the [California Native Plant Society](#).

Figure 5.4.1: Geographic extent of the C3JV Oaks and Prairies Conservation Target



California Central Coast Joint Venture
Oaks and Prairies
 CONSERVATION TARGET

 C3JV Terrestrial Planning Region (approx. 7.2 million acres)

Coarse Habitat Types




-  Grasslands (approx. 2.175 million acres)
-  Oak Woodlands and Savannah (approx. 1.23 million acres)
-  Vineyard (approx. 156,000 acres)



Table 5.4.1: Habitat Types Characteristic of the Oaks and Prairies System Conservation Target. *

Habitat Types	Description	~ Extent (acres)	~ % of C3JV	~ % Protected
Oak Woodlands And Savannah	Oak Woodlands principally consist of Coastal Oak and Blue Oak Woodlands in the C3JV region, though significant representation of Blue Oak – Foothill Pine and Valley Oak Woodland types are present (CADFW 2014). Oak woodland habitats are highly variable, ranging from closed canopies in mesic sites to relatively open conditions in drier sites with poor, shallow soils. In closed canopies, trees tend to exhibit columnar shaped growth patterns with limited lower branch and foliage development (Altman and Stephens 2012). The understory is also variable, with shade-tolerant forbs (bracken fern (<i>Pteridium aquilinum</i>), miner’s lettuce (<i>Claytonia perfoliate</i>)) and shrubs (Toyon (<i>Heteromeles arbutifolia</i>), California blackberry (<i>Rubus ursinus</i>)) under canopies, and annual grasses and shrubs (coffeeberry (<i>Frangula californica</i>), poison oak (<i>Toxicodendron diversilobum</i>)) in open woodlands. Over 110 bird species are known to breed in Central Coast Oak Woodlands, with some characteristic bird species including Black-headed Grosbeak and Purple Finch in closed canopies, and Oak Titmouse, Bushtit, and California Scrub Jay in more open and variable canopies. Savannah conditions exist principally in the deep soils of the Valley Oak Woodlands, though Blue Oak Woodland, Blue Oak-Foothill Pine Woodlands and Coastal Oak Woodlands all exhibit savannah under certain conditions. Oak Savannah habitats are grasslands with scattered oak trees and an open canopy (<25% cover). Oak trees in savannahs are “open-grown” which at maturity results in large mushroom-shaped trees with well-developed limbs and canopies. Characteristic bird species include Western Bluebird, Acorn Woodpecker and Lazuli Bunting (Altman and Stephens 2012).	Coastal Oak Woodland: 740,000	10%	22%
		Blue Oak Woodland: 386,000	5%	15%
		Blue Oak – Foothill Pine: 82,000	1%	13%
		Valley Oak Woodland: 24,000	0.3%	7.5%
		Total: 1,232,000	17%	19%
Annual Grasslands and Coastal Prairie	Grassland habitats in the Central Coast are often further classified into two main types: perennial or coastal prairie (Keeler et al. 2007). Perennial grasslands consist of small, relic holdouts of native perennial bunchgrasses and forbs and often restricted to the coastal fog-belt, while interior grasslands are composed primarily of annual, nonnative grasses and native and nonnative forbs, known as Annual Grasslands by CWHR or Valley Grasslands by others (Bartolome et al. 2007). The specific vegetative structure in Annual Grasslands depends largely on weather patterns and livestock grazing, but importantly, forb richness is typically four times greater than grass richness (Sims and Risser 2000). These habitats occur mostly on flat plains, coastal terraces and gently rolling foothills (Jackson and Bartolome 2002). Perennial species in the more humid climate of the coast maintain higher biomass and are active over a longer period of the year, whereas the native and non-native annual species in the drier inland areas thrive in the more erratic and generally lower moisture regimes (Langridge 2018). Characteristic bird species include Northern Harrier, Western Meadowlark and Loggerhead Shrike.	Annual Grassland: 2,170,000	29%	10%
		Perennial Grassland: 4,500	<1%	16.5%
		Total: 2,175,000	30%	10%
Vineyard	Vineyards, primarily including grapes but also kiwi, raspberry and other vine crops, are often developed in Oak and Prairie habitats, including annual grasslands, oak woodland and oak savannah ecosystems. Vineyard development has and continues to occur in regions of deep, fertile soil, often on valley bottoms or rolling foothill regions, and are mostly irrigated. The extent of vineyards in the C3JV has grown significantly over the past two decades, particularly in the early 2000’s when annual increases exceeded 60% in counties such as San Luis Obispo (Mummert et al. 2002). While vineyards simplify ecosystems and reduce overall biodiversity, opportunities exist to strengthen practices that reduce wildlife conflict, and support greater bird and other wildlife species diversity through retention, restoration and integration of oak and prairie habitat conditions within operations (Fiehler et al. 2006). Characteristic bird species of vineyards include American Kestrel, Barn Owl, Western Bluebird and Western Kingbird.	Total: 155,600	2%	<1%
TOTAL		3.56 million acres	49%	13%

* It is important to note that habitat types, and the nature of their transitions within Oaks and Prairies have been influenced over millennia by anthropogenic activities, and today’s forest, woodland, grassland and agricultural mosaic is a product of both abiotic factors as well as historic and current land uses. Refer to Cuthrell et al. 2012, Anderson 2005, Kay 1995, Lewis 1993 for further reading.

5.4.1 FOCAL SPECIES OF THE OAKS AND PRAIRIES

Following the Focal Species Selection Method described in Chapter 3, 19 species were selected as “Avian Focal Species” of the Oaks and Prairies Conservation Target, representing diverse habitat elements (Table 5.4.3), species with an outsized dependence on the C3JV region during all or a portion of their annual lifecycle (Stewardship Species), species of key cultural significance, and good indicators for monitoring management interventions and ecosystem function among other factors. Table 5.4.2 shows the Oaks and Prairies Focal Bird Species, including their principle habitat association, limiting factors (if well known), population trends, and species-specific directional population objectives.

While no focal species are listed with state or federal conservation listing designations for this target, many are identified as species of special conservation concern given steep population declines, vulnerability to climate change and other threats. As further described in Chapter 3, focal species are organized into three categories; 1) **Conservation Priority Species**; 2) **C3JV Stewardship Species**; and 3) **Indicator Species**. The C3JV region is an incredibly important geography for oak-associated species, exemplified by the significant number of stewardship species, most of which are declining. Links to species profiles for individual focal species, where available, can be found in [Appendix I](#) of this plan.



Two iconic denizens of the Central Coast’s Oaks and Prairie landscapes, the Acorn Woodpecker and Yellow-billed Magpie. Photo Credits: Acorn Woodpecker by Ondrej Prosicky | Yellow-billed Magpie by Owen Deutsch | Valley Oak by Marta Jandreau

Table 5.4.2: C3JV Oaks and Prairies Conservation Target Avian Focal Species. Focal Species are organized by type: (red)- Conservation Priority, (orange)- C3JV Stewardship, (green)- Indicator.

	Common Name	Scientific Name	Primary Habitat Association	Trend and PIF Score*	Listed Status**	Limiting factors	C3JV Importance	Population Objective***	Notes
Conservation Priority Species	Yellow-billed Magpie	<i>Pica nuttalli</i>	Oak savannah	Declining 16	R2R Very High Urgency, USFWS BCC,	Restricted range, sensitivity to West Nile Virus, rodenticides, agricultural persecution	>25%	Double	True California Endemic- C3JV Stewardship Species with restricted range and vulnerable to stochastic events (e.g., West Nile Virus).
	Lawrence's Goldfinch	<i>Spinus lawrencei</i>	Dry, open oak woodlands with chaparral,	Stable to slight decrease 15	USFWS BCC	Restricted range, habitat degradation presumed to be principal threat	>10%	Maintain	Endemic breeder in California and extreme north Baja California. A C3JV Stewardship Species.
	Oak Titmouse	<i>Baeolophus inornatus</i>	Open to closed, dry oak or oak-pine woodlands	Declining 15	R2R, USFWS BCC	Restricted range coupled with habitat loss due to timber harvesting, clearing for agriculture, and urban and suburban development. Starling competition may be important	>10%	Determine Status	A common and iconic species in significant decline. The loss of dead standing trees, live trees with dead limbs or diseased trees reduces the number of cavities available for nesting. More direct studies of breeding biology and habitat requirements may be helpful in better understanding the decline of this species.
	Mountain Plover	<i>Charadrius montanus</i>	Alkaline flats, grazed grasslands, early seral/burned agricultural lands	Declining 16	2 nd priority BSSC, R2R Very High Urgency	Continued loss of isolated relic pockets of suitable habitat		Increase by 50% Determine Status	A winter migrant to the Central Coast, with the Carrizo Plain an historically important overwintering location.
C3JV Stewardship Species	Acorn Woodpecker	<i>Melanerpes formicivorus</i>	Open oak woodland	Stable 9		Granary trees, oak regeneration	>10%	Maintain	Keystone Species as major primary cavity nest excavator (CalPIF 2000).
	Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	Open oak woodland scrub, and mature riparian	Stable or Increasing 8		Tends to avoid urban/suburban environs despite willingness to use man-made nest boxes	+5%	Maintain/ Determine Status	Common inland breeder, rare along the coast. Particularly responsive to ungrazed habitats in arid regions, where food availability appears to drive abundance (CalPIF 2009).
	Band-tailed Pigeon	<i>Patagioenas fasciata</i>	Oak woodland and conifer	Declining 13		Low fecundity, disease sensitivity, agricultural and forestry practices, hunting, mast crop failures	>5%	Double	A hunted species in California, the pacific coast population of the band-tailed pigeon has experienced long-term population declines. A management plan is in place, but challenges remain in monitoring and reversing declines. Mineral sites are key both to species monitoring and long-term conservation.
	California Scrub Jay	<i>Aphelocoma californica</i>	Open oak woodlands with scrub	Stable or increasing 9		Adaptable to human-dominated systems	>5%	Maintain	Keystone Species, critical to oak regeneration as prolific acorn harvester and caching behavior.
	Hutton's Vireo	<i>Vireo huttoni</i>	Coast live oak woodland and riparian, also mixed hardwood and conifer	Stable or increasing 9		Sudden oak death, wood harvesting and other habitat modifications resulting in loss of oak woodlands	>5%	Maintain	Common resident bird, only nonmigratory vireo in California. Less prone to nest parasitism. Populations have not reflected trends of other insectivorous species, with significant gains over the last 40 years.
	Nuttall's Woodpecker	<i>Dryobates nuttallii</i>	Open and closed oak woodlands and riparian corridors	Stable 11	USFWS BCC	Restricted range, Sudden oak death a concern, loss of riparian habitats	>10%	Maintain	C3JV Stewardship Species – Endemic to California and northern Baja California. Associated with intact oak woodlands, providing a good indicator of forest health. As a primary cavity nester, this species is important because it provides nest sites for many other species in these forests.

	Western Bluebird	<i>Sialia mexicana</i>	Open woodland and savannah/agricultural edge	Stable 9		Suitable nest site competition, agricultural intensification	>5%	Maintain/ Determine Status	Common inland breeder in extensive oak woodland and savannah. Are easily displaced by European Starlings and House Sparrows, and avoids open grassland, intensive agricultural lands, dense woodland and chaparral (Fiehler et al. 2006).
	White-breasted Nuthatch	<i>Sitta carolinensis</i>	Mature oak woodland	Stable or increasing 6		Mature woodland with preponderance of dead or dying trees and snags	+5%	Maintain/ Determine Status	Common resident in woodlands with large, mature trees and snags with advanced decay (where they can excavate cavities for nesting). Habitat generalist.
	White-tailed Kite	<i>Elanus leucurus</i>	Grassland, savannah and agricultural lands with roost/nesting tree stands. Riparian habitats also preferred for nesting.	Declining 10	California Fully Protected Species	Increased urbanization of agricultural lands. Nesting competition with other raptors. Grazing pressure and land-uses reducing small mammal prey abundance	+5%	Determine Status	Habitat generalist dependent on open landscapes and high prey abundance. Population trends have increased in California, though not statistically significant, while overall species population is declining. Grazing intensity, urbanization and clean-farm practices likely to reduce kite presence and breeding success. Loss of riparian corridors increase competition with other nesting raptors. A California Fully Protected Species.
Indicator Species	Burrowing Owl	<i>Athene cucularia</i>	Grasslands, pasture and agricultural/urban edge	Declining 12	2 nd priority BSSC	Urbanization, rodent management, agricultural practices		Increase by 50% (breeding)	Breeding populations largely extirpated from Coastal counties, extant populations in Salinas and interior agricultural valleys. Owls can be tolerant of human activities provided suitable habitat exists, principally access to burrowing sites and prey base.
	European Starling	<i>Sturnus vulgaris</i>	Open oak woodland associated with urban and agricultural edge	Declining		Cavities for nesting, agricultural/urban foraging areas		Decrease abundance, prevent further range expansion	Negative Indicator as aggressive competitor for limited nesting cavities. Also, an important vector of food-borne disease.
	Grasshopper Sparrow	<i>Ammodramus savannarum</i>	Large, intact grasslands	Declining 12	2 nd priority BSSC	Grassland habitat loss and degradation due to agricultural conversion, urban and suburban development, and loss of native grasslands to invasive annual species		Determine Status	An umbrella species: grasshopper sparrows are poorly studied, but research suggests breeding sites of at least 30 acres and preferably greater than 100 acres are required. With such large contiguous habitat needs, grasshopper sparrow conservation efforts impact other grassland-dependent species including Western meadowlarks, white-tailed kites, American kestrels, golden eagles and ferruginous hawks, short-eared owls and burrowing owls.
	Lark Sparrow	<i>Chondestes grammacus</i>	Savannah with scattered shrubs and trees, orchards	Declining 10		Cowbird parasitism, grazing practices, loss of grasslands		Determine Status	Relatively understudied, very limited information. Important predator of crop pest, could be valuable in the control of agricultural pests, but this same feature also makes them vulnerable to pesticide use
	Loggerhead Shrike	<i>Lanius ludovicianus</i>	Open woodland and savannah, pasture, open shrubland	Declining 11	2 nd priority BSSC	Poorly understood: loss of agricultural edge habitats, insecticides, vineyard development, and grazing practices are often cited		Increase by 50%	A species experiencing significant declines across its range, as well as in the Central Coast, particularly along the Salinas Valley, and in oak woodlands undergoing conversion to vineyards. With winter survival a possible limiting factor, may be useful to establish winter season population monitoring project focused on vital demographic rates.
	Western Screech-owl	<i>Megascops kennicottii</i>	Open woodlands, riparian canyons, increasingly urban forests	Declining 12		Relatively unknown, but could include cavity-nest competition, loss of mature forests and meso-predator abundance		Increase by 50%	Dependent on standing dead trees containing cavities for their nest sites. Maintaining robust populations of the Western Screech-Owl will require protecting open forested areas along bodies of water in undeveloped, rural and residential areas.

* PIF Score: Partners in Flight (PIF) scores the relative vulnerability of all landbirds according to the following six factors: population size, breeding distribution, non-breeding distribution, threats to breeding, threats to non-breeding, and population trend. Refer to the [Avian Conservation Assessment Database Handbook](#) for specific methodology. Please see Chapter 3 of this Plan

** California Bird Species of Special Concern are prioritized in the focal species list for the C3JV Implementation Plan, representing regionally specific species of conservation need (<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=84247&inline>).

*** Population Objectives offer directional goals based on regional population trends (trends derived from PIF assessments, CDFW species accounts and/or expert opinion of trend if actual trends are not known). Population objectives will be modified as JV-regional population measures/monitoring systems are developed

Table 5.4.3: Essential Habitat Elements for focal species in C3JV Oaks and Prairies Conservation Target.

Common Name	Acorns	Cavities	Trees	Shrubs	Grass/herb	Snags	Water/ Riparian	Notes
**Yellow-billed Magpie	X		X		X		X	70% of diet is animal matter, particularly eggs/nestlings. Closely associated with rangelands with large trees proximate to open pasture and woodland.
**Lawrence's Goldfinch			X	X	X		X	Requires dense foliage for nesting, preferring oak, proximate to open areas with forb and shrub seeds. Highly erratic distribution.
**Oak Titmouse	X	X	X			X		Small territory, suffers from nest predation by Scrub Jay, forages on insects, berries, acorns and some seeds. Cavity limited/dependent. Secondary cavity nester.
**Mountain Plover					X			Roosts in depressions, avoids dense vegetation, grasshoppers favored.
Acorn Woodpecker	X	X	X			X		Gregarious, requires large oak stands, dependent on acorns throughout much of the year. Primary cavity nester.
Ash-throated Flycatcher		X	X	X	X	X		Secondary cavity nester. Tends to forage from lower heights, requiring shrubby understory in open woodlands (CalPIF 2009).
Band-tailed Pigeon	X		X	X			X	Frugivore, needs mineral deposits or mineral waters, requires cooing perch (tall trees), often wide ranging during nonbreeding season.
California Scrub Jay	X		X	X			X	Tolerant of residential habitats, steals acorn woodpecker caches, caches acorns in soil.
Hutton's Vireo			X	X				Prefers larger blocks (greater than 50 acres) of contiguous woodland and forest. Tends to forage relatively high in the canopy. Will consume berries, including poison oak, elderberry and buckthorn.
Nuttall's Woodpecker		X	X			X		Frequents riparian habitats, primarily insectivorous. Primary cavity nester.
Western Bluebird		X	X	X	X	X		Secondary cavity nester. Relies heavily on winter berry crops, particularly mistletoe.
White-breasted Nuthatch	X	X	X			X		Large trees and snags in oak woodlands required. Will excavate its own nest or use existing.
White-tailed Kite			X		X			Dense, deciduous trees used for nesting and roosting, with proximity to dense small mammal populations (primarily voles).
Burrowing Owl					X			Requires burrows for roosting and nesting cover. Hunts from perches. Strong site fidelity
European Starling		X	X		X			Disturbed, edge and agricultural habitats. Secondary cavity nester.
Grasshopper Sparrow				X	X			Prefers thick cover, uses shrubs for singing/lookout (Ruth 2015).
Lark Sparrow			X		X		X	Requires elevated perches for singing/lookout.
Loggerhead Shrike				X	X			Fences and roadsides often favored.
Western Screech-owl		X	X			X		Obligatory secondary cavity nester. Prefers forest openings and woodland edge for foraging. Typically found near water, but likely not an essential habitat element.

**** conservation priority focal species**

5.4.2 KEY ATTRIBUTES OF THE OAKS AND PRAIRIES

Using the Conservation Standard’s Viability Assessment framework discussed in **Chapter 3**, a selection of Key Attributes, or the factors, interactions and/or elements that enable the target to persist, were identified along with indicators used to measure the status and trend of each attribute. These are presented in Table 5.4.4.

The Table identifies each key attribute, a summary description of its meaning and importance as a measure of functionality of the Oak and Prairie ecosystems of the Central Coast, identifies the

indicators the JV will use to quantify and monitor the attribute, and provides a conditional status rating of each indicator. The current conditional status code was derived from knowledge and consensus among Implementation Task Force members and advisors, but does not represent a quantitative measure. Instead, it is a qualitative, and relative, conditional statement that will be refined as information and monitoring systems develop, and it allows for an initial and comparative snapshot of the indicators perceived to be more or less compromised today.

Table 5.4.4: Key attributes identified for the Oaks and Prairies Conservation Target. Colors indicate current status of a factor: Red = poor, orange = fair, green = good, dark green = excellent.

Key Attributes	Description	Indicators	Attribute’s Current Status	Status Notes
Fire Regime	The Central Coast of California has a fire-prone Mediterranean climate, and together with the influence of native peoples over many thousands of years, much of the oak and prairie systems of the C3JV region have coevolved with fire. With effective suppression efforts over the last century, the fire regime has shifted from patchy, frequent, low intensity fires, to large-scale, high intensity events exacerbated by climate change. Fuel ladders expose oak woodlands to stand-replacing fires, destroying old-growth trees resistant to low severity fire. The fire regime influences oak recruitment, shrub and grass cover and extent, and the avian and other wildlife species these habitats can support. In short, fire plays a vital role in the long-term functionality of the Oaks and Prairies Conservation Target (Suighara and Barbour 2018).	1. Timing (seasonality)	Yellow	Fire-prone months increasing
		2. Duration (length of incident period)	Red	Fire events burn longer relative to historic condition
		3. Frequency (interval between events)	Red	Insufficient frequency relative to historic condition
		4. Extent (scale of burned area)	Red	Singular events much larger relative to historic condition. However, overall annual burned area equal to or less than historic conditions.
		5. Intensity (extent of high-severity fire)	Red	Fire intensity greatly elevated relative to historic condition
		6. Source (prescribed, cultural-fire, lightning, accidental, arson)	Red	Insufficient prescribed and cultural fire events
	Focal species were selected as representatives of diverse habitat elements, species of key cultural	1. Focal species occupancy	Green	Relatively high (focal species are still present)

Avian Focal Species	significance, species of weighted importance to the Central Coast relative to their range-wide distribution (e.g., endemics), and species which represent good indicators for monitoring management interventions and ecosystem functions among other criteria. Further description of the focal species can be found below.	2. Focal Species population trends and relative abundances	Significant concern across most focal species
		3. Priority Conservation Focal Species demographics (limiting factor parameters)	Significant concern across focal species
Habitat quality and quantity	Ultimately, the viability of Oak and Prairie habitats in the Central Coast is in large part contingent upon the extent (including patch size) and condition (including plant community diversity) of the habitat supporting birds, other wildlife, and people (Rao et al 2006). Given the significant pressures acting on the viability of both quality and quantity of habitat, the C3JV is committed to monitoring the status of these key attributes, including measuring changes in habitat extent, the degree of connectivity between habitat blocks, and the extent of native species dominance in the landscape. To conserve species as habitat extent changes (both in response to climate change and human land uses), it is important to protect species where they are now, where they will be in the future, and to know the connecting paths in-between. These 'chains' of habitat link present conditions to similar suitable conditions in the future.	1. Area of habitat (acres of habitat change)	Significant historic loss of habitat. Losses continue but at lower rate
		2. Avian species richness (number of species present in a given sample site)	
		3. Oak recruitment and forest structure/condition	Extremely poor recruitment among deciduous oak species
		4. Native species dominance (extent of invasive vs native species)	Invasion of plants (e.g., medusa head, yellow star thistle) significant across rangelands. Vertebrate species of concern (starling, pig)



Western Screech-Owl, original photo by Dave Keeling

5.4.3 PRESSURES ON THE OAKS AND PRAIRIES

Oak and Prairie Systems are under significant pressures from numerous and interrelated forces that impact the ability of these habitats to support birds, other wildlife, and people. Table 5.4.5 identifies the major pressures acting on Oak and Prairie Systems,

derived through the Threats Assessment methodology described in Chapter 3. While habitat loss to intensive agriculture, orchards, vineyards and urban/suburban development remains a persistent pressure, fire and fire suppression ranked highest overall, with invasive species and incompatible livestock practices also of high importance.

Table 5.4.5. Summary of overall pressure ratings perceived to be acting on birds inhabiting the Oaks and Prairies Conservation Target in California’s Central Coast.

Pressure	Rating*
Severe fire** and fire suppression	Very High
Residential development (urban/exurban development)	High
Agricultural conversion (encroachment of woodlands and grasslands by intensive agriculture (e.g., vineyards)	High
Drought (climate change-induced) **	High
Invasive and problematic species (including undesirable native, non-native and invasive plants and animals)	High
Incompatible livestock and ranching practices	Medium
Surface and subsurface water diversion	Medium
Pathogens/disease (e.g., sudden oak death, oak borer)	Medium
Roads and related infrastructure development	Medium
Pesticides, herbicides, rodenticides	Medium
Wood harvesting (firewood, dead snags, old-growth trees)	Low
Nest parasitism and competition (e.g., starlings)	Low
Renewable energy development (e.g., solar arrays)	Low

* Ratings are derived from a qualitative index whereby a given pressure is evaluated based on its scope (i.e., scale impact), severity (within the scope, how severe is the potential destruction/degradation), and irreversibility (whether the impact can be reversed, and anticipated length of recovery). **Very High** equates to a large scope, severe impacts and a low likelihood of reversibility within 100 years, whereas **Low** equates to a small scope, relatively insignificant degradation, and restoration of the impact easily achievable/likely. Refer to Chapter 3 for greater elaboration on threats ratings.

** denotes a climate change-induced pressure, where the C3JV may have limited capacity to address the direct cause. Given that climate change-induced drought has a relationship with fire and fire suppression, overlapping strategies may be developed to address or mitigate impacts from both pressures.

Severe Fire and Fire Suppression: The conservation target is well-adapted to fire, having evolved with the disturbance over millennia, in concert with Indigenous burning practices (Blackburn and Anderson 1993, Kay 1995).¹⁶ Many at-risk species, and the habitat conditions they depend on, cannot be sustained or recovered without the re-introduction and

rehabilitation of landscape-scale fire (Sugihara et al. 2006). Today’s fire regime, however, differs dramatically from a century or more ago due in part to suppression efforts and exacerbated by climate change. The current regime favors comparatively lower fire frequencies paired with increased intensity resulting in more uniform, stand-replacing blazes and larger, mega-

¹⁶ See Purcell and Stephens 2005 for further description of fire history in California

scale events abetted by extreme weather conditions (Stevens et al. 2017, Jones et al. 2016). Efforts to revitalize fire regimes that mimic historical fire patterns and frequencies while also minimizing loss of property are beginning.¹⁷ Prescribed burning can be an effective management tool, with spring and early summer fires proving effective at controlling most invasive annual plants if they occur before invasive plants set seed (DiTomaso et al. 2006). In fact, prescribed fire offers one of the best opportunities for recovery of at-risk species in degraded oak and prairie habitats (Sugihara et al. 2006). However, spring fires can also be extremely damaging to nesting birds and young mammals and must be used with caution.

In the Central Coast regions, particularly the eastern portion the Coast Ranges, wildfire risk is projected to increase 4 to 6 times current conditions under climate change. The number of escaped fires is projected to increase by 51%, while total area burned by contained fires is projected to increase 41%. The probability of large fires (>200 ha) is expected to increase by the end of the 21st century, and area burned is projected to increase from 10 to 50% by the 2070–2099 period (PRBO 2011).¹⁸

Residential Development: Urban and ex-urban residential housing and associated development has resulted in significant loss of oak and prairie vegetation to date. In Santa Cruz County, for example, more than 75% of oak woodlands have already been developed (Gaman and Firman 2006). With populations projected to continue increasing in the Central Coast, land conversion remains a concern. Low profitability, high management costs, and high opportunity costs associated with competing uses (e.g., vineyard development) continues to drive ranchland sales and conversion (Sulak and Huntsinger 2007, Cheatum et al. 2011). Land investors are purchasing oil-lease and cattle ranching operations to subdivide into 40-acre to 160-acre rural residential parcels, which increases fragmentation, encroachment of invasive species, fire suppression and other land-use changes. The Highway 101 corridor is experiencing some of the highest growth pressure as cities such as Morgan Hill, Hollister, Gilroy, Watsonville and Salinas experience high growth rates.

¹⁷ See California Prescribed Burn Association to explore some examples across the state <https://calpba.org/>

While Santa Cruz had a projected growth of 4% between 2010 and 2019, San Benito County was projected to increase by nearly 14%. Retreat strategies to mitigate climate change may also increase pressure on oak and prairie systems by driving residential development inland (Langridge 2018).

Agricultural Conversion: The growth of agriculture over the last century, particularly within floodplain grasslands and coastal terraces, has resulted in both the loss of important habitat areas and the fragmentation of larger natural landscapes (CalPIF 2000). While most of the once vast expanses of Valley Oak Woodland and savannah have already been lost to conversion, remaining grasslands and rangelands in Valley Floodplains are at high risk to development and/or conversion, particularly at the margins of the Salinas Valley (Mensing 2006). Furthermore, in recent decades, perennial, non-timber crops (such as vineyards, citrus, avocados and olives) have been expanding into areas formerly used for extensive livestock systems and intact oak woodlands, modifying wildlife habitat values and often taxing limited groundwater resources (Fiehler et al. 2006). With the high opportunity cost to continue ranching and no heirs to take over the operations, some ranchers are either selling their land to developers or converting their properties to vineyards or orchards (Cameron et al. 2014).

Incompatible Livestock and Ranching Practices: Livestock and ranching practices, being the dominant land use within the Oaks and Prairies Conservation Target, exert significant influence over habitat conditions for birds and other wildlife in the C3JV geography (CalPIF 2000). The effects of grazing by livestock on birds and other wildlife differ depending upon key management variables, including the seasonality and duration of grazing and the type and number of livestock, among other factors (CDFW 2015). Grazing can improve habitats by reducing competition from annual grasses and invasive plants to enhance native plant diversity, removing decedent and understory growth to increase plant vigor and enhancing mature woodland resilience to fire (Gennet et al. 2017). Grazing is an effective tool used to create heterogenous conditions providing diverse habitat structure for greater assemblages of species, including heavily grazed sites for

¹⁸ Refer to [PRBO Climate Change Forecast](#) for more thorough examination of the drivers influencing fire behavior in the Central Coast.

Horned Lark and Mountain Plover (Gennet et al. 2017). However, grazing can also occur at frequencies or intensities that cause degradation of native plant communities, reduce habitat values for native wildlife species, degrade aquatic or other ecosystems, or impair ecosystem functions (Poessel et al. 2019). Impacts to deciduous oak regeneration, soil compaction and erosion, invasive species encroachment, and loss of plant community diversity are key stressors that can result from mismanaged livestock (CDFG 2005; McCreary 2001). In addition to livestock herbivory and associated activities, other ranching practices that include haying, removal of oak trees and shrub canopies, insecticide/herbicide applications, wildlife disturbance, rodent control, prescribed fire and fire prevention are all practices that can influence habitat conditions with positive and negative responses by birds depending on how they are approached. The long-term viability of Oaks and Prairies is in large part linked to the viability of extensive rangelands and building compatibility between livestock and birds is a key priority of the C3JV.

Invasive and problematic species: Invasive plant and animal species pose significant threats to the conservation target, often in coordination with other pressures. In grasslands, while a type-conversion has already occurred in some locations with the introduction of non-native Mediterranean grasses hundreds of years ago, some of the more challenging plant invaders posing threats today include fountain grass (*Pennisetum setaceum*), barbed goatgrass (*Aegilops triuncialis*), gorse (*Ulex europaea*), medusahead (*Taeniatherum caput-medusae*), tree of heaven (*Ailanthus altissima*) and yellow starthistle (*Centaurea solstitialis*). Oak woodlands are invaded by plants such as Scotch broom (*Cytisus scoparius*) and French broom (*Genista monspessulana*). Non-native terrestrial animal species have also invaded Oaks and Prairie's, including European starlings, domestic cats (*Felis catus*), introduced red foxes (*Vulpes vulpes*) and feral pigs (*Sus scrofa*). In oak woodlands, feral pigs can inhibit the germination and growth of young oaks by eating acorns and oak seedlings and removing leaf litter, thus causing soils to dry out (CDFW 2005). Wild turkeys, also a relative newcomer to this region, may have similar effects on oak recruitment, soil disturbance and damage to sensitive native species. Turkeys also consume endangered reptiles and amphibians, compete with ground-dwelling birds for resources, and potentially contribute to the spread of

sudden oak death (Gillingham 2008). Finally, changes to disturbance regimes have resulted in native and non-native scrub and conifer encroachment into Oaks and Prairies.



Burrowing Owl,
Wirestock Creators

5.4.4 IMPLEMENTATION ACTIONS

Achieving our vision of a resilient Oak and Prairie System shared by thriving populations of birds, other wildlife, and people will in part depend on effective implementation, adaptation and modification of several key initiatives. As strategies are further developed and adjusted over time, the efforts of the JV to advance Oak and Prairie conservation will be guided and evaluated by the achievement of the following four benchmark goals:

Oak and Prairie BENCHMARK GOALS

- By 2035, oak woodland habitats with protected status have increased by at least 10%, or approximately 120,000 acres, of which at least 10% are under Indigenous-led stewardship.
- By 2035, grassland habitats with protected status have increased by at least 10%, or approximately 220,000 acres, of which at least 10% are under Indigenous-led stewardship.
- By 2035, acres actively managed for low-severity fire have increased by at least 30%.
- By 2040, all Conservation Priority focal species' populations have stabilized and/or increased in the C3JV geography.
- By 2040, 90% of desirable focal species (with expectation of occurrence) are present on 75% of monitored oak woodland, savannah and grassland sites.

Employing the Strategy Development method further described in Chapter 3, Table 5.4.6 offers a description of Implementation Strategies identified and rated in accordance with the C3JV Strategy Ranking Criteria ([Appendix F](#)). Among these, a sub-set of strategies was identified as having potential for high-impact value strengthening the viability of the Oaks and Prairies Conservation Target *and* in addressing one or more human wellbeing domains (refer to [Chapter 5.1](#)). These *synergistic strategies* are outlined in [green in Table 5.4.6](#). Synergistic strategies, although prioritized, will not necessarily exclude implementation of other strategies depending on

partner goals, conservation urgency and other factors. Here, all strategies are organized under broader Initiatives based on thematic commonality, and while specific strategies will necessarily adapt over time, these Initiatives offer continuity as overarching approaches the JV will take to address contributing factors, reduce key pressures, and decrease biophysical stresses to achieve desired Oak and Prairie habitat conditions. The strategies in Table 5.4.6 will in turn form the basis for our annual operating plans that build specificity to short, midterm and long-term objectives and the explicit conservation actions that deliver conservation outcomes.



Table 5.4.6: C3JV Oaks and Prairies Conservation Target Implementation Strategies

Strategies	Description	Rating*
Initiative 1: Strengthen and expand conservation on Public and Private lands		
1.1 Advance existing easement programs through funding, capacity, planning and targeted outreach	Increase the scale and pace of land conservation through actions, including: - Support establishment of regional clearinghouse to satisfy easement holder and landowner data needs in partnership with the California Council of Land Trusts and regional partners. - Identify and support trusted entities to expand easement programs in underserved/apprehensive regions or communities. - Engage in state and federal programs to lobby for additional easement funding and cutting "green tape."	HIGH
1.2 Engage, support and participate in State and Federal 30x30 initiatives in the Central Coast to steer and/or lead regional implementation	- Work with Partners to prioritize easement and fee acquisitions at high risk of conversion and corresponding high conservation value. -Emphasize protected lands establishment with equity goals. - Develop and/or support mechanisms for Indigenous land-transfer and/or co-management arrangements.	VERY HIGH
1.3 Increase scale and pace of restoration and habitat delivery	- Work with partners to advance implementation of grazing strategies that meet the economic bottom line for agriculture while promoting healthy bird and other wildlife populations. - Provide technical assistance for large scale conservation planning efforts and for project-by-project planning and implementation. - Increase patch size and connectivity and prioritize restoration and protection efforts with these landscape variables in mind.	MED
Initiative 2: Address focal priority species conservation needs		
2.1 Increase populations of priority focal species and stabilize populations of declining species	- Partner with land managers to implement site-specific habitat actions designed to increase populations of priority focal species. - Develop priority focal species monitoring plans, working groups (where absent) and limiting factor research to inform recovery efforts, including consideration of Full Annual Cycle conservation actions and needs.	VERY HIGH
Initiative 3: Influence regional planning policies		
3.1 Work with County Supervisors to address zoning and development policies	-Taxation Policy for 2 nd + home development, limit lot size reductions and subdivisions in appropriate areas, encourage in-fill and denser housing, etc. -Evaluate climate change mitigation planning for assumed migration from coastal to inland communities -Engage in robust planning for rural areas, including scaling of programs like " SOAR " implemented in Ventura County.	MED
Initiative 4: Inform fire management, mitigation and policy		
4.1 Develop fire BMPs for land stewards that strengthen habitat outcomes within WUI.	-Provide land stewards guidance on wildlife-friendly practices for fuel-load reduction and fire mitigation, to improve bird and wildlife habitat, mitigate habitat loss, and strengthen fire preparedness.	MED

<p>4.2 Partner with insurance companies to help inform development patterns</p>	<p>-Establish high-fire danger zones to discourage back country development; create funding for fire-safe housing and ignition zone management (relates to Initiative 3).</p> <p>- Create natural buffers to protect urban areas from wildfire. See also Syphard et al. 2016.</p>	<p>MED</p>
<p>4.3 Expand prescribed fire implementation, including assisting in the strengthening of an Indigenous-led Cultural Fire Council or Good Fire Alliance for the Central Coast</p>	<p>- Support the scaling up of prescribed fire, employing TREX or similar models, and in coordination with Prescribed Burn Associations and Cal Fire. See AB642 and SB 332, current legislation designed to increase use of prescribed fire and cultural burning while strengthening workforce development</p> <p>-Refer to the Indigenous Peoples Burning Network, Good Fire Alliance and other models across California to expand utilization of cultural fire practices at scale in the Central Coast.</p>	<p>VERY HIGH</p>
<p>4.4 Establish Grazing Cooperatives to manage fire risk in wildland urban interface (WUI) communities.</p>	<p>-Promote Community Grazing Cooperative as a method for rural residential neighborhoods to empower themselves in their own land stewardship. The primary concern or need is for fire fuel load reduction.</p> <p>-Increase interest, education and opportunities for young people to move into regenerative agriculture</p>	<p>MED</p>
<p>Initiative 5: Strengthen knowledge and awareness of oaks and prairies</p>		
<p>5.1 Measure (economically and culturally) the value of oak and prairie systems in the Central Coast to inform existing programs, policy makers and planners</p>	<p>-Improve societal understanding of oak ecosystem services (DATA GAP: need social study underpinning this effort to target age/demographic).</p> <p>-Promote further research exploring the importance of oak woodlands to the aesthetic of the Central Coast.</p> <p>-Educate the public about rangeland ecosystem services and values</p>	<p>MED</p>
<p>5.2 Strengthen access to green space (focused on existing oak woodlands) within/ around cities, especially near public transit</p>	<p>-Establish county-level funding source for open space, conservation areas, recreation lands, agricultural easements, etc., possibly based on a transfer tax</p>	
<p>Initiative 6: Strengthen livelihoods compatible with oaks and prairies</p>		
<p>6.1 Expand and support certification schema for bird-friendly commodities in Central Coast</p>	<p>-Encourage Bird-Friendly Beef (expand and support certification schema for bird-friendly beef in Central Coast in partnership with Audubon and others).</p> <p>-Consider the introduction of Bird-Friendly Wine certification in partnership with WildFarm Alliance and others.</p>	<p>MED</p>
<p>6.2 Partner with Cal Poly San Luis Obispo to develop a Conservation Livelihoods Curriculum</p>	<p>-Through the Strategic Research Initiatives (SRI) program or similar avenue, and in coordination with Colleges of Agriculture, Business, Biology, Architecture, Engineering and Liberal Arts, advance the development of a Conservation Livelihoods Curriculum, tooling skillsets for interdisciplinary, applied land stewardship to bridge knowledge and practice in undergraduate and graduate programs with opportunities for practitioner training and off-campus community technical capacity.</p>	<p>HIGH</p>
<p>6.3 Establish carbon markets and/or other incentives to capture value of ecosystem services provided by rangelands</p>	<p>-Consider eco-tourism opportunities for on-farm/ranch operations</p> <p>-Build support for California’s Healthy Soils Initiative, including expanding programming in rangeland systems.</p>	<p>MED</p>

* Ratings provide a measure of effectiveness for each strategy based on a number of criteria including its expected impact on a pressure or conservation threat, whether the strategy is resilient to climate change, and if the strategy is feasible, etc. Low= not effective, Med=less effective, High= effective, Very High= very effective.



5.5 CONIFER AND MIXED HARDWOOD SYSTEMS

The Central Coast is especially rich in conifer and mixed hardwood diversity, owing to significant endemism, the intersection of several [ecoregions](#), and an abundance of microhabitats influenced by aspect, soils and summer fog. Paleoendemics, including coastal redwood, Monterey pine and Santa Lucia fir, once existed across much larger ranges but are now highly restricted to climatic conditions of the past. Conversely, numerous cypress species represent neoendemics that have adapted to unique micro-sites in isolation from each other, resulting in relatively recent speciation events (Kauffmann 2013). The Central Coast hosts the meeting place of the cool forests of northern California, dominated by coastal redwood and Douglas fir, the drier southern and rocky mountainous interior of yellow pines (Ponderosa and Jeffrey), and the far western extent of piñon-juniper woodlands. While equating to less than 10% of the C3JV region, the diversity of habitats represented by conifer and mixed hardwood forests and woodlands greatly enhances the region's avian diversity.

While the Central Coast as a whole is not characterized by extensive conifer forests, important hotspots including the Santa Cruz Mountains, Monterey Peninsula, Big Sur Coast, Santa Lucia Range, Santa Barbara County's Sierra Madre and the Transverse Range, all represent key habitat complexes supporting resident and migrant conifer-dependent birds. Notably, more than 60%, or over 300,000 acres, of the Conifer and Mixed Hardwood Conservation Target is under some type of protected area management, principally as U.S. National Forest lands, but also State Parks, National Wildlife Refuges, and private conservation lands. While much of the conifer forested landscapes are largely protected from wholesale conversion, important concerns remain for long-term viability of the target. Resulting from

historic timber harvest, livestock production practices, and fire suppression, conifer and hardwood forests have undergone influential changes impacting avian species, including:

- reduced mature/old-growth forest stands;
- increased forest fragmentation;
- reduced amounts of large standing snags; and
- increases in early- and mid-successional even-aged stands dominated by a single species (CalPIF 2002b).

The legacy of these modified forest dynamics limits the capacity of remaining habitat patches to support breeding birds, particularly those most dependent upon intact, old-growth, and multi-level canopies. Birds such as the Marbled Murrelet, California Spotted Owl, and Sooty Grouse ¹⁹, all dependent on unique forest characteristics, have experienced population declines or extirpation in the Central Coast bioregion. What's more, the sensitivity of remaining forest patches to catastrophic wildfire has increased both as a result of historic fragmentation and fire suppression (CALFIRE 2021). Large-scale, stand-replacing fires are increasingly common in the region, resulting in the loss of remnant old-growth patches along with the bird species dependent upon these increasingly isolated habitats (Stephens et al. 2016).

Refer to Table 5.5.1 for greater elaboration on habitat assemblages found in the Conifer and Mixed Hardwoods Conservation Target. The following chapter elaborates the attributes, pressures, strategies and goals orienting the C3JV's approach to conservation in the Conifer and Mixed Hardwoods of the Central Coast.

¹⁹ The Mount Pinos Sooty Grouse (*Dendragapus fuliginosus howardi*), is likely extirpated from the southern and western extent of its range in Santa Barbara/Ventura Counties, in part due

to the diminishment of white fir canopies, and the loss of diverse stand height, age-class and species diversity.

Figure 5.5.1: Geographic extent of the C3JV Conifer and Mixed Hardwoods Conservation Target



California Central Coast Joint Venture
**Conifer and
 Mixed Hardwood
 Conservation Target**









-  C3JV Terrestrial Planning Geography (approx. 7.2 million acres)
-  Sierran Mixed Conifer and Pine (approx. 19,200 acres)
-  Mixed Hardwood and Conifer (approx. 225,400 acres)
-  Juniper and Pinyon Pine (approx. 129,600 acres)
-  Closed Cone Pine-Cypress (approx. 28,400 acres)
-  Redwood - Douglas Fir Complex (approx. 107,200 acres)



Table 5.5.1: Habitat Types Characteristic of the Conifer and Mixed Hardwoods Conservation Target.

Habitat Types	Description	~ Extent (acres)	~ % of C3JV	~ % Protected
Redwood – Douglas Fir	<p>Though Redwood habitats, as described by the California Wildlife Habitat Relationships System, are a composite of a suite of species, coastal redwood (<i>Sequoia sempervirens</i>) expectedly forms the dominant canopy, often in association with scattered Pacific Douglas fir (<i>Pseudotsuga menziesii</i>). Tanoak (<i>Notholithocarpus densiflorus</i>) and Pacific madrone (<i>Arbutus menziesi</i>) also tend to play a major role, while numerous other species are present depending on microclimate and soil characteristics, including Bishop pine (<i>Pinus muricata</i>), Monterey pine (<i>P. radiata</i>), sugar pine (<i>P. lambertiana</i>), Santa Lucia fir (<i>Abies bracteate</i>), California bay (<i>Umbellularia californica</i>), California sycamore (<i>Platanus racemose</i>) and big-leaf maple (<i>Acer macrophyllum</i>). The habitat hugs the coastal slopes of San Mateo, Santa Cruz and Monterey Counties and the far northern extreme of San Luis Obispo County where the Coastal Redwood’s native range terminates, along a relatively narrow strip reduced to canyon bottoms at its farthest southern extent. Redwoods extend far inland from the coast in the Santa Cruz Mountains northward. Understory composition is diverse in response to successional dynamics, aspect and slope, soil depth, distance from the coast among other factors, but typically includes Western Sword Fern (<i>Polystichum munitum</i>) and Redwood Sorrel, (<i>Oxalis oregona</i>) in the dense shade and Salmon Berry (<i>Rubus spectabilis</i>), Thimbleberry, (<i>Rubus parviflorus</i>), California Huckleberry (<i>Vaccinium ovatum</i>), poison oak, California rose-bay (<i>Rhododendron macrophyllum</i>), Western Azalea (<i>Rhododendron occidentale</i>), Wood Rose (<i>Rosa gymnocarpa</i>) and western fescue (<i>Festuca occidentalis</i>) in more open areas. In the Central Coast, Redwood habitats co-mingle and often transition into Coastal Oak Woodland and Montane Riparian. The Pileated Woodpecker has been identified in some areas as a management indicator species for old-growth forests, though the species reaches its southern limit here. In the Central Coast, additional barometers of old-growth forests include the California Spotted Owl and Marbled Murrelet, while Western Tanager, Vaux’s Swift, Brown Creeper, Red-breasted Nuthatch, and Varied Thrush are all sensitive species in the region. Approximately 30% of the entire extent of Redwood forest in the C3JV region burned in the 2020 CZU Complex fire.</p>	Total: 107,000	1.5%	41%
Montane Hardwood and Montane Hardwood Conifer	<p>Montane Hardwood (MH) and Montane Hardwood Conifer (MHC) forest types are perhaps the most variable in California, and while arguments could be made for their inclusion in the Oaks and Prairies Conservation Target, Montane Hardwoods are included here due to their often association with conifer forest-types as well as their management as commercial hardwood forests (as opposed to hardwood rangelands of other oak dominated habitats). MH of the Central Coast are dominated by canyon live oak (<i>Quercus chrysolepis</i>), occurring in pure stands as well as mixed canopies with scattered overstory of tanoak, California laurel, California black oak (<i>Quercus kelloggii</i>), and Coulter pine at higher elevations, and knobcone pine, coast live oak and foothill pine at lower elevations. Often on moderate to steep slopes, MH is a stable, long-lived habitat-type with a variable range of species enabling its dominance. MHC is a diverse forest-type emblematic of vegetative transition and exhibiting significant variation across the Central Coast. In the northern reaches of the geography, coastal redwood, Pacific Douglas fir, and Coulter pine typically pair with coast live oak, big leaf maple, tanoak and Pacific madrone, whereas in the southern extent, canyon live oak and coast live oak co-inhabit with Jeffrey pine (<i>P. jeffreyi</i>), sugar pine and incense cedar (<i>Calocedrus decurrens</i>). The endemic Santa Lucia fir is included in the association, and California black oak and bigcone Douglas fir (<i>Pseudotsuga macrocarpa</i>) may also occur. Key to the classification is a composition of at least 1/3 conifer and 1/3 broad-leafed hardwood, often in a mosaic of small pure stands, and typically closed with little understory. While defined by variability, characteristic bird species include. Black-throated Gray Warbler, Dark-eyed Junco, Flammulated Owl, Fox Sparrow, Steller’s Jay, and Yellow-rumped Warbler.</p>	<p>Montane Hardwood: 121,500</p> <p>Montane Hardwood-Conifer: 103,860</p> <p>Total: 225,360</p>	3%	55%
Sierran Mixed Conifer and Pine Forests	<p>Distributed in small pockets throughout the C3JV region, the Sierran Mixed Conifer (SMC) is a diverse assemblage typified by a mix of conifer-hardwood association forming a multilayered forest with nearly 100% overlapping cover. In the Central Coast, this is typically dominated by Ponderosa pine and California black oak in the Santa Lucia Range, which represents the stronghold of the habitat association, though pockets also exist in the Santa Cruz Mountains, San Rafael Range, Sierra Madre Mountains, the montane slopes of Mt. Pinos, as well as the highest elevations of the Garcia Mountains and La Panza Range. The extent of Jeffrey and sugar pines increase as one moves into the Interior Coast and Transverse Ranges. Ponderosa pine (<i>Pinus ponderosa</i>) and Jeffrey pine both also occur as dominant stands themselves, sharing the canopy with lesser components of incense cedar, Coulter pine, sugar pine, Douglas fir, bigcone Douglas fir, canyon live oak, California black oak, Oregon white oak (<i>Quercus garryana</i>), Pacific madrone and tanoak depending on locale. Jeffrey pine tends to replace Ponderosa pine in the Mt. Pinos foothills of Santa Barbara and northwestern Ventura Counties, though overall Jeffrey pine is rather uncommon in the C3JV region. SMC and ponderosa forests, sometimes referred to as Yellow Pine forests, are often juxtaposed with Coastal Scrub, Chamise-Redshank, Mixed Chaparral, or oak woodland-types at the lower boundaries, with sugar pine, bigcone Douglas fir or true firs (white fir (<i>Abies concolor</i>), typically one of the more dominant species of SMC associations, is nearly absent from</p>	<p>Sierran Mixed Conifer 11,850</p> <p>Yellow Pine Forests 7,400</p>		

	the C3JV region) at their upper edge. Flammulated Owl, Northern Pygmy-owl, Pygmy Nuthatch, Yellow-rumped Warbler, Olive-sided Flycatcher and Purple Martin represent some of the avian diversity of these forests.	Total: 19,250	<1%	91%
Closed Cone and Cypress	Relatively rare and typically isolated, Closed Cone Pine (CCP) and cypress forests are often composed of a dominant endemic species embodying a small relic of a much larger historic range. These species are often adapted to a unique combination of biotic and abiotic factors including the inland reach of summer fog, soil type, annual rainfall, availability of soil nutrients, root diseases and other factors (Vogl et al. 1988). In the Central Coast, this includes the Monterey cypress (<i>Hesperocyparis macrocarpa</i>), native only to two known sites; the Santa Cruz cypress (<i>Hesperocyparis abramsiana</i>), confined exclusively to the Santa Cruz Mountains, and Gowen cypress (<i>Hesperocyparis goveniana</i>), also endemic to the Monterey Peninsula. The Sargent's cypress (<i>Hesperocyparis sargentii</i>), also a California endemic, is more widespread, occurring locally, though infrequently, throughout the Coast Range of the C3JV. Within CCP, the Monterey pine is an endemic, endangered species known only to three remnant patches in the Central Coast and on two Mexican islands, occurring in co-dominance with Monterey cypress. Bishop Pine, endemic to California ²⁰ , as well as knobcone pine, are both more widespread, occurring locally from Santa Barbara to San Mateo County on poor, rocky and mountainous soils, Bishop almost always on or near the coast. While these forests support numerous endemic plants and insects, no bird species are specialized breeders here, though they are important for mast crops (e.g., band-tailed pigeons, red crossbills and pine siskins), and support a number of conifer specialists otherwise at the edge of their range, such the pygmy nuthatch. Having coevolved with fire, these habitats often provide ample snags for cavity nesting birds, including woodpeckers, chickadees, nuthatches and screech owls. Importantly, Monterey pine is a key wintering substrate for the Western monarch butterfly.	Total: 28,400	<1%	37%
Juniper and Piñon Pine	The drier slopes of the Inner Coast Ranges, including the Temblor, Diablo, La Panza, Caliente and Sierra Madre mountains, introduces a markedly different canopy of evergreens. Though California juniper (<i>Juniperus californica</i>) extends throughout the C3JV region as far north as Santa Clara County, often as a secondary component in blue oak woodlands, the heart of juniper country lies in the montane slopes of the Temblor, and Sierra Madre Ranges. Typically occurring on ridges and slopes and in valleys in bedrock or alluvium-derived soils, California juniper is the sole or dominant tree emerging over a shrub canopy. The ground layer is sparse or grassy. Desert scrub oak (<i>Quercus turbinella</i>) may be present along with interior goldenbush (<i>Ericameria sp</i>), California buckwheat, rubber rabbitbrush (<i>Ericameria nauseosa</i>), California matchweed (<i>Gutierrezia californica</i>), or blue witch (<i>Solanum umbelliferum</i>). Native perennial grasses, including desert needlegrass (<i>Achnatherum speciosum</i>) and one-sided blue grass (<i>Poa secunda</i>), are also present. Moving south along the upper Cuyama watershed in the montane slopes of the northern Transverse Range, juniper woodlands transition into single-leaf piñon (<i>Pinus monophylla</i>) and California juniper associations, otherwise known as PJ woodland. Scattered trees grow over intermittent to open shrubs. The C3JV terrestrial planning region may represent the farthest western extent of Joshua tree (<i>Yucca brevifolia</i>). Single-leaf piñon tends to favor alluvial fans, pediments, slopes and ridges in well-drained soils, sometimes as the dominant tree. Shrubs are common and the ground layer is absent, sparse, or grassy. California juniper, canyon live oak, Jeffrey pine, and Tucker oak (<i>Quercus john-tuckeri</i>) may be present with bitterbrush (<i>Purshia tridentata</i>), big sagebrush (<i>Artemisia tridentata</i>), green ephedra (<i>Ephedra viridis</i>), and/or low sagebrush (<i>Artemisia arbuscula</i>). Juniper and piñon forest-types introduce a unique compilation of evergreen-associated birds, again at the edge of their range in the Central Coast, including Townsend's Solitaire, Clark's Nutcracker, Scott's Oriole and Pinyon Jay.	Juniper 41,200 Juniper-Piñon: 88,400		
TOTAL		Total: 129,600	1.8%	89%
		510,000 acres	7%	61%



5.5.1 KEY ATTRIBUTES OF THE CONIFER AND MIXED HARDWOODS

Using the Conservation Standard’s Viability Assessment framework discussed in **Chapter 3**, a selection of Key Attributes, or the factors, interactions and/or elements that enable the target to persist, were identified along with indicators used to measure the status and trend of each attribute. These are presented in Table 5.5.2. The Table identifies each key attribute, a summary description of its meaning and importance as a measure of functionality of the Conifer and Mixed Hardwood

ecosystems of the Central Coast, identifies the indicators the JV will use to quantify and monitor the attribute, and finally provides a conditional status rating of each indicator. The current conditional status code was derived from knowledge and consensus among Implementation Task Force members and advisors, but does not represent a quantitative measure. Instead, it is a qualitative, and relative, conditional statement that will be refined as information and monitoring systems develop, and it allows for an initial and comparative snapshot of the indicators perceived to be more or less compromised today

Table 5.5.2: Key attributes identified for the Conifer and Mixed Hardwoods Conservation Target

Key Attributes	Description	Indicators	Attribute’s Current Status	Status Notes
Fire Regime	Conifer systems of the Central Coast range from fire-adapted to fire-dependent (Reilly et al. 2019). With serotinous cones, knobcone and Bishop pines (and to a lesser extent Monterey pine) require fire for germination, while redwood and Douglas fir have developed fire-resistant characteristics that enable persistence in relatively fire-prone climates for hundreds to thousands of years. However, with effective suppression efforts over the last century or more, the fire regime has shifted from patchy, frequent, low intensity fires, to large-scale, high intensity events exacerbated by climate change. Fuel ladders expose mature forests to stand-replacing fires, destroying old-growth trees typically resistant to low severity fire. With small, isolated populations, endemic conifers may be particularly vulnerable to mismanaged fire (CalPIF 2002b). The fire regime influences recruitment, shrub and grass cover and extent, and therefore the avian and other wildlife species these habitats can support. In short, fire plays a vital role in the long-term functionality of the Conifer and Mixed Hardwoods Conservation Target. See also Holmes et al. 2006 and Purcell and Stephens 2005 .	1. Timing (seasonality)	Yellow	Fire-prone months increasing
		2. Duration (length of burn period)	Red	Fire events burn longer relative to historic condition
		3. Frequency (interval between events)	Yellow	Insufficient frequency relative to historic condition
		4. Extent (scale of burned area)	Red	Singular events much larger relative to historic condition. However, overall annual burned area consistent with historic conditions.
		5. Intensity (extent of high-severity fire)	Red	Fire intensity greatly elevated relative to historic condition
		6. Source (prescribed, cultural-fire, lightning, accidental, arson)	Red	Ignition mostly accidental. Insufficient prescribed and cultural fire events.

Avian Focal Species	Focal species were selected as representatives of diverse habitat elements, key conservation concern, species of weighted importance to the Central Coast relative to their range-wide distribution (e.g., endemics), and species which represent good indicators for monitoring management interventions and ecosystem function among other criteria. Further description of the focal species can be found below.	1. Focal species occupancy		Relatively high (focal species are still present)
		2. Focal Species population trends and relative abundances		Significant concern across most focal species
		3. Priority Focal Species demographics		Significant concern across focal species
Habitat quality and quantity	Ultimately, the viability of Conifer and Mixed Hardwoods is in large part contingent upon the extent and condition of the habitat supporting birds, other wildlife and people. Given the significant pressures acting on the viability of both quality and quantity of habitat, the C3JV is committed to monitoring the status of these key attributes, including measuring changes in habitat extent, the degree of connectivity between habitat blocks, vegetative structure and essential elements, and the extent of native species dominance in the landscape. While much of the Target is subject to resource-management plans by Federal and State agencies and are therefore under some degree of protection, key unprotected habitats remain, as does a critical need for habitat restoration to improve stand function, resilience to climate change, and long-term persistence and viability. Connectivity is a significant barrier given the isolation of habitat patches, and redwood forests are particularly vulnerable to land use change and conversion. More generally, vegetative structure is a limiting factor for most focal species (CalPIF2002b).	1. Area of habitat (acres of habitat change)		Significant historic loss of habitat. Losses continue but at lower rate
		2. Avian species richness (number of species present in a given sample site)		Relatively under monitored in the C3JV region, particularly in conifer systems.
		3. Habitat connectivity (degree of connectedness)		Active fragmentation in redwood stands, while other conifer habitats often isolated and disconnected.
		4. Native species dominance (extent of invasive vs native species)		Invasion of eucalyptus, French broom, silver wattle (<i>Acacia dealbata</i>) and fungus (pitch canker) a significant concern in conifer landscapes.
		5. Vegetative Structure and successional dynamics (age-class, canopy, shrub and herbaceous structure and characteristics, snag density ²¹)		Significant loss of old-growth and mature forest conditions. Second growth often too dense, lacking understory and even-aged. Closed-cone forests often in or near senescence.

Red = poor, orange = fair, green = good, dark green = excellent.

²¹ Additional readings on importance of snags:

The Cavity Conservation Initiative (2016). The value of dead trees. <http://cavityconservation.com/value-of-dead-trees/>
National Wildlife Federation. (1997). Turning deadwood into homes for wildlife. Retrieved from <https://www.nwf.org/News-and-Magazines/National-Wildlife/Gardening/Archives/1998/Turning-Deadwood-into-Lively-Homes-for-Wildlife.aspx>
Torsello, M. & McLellan, T. (2004). There's life in hazard trees. http://na.fs.fed.us/spfo/pubs/uf/wl_haztrees/haztrees.htm
Washington Department of Fish and Wildlife. (2011). Snags—the wildlife tree. <http://wdfw.wa.gov/living/snags/snags.pdf>
Writter, S. (1997). Dead trees and living creatures: the snag ecology of Idaho. Idaho Wildlife (Vol. 17 No. 4). <https://fishandgame.idaho.gov/public/wildlife/nongame/leafletSnag.pdf>



Olive-sided Flycatcher, photo Dave Keeling

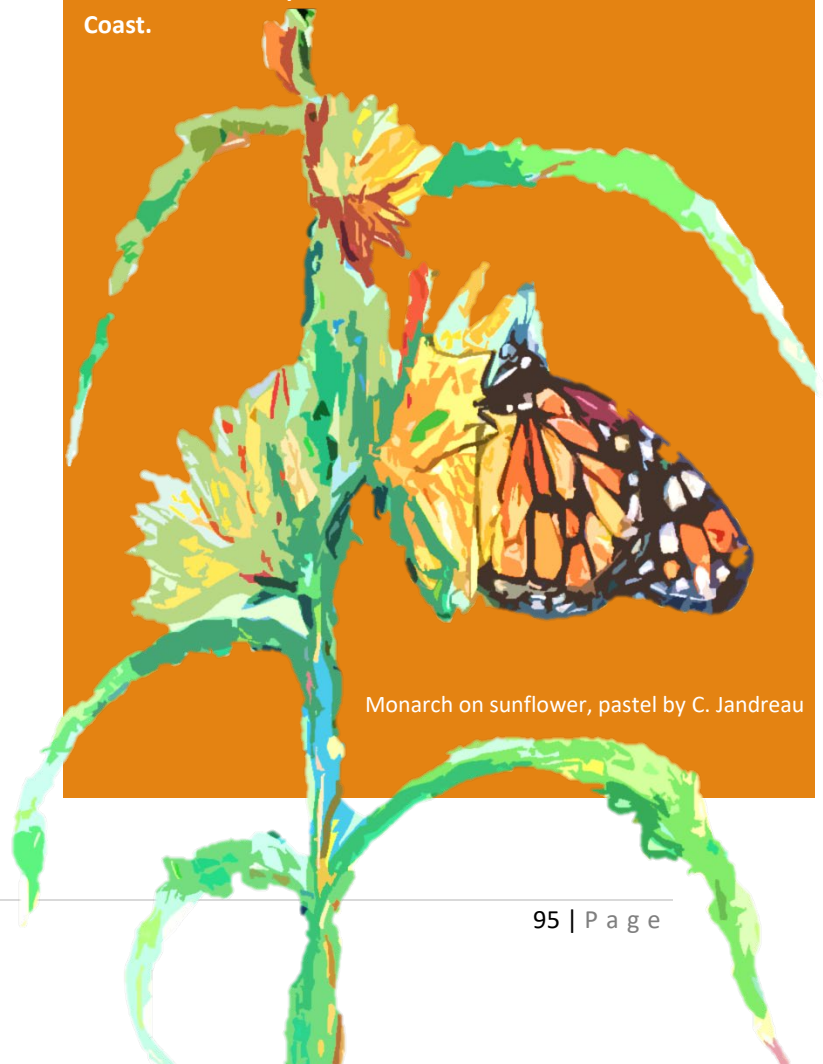
5.5.2 FOCAL SPECIES OF THE CONIFER AND MIXED HARDWOODS

Following the Focal Species Selection Method described in [Chapter 3](#), 15 species were selected as “Avian Focal Species” of the Conifer and Mixed Hardwoods Conservation Target, representing species of acute conservation concern, diverse habitat elements (Table 5.5.4), species with an outsized dependence on the C3JV region during all or a portion of their annual lifecycle (Stewardship Species) and good indicators for monitoring management interventions and ecosystem function, among other factors. Table 5.5.3 shows the Conifer and Mixed Hardwoods Focal Bird Species, including their principal habitat association, limiting factors (if known), population trends, and species-specific directional population objectives.

Given the relatively small footprint of conifer-dominated forests in the C3JV, few Stewardship Species are included, currently reserved solely to the Steller’s Jay. However, the relative dearth of Stewardship Species is in sharp contrast to species of conservation concern or ones that are otherwise experiencing population declines regionally and range wide, with at least 10 of the 14 focal species declining. One species is listed as Federally Threatened and State Endangered, the Marbled Murrelet, while three are included on the California Species of Conservation Concern list, all as Priority Two species. One of those species, the Olive-side Flycatcher, is also included on the Road-to-Recovery list, and three focal species are also listed on the USFWS’s 2021 Species of Concern for BCR 32. Available species profiles for individual focal species can be found in the [Appendix I](#) of this plan.

CO-BENEFITS

The Western Monarch Butterfly (*Danaus plexippus plexippus*) has experienced significant population declines in recent years (Pelton et al 2019), including a [99.9% population decline](#) of overwintering adults recorded in 2020 relative to the 1980s. The Central Coast is essential wintering habitat for the species, and while eucalyptus (*E. globulus* and *E. camaldulensis*) is now utilized extensively, native trees including Monterey pine (*Pinus radiata*), Monterey cypress (*Hesperocyparis macrocarpa*), western sycamore (*Platanus racemosa*), and coast redwood (*Sequoia sempervirens*) composed the original habitat prior to eucalyptus invasion (Stock et al 2005). In fact, butterflies do not prefer eucalyptus to native tree species, and there is increasing recognition of native tree restoration for the long-term viability of the species. The senescence of Monterey pine, pitch canker, and associated tree pruning can reduce suitability of Monterey pine as overwintering habitat for monarchs, concerns which overlap with the Pygmy Nuthatch, a C3JV focal species. The opportunities for building multiple-benefit outcomes across taxa and within communities such as Pacific Grove, aka Butterfly Town, is an important driver of the Joint Venture’s vision and mission as we implement conservation efforts in the Central Coast.



Monarch on sunflower, pastel by C. Jandreau

Table 5.5.3: C3JV Conifer and Mixed Hardwoods Conservation Target Avian Focal Species

	Common Name	Scientific Name	Primary Habitat Association	Trend and PIF Score*	Listed Status **	Limiting factors	C3JV Importance	Population Objective ***	Notes
Conservation Priority Species	Marbled Murrelet	<i>Brachyramphus marmoratus</i>	Old-growth and older second-growth coastal redwood and Douglas fir forest	Declining 15	FT, SE	Suitable nesting platforms, nearshore marine prey dynamics	100% of Distinct Central Coast Population	Increasing trend over 10-year period	Restricted to the Santa Cruz Mountains within approximately 7 critical habitat blocks, or “Murrelet Important Areas”. As much as 60% of nesting habitat burned in CZU-Complex Fire in 2020, increasing uncertainty for the Central Coast population.
	California Spotted Owl	<i>Strix occidentalis</i>	Mature and old-growth forests with closed canopies, including redwood, mixed hardwood-conifer and riparian forests.	Declining 15	2 nd Priority BSCC	Strict habitat conditions including large nest trees, large forest blocks, complex closed canopies	Determine Status	Determine Status	Largely confined to old-growth redwood, hardwood-conifer and riparian patches along Big-Sur Coast of Monterey County, though isolated populations are known to exist in San Luis Obispo, Santa Barbara and Ventura Counties. Relative specialist on small mammal prey, likely rely on dusky-footed woodrat as principle prey source in the Central Coast, though pocket gophers may also be important. USFWS 2021 BCR 32 Species of Conservation Concern.
C3JV Stewardship Species	Steller’s Jay	<i>Cyanocitta stelleri</i>	Conifer, montane hardwood-conifer and dense, oak woodland forests	Stable or Declining 11		A generalist, but benefits from anthropogenic supplements, forest edge and complex forest mosaics	+5%	Determine Status	A native corvid of forested habitats, increasingly successful at adapting to human activities. Populations are appearing to decline in the Santa Cruz Mountains and perhaps throughout the Central Coast. Species range-wide population exhibits overall decreasing trend. This jay, along with other corvids, poses an important threat to Murrelet populations, and may impact reproductive success of other conifer and mixed-hardwood nesting birds. A C3JV Stewardship Species.
Indicator Species	Black-throated Gray Warbler	<i>Dendroica nigrescens</i>	Open pine, oak and piñon-juniper forests with scrub understory	Declining 13		Considered a piñon-juniper obligate across much of range, though habitat use diversifies in California. Requires well-developed shrub canopy.		Determine Status	Relatively understudied given its widespread distribution, largely occurring on drier sites within the Santa Cruz Mountains and Santa Lucia Range in Montane Hardwood-Conifer and Sierran Mixed Conifer complexes. Extent of use in Piñon-Juniper habitats in the Central Coast needs further exploration.
	Brown Creeper	<i>Certhia americana</i>	Mature, dense redwood, Douglas fir and Montane Hardwood-Conifer	Declining 8		Large foraging trees, dead or dying nesting trees, and a diverse canopy (particularly favoring incense cedar)		Determine Status	Creepers are most common in the Santa Cruz Mountains, generally becoming increasingly uncommon southward along the Southern Coast Range to Morro Bay, but also breeds on the higher foothill slopes of Mt. Pinos region and in isolated interior riparian woodlands. Some of the highest statewide winter counts occur in the Central Coast region, particularly during sporadic fall migration episodes. Breeding habitat associates can include Chestnut-backed Chickadees, Golden-crowned Kinglets and Yellow-rumped (Audubon’s) Warblers.
	Chestnut-backed Chickadee	<i>Poecile rufescens</i>	Mature, dense redwood, Douglas fir, Montane Hardwood, Monterey Pine and coastal oak woodland	Declining 12			+3%	Determine Status	Though the species has undergone recent range expansion into the Sierras and the San Francisco Bay area, overall the species appears to be declining. Fire suppression has facilitated dense conifer stands favored by the species, as has the cultivation of Monterey pine outside its native range. Reason’s for population level declines unknown.
	Dark-eyed Junco	<i>Junco hyemalis</i>	Montane conifer and mixed conifer/oak forests, also mature oak woodland and	Declining 8		Herbaceous layer under an open canopy or forest edge			At least two subspecies are resident in the C3JV region, including widespread <i>thurberi</i> and the more narrowly distributed <i>pinosus</i> , both of the Oregon-group. Wintering subspecies are more variable. As a ground nester, herbaceous cover is a requisite for nesting suitability, and therefore can respond positively to post-fire succession, forest thinning and logging activities.

		eucalyptus more coastally						As a common bird in steep decline, a greater understanding of nest success, winter mortality, and other factors needed.
Flammulated Owl	<i>Otus flammeolus</i>	Yellow pine forests	Trend not well known 15		Presence of high vegetative and structural diversity, yielding abundant nocturnal insect prey densities, potentially limits the species		Determine Status	With the relatively small extent of yellow pine forests in the Central Coast, occurrence of the Flammulated Owl appears limited principally to the Santa Lucia Range, isolated pockets in Santa Cruz County, and the Southern Coast Ranges in Santa Barbara and Ventura County. With a relatively specialized diet and specific nesting/roosting characteristics, the species tends to be sensitive to habitat manipulation. USFWS2021 BCR 32 Species of Conservation Concern
Golden-crowned Kinglet	<i>Regulus satrapa</i>	Moist, dense redwood-Douglas fir	Declining 8		Moderately dense to closed fir and redwood forests		Determine Status	A fairly common resident of Santa Cruz Mountains, with isolated breeding populations along the Santa Lucia Range and Mt. Pinos Region (largely restricted to pockets of white fir). Does not necessarily respond well to forest thinning efforts, and prefers diverse, old-age stands.
Olive-sided Flycatcher	<i>Contopus cooperi</i>	Late successional coniferous forests with open canopies	Declining 13	2 nd Priority BSCC, R2R	Habitat mosaic of forest edge with extensive tall perches for sallying and singing		Determine Status	Population decline not fully understood, though changes in fire regime likely important, as well as potential wintering ground habitat impacts. Has been suggested that forest management practices may function as an ecological trap given continued decline in apparent suitable habitat. With a low reproductive rate, and fairly specialized in their diet (concentrating on bees and wasps), a better understanding of drivers is necessary. USFWS 2021 BCR 32 Species of Conservation Concern and Road-to-Recovery Species.
Purple Finch	<i>Haemorhous purpureus</i>	Montane conifer and mixed deciduous forests	Declining 9		Not well-known, though intraspecific competition with House Finch a concern		Determine Status	An understudied species experiencing steady yet dramatic population declines across its range. Drivers of population loss is not clear, given that the species has relatively plastic habit needs, appears adaptable to landscape changes, and is tolerant of urban areas, often visiting feeders.
Pygmy Nuthatch	<i>Sitta pygmaea</i>	Closed-cone pine forests	Stable or Increasing 12		Nest-site availability, including cavities or soft decaying wood/snags, and sufficient nut-producing trees for foraging		Maintain/Determine Status	A pine specialist, particularly in association with Ponderosa pine, but in the Central Coast, also found in Monterey, Knobcone, Bishop, Coulter and Jeffrey pine stands. As a good indicator of long-needle pine forest health, the nuthatch correlates directly with increased snag density and foliage volume achieved with heterogenous canopy and age-class structure.
Vaux's Swift	<i>Chaetura vauxi</i>	Mature/Old-growth redwood Douglas fir and Mixed Conifer	Declining 13	2 nd Priority BSCC	Large snags or hollow trees, or Pileated Woodpecker cavities; proximity to water bodies		Determine Status	Largely confined to the Santa Cruz Mountains, though established breeding populations likely occur throughout Big Sur and the Santa Lucia Range. Population trend not well understood, but Breeding Bird Survey indicates a modest annual decline. As with many focal species, attention to retention of existing old-growth habitats, and restoration of old-growth-like conditions, in addition to management of large snags important to the species.
Western Tanager	<i>Piranga ludoviciana</i>	Open Montane Hardwood-Conifer forests, favoring pine	Increasing 9		Extent of montane conifer forests likely limits the species range in the C3JV		Determine Status	Fairly common in the Santa Lucia Range, Santa Ynez Mountains, and higher elevations of Pine Mountain and Mt. Pinos regions, with local breeding in Santa Cruz and San Luis Obispo Counties. Overall, given the species preference for open forest mosaics and small patch sizes, the species has fared well with conifer and hardwood fragmentation for the most part. However, with increased edge exposure, can be a common host to brown-headed cowbirds

* PIF Score: Partners in Flight (PIF) scores the relative vulnerability of all landbirds according to the following six factors: population size, breeding distribution, non-breeding distribution, threats to breeding, threats to non-breeding, and population trend. Refer to the [Avian Conservation Assessment Database Handbook](#) for specific methodology.

** Status codes: FE: Federally Listed - Endangered, FT: Federally Listed – Threatened, SE: State Listed – Endangered, ST: State Listed – Threatened; 1st, 2nd and 3rd Priority birds included in California Bird Species of Special Concern (Shuford and Gardali 2008), representing regionally specific species of conservation need (<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=84247&inline>).

*** Population Objectives offer directional goals based on regional population trends (trends derived from PIF assessments, CDFW species accounts and/or expert opinion of trend if actual trends are not known). Population objectives will be specified as JV-regional population measures/monitoring systems are developed.

Table 5.5.4: Essential Habitat Elements for C3JV Conifer and Mixed Hardwoods Conservation Target avian focal species.

Common Name	Mature/Old-growth Forest Patches	Cavities	Pine Tree dominant canopies	Well-developed shrub layer	Grass/Herbaceous layer	Snags	Interior forest patches (buffered from edges)	Structural Diversity (diverse habitat layering)	Forest mosaic/edge (e.g., fire facilitated openings)
Marbled Murrelet*	X						X		
California Spotted Owl*	X					X	X	X	
Steller's Jay									X
Black-throated Gray Warbler				X					
Brown Creeper	X					X			
Chestnut-backed Chickadee	X	X				X	X		
Dark-eyed Junco					X				X
Flammulated Owl		X	X			X			
Golden-crowned Kinglet	X						X	X	
Olive-sided Flycatcher						X		X	X
Purple Finch									
Pygmy Nuthatch		X	X			X			
Vaux's Swift	X	X				X			
Western Tanager									X



5.5.3 PRESSURES ON CONIFER AND MIXED HARDWOODS

Conifer and Mixed Hardwood Systems face a suite of pressures from numerous and inter-related forces that impact the ability of these habitats to support birds, other wildlife and people. Table 5.5.5 identifies the major pressures acting on Conifer and Mixed Hardwood Systems, derived through the Threats Assessment methodology described in Chapter 3. The historic legacy of past land-uses is particularly acute in conifer-dominated systems given the relatively long period of succession and the extent of utilization for mission and state-building²². The combined influences of wholesale clear-cutting, landscape-scale fire suppression, and to a lesser extent livestock grazing through the nineteenth and twentieth centuries have all left important signatures, including the simplification of the canopy, reduced age-class heterogeneity, increased stand density,

introduction of edge and loss of interior forest patches, and the disappearance of old-growth species (Draft [Santa Cruz RCIS 2022](#)). For instance, less than 10% of old-growth redwood and Douglas fir stands remain in the Central Coast, concentrated in State Parks, of which approximately half were burned in the [2020 CZU Complex Fire](#).²³ These historic signatures contribute to increased stand-replacing fire risks and reduced forest health, likely resulting in diminished populations of birds and other wildlife, particularly those dependent upon old-growth forest characteristics. With continued pressure from residential, commercial and agricultural encroachment, introduction and proliferation of invasive species, and climate change-induced alterations to precipitation regimes, the long-term stewardship of conifer and hardwood forests demand our increased attention.

Table 5.5.5. Summary of overall pressure ratings perceived to be acting on the Conifer and Mixed Hardwoods Conservation Target in California’s Central Coast.

Pressure	Rating*
Severe fire** and fire suppression (including incompatible vegetation management)	Very High
Residential development (urban/exurban development and associated infrastructure)	High
Invasive and problematic species	High
Timber and non-commercial wood harvesting practices	High
Recreation and other human activities	Medium
Incompatible livestock and ranching practices	Medium
Pathogens/disease (e.g., pine pitch canker) **	Medium
Agricultural conversion (encroachment of forests by agriculture (e.g., vineyards)	Medium
Roads and related infrastructure development	Medium
Pesticides, herbicides, rodenticides	Medium
Renewable energy development (e.g., wind energy)	Medium
Nest parasitism and competition (e.g., brown-headed cowbirds)	Low

* Ratings are derived from a qualitative index whereby a given pressure is evaluated based on its scope (i.e., scale impact), severity (within the scope, how severe is the potential destruction/degradation), and irreversibility (whether the impact can be reversed, and anticipated length of recovery). **Very High** equates to a large scope, severe impacts and a low likelihood of reversibility within 100 years, whereas **Low** equates to a small scope, relatively insignificant degradation, and restoration of the impact easily achievable/likely.

** denotes a climate change-induced pressure, where the C3JV may have limited capacity to address the direct cause. Given that climate change-induced drought has a relationship with fire and fire suppression, overlapping strategies may be developed to [address or mitigate impacts from both](#) pressures.

²² Timber products were utilized significantly in the expansion of the mission systems, and later tanneries, charcoal, soft-wood forest products (Marcille et al 2020).

²³ While old-growth redwoods are likely to recover over the next 50-100 years, significant loss of old-growth Douglas fir occurred. More of the CZU-fire can be found [here](#) and [here](#).

Severe fire and fire suppression: Aptly illustrated by the CZU Complex and Dolan Fires in 2020, perhaps no other pressure has as much immediate and long-term impacts to conifer-dominated forests as fire. Fire suppression in juxtaposition with historic, ubiquitous clearcutting and wholesale timber removal has resulted in dense, even-aged stands, often reduced to one or two dominant species, with very little shrub and herbaceous understory cover. This not only reduces habitat suitability for focal species, but also leads to an elevated risk of large-scale, high-intensity canopy-replacing fires that are difficult to control, result in destruction of human infrastructure and life, and alter forest dynamics in myriad ways. Given the nature of conifer habitats occurring in the geography as often small, isolated and patchy mosaics, mega-fires can literally eliminate extant habitats in the region. This is perhaps most acute for Marbled Murrelets, but also for isolated populations of California Spotted Owl, Vaux's Swift, Flammulated Owl, Pileated Woodpecker and others species. With increasing socio-political and cultural recognition of the importance of fire, both as a threat to the maintenance of the conservation target, but also as an essential element to the persistence of healthy conifer and mixed woodland habitats, the opportunity to revitalize historic fire regimes has perhaps never been as great nor as urgent.

Development: Habitat fragmentation in conifer and hardwood systems is largely a result of low density, ex-urban residential housing and associated development, but also includes higher density urban expansion, industrial, energy and infrastructure projects, conversion of forest and woodland patches to agriculture, and defensible space ordinances among other pressures. Development activities results in habitat loss directly, but also increases edge effects, including accessibility of the forest by both nest parasites and predators. Development pressures differ across habitat types, where closed-cone stands like Monterey pine as well as redwood-Douglas fir stands are more threatened by development given proximity to urban growth centers, whereas yellow

pine, Sierran mixed conifer and piñon-juniper habitats are less exposed given their principal occurrence within Los Padres National Forest.

Timber Management: While commercial timber harvesting²⁴ is principally limited to a small handful of operators in the Santa Cruz Mountains, managed under relatively strict rules and guidelines governed by the California Department of Forestry and Fire Protection, Santa Cruz County and other agencies (CalFire 2020), timber and forest management practices (including non-commercial activities) remain a principal pressure *and* opportunity for forest-dwelling birds in the JV geography. For species dependent upon old-growth forests, the loss of as much as [95%](#) of California's old-growth redwood forest speaks to the significant deficiency of available habitat. To prevent further degradation of remaining stands and to foster the characteristics of late seral conditions, considerations of forest management activities within conifer forests is key, including: timing (e.g., harvest operations often coincide with nesting), proximity to old-growth/mature stands, noise disturbance (e.g., machinery, trucking), corvid management, salvage logging, selective harvest criteria, rotation intervals, forest-floor impacts, understory clearing among other factors. Furthermore, with growing concerns for catastrophic wildfire, public pressure grows for proactive forest management efforts. While these fears are amply justified, defensible space projects can be detrimental to forest habitats, enhancing edge effects and reducing forest cover. Balancing public safety, forest health and wildlife habitat is a significant and growing challenge in the conifer and mixed hardwoods of the Central Coast, but one that offers opportunities for novel conservation partnerships and outcomes at a watershed or landscape scale.

Climate Change-Induced Pressures: Climate modeling and vulnerability assessments for the Central Coast consistently anticipate exposure to increased temperatures, more variable and extreme precipitation patterns including increasing

²⁴ The Central Coast accounts for less than 2% of California's annual timber harvest, averaging approximately 23 million board

feet per annum.
https://www.fs.fed.us/pnw/pubs/pnw_gtr994.pdf

occurrence of drought and atmospheric rivers, and decreased soil moisture. While the long-term impacts to coastal fog remain uncertain, the overall extent of many conifer-dominant habitats is projected to decline, particularly for those species at the edge of their range, such as coastal redwood and piñon-juniper (EcoAdapt 2017). Climate change-induced impacts are coupled with land and water stewardship, fire and disturbance, as well as invasive

species, all of which will influence the degree of vulnerability of conifer and hardwood communities. Vulnerability is exacerbated by the relatively narrow and specialized ranges of many conifer species found in the C3JV region, potentially limiting adaptive capacity. With anticipated increases in fire frequency, the fragmented nature of conifer habitats leaves the Conservation Target moderately to highly vulnerable to climate change depending on the community type.

5.5.4 IMPLEMENTATION ACTIONS

Achieving our overarching vision of a resilient Conifer and Mixed Hardwood System shared by thriving populations of birds, other wildlife and people will in part depend on effective implementation, adaptation and modification of the Initiatives identified herein. As strategies are further developed and adjusted over time, the efforts of the JV to advance Conifer and Mixed Hardwood conservation will be guided and evaluated by the achievement of the following four goals:

Conifer and Mixed Hardwood BENCHMARK GOALS

- **By 2035, at least 90% of remaining old-growth forest patches are protected, prioritizing stands in coastal redwood, Douglas fir, and Montane Hardwood-Conifer forests.**
- **By 2035, at least 90% of rare closed-cone and pine forest patches, including Monterey and knobcone pine, as well as Monterey, Gowen and Santa Cruz cypress, are protected.**
- **By 2035, acres actively managed for low-severity fire have increased by at least 30%.**
- **By 2040, Conservation Priority focal species' populations have stabilized and/or increased in the C3JV geography.**
- **By 2040, 90% of focal species (with expectation of occurrence) are present on 75% of monitored conifer and hardwood sites.**

Employing the Strategy Development method further described in Chapter 3, Table 5.5.6 offers a description of possible Implementation Strategies identified and rated in accordance with the C3JV Strategy Ranking Criteria (Chapter 3). Among these, a sub-set of strategies were identified as having potential for high-impact value in addressing the viability of the Conifer and Mixed Hardwoods Conservation Target *and* which addresses one or more human wellbeing domains (refer to Chapter 5.1), these *synergistic strategies* outlined in **green**. Synergistic strategies, though prioritized, will not necessarily exclude implementation of other strategies depending on partner goals, conservation urgency and other factors. All strategies are organized

under broader Initiatives based on thematic commonality, and while specific strategies will necessarily adapt overtime, these Initiatives offer continuity as overarching approaches the JV will take to address contributing factors, reduce key pressures, and decrease biophysical stresses to achieve desired Conifer and Mixed Hardwood habitat conditions. The strategies in Table 5.5.6 in turn inform the basis of our short, midterm and long-term objectives for the Conifer and Mixed Hardwoods Conservation Target, acknowledging the need to further refine and adapt specific objectives as knowledge and JV capacity grows and evolves over time. The synergistic strategies are expanded upon below and include conservation actions that provide entry points for JV implementation.

Table 5.5.6: C3JV Conifer and Mixed Hardwoods Conservation Target Implementation Strategies

Strategies	Description	Rating*
Initiative 1: Strengthen and Expand Conservation on Public and Private Lands		
1.1 Advance existing easement programs through funding, capacity, planning and targeted outreach	Increase the scale and pace of land conservation through a series of actions, including: <ul style="list-style-type: none"> - Support establishment of regional clearinghouse supporting easement holder and landowner data needs in partnership with the California Council of Land Trusts and regional partners. - Identify and support trusted entities to expand easement programs in underserved/apprehensive regions or communities. - Engage in state and federal programs to lobby for additional easement funding and cutting the green tape. 	HIGH
1.2 Engage, support and participate in State and Federal 30x30 initiatives in the Central Coast to steer and/or lead regional implementation	<ul style="list-style-type: none"> - Work with Partners to further easement and fee acquisitions in high priority old-growth, mature second growth, old-growth buffer zones, and endemic pines within priority habitats in accordance with existing regional planning efforts. - Develop and/or support mechanisms for Indigenous land-transfer and/or co-management arrangements. 	VERY HIGH
1.3 Increase scale and pace of restoration and habitat delivery	<ul style="list-style-type: none"> - Strengthen partnership efforts with U.S. Forest Service, Bureau of Land Management, California State Parks, County Open Space Divisions, private landowners and other entities to identify, prioritize and advance implementation of forest management and restoration strategies consistent with and promotional of focal bird habitat needs. - Provide technical and financial assistance for large scale conservation planning efforts and for project-by-project planning and implementation. 	MED
Initiative 2: Address Focal Priority Species Conservation Needs		
	- Partner with land managers to implement site-specific habitat actions designed to increase populations of priority focal species. Refer to	

2.1 Increase populations of priority focal species and stabilize populations of declining species	<p>county Regional Conservation Investment Strategies (RCIS), National Forest, and species-specific recovery plans among other planning efforts for guidance on priority needs.</p> <ul style="list-style-type: none"> - Support and/or develop, where absent (e.g., California Spotted Owl), JV geography-specific recovery and monitoring programs for conservation priority focal species. This may include establishing working groups, prioritizing assessment of reproductive success and survival rates, determining Full Annual Cycle conservation actions and needs, conducting limiting factor research to inform recovery efforts. - As part of the development of the Central Coast Avian Monitoring Network, a C3JV Enabling Strategy, establish a geography-wide monitoring system built around the nodes of avian monitoring efforts already extant²⁵ as well as with particular emphasis on filling gaps, such as in piñon-juniper forests, high elevation yellow pine and conifer stands. - Employ, develop (where absent) and support existing efforts to determine habitat occupancy and/or suitability for Flammulated Owl, Olive-sided Flycatcher, Vaux’s Swift and other indicator species with the potential for recovery or range expansion. 	VERY HIGH
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Initiative 3: Inform fire management, mitigation and policy

3.1 Develop fire BMPs for land stewards that strengthen habitat outcomes within the Wildland-Urban Interface (WUI).	<ul style="list-style-type: none"> - Strategy to provide land stewards guidance on wildlife-friendly practices for fuel-loads reduction and fire mitigation, to improve bird and wildlife habitat, mitigate habitat loss, and strengthen fire preparedness. 	MED
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3.2 Expand prescribed fire implementation, including assisting in the strengthening of an Indigenous-led Cultural Fire Council for the Central Coast	<ul style="list-style-type: none"> - Support the scaling up of prescribed fire, employing TRES or similar models, and in coordination with Prescribed Burn Associations and Cal Fire. - Refer to the Indigenous Peoples Burning Network, models from California State Parks and leadership from Northern California to expand utilization of cultural fire practices at scale. 	VERY HIGH
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Initiative 4: Strengthen knowledge and awareness of Conifer and Mixed Hardwoods

4.1 Seek funding for improving access to green space (focused on existing oak	<ul style="list-style-type: none"> - Establish county-level funding sources for open space, conservation areas, recreation lands, agricultural easements, etc. Consider neighboring transfer tax models or other mechanisms. 	
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* Ratings provide a measure of effectiveness for each strategy based on a number of criteria including its expected impact on a pressure or conservation threat, whether the strategy is resilient to climate change, and if the strategy is feasible, etc. Low= not effective, Med=less effective, High= effective, Very High= very effective.

²⁵ Including revitalizing non-operating MAPS Stations in Pescadero, Big Sur, and Figueroa Mountain among others.

5.6 COASTAL AND MARINE SYSTEMS

Perhaps no other setting evokes the essence of the C3JV region more than the coastal strand, sheer bluffs, and endless horizon of the Pacific's eastern edge. The Central Coast's shoreline and cool waters of the California Current support an abundance of life, robust fisheries, and some of the region's densest human population centers, both past and present. Relative to the coastlines and offshore activities north and south of the region, however, the C3JV has remained relatively undeveloped, accounting for the highest percentage of conserved coastline in the entire state (Morris et al. 2018). With large swaths contained within Vandenberg Space Force Base and the Los Padres National Forest for instance, U.S. federal agencies including the Department of Defense, Forest Service and the Bureau of Land Management administer the majority of the region's conserved coastal lands, though notably, close to 20% of coastal public lands in the Central Coast are administered by California State Parks. While the Central Coast in effect provides immense opportunities for continued stewardship of intact landscapes and wildlife-habitat refugia, it also faces significant challenges from past land uses and an increasingly uncertain future under climate change. Historic, large-scale habitat alterations, surrounding land uses and upstream impacts continue to constrain restoration opportunities in key wetland sites at Elkhorn and Watsonville Sloughs, the Pajaro and Salinas River estuaries and Morro Bay, among others. A new renewable energy industry is emerging rapidly in offshore waters off the Central Coast in accordance with state and national commitments to reducing carbon emissions, accompanied by a dearth of understanding regarding impacts to marine flora and fauna.

At the same time, alterations in the behavior of currents and climate oscillations are promising to alter ocean conditions with uncertain impacts to marine communities and species distributions. And as ocean levels rise, concern for some of our most vulnerable coastal habitats including rocky intertidal zones and saltmarsh continues to mount, habitats harboring some of the most threatened bird species in California.

As the C3JV's largest conservation target encompassing over 45 million acres (53 nautical square miles), and perhaps the most diverse spanning open oceans, intertidal habitats, coastal wetlands, and rare dune ecosystems, the Coastal and Marine Conservation Target features prominently in our stewardship role as a regional Joint Venture. While the C3JV region supports important breeding habitats for at least fifteen waterbirds, a dozen seabirds, and six shorebirds, the region is particularly noted for its critical importance to migrating, nonbreeding and wintering species, including more than seventy seabirds and thirty shorebirds. While calls for the creation of a California Current Joint Venture have surfaced from time to time in recognition of the region's worldwide importance for marine birds and wildlife, the C3JV is committed to strengthening within its planning geography, attention of the Marine Conservation Region 17 as part of an all-bird strategy, coupled with the rich coastal and littoral zones that have supported people and wildlife for millennia. Refer to Table 5.6.1 for greater elaboration on habitat assemblages found in the Coastal and Marine Conservation Target. The following chapter elaborates the attributes, pressures, strategies and goals orienting the C3JV's approach to supporting our collective stewardship of coastal and marine systems.

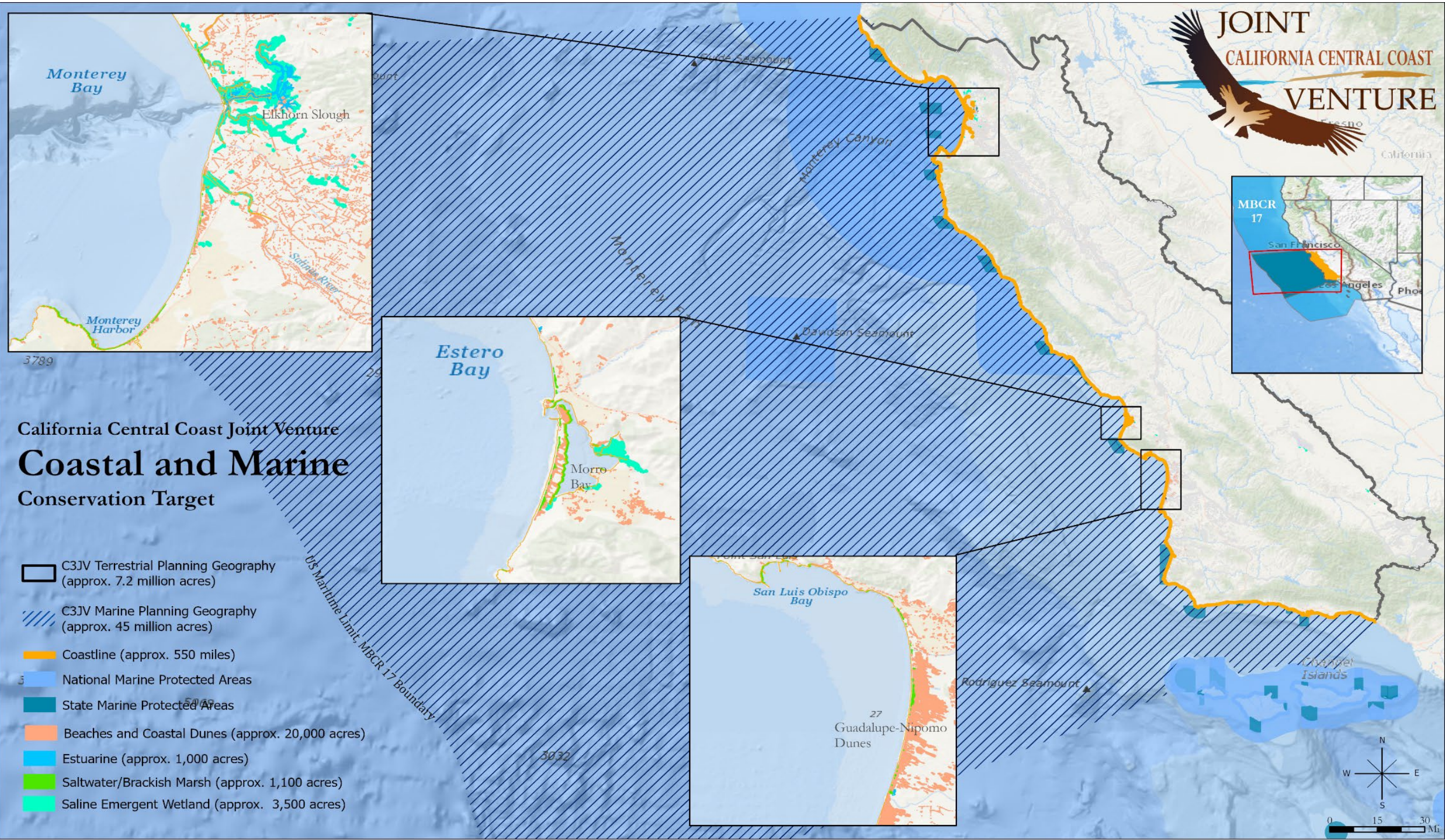


Snowy Plover by Paul St. Clair



Birds and Habitats of the Coastal and Marine Conservation Target: Top: Guadalupe Dune Complex (Mussel Rock Dunes) and Santa Maria River Bar-built Estuary; Santa Barbara County; Middle Left: Pacific Loon; Middle Center: Black Oystercatcher with Western Gull; Middle Right: Western Grebes. Bird images by Dave Keeling. Bottom: Año Nuevo Island, San Mateo County; landscape images by Jim Dougherty










Figure 5.6.1: Geographic extent of the C3JV Coastal and Marine Conservation Target



**JOINT
CALIFORNIA CENTRAL COAST
VENTURE**



California Central Coast Joint Venture
**Coastal and Marine
Conservation Target**

-  C3JV Terrestrial Planning Geography (approx. 7.2 million acres)
-  C3JV Marine Planning Geography (approx. 45 million acres)
-  Coastline (approx. 550 miles)
-  National Marine Protected Areas
-  State Marine Protected Areas
-  Beaches and Coastal Dunes (approx. 20,000 acres)
-  Estuarine (approx. 1,000 acres)
-  Saltwater/Brackish Marsh (approx. 1,100 acres)
-  Saline Emergent Wetland (approx. 3,500 acres)

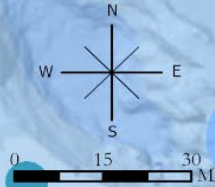
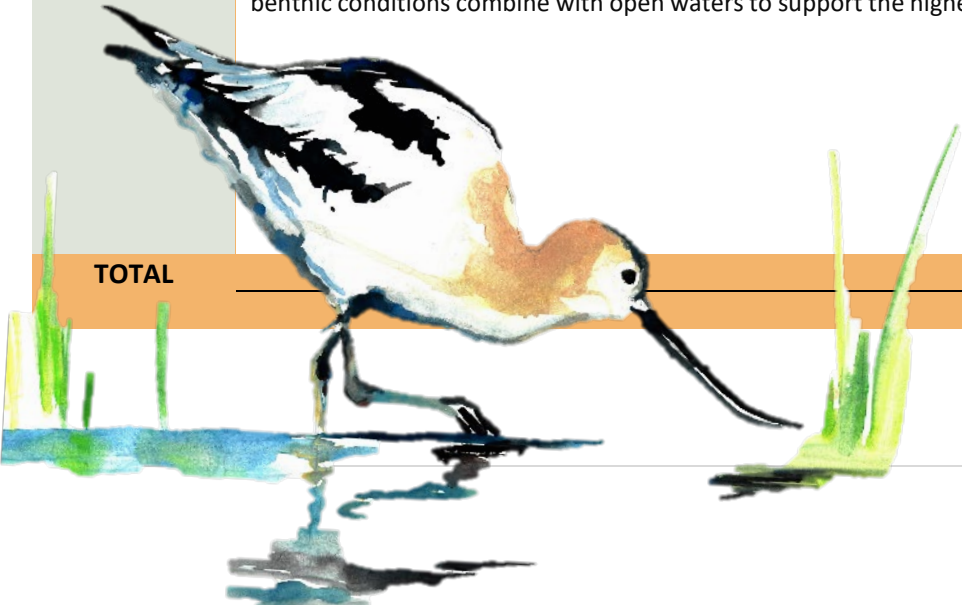


Table 5.6.1: Habitat Types Characteristic of the Coastal and Marine System Conservation Target.

Habitat Types	Description	~ Marine Extent (acres)	~% of C3JV	~ % Protected
<p>Coastal Dunes and Beaches</p>	<p>Of the approximately 550 linear miles of coastline in the Central Coast, 36% are composed of sandy beaches. The Central Coastal region, in fact, hosts the highest amount of <i>swash</i> beach ('wet sand') in California, offering essential habitat for migrating and wintering shorebirds among other wildlife (Morris et al. 2018). The near equal extent of <i>upper</i> beach habitats (above mean high tide, or 'dry sand') are the most vulnerable to climate change in the Central Coast, however, and represent critical habitat for breeding shorebirds including plovers and terns. Upper beach habitats are particularly vulnerable to sea-level rise when backed by cliffs, a common feature in the region, with over 65% of upper beach habitats are at risk to inundation. Significant beaches in the C3JV region include (from North to South): Año Nuevo, Santa Cruz-to-Monterey Beach Complex, Asilomar, San Simeon, Moonstone, Atascadero, Morro Strand, Sand Spit, Avila, Pismo-to-Santa Maria River Mouth Beach Complex, Point Sal, Surf (and other Vandenberg beaches), Jalama, Hollister Ranch, Gaviota Coast Beach Complex, Santa Barbara, and Carpentaria Beaches, among others. Many of these beaches abut dune complexes, particularly in association with adjacent rivers, estuaries or bays where sediment deposition occurs and is carried by ocean currents and wind to onshore depositional areas. Coastal dunes represent a relatively rare and dynamic habitat system characterized by high endemism. Dunes support a unique herbaceous, succulent, and low-shrub plant community tolerant of salt spray, wind and sand abrasion, and constant substrate flux. The Guadalupe-Nipomo and Oceano Dunes complex, spanning over 18 miles of coastline, represents the largest dune complex along the U.S. West Coast, if not the largest intact coastal dune ecosystem in the world (TNC 1999). While the vast majority of coastal dune habitats occur in the Oceano complex, other dune ecosystems in the Central Coast can be found at (from south to north) Purisima Point, Vandenberg, Sandspit-Morro Bay, Morro Strand, Point Sur, Fort Ord, Marina, Monterey, Año Nuevo, and Franklin Point Dunes. Dunes have been impacted significantly by development, stabilization efforts, off road vehicle impacts and encroachment of exotic species, and some of the region's most endangered birds, plants, mammals, mollusks and invertebrates are found here.</p>	20,000	0.3%	Further analysis needed
	<p>A diverse assemblage of highly productive habitats, embayments, estuaries, lagoons, saltwater marsh and other brackish and coastal wetlands represent essential foraging, loafing, breeding and nursery habitats for over one-hundred and fifty seabird, shorebird and waterbird species among many other taxa. These habitats are also of concentrated importance for people as socio-cultural and economic centers for millennia. Embayments exist where shorelines partially enclose coastal waters, sheltering the near-shore and intertidal zone from larger wave actions of the open ocean. With elevated sediment deposition and calmer surface waters among other features, bays offer food, shelter and spawning habitats for many species of fish, such as Pacific herring and Chinook salmon as well as birds, particularly in winter when abundance and diversity is highest. The iconic and celebrated Monterey Bay shares the C3JV coast with other smaller bays including Año Nuevo, Carmel, San Simeon, Estero, Morro, and San Luis Obispo, among others.</p> <p>Coastal estuaries, the largest of which are typically contained within bays, are defined simply by the interaction between marine and freshwater systems, typically at the mouth of a stream or river. Of the more than 120 recognized California estuaries, approximately 33% occur within the C3JV geography. With a few exceptions, most rivers and streams form bar-</p>	Estuaries and lagoons: 1,000		50%

<p>Embayments, Estuaries, and Saltmarsh</p>	<p>built estuaries in the C3JV, where sandbars interrupt the movement of organisms, forming lagoon-like conditions with unique salinity gradients and/or stratification. These habitats are found at river and creek mouths throughout the region, including from South to North (bold indicates a regionally significant estuary): Santa Ynez, San Antonio, Santa Maria, Oso Flaco, Arroyo Grande, Pismo, San Luis Obispo, Islay, Cayucos, Villas and Ellyslly, Santa Rosa, San Simeon/Van Gordon, Pico, Little Pico, Arroyo del Puerto, Oak Knoll, Adobe, Arroyo Del Corral, Arroyo de la Cruz, Arroyo de la Laguna, Point Sierra Nevada, Arroyo Hondo, San Carpoforo, Big Sur, Little Sur, Bixby, Malpaso, San Jose, Carmel, Salinas (key shorebird site), Pajaro, San Lorenzo, Arana Gulch, Moore Creek (Natural Bridges), Wilder, Little Strawberry Beach, Baldwin, Majors, Laguna (Coast Dairies), Liddell, Scott, Waddell, Gazos, Arroyo de los Frijoles, and Butano/Pescadero Creeks among others. Similarly, true coastal lagoons are bodies of water separated from ocean water exchange by a strip of terrestrial substratum such as sand dunes, gravel, or mud berms. Breaching is infrequent and often unusual in lagoons (relative to bar-built estuaries) and may not occur annually or for a number of years. While rarer, true lagoons can be found at Oceano, Sidneys', El Estero, Del Monte, Roberts Lake, Laguna Grande, Shwan, Neary, and Younger Lagoons, among others. Though most of the C3JV estuaries and lagoons are small, Elkhorn Slough is a noted exception, recognized as 'wetlands of international importance' by the Ramsar Convention and, together with Morro Bay, is included in the EPA's National Estuary Program.</p> <p>While Elkhorn Slough is a complex of habitats, it is of particular importance as host to the second largest saltmarsh in California after San Francisco Bay. Often a fundamental feature of estuaries and an important priority habitat for the C3JV, saline emergent wetlands, or saltmarsh, occupies the margin of sheltered saline waterbodies. Vegetation communities differ depending upon tidal exposure (and therefore salinity), and include cord grass (<i>Spartina foliosa</i>), pickleweed (<i>Salicornia pacifica</i>), glasswort (<i>Salicornia depressa</i>), saltwort (<i>Batis maritima</i>), California seablite (<i>Suaeda californica</i>), seaside arrowgrass (<i>Triglochin maritima</i>), alkali heath (<i>Frankenia salina</i>), seashore saltgrass (<i>Distichlis spicata</i>), sea-lavender (<i>Limonium californicum</i>), saltmarsh dodder (<i>Cuscuta pacifica</i>), and salt rush (<i>Juncus lescurii</i>) among others. Algal mats are often present on moist soils, and include greens, bluegreens, and diatoms (CWHR). Saltmarsh provides critical nesting and feeding opportunities for innumerable resident and migrant plant and animal species, including highly specialized birds. Important saltmarsh complexes within the JV geography occur at: Carpenteria Marsh, Goleta Slough, Devereaux Slough, Morro Bay, Elkhorn Slough (a WHSN site), Moro Cojo Slough, and Watsonville Slough among other smaller sites.</p>	<p>Saltmarsh: 4,600</p> <p>Total: 5,600</p>	<p><.1%</p>	<p>56%</p> <p>55%</p>
<p>Coastal Bluffs, Offshore Rocks and Rocky Intertidal</p>	<p>Over 4,500 islets, rocks, exposed reefs, and pinnacles are scattered throughout the C3JV coastline, the largest and most significant being Año Nuevo Island (approximately 9 acres, part of Año Nuevo State Park), but also key roosting and breeding colonies at Piedras Blancas, Plaskett Rock, Lobos Rock, Bird Island, Sea Lion Rocks, Pescadero Rocks, Bird Rock, Pelican Rock, Rocky Point, Greyhound Rock, Smith Island, Pecho Rock, Point Arguello, among many others. Together with inaccessible bluff habitats, these offshore rocks and islets support at least 120 nesting colonies, principally consisting of Brandt's and Pelagic Cormorants, Western Gulls, Pigeon Guillemots, Cassin's and Rhinoceros Auklets, and to a lesser extent Common Murres (Carter et al. 2000).</p> <p>The extent of rocky intertidal habitats is greatest in the Central Coast relative to the rest of the <i>outer</i> California coast, though still representing a very narrow and relatively small fraction of terrestrial habitats in the C3JV region (Morris et al. 2018). A product of consistent dynamism, rocky intertidal zones are productive, rich ecosystems perhaps most vulnerable to climate change as sea levels rise. Statewide, approximately 58% of the extent of rocky intertidal habitat is projected to transition to sub-tidal habitat under some projections. That said, the Central Coast hosts over 50% of the state's resilient rocky intertidal habitats (not too surprising, given over 270 miles of the C3JV coastline sits adjacent to a</p>	<p>Rocky Intertidal Zone: 1,000</p>	<p><.1%</p>	<p>Further analysis needed</p>

	<p>State or National Marine Protected Area), where habitats are anticipated to persist despite sea-level-rise, elevating the importance of the region for dependent species such as the Black Oystercatcher, a focal species.</p> <p>Finally, the relatively inaccessible cliffs and headlands along the mainland coast also feature importantly for sea and shorebirds, particularly those nesting in our region including cormorants, Common Murre, Pigeon Guillemot and Western Gull. Coastal bluffs consist of escarpments or steep faces of rock and crumbling substrates resulting from active erosion and faulting at the land/sea interface.</p>			
<p>Pelagic, Nearshore Marine and Surf zone</p>	<p>The C3JV Marine Planning Region is entirely within NABCI's MBCR 17, bounded by the 200-mile Exclusive Economic Zone (EEZ), and includes both Federally and State managed waters. Over 34%, or approximately 15,443,000 acres of the 45 million-acre (53,000 nautical square mile) C3JV Marine Planning Region is under some form of protected area designation. This figure includes an extensive array of National Marine Fisheries Service Essential Fish Habitat Conservation Areas, 34 State Marine Protected Areas (including 14 Marine Reserves, 18 Conservation Areas, and 1 Marine Park), in combination with the Monterey National Marine Sanctuary (approximately 3.5 million acres designated, representing approximately 7.7% of the Marine Planning Region). In effect, the nearshore waters off the Central Coast showcases a robust network of protected waters, representing well over 50% of the State-managed zone (within 3-miles of the coast). Furthermore, with the designation of the Chumash Heritage National Marine Sanctuary, approximately 7,000 square miles of oceanic and neritic marine habitats would join the MPA legacy, more than doubling the Sanctuary-designated sea space and resulting in close to 100% protected status for <i>nearshore</i> marine environs. Within the proposed Chumash Sanctuary boundaries near Point Conception, currents split into an offshore dominant current and an inshore current that overlays Arguello Canyon, the Santa Lucia Bank and Rodriguez Seamount among other features, creating one of the most consistent upwelling centers in the Eastern Pacific and a key site for seabirds among many other marine species. Seamounts, an important habitat element for many seabirds, are some of the least protected habitats in the world, and in California, only one of an estimated 60 seamounts have protected status (Davidson Seamount, Monterey NMS). At least 15 seamounts occur within the C3JV marine geography, where an abundance of shearwaters, albatrosses, petrels, terns, and auklets converge depending on forage conditions. In nearshore marine habitats where shallower (under 30m) water enables a well-developed plant community, seagrass beds, kelp forests, subtidal reefs, and extensive silty or sandy benthic conditions combine with open waters to support the highest diversity of marine wildlife in the California Current.</p>	<p>Nearshore/ continental shelf (0-100m)</p>	<p>2%</p>	<p>78%</p>
		<p>1 million acres</p>	<p>98%</p>	<p>33%</p>
<p>TOTAL</p>		<p>27,600</p>	<p>>0.5%</p>	<p>-</p>
		<p>45 Million</p>	<p>100%</p>	<p>34%</p>



Using the Conservation Standard’s Viability Assessment framework discussed in **Chapter 3**, a selection of Key Attributes, or the factors, interactions and/or elements that enable the target to persist, were identified along with indicators used to measure the status and trend of each attribute. These are presented in Table 5.6.2. The Table identifies each key attribute, a summary description of its meaning and importance as a measure of functionality of the Coastal and Marine ecosystems of

the Central Coast, identifies the indicators the JV will use to quantify and monitor the attribute, and finally provides a conditional status rating of each indicator. The current conditional status code was derived from knowledge and consensus among Implementation Task Force members and advisors, but does not represent a quantitative measure. Instead, it is a qualitative, and relative, conditional statement that will be refined as information and monitoring systems develop, and it allows for an initial and comparative snapshot of the indicators perceived to be more or less compromised today.

Table 5.6.2: Key attributes identified for the Coastal and Marine Conservation Target

Key Attributes	Description	Indicators	Attribute’s Current Status	Status Notes
Climatic Oscillations	Highly dynamic climate cycles in the world’s oceans and atmosphere strongly influence the California Current System, and with it the ocean habitats that seabirds and other marine life depend upon. Seabirds respond to El Niño (the periodic, approximately 4-7 year warming of the ocean), La Niña (ocean cooling associated with the El Niño Southern Oscillation cycle), and lower-frequency ocean warming and cooling due to polarity reversals of the Pacific Decadal Oscillation (PDO), among other drivers (Passuni et al. 2016). These oscillations drive upwelling, nutrient cycling, and ultimately, prey availability, predator movement patterns and species productivity and survival. Under climate change, monitoring and measuring ocean parameters are of even greater importance as conditions supporting current populations of birds and other wildlife may shift.	1. Oceanographic productivity indices (upwelling, dissolved oxygen, chlorophyll concentrations)	Yellow	Difficult to isolate climate change-induced fluctuations with inherent variability, but given the importance of currents to system productivity, these indices are essential indicators for the target.
		2. Ocean biophysical markers (surface temperature, thermocline depth, salinity)	Red	Linked with oceanic productivity, these indicators (surface temperatures, salinity, and stratification) have already demonstrated population level impacts linked to climate change (e.g., the blob).
Avian Focal Species	Focal species were selected as representatives of diverse habitat elements, species of key cultural significance, species of weighted importance to the Central Coast relative to their range-wide distribution (e.g., endemics), and species which represent good indicators for monitoring management interventions and ecosystem function among other criteria. Many of the focal species are monitored by existing efforts throughout California, providing a better understanding of overall trends than for other conservation target focal species, and offering	1. Focal species occupancy	Green	Occupied habitats relatively high aside from marsh rails, sparrow, brant, plover and tern.
		2. Focal Species population trends and relative abundances	Yellow	Trends and abundance variable, but concerning across focal species. Some show increasing abundance (e.g., pelican, cormorant, tern), others decreasing (e.g., Sooty Shearwater, Western Gull)

	<p>opportunities for more cost-effective monitoring. Unlike other focal species, many included in the Coastal and Marine CT are nonbreeding birds, given the importance of the region for migrating and overwintering species. Further description of the focal species can be found below.</p>	<p>3. Conservation Priority Focal Species demographics (e.g., nest success, recruitment)</p>		<p>Highly variable, with many focal species nesting habitats outside of geography. Recruitment persistently low for plover and oystercatcher, decreasing for gull and guillemot, increasing for cormorant.</p>
<p>Habitat Quality and Quantity</p>	<p>Ultimately, the viability of Coastal and Marine habitats is in large part contingent upon the extent and condition of the habitat supporting birds, other wildlife and people. Given the significant pressures acting on the viability of both quality and quantity of habitat, the C3JV is committed to monitoring the status of key attributes and indicators of habitat condition, including monitoring and measuring changes in habitat extent (e.g., gain or loss of nesting habitat for snowy plover in upper beach zones), tracking richness and density indices for shorebirds, seabirds and waterfowl (e.g., spring and fall shorebird surveys), monitoring prey conditions (such as assessing forage fish populations) and the extent of native species dominance within coastal and marine habitats (e.g., extent and condition of ice plant encroachment).</p> <p>To conserve species as habitat extent changes (both in response to climate change and human land uses), it is important to protect species where they are now, where they will be in the future, and to know the connecting paths in-between. These ‘chains’ of habitat link present conditions to similar suitable conditions in the future.</p>	<p>1. Area of habitat (acres of habitat change)</p>		<p>Some concerns include historic and persistent loss of saltmarsh, inundation of intertidal habitats, pending habitat displacement from offshore wind.</p>
		<p>2. All shorebird, seabird and waterfowl richness, abundance and/or density</p>		<p>Spring/Fall/Winter abundance for all species occurring within the geography. Total abundance indices are</p>
		<p>3. Prey conditions (forage fish monitoring: diversity, abundance, physiological condition)</p>		<p>Not thoroughly understood, monitoring efforts could be enhanced across the region to better understand forage fish productivity and linkages to seabirds and food web dynamics.</p>
		<p>4. Native species dominance (extent of invasive vs native species)</p>		<p>Species of concern: beach grass, ice plant, red fox and other nonnative and overly abundant native predators, benthic invertebrates.</p>

Red= poor, orange= fair, green= good, dark green= excellent.



5.6.2 FOCAL SPECIES OF COASTAL AND MARINE HABITATS

As is the case with NABCI’s terrestrial Coastal California BCR 32, the California Current Marine BCR 17, for which the C3JV is part, hosts the most Bird Species of Conservation Concern in the United States. Following the Focal Species Selection Method described in Chapter 3, 22 species were selected as “Avian Focal Species” of the Coastal and Marine Conservation Target, representing diverse habitat elements (Table 5.6.4), species with an outsized dependence on the C3JV region during all or a portion of their annual lifecycle (Stewardship Species), species of key cultural significance, and good indicators for monitoring management interventions and ecosystem function among other factors. Table 5.6.3 shows the Coastal and Marine Focal Bird Species, including their principle habitat association, limiting factors (if known), generalized population trends, and species-specific directional population objectives. Table 5.6.4 further elaborates on essential habitat elements important to each focal species. Most focal species (>60%) are experiencing declining populations range wide even if local populations may be stable or increasing, six (6) are under the protection of the US Endangered Species Act or are California state listed, and the vast majority (~80%) are designated as species of special conservation concern by various agencies and organizations given steep population declines, vulnerability to climate change and other factors. Therefore, among focal species, eight (8) were identified as **Conservation Priority Focal Species**. This includes the lumped “Secretive Saltmarsh Rail” focal species, which is an umbrella for three threatened and endangered species occupying overlapping salt marsh habitats and which are all extremely depressed in their occurrence within the region. Available species profiles for individual focal species can be found in the [Appendix I](#) of this plan.

The California Current System

The biotic communities of coastal and marine habitats in the C3JV are in many ways driven by the California Current, a large, slow-moving, southward-flowing pelagic current along the edge of the Eastern Pacific and West Coast (Mills et al 2005). As one of the most biologically productive regions in the world, the California Current System is a complex of seasonally variable currents, undercurrents and eddies that through dramatic transitions, and in collaboration with innumerable variables such as bathymetry, coastal topography, and weather, produce the quintessential upwelling of cold, nutrient-rich waters that forms the basis of a productive, diverse and abundant food web. In the Central Coast, this includes at least 26 species of marine mammals, 75 species of seabirds, 345 species of fish, four species of sea turtles, thousands of species of invertebrates, and more than 450 species of marine algae (CDFW 2005; CDFW 2014). This system is inherently variable across space and time, with some species exhibiting a boom and bust cycle of reproductive success depending on ocean conditions and prey availability. However, climate change-induced impacts resulting in an overall warmer, more acidified ocean with higher carbon content and lower oxygen concentrations, spells out the potential for dramatic consequences to this productive system, growing concern demanding diligence and attention across the C3JV partnership.

Table 5.6.3: C3JV Coastal and Marine Conservation Target Avian Focal Species

	Common Name	Scientific Name	Primary Habitat Association	Trend and PIF Score*	Listed Status **	Limiting factors	C3JV Importance	Population Objective ***	Notes
Conservation Priority Species	Ashy Storm-Petrel	<i>Oceanodroma homochroa</i>	Islands, islets, continental shelf and sea canyons	Likely Declining 17	2 nd Priority BSSC, R2R, SGCN	Not well known, though a combination of factors including adult and nestling predation on key breeding sites (outside the C3JV) is likely impacted populations. Suitable breeding habitat availability likely limiting in the Central Coast.	Core nonbreeding habitat; Isolated known and un-surveyed breeding sites	Determine Status	As a restricted species, Ashy Storm-Petrels breed in a narrow latitude from extreme northern Baja California to Cape Mendocino, and coupled with evidence suggesting the species has likely declined by as much as 30% since the 1970s, it ranks high as a conservation priority species. It is listed as an R2R data deficient species, and listed as endangered by the IUCN, and has been formerly petitioned for listing under the ESA, though the listing was deemed unwarranted in 2013. Limited but growing surveys of nearshore rocks have been conducted in the C3JV region (i.e., Castle Rocks and Mainland, Hurricane Point Rocks, and Bench Mark-227x) which has confirmed breeding in the Central Coast south of the Farallon's. Further exploration is needed, including at Vandenberg, and offshore rocks throughout the California Coastal Monument. The species habitat use leaves it a potential risk to sea space development from renewable energy.
	Brant (Pacific)	<i>Branta bernicla</i>	Embayments, estuaries and saltmarsh	Declining 14	2 nd Priority BSSC	Wintering and stopover habitat quality and availability	Important Migratory Stopover	Determine Status	A PIF Yellow Watch specie due to its relatively restricted range, Brant make trans-pacific migratory flights from staging grounds in the Alaska to the west coast, including stopover habitats in Monterey and Morro Bays. Use and importance of the C3JV vary in large-part depending on the condition of eelgrass beds, with recent recovery of eelgrass in Morro Bay corresponding to a sharp return of Brant to the Estuary in 2020 and 2021.
	Black Oystercatcher	<i>Haematopus bachmani</i>	Rocky intertidal, mudflats	Declining 15	BCC, SGCN	Nest disturbance and predation, nesting and foraging habitat availability, particularly under climate change	Core Breeding Range	Increase by 50%	With an estimated range of between 4,700 to 6,000 for the entire California coast, oystercatchers are a yellow listed species given small population and restricted range. With poor recruitment rates, and declining population trends, within the C3JV region and state wide, it is also listed as a USFWS SCC 2021,
	Brandt's Cormorant	<i>Urile penicillatus</i>	Coastal bluffs, offshore rocks, nearshore marine (kelp beds) and inner continental shelf	Local increasing trend, global population likely declining 14	PIF, BCC, SGCN	Populations largely driven by prey availability and condition; also limited nesting habitat and colony disturbance	Core Breeding Range	Determine Status	Restricted to the West Coast of North America (principle breeding populations in California), Brandt's Cormorant is listed as a Yellow Watch Species by PIF for its relatively restricted range. While populations are believed to be declining range wide, recent trends in Central California show steady population increases, though the species exhibits significant boom-and-bust cycles depending on forage conditions. Oil spills and chemical pollution threaten seabirds and their marine prey species, and several major spills have killed significant numbers of Brandt's Cormorants, which may be more vulnerable than some other seabirds because they forage in coastal areas where spilled oil concentrates. Disturbance at colonies by boaters, aircraft and other activities can quickly result in nest abandonment. Cormorants are good indicators of pelagic and subtidal fish abundance, and are also quick to respond to algal blooms and environmental contaminants.
	California Least Tern	<i>Sternula antillarum browni</i>	Sandy beaches, embayments and estuaries	Increasing 15	FE, SGCN,	Nest failure due to predation limit population recovery. Suitable nesting habitat also limiting	Select breeding sites, significant potential habitat		Severe declines over the past half century, though the California subspecies has shown increases since listing. Just under 10 % of designated Critical Habitat, approximately, falls within C3JV geography, with potential for range expansion on unoccupied beaches. Terns are good indicators of forage fish abundance adjacent to breeding sites, particularly in estuaries, coastal wetlands, bays and shallow nearshore waters.
	Snowy Plover (coastal popn)	<i>Charadrius nivosus nivosus</i>	Sandy beaches and dunes	Increasing 15	FT, SGCN	Nest failures due to predation and low and fecundity are significant limitations for population recovery. Suitable nesting habitat also limiting	Core breeding Range	See USFWS Recovery Plan	Occupying a core portion of the species' breeding range, the Snowy Plover is a C3JV stewardship, and indeed flagship species. While ongoing efforts to recover the population have had measurable success, significant challenges remain in achieving stable, self-sustaining populations. Human disturbance (dogs, recreational vehicles, trampling) as well as elevated predation rates from native and nonnative predators

								including red fox, coyote, skunk, corvid species, and Northern Harriers, limit reproductive success, and encroachment of nonnative species (i.e., ice plant) reduces available habitat. At least 20 % of designated Critical Habitat falls within the C3JV Region.	
	Salt Marsh Rails: California Black Rail, California Ridgeway's Rail, Light-footed Ridgeway's Rail	<i>Laterallus jamaicensis coturniculus</i> , <i>Rallus obsoletus</i> , <i>Rallus obsoletus levipes</i>	Tidal marsh, brackish wetlands, estuaries	Declining 17, 18	FE, ST, SGCN, R2R	Suitable habitat conditions including stable, regularly flooded pickleweed and cordgrass marsh; nest disturbance and predation	Select breeding populations, potential habitat	Assess/ establish breeding populations	The C3JV hosts former, and to a lesser extent, existing habitat for three secretive, rare and endangered rail species closely associated with saltmarsh and estuary habitats in coastal California. While fine-scale habitat needs differ across species, given the limited occupancy of all three species within the C3JV and the limited scope of key restoration sites, we have chosen to lump these near-endemic species. The California Ridgeway's Rail is likely extirpated from the C3JV (formerly occupied Elkhorn Slough and Morro Bay), the California Black Rail may have small breeding populations in Morro Bay and elsewhere, and there are likely small breeding populations of Light-footed Ridgeway's Rail in Carpenteria marsh and other Santa Barbara sites. Habitat protection and enhancement designed for these rail species, including site management and predator control, likely aids in the recovery of Snowy Plover, Least Tern and Savannah Sparrows among other rare coastal wetland wildlife species. As much as two thirds of suitable habitat for these species have been lost. Further consideration to the inclusion of Virginia Rail and Sora as indicators of potential suitable habitat for endangered rails should be explored.
	Savanna Sparrow (subspecies Belding's and Bryant's)	<i>Passerculus sandwichensis (alaudinus and beldingi)</i>	Saltmarsh, coastal wetlands	Stable to increasing	SE, BCC, 3 rd Priority BSSC	Suitable habitat conditions (extent of intact saltmarsh) likely the primary limiting factor	Isolated breeding populations	Determine Status	These subspecies are resident in coastal salt marshes across the C3JV. Nesting occurs primarily in pickleweed habitat at the mid- and high-marsh elevations of the salt marshes. Birds occur in highest densities in marshes with full tidal flushing. Some wetlands, such as Goleta in Santa Barbara County, have been fenced to prevent human access. Marshlands with large populations of Belding's Savannah sparrow have been supporting these populations long-term at stable or increasing levels, whereas areas with small populations are more subject to serious local declines.
C3JV Stewardship Species	California Brown Pelican	<i>Pelecanus occidentalis californicus</i>	Nearshore marine, coastal bluffs and offshore rocks	Increasing 8	SGCN	Current populations limited by breeding habitat, upwelling and forage fish conditions, but also adult mortality (fishing-line entanglement)	Core nonbreeding Range	Maintain	The C3JV is critical habitat for the now-delisted subspecies, supporting post-breeding adults and juveniles. Populations crashed in the 1960's and 70's when DDE flatlined reproduction, but through listing and recovery efforts, breeding colonies have largely rebounded. The C3JV region hosts some of the largest roosting sites on the West Coast, harboring approximately 10% of observed birds during bi-annual Pacific Brown Pelican Surveys (California Audubon 2018). Brown Pelicans offer relatively accessible indicators of pelagic fish abundance. The species is also highly charismatic, standing as a flagship species of the nearshore habitat, and in particular human-wildlife interactions.
	Western Grebe	<i>Aechmophorus occidentalis</i>	Embayments, nearshore marine	Declining 11	BCC, R2R	Human disturbance on freshwater lakes and breeding habitats may be impacting nest success; winter mortality from red-tide events and poor ocean conditions may be driving declines.	Important California breeding colonies, core wintering range	Determine Status	A Moderate Urgency R2R species, though Clark's Grebe (a bird of High Urgency R2R) should also be considered under the umbrella of Western Grebe. Coastal California is increasingly important for wintering birds, with shifting range from the Salish Sea to southern California Current waters (Wilson et al. 2013). Key breeding populations at Cachuma, Santa Margarita, Lopez Lake and other reservoirs supplemented by wintering birds from across western NA. The species is very sensitive to oil spills, red-tide events, and gill nets. Improved fecundity on breeding grounds may be the only viable way to help compensate for winter-time mortality and to effectively conserve these species; although complete seasonal protection will ultimately be necessary to maintain long-term population viability. (Robison et al. 2008).
	Western Gull	<i>Larus occidentalis</i>	Beaches, nearshore marine and continental shelf	Declining 14	BCC, R2R		Core Breeding Range	Determine Status	Noted as R2R High Urgency and PIF Yellow-listed species, the Western Gull populations have recovered from significant declines in the 1970s and 80s, but recent trends over the past 10 years have shown a steady decline from highs in the mid-2000s. As an endemic to the California Current, the Western Gull is sensitive to climatic shifts (such as El Niño) and corresponding upwelling conditions, providing a potential indicator for forage conditions, cetacean monitoring, and other oceanic metrics under climate change.

	Long-billed Curlew	<i>Numenius americanus</i>	Shorebird generalist: beaches, mudflats, tidal marsh, uplands	Declining? 12	BCC	Breeding range habitat quality and quantity presumed to be limiting long-term population trends. Adult mortality is important, and may be a winter/migration variable.	Key migratory and wintering habitat	Determine Status	A species that has undergone significant range and population reduction over the last 150 years in concert with expansion of agriculture throughout the Great Plains (Dark-Smiley and Keinath 2004). As much as 25% of Pacific portion of overwintering birds can be found within the C3JV region. Curlews may function as an important umbrella species for numerous migratory and wintering shorebirds including Marbled Godwit, Willet, and Whimbrel (an R2R species), all species of conservation concern and all users of intertidal mudflats, beaches, and saltmarsh habitats in winter.
Indicator Species	Black-footed Albatross	<i>Phoebastria nigripes</i>	Pelagic waters, particularly around seamounts and continental slopes	Stable to Increasing 15	BCC, R2R	Upwelling conditions, adult mortality from anthropogenic ocean uses, and reduced reproductive success due to environmental contaminants	Important foraging habitat (breeding and nonbreeding)	Determine Status	A PIF Yellow Watch Species given its highly restricted breeding range and major historic population loss, the Black-footed Albatross has also been identified by the R2R team as a data deficient species, indicating a need for greater monitoring on and off breeding colonies. While populations appear to be increasing, the recovery of the species remains challenged by fisheries impacts (longline, drift net, and gillnet bycatch), marine pollutants such as plastics and oil spills, heavy metal and organochlorine toxins, and changing ocean conditions and sea-level rise due to climate change. Given recent predictive density modelling efforts, the albatross may also be exposed to emerging conflicts with offshore wind development on the Central Coast and throughout the Pacific.
	Cassin's Auklet	<i>Ptychoramphus aleuticus</i>	Inner continental shelf, more dispersed in pelagic waters in winter	Declining 14	3 rd priority BSSC, BCC, SGCN	Declines largely associated with non-native island predators, loss of suitable breeding sites due to invasive plants and burrow trampling. Upwelling conditions under climate change pose perhaps greatest factor for the species	Some breeding, key nonbreeding/foraging habitat		A PIF Yellow Watch Species given sharp population declines over the last half century, Cassin's Auklet is identified as one of three USFWS Seabird Program indicator species given their importance as a measure of krill abundance. The C3JV does not host population-significant breeding colonies, but given its proximity to the Farallon and Channel Islands, provides critical nonbreeding and foraging habitat. Given recent predictive density modelling efforts, auklets may also be exposed to emerging conflicts with offshore wind development on the Central Coast and throughout the Pacific.
	Common Murre	<i>Uria aalge</i>	Nearshore marine, mid-continental shelf, coastal bluffs, offshore rocks/islands	Declining 11	SGCN	Upwelling conditions, adult mortality due to ocean contaminants	Breeding range (limited colonies), key foraging/wintering habitat		One of three USFWS Seabird Program indicator species, the Common Murre is one of the most abundant piscivorous seabirds in the North Pacific, though in the C3JV region, breeding is restricted to Westcliff Drive and Hurricane-Castle Rock Complex in Monterey County. With a large biomass and relatively accessible to observation, and an existing longtime data series, Murres are an important mid-shelf foraging indicator species of pelagic fish abundance. Recent ocean warming events have resulted in large-scale die-offs, and though cyclical patterns of abundance are common for Murres and other seabirds dependent upon upwelling conditions, the magnitude and scale of mortality is unprecedented. Despite the current large populations, global climate change is forecast to modify ocean temperatures and currents and thus the distribution and availability of prey species. Such changes could have significant, even catastrophic effects on murres and other seabirds.
	Pacific Loon	<i>Gavia pacifica</i>	Nearshore marine and embayments, inner continental shelf	Likely Declining 10		Highly vulnerable to climate change, but outside breeding habitat impacts in the Arctic, mortality from gill-nets and pollutants are of concern in nonbreeding habitats.	Migration and wintering	Determine Status	A common migrant and nonbreeding visitor to the C3JV, Pacific Loons can occur in high densities along the Central Coast, especially during fall and spring migration when flotillas of many thousand(s) of birds can be observed. In winter, birds prefer more sheltered bays, including Monterey, Estero and San Luis Obispo, but generally occur in nearshore to mid-continental shelf, sandy bottom waters, sometimes in association with Western Grebes and cormorants. Indication of declines from California spring migration counts, but overall trends not well understood. Migratory routes may overlap with proposed offshore wind development areas, an area of emerging research needs for and other migratory species.
	Pigeon Guillemot	<i>Cephus columba</i>	Nearshore marine, continental shelf	Likely Declining 12	SGCN	Food web issues similar to other seabird species, but also nest abandonment due to	Breeding range		The Pigeon Guillemot is a common year-round resident of the Central Coast, with more than fifty breeding colonies spanning the length of the C3JV coastline, some of the largest at Point Arguello, Santa Barbara County. Often found closer to shore and in shallower waters relative to other auks, puffins and murrelets, the species is accessible,

						disturbance and mortality associated with pollutants			charismatic, and relatively underrepresented in long-term datasets. Guillemots are indicative of subtidal fish abundance.
Red-necked Phalarope	<i>Phalaropus lobatus</i>	Continental shelf, pelagic waters	Likely Declining 11				Migration and wintering	Determine Status	An understudied pelagic shorebird, tens of thousands of Red-necked Phalaropes migrate along the Pacific Coast and through the C3JV, with peak densities occurring in late summer/fall. Strong overlapping use of continental shelf waters indicates concern for off shore wind development displacement/collision impacts. Global trends not well known, but declines have been measured in the US, particularly in the Atlantic Populations.
Sanderling	<i>Calidris alba</i>	Sandy beaches, mudflats	Declining 11	SGCN			Migration and wintering	Determine Status	A widely distributed, common and abundant shorebird experiencing steady population declines across its range, and included as a species of high concern by the Western Hemisphere Shorebird Reserve Network, the Sanderling is a harbinger of a healthy swash beach zone.
Sooty Shearwater	<i>Ardenna grisea</i>	Pelagic waters, continental shelf, above sea canyons	Declining 12				Key nonbreeding habitats	Determine Status	An abundant seabird, with a total global population recently estimated at about 20 million. Numbers of visiting Sooty Shearwaters have declined in parts of the West Coast, and though causes are unknown, a general rise in sea surface temperatures have been implicated. Potential concern for offshore wind development. Concentrates in Monterey Bay and upwelling centers in summer, and offers a strong indicator of pelagic fish abundance and movement.
Surf Scoter	<i>Melanitta perspicillata</i>	Surf zone, embayments	Declining 13			Not well known, winter survival may be important for the species	Key nonbreeding habitats	Determine Status	Pacific Coast populations are estimated at approximately 225,000 birds, with noted declines within the limited surveyed areas (principally San Francisco Bay). Scoters may be strong indicators of healthy sandy bottom nearshore environments, particularly for mollusks and benthic invertebrates such as mole crabs. Surf scoters generally winter in estuaries and shallow marine coastal waters (less than 10m), usually over pebbles and sand substrates. Vulnerable to oil spills, environmental contaminants, climate change induced alterations in prey abundance and human disturbance (SDJV 2015).
Western Sandpiper	<i>Calidris mauri</i>	Intertidal mudflats	Unknown 12				Key migration habitats	Determine Status	The most abundant shorebird in the region, though occurrence in the C3JV peaks during migration rather than overwintering birds. The Western Sandpiper provides a species of common concern across the Pacific Flyway, and a focal bird that connects international conservation efforts (Fernandez et al. 2010).

* PIF Score: Partners in Flight (PIF) scores the relative vulnerability of all birds according to the following six factors: population size, breeding distribution, non-breeding distribution, threats to breeding, threats to non-breeding, and population trend. Refer to the [Avian Conservation Assessment Database Handbook](#) for specific methodology.

** Population Objectives offer directional goals based on regional population trends (trends derived from PIF assessments, CDFW species accounts and/or expert opinion of trend if actual trends are not known). Population objectives will be modified as JV-regional population measures/monitoring systems are developed. Employing methodology from Fleming et al. 2019 may support strengthening our waterfowl population targets in coordination with NAWMP's Science Support Team.



Photo: Sooty Shearwaters by Dave Keeling

Table 5.6.4: Essential Habitats of C3JV Coastal and Marine Conservation Target avian focal species

Common Name	Pickleweed-dominated saltmarsh	Supratidal and backshore beaches/dunes	Intertidal beaches and mudflats	Seagrass beds	Bar-built estuaries	Kelp beds and hard-bottomed nearshore	Rocky intertidal/shellfish beds	Soft-bottomed nearshore/surf-zone	Islands, offshore rocks, bluffs	Continental shelf and slope	Sea mounts and canyons	Deep, offshore waters
Ashy Storm-Petrel									X	X	X	
Black Brant	X		X	X								
Black Oystercatcher			X				X		X			
Brandt's Cormorant						X			X			
California Least Tern		X			X							
Snowy Plover		X			X							
Secretive Marsh Rails	X											
Savanna Sparrow (subspecies Belding's and Bryant's)	X											
California Brown Pelican				X		X		X	X	X		
Western Grebe				X		X		X		X		
Western Gull	X	X	X	X	X	X	X	X	X	X	X	X
Long-billed Curlew	X	X (loafing)	X		X							
Black-footed Albatross										X	X	X
Cassin's Auklet									X	X	X	
Common Murre									X	X	X	
Pacific Loon						X		X		X	X	
Pigeon Guillemot											X	
Red-necked Phalarope					X					X	X	X
Sanderling			X		X							
Sooty Shearwater										X	X	X
Surf Scoter								X				
Western Sandpiper			X				X					

5.6.3 PRESSURES ON COASTAL AND MARINE SYSTEMS

Coastal and Marine Systems are under significant pressures from numerous and inter-related forces that impact the ability of these habitats to support birds, other wildlife and people. Table 5.6.5 identifies the major pressures acting on Coastal and Marine Systems, derived through the Threats Assessment methodology described in Chapter 3. Of particular concern, continued coastal development

from growing residential demands, conversion of coastal habitats to industrial and agricultural uses, expanding sea space development activities and coastal hardening rank high among pressures. Human disturbance, oceanographic changes due to climate change, contaminants, and sea level rise are also among the highest ranked pressures acting on coastal and marine habitats. Some of the highest pressures are further elaborated upon below.

Table 5.6.5. Summary of overall pressure ratings perceived to be acting on the Coastal and Marine Conservation Target in California’s Central Coast.

Pressure	Rating*
Ocean acidification and sea surface temperature change**	Very High
Heightened variability of climate oscillations and corresponding impacts to upwelling conditions**	Very High
Human disturbance (e.g., coastal and nearshore recreation, etc.)	Very High
Contaminants (e.g., harmful algal blooms, oil spills, agricultural/ industrial/ urban/household and wastewater runoff and point discharges)	High
Coastal development/modification (e.g., residential, port, coastal hardening, jetties, weirs, armoring, water control, etc.)	High
Surface and subsurface water diversion	High
Invasive and problematic species	High
Sea-level rise and coastal erosion**	High
Sea space development (offshore wind, transmission, shipping, oil drilling)	High
Pathogens/disease (e.g.,)	High
Sedimentation (fire impacts, agriculture, upstream uses)	High
Fisheries/Aquaculture (forage availability, displacement, bycatch, entanglement)	Medium

* Ratings are derived from a qualitative index whereby a given pressure is evaluated based on its scope (i.e., scale impact), severity (within the scope, how severe is the potential destruction/degradation), and irreversibility (whether the impact can be reversed, and anticipated length of recovery). **Very High** equates to a large scope, severe impacts and a low likelihood of reversibility within 100 years, whereas **Low** equates to a small scope, relatively insignificant degradation, and restoration of the impact easily achievable/likely.

** denotes a climate change-induced pressure, where the C3JV may have limited capacity to address the direct cause. Given that climate change-induced drought has a relationship with fire and fire suppression, overlapping strategies may be developed to address or mitigate impacts from both pressures.

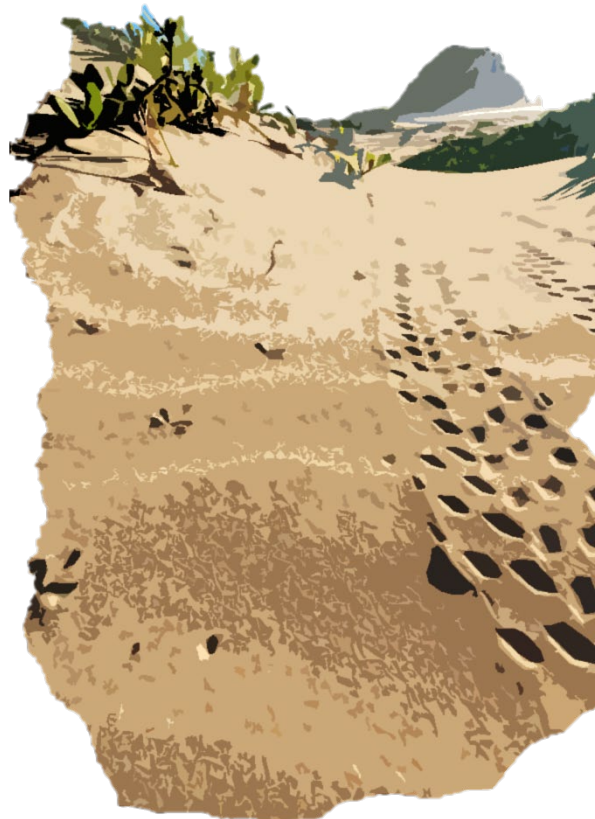
Coastal and Sea Space Development: While California has taken regulatory actions to protect coastal ecosystems through mechanisms like the Coastal Act, historic degradation, conversion and ‘reclamation’ of saltmarshes, wetlands, estuaries, beaches, and other coastal habitats have resulted in

substantial reduction of these productive systems, and corresponding populations of sensitive species. In particular, the historic modifications to estuaries (and upstream basins) and saltmarshes continue to influence the viability of these habitats, the restoration efforts needed to repair function, and the

extent of recovery needed to reverse declines of bird species on the edge, like the California Black Rail. Given their outsized importance for birds, wildlife and people, significant historic and ongoing loss/modification (over 50%), and their acute vulnerability to current land uses, upstream influences, climate change, and legacy-effects from historic modification, saltmarsh and estuarine habitats are positioned at the top of conservation priority for the Joint Venture. While past development impacts linger large, continued urban and industrial growth, agricultural-land reclamation, coastal hardening and sea level rise mitigation, investments in port infrastructure, highway construction and maintenance and recreational development among other activities continue to stress coastal and nearshore habitats. What's more, offshore wind energy and associated development into continental shelf waters, a relatively intact habitat, is an emerging pressure which is poorly understood, and yet may prove impactful to C3JV focal species.

Human Disturbance: Some of the region's most vulnerable species include beach-nesting birds like the Snowy Plover and California Least Tern, which are highly sensitive to human disturbance, in addition to elevated presence of predators facilitated by human activities and behaviors. However, disturbance effects are far from exclusive to beach-nesting birds, extending to resident, migratory and wintering shorebirds, waterfowl, waterbirds and seabirds, among innumerable other wildlife dependent upon this increasingly dense land and seascape of co-habitation. Recreational activities (camping, beachcombing, biking, off-road vehicle use, 'tide pooling', boating, dog-walking, fishing, drones) increasingly dominates coastal land uses, layered upon other sources of disturbance including port and commercial activities, shipping, aircraft, oil and gas development, etc.), in increasingly limited habitat, with cumulative population-level impacts to birds. Strengthening the compatibility of human activities and healthy bird populations along our coasts and marine waters is at the center of a socio-ecological approach to conservation.

Climate change-induced pressures: The implications of climate change for our coasts and oceans, while remaining uncertain and difficult to model, are nonetheless immense. Changes to temperature, salinity, and dissolved oxygen have already been implicated in mass mortality events of seabirds, shifting distribution of fish species, imbalances in predator-prey dynamics across food webs, among other impacts (Piatt et al. 2020). Coastal erosion and sea-level rise pose significant threats to beach, marsh and intertidal habitats, particularly where topography and human development prevents migration of these habitats (e.g., Carpentaria Marsh, Morro Bay (Thorne et al. 2018)). Even among widely distributed species with robust populations, such as Common Murres, the modification of ocean temperatures and currents and corresponding distribution and availability of prey species under differing climate models will inevitably influence local and regional populations, with the potential for calamitous outcomes.



Snowy Plover and bike tracks, Morro Strand Beach, San Luis Obispo County.

5.6.4 IMPLEMENTATION ACTIONS

Achieving our overarching vision of a resilient Coastal and Marine System shared by thriving populations of birds, other wildlife and people will depend on effective implementation, adaptation and modification of the Initiatives identified herein. As strategies are further developed and adjusted over time, the efforts of the JV to advance Coastal and Marine stewardship will be guided and evaluated by the achievement of the following goals:

Coastal and Marine BENCHMARK GOALS

- **By 2035, marine habitats with protected status have increased by at least 10%, or approximately 4.5 million acres, of which at least 50% are under Indigenous-led stewardship.**
- **Approximately 5,000 *additional* acres of coastal marsh, coastal dunes, and other coastal habitats are protected by 2035, of which at least 5% are under Indigenous Stewardship.**
- **Restore, reclaim and/or create at least 1,000 acres of saltmarsh, estuarine and/or coastal riparian habitats by 2035.**
- **By 2035, have supported the creation of at least 25 livelihoods through the development of coastal stewardship programs, socio-ecological monitoring, Indigenous-led foodway revitalization, and/or eco-tourism enterprises among other mechanisms.**
- **By 2040, 90% of focal species are present on 75% of monitored Coastal and Marine Sites.**
- **By 2040, populations of Conservation Priority Focal Species are stabilizing and/or increasing within the C3JV geography.**

Employing the Strategy Development method further described in Chapter 3, Table 5.6.6 offers a description of possible Implementation Strategies identified and rated in accordance with the C3JV Strategy Ranking Criteria ([Chapter 3](#)). Among these, a sub-set of strategies were identified as having potential for high-impact value in addressing the viability of the Coastal and Marine Conservation Target *and* which addresses one or more human wellbeing domains (refer to Chapter 5.1), these *synergistic strategies* outlined in **green**. Synergistic strategies, though prioritized, will not necessarily exclude implementation of other strategies depending on partner goals, conservation urgency and other factors. All strategies are organized under broader

Initiatives based on thematic commonality, and while specific strategies will necessarily adapt overtime, these Initiatives offer continuity as overarching approaches the JV will take to address contributing factors, reduce key pressures, and decrease biophysical stresses to achieve desired Coastal and Marine habitat conditions. The strategies in Table 5.6.6 in turn inform the basis of our short, midterm and long-term objectives for the Coastal and Marine Conservation Target, acknowledging the need to further refine and adapt specific objectives as knowledge and JV capacity grows and evolves over time. The synergistic strategies are expanded upon below, and include conservation actions that provide entry points for JV implementation.

Table 5.6.6: C3JV Coastal and Marine Conservation Target Implementation Strategies

Strategies	Description	Rating*
Initiative 1: Strengthen and Expand Conservation on Public and Private Lands and Waters		
1.1 Engage, support and participate in State and Federal 30x30 initiatives in the Central Coast to steer and/or lead regional implementation	<ul style="list-style-type: none"> - Work with Partners to evaluate and prioritize easement and fee acquisitions of remaining or future unprotected estuary, saltmarsh, coastal bluff and beach/dune complexes on the Central Coast utilizing North American Wetland Conservation Act (NAWCA), National Coastal Wetlands Conservation Grant (NCWG), Southern California Wetlands Recovery Project, and other programs. - Support the designation of the Chumash Heritage National Marine Sanctuary <i>and</i> its co-management by coastal Indigenous Communities - Support nomination of seamount, sea canyon and continental shelf conservation designations - Prioritize important roosting and breeding habitats within the CCS with insufficient protected status. - Develop and/or support mechanisms for Indigenous land-transfer and/or co-management arrangements. 	VERY HIGH
1.2 Increase scale and pace of restoration and habitat delivery	<ul style="list-style-type: none"> - Work with partners to advance existing planning and implementation efforts to advance scale of saltmarsh reclamation, estuarine restoration (including upstream sedimentation issues), and wetland creation in converted agricultural landscapes (in anticipation of sea-level rise), particularly within the Pajaro, Salinas, Santa Maria and Santa Ynez river mouths, Morro Bay and Elkhorn Slough. Includes non-native species management, levee breaching, channel development, surface-flow protections, and habitat creation/protection with climate change in mind. - Provide technical assistance for large scale conservation planning efforts and for project-by-project planning and implementation. 	HIGH
Initiative 2: Address Focal Priority Species Conservation Needs		
2.1 Support and expand an integrated, holistic approach to corvid management in sensitive coastal areas	<ul style="list-style-type: none"> - Partner with regional policy-makers, researchers, land managers and stewards to strengthen understanding of human-corvid relationships, implement site-specific habitat actions and explore policy changes all designed to mitigate corvid impacts and increase populations of priority focal species. 	HIGH
2.2 Explore expansion of existing and new models for community-based monitoring to reduce wildlife disturbance impacts	<p>In coordination with city councils, community leaders, the Respect Wildlife Campaign and others, develop a <i>Coast Stewards Program</i> or similar mechanism across the region, supporting employment and training of at-risk and/or underserved community members in career-advancing roles to strengthen awareness, engagement, and local stewardship of coastal wildlife and habitats, with particular attention to nighttime recreation, parking issues, off-trail impacts, pet-wildlife interactions, nearshore recreational activities, etc.</p>	VERY HIGH
2.3 Species specific recovery plan implementation	<ul style="list-style-type: none"> - Develop priority focal species monitoring plans, working groups and limiting factor research to inform baseline knowledge and recovery efforts (where absent). Particular focus on Black Oystercatcher, Black Brant, Ashy Storm Petrel, Savannah Sparrow, and Secretive Marsh Rails is warranted. 	

<p>2.4 Implement seascape prioritization effort (Enabling Strategy) and support limited factor research</p>	<ul style="list-style-type: none"> - As part of our Green/Blue Print Enabling Strategy, Chapter 3): Identify important historic breeding and roosting sites, the causes for change in use of these areas, and potential for restoration. - In furthering limiting factor research, explore where introduced plants and animals limit seabird breeding opportunities; explore where seabird/shorebird breeding is limited by interactions with overabundant species (e.g., gulls); Identify areas of high boat or air traffic that cause potential or actual disturbance to colonies; Identify the principle predators at colonies, and those colonies that are most threatened by predators; explore major threats to seabirds during their migration through the C3JV marine region; Investigate the effects of native animal disturbance at seabird colonies (e.g., pelicans, owls, pinnipeds). 	<p>MED</p>
<p>Initiative 3: Engage in the intersection of livelihoods and coastal/marine resilience</p>		
<p>3.1 Recreational and Commercial Fisheries</p>	<ul style="list-style-type: none"> - Strengthen relationships and engagement among fisher communities in the Central Coast to expand partnership opportunities for coastal and marine conservation. Focus efforts on avian and forage fish monitoring, incidental bycatch and entanglement, collaborative stewardship opportunities, species recovery, etc. 	<p>HIGH</p>
<p>3.2 Engage in and inform the deployment of off-shore wind in the Central Coast</p>	<ul style="list-style-type: none"> - In coordination with the Ocean Protection Council and other state, federal and NGO/Academic partners, expand the collection of baseline data to measure displacement impacts for seabirds and other wildlife. - Advance California Current-wide scope of cumulative impacts, strengthening connectivity of the issue across the flyway. 	<p>MED</p>
<p>3.3 Explore the intersection of aquaculture, conservation and Indigenous food sovereignty</p>	<ul style="list-style-type: none"> - Support, in collaboration with Indigenous Communities, the expansion and development of native shellfish, marine algae and other aquaculture candidates for coastal restoration, food web recovery, and Indigenous foodways. 	<p>MED</p>

* Ratings provide a measure of effectiveness for each strategy based on a number of criteria including its expected impact on a pressure or conservation threat, whether the strategy is resilient to climate change, and if the strategy is feasible, etc. Low= not effective, Med=less effective, High= effective, Very High= very effective.



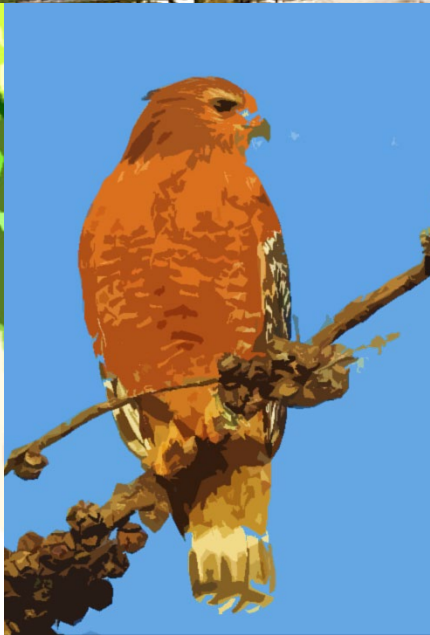
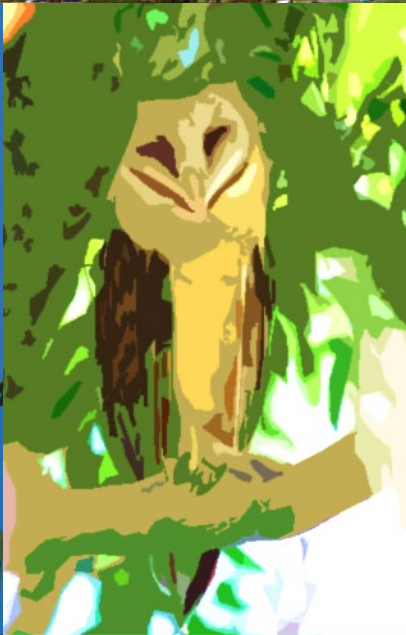
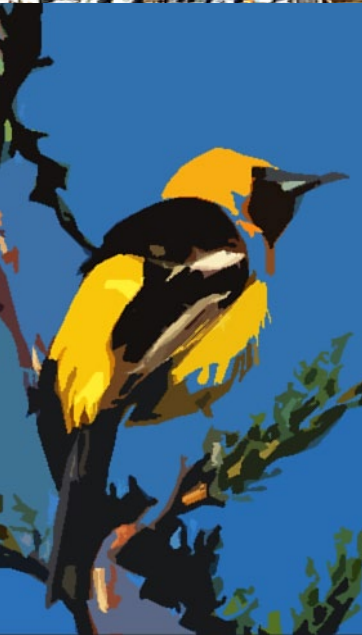
5.7 URBAN AND INTENSIVE AGRICULTURAL SYSTEMS

While generally characterized by its agrarian and small-town character, the Central Coast nonetheless represents an important piece in California's colossal agricultural economy and growing population. Home to over 1.5 million people, the C3JV region supports several large and growing metropolitan areas, hosts the second fastest growing county in California, and experienced a population increase of more than 120,000 people over the last decade, an average growth rate of approximately 7.5% (US Census Bureau 2021). Agriculturally, the Central Coast represented approximately 16% of the state's gross agricultural receipts in 2019-2020, amounting to more than \$8 billion in production value (CDFA 2020). Monterey County, principally the Salinas Valley, ranks 4th among the state's 58 counties in crop-commodity value. With over 3,000 agricultural operations and nearly 45% of the state's irrigated lands, the Central Coast is the dominant player in the production of strawberries (~77%), raspberries (~50%), lettuce (~42%), broccoli (~78%), artichoke (~75%), green peas (~98%), cauliflower (~85%), and spinach (~45%), among other commodities (CDFA 2020, Drevno 2016). Often colloquially referred to as the 'Nation's Salad Bowl', the Salinas Valley, along with important agricultural hotspots in San Benito, San Luis Obispo, and Santa Barbara Counties together account for approximately one-third of the region's workforce (US Census Bureau 2021). In short, urban and agricultural landscapes are a significant and growing part of the C3JV ecosystem.

Overall, the urban footprint encompasses approximately three percent of the C3JV geography, largely concentrated along the region's coastal lowlands and interior valley bottoms. Together with intensive agriculture, including annual and perennial croplands, human-dominated landscapes approximate ten percent of the landcover. Importantly, rural and low-density development are not fully captured here, and instead

are counted toward the acreage of other conservation targets where those forms of development occur. As spatial analyses are refined (see Chapter 3), the footprint of development will assuredly change. Analyses of land conversion document significant losses of intact habitats to intensified land uses (including housing and agriculture) in recent decades. By one estimate, developed lands grew by approximately 2% across the C3JV region between 2001-2011, a conversion of about 30,000 acres (Theobald et al. 2016). While overall habitat loss may be slower relative to other parts of California and across the West (CAP 2016), this trend is a continuation of centuries of intensifying land uses and loss of native flora essential to the maintenance of regional biodiversity and ecosystem function (Mooney and Zavaleta 2016).

It remains without question the protection and restoration of intact habitats is of critical importance to the improved stewardship and recovery of birds and other wildlife. However, it is also the case that increased attention must turn to highly altered habitats and ecosystems which are the backbone of our economies, communities, and spaces of human-nature interactions (Chaplin-Kramer et al 2019). By elevating urban and agricultural habitats as conservation targets themselves, the C3JV is eager to improve on-farm practices for watershed health, reduce human-induced mortality of birds and wildlife, strengthen opportunities for deepening human-nature relationships, and ultimately, improve the functionality of our own essential habitats- be that our farms, parks, neighborhoods and backyards (Chaplin-Kramer et al. 2019). Refer to Table 5.7.1 for greater elaboration on habitats found in the Urban and Intensive Agriculture Conservation Target. The following chapter elaborates the pressures, strategies and goals helping to orient the C3JV's approach to conservation of Urban and Intensive Agriculture habitats in the Central Coast.



Birds and Habitats of the Urban and Intensive Agriculture Conservation Target. Top: Intensive Row Crop Agriculture, Santa Maria Valley; Middle: Urban Santa Cruz County; Bottom: Hooded Oriole (left); Barn Owl (left-center); Red-shouldered Hawk (right-center); Anna's Hummingbird (right). Landscape photos by Jim Dougherty. Original bird photos by Dave Keeling.

Figure 5.7.1: Geographic extent of the C3JV Urban and Intensive Agriculture Conservation Target



Table 5.7.1: Habitat Types Characteristic of the Urban and Intensive Agriculture Conservation Target.

Habitat Types	Description	~ Extent (acres)	~ % of C3JV	~ % Protected
Urban	Urban and built-up lands, defined here as occupied by structures with high building density (at least 1 unit to 1.5 acres) include residential, industrial, commercial, institutional facilities, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, and water control structures. Not included here are rural residential and agricultural-oriented lands such as farmsteads, or confined animal agriculture. Supporting approximately 1.6 million people, the region’s largest municipalities include Salinas (163,542 people), Santa Maria (109,707), and Santa Barbara (88,665), along with another thirty-five (35) cities and nearly one hundred (100) census-designated places. These built lands are typically composed of impermeable surfaces, exotic and introduced vegetation communities, and high human disturbance, but can include extensive albeit manicured forest habitats, suburban parks, backyard gardens, abandoned lots and weedy fields, narrow riparian corridors and other incidental wildlife habitat. Urban and suburban landscapes can often function as bird sinks; providing attractive habitats with elevated predators, increased disturbance and stress, and other factors that reduce survival and fecundity. However urban landscapes are ripe for opportunity to not only reduce mortality of migratory, breeding and wintering birds, but also to improve habitat conditions that support other wildlife, and deepen connections to nature within developed places (Bütler et al 2013). Birds, such as Hooded Orioles, are expanding their range due to naturalization of palms in urban landscapes, while Anna’s hummingbirds have responded to the availability of artificial nectar sources. Birds offer accessible opportunities for local natural history education across demographics; pairing these efforts with programs such as Bird City Americas can garner outcomes that advance birds in natural areas, parks, gardens and main streets, while making communities better places to live.	225,000	3%	3.5%
Pasture, Hay and Grain Crops	This habitat includes alfalfa and grass hayfields, pastures, and cereal grains both irrigated and non-irrigated. Alfalfa is typically left unplowed for at least three years, often more, followed by rotation with cereal grain crops or root vegetables for a series of growing cycles before being planted to alfalfa again. In contrast, hayfields and pastures are often left un-tilled longer, and composed of both native forbs, graminoids and legumes as well as introduced grasses and legumes depending upon management intensity. As an irrigated crop, either through sprinkler systems or by flood irrigation, alfalfa, hay and native pastures provide valuable wildlife habitat, perhaps the highest of any agricultural system in the Central Coast. Old or poorly drained pastures may have patches of dense weedy or aquatic vegetation providing valuable nesting and foraging habitat for birds, though the value of these habitats is often also dependent upon adjacent landscape connectivity. Flood irrigation of pastures provides feeding and roosting sites for many wetland-associated birds, including shorebirds, wading birds, gulls, waterfowl, and raptors. While habitat structure varies considerably over the growing season, from dense canopy closer at peak flower to low stubble post-harvest and bare-ground when tilled, high-quality seasonal resources for blackbirds, doves, raptors and other species are often present. However, these habitats can become significant ecological traps when harvest coincides with nesting, a situation that has plagued Tricolored Blackbirds in the Central Valley. Vegetation in the dryland (non-irrigated) grain and seed crops habitat includes annual seed producing grasses such as barley, cereal rye, oats, and wheat, whereas irrigated grain/seed crops consist of corn, safflower, beans, sorghum and sunflower among others. Dryland crops often follow a planting regime of cultivation followed by one or more years of fallowing. Many species of rodents and birds have adapted to croplands and are controlled by fencing, trapping, and poisoning to prevent excessive crop losses. As with other croplands, pasture, hay and grain crops have replaced some of the most productive wildlife habitat in the Central Coast, likely contributing at least in part the extirpation of species such as the Yellow-billed Cuckoo and Swainson’s Hawk. And while these crops are also some of the most water-intensive, they do provide significant potential to support the recovery of birds in the region.	350,000	4.8%	1%
Row and Field Crops	Row-crop agriculture accounts for much of the cash-crops produced in the Central Coast today, including annuals such as lettuce, spinach, cabbage, broccoli, sugar beets, as well as perennial crops such as strawberries, artichokes and asparagus. Crops are typically low to the ground, though can exceed three feet (e.g., asparagus), and canopy closure is also variable. Plastics are increasingly being used to maintain soil moisture, reduce weeds and improve harvest quality (e.g., strawberries), resulting in increased impermeable surfaces, and bare ground. Dominate crops have changed over the last 150 years, starting with potatoes to support California gold rush miners, followed by a period of wheat production until sugar beets became the preferred crop at the turn of the century. Today, row crop production is dominated by leafy greens, brassicas, and berries. Row-cropping systems in the Central Coast account for some of the most intensive agricultural systems in production, with multiple planting cycles, high inputs, the use of precision methodologies such as plasticulture, and significant labor and water demands. At the same time, the Central Coast is a dominant player in organic production, playing a major role in the advancement of organic production methods, sustainable agricultural innovations, and community-supported agricultural systems. The intersection of birds and row crops is often a conversation of pest control and management, either bird species as pests themselves, or birds as beneficial	100,000	1.3%	6%

Source: See footnote ²⁶

²⁶ Acreage figure is sourced from the California Department of Conservation’s Farmland Mapping and Monitoring Program (FMMP)

	components to integrated pest management practices. Notable birds within row crop agriculture include House Finch, European Starling, American Robin, Barn Swallow, Black Phoebe, blackbird <i>spp</i> , among others).			
Orchards	Orchards in the Central Coast are typically composed of relatively open canopied, single species habitats often associated with a bare ground understory or a cover crop of planted or naturalized introduced grasses (Bermuda, red brome, wild oats, etc.) or forbs (wild mustard, fiddleneck, etc.). Orchards include both evergreen (avocados, citrus, and olives) and deciduous (almonds, apples, apricots, cherries, fig, pomegranate, plums, walnuts, pecans, others) cultivars. The use of tillage and herbicides is commonly used to reduce understory cover and weeds, though under deciduous canopies these cover crops often persist year-round or are cultivated as forage in spring and summer. Many orchards are treated in strips down the tree rows with herbicides. Some species of birds and mammals have adapted to exploit orchards, and have become known as "agricultural pests", including American Crow, Brewer's Blackbird, House Finch, Band-tailed Pigeon, Yellow-billed Magpie, American Robin, and Cedar Waxwing among others. Nut (almonds and walnuts) crops may experience damage from Northern Flicker and California Scrub Jay. Significant and intensive efforts to reduce crop losses through fencing, sound guns, or other management techniques have been developed, though recognition of biocontrol agents (including Barn Owls and American Kestrels) and falconry have recently received greater attention and study. Other species (e.g., Mourning Dove, California Quail) are more passive in their use of the habitat for cover and nesting sites or are beneficial as insectivores (e.g., Western Bluebird, Hermit Thrush). Significant overlap in terms of species composition, pressures, and habitat goals exist between vineyard (Oaks and Prairies Conservation Target) and orchards.	~45,000	<1%	~2%
TOTAL		~720,000	~ 10%	~12.5%



Killdeer fantail display: Original Photo Courtesy of Dave Keeling

5.7.1 KEY ATTRIBUTES OF URBAN AND INTENSIVE AGRICULTURE

Using the Conservation Standard’s Viability Assessment framework discussed in **Chapter 3**, a selection of Key Attributes, or the factors, interactions and/or elements that enable the target to persist, were identified along with indicators used to measure the status and trend of each attribute. These are presented in Table 5.7.2. The Table identifies each key attribute, a summary description of its meaning and importance as a measure of functionality of the Urban and Intensive Agriculture

ecosystems of the Central Coast, identifies the indicators the JV will use to quantify and monitor the attribute, and finally provides a conditional status rating of each indicator. The current conditional status code was derived from knowledge and consensus among Implementation Task Force members and advisors, but does not represent a quantitative measure. Instead, it is a qualitative, and relative, conditional statement that will be refined as information and monitoring systems develop, and it allows for an initial and comparative snapshot of the indicators perceived to be more or less compromised today.

Table 5.7.2: Key attributes identified for the Urban and Intensive Agriculture Conservation Target

Key Attributes	Description	Indicators	Attribute’s Current Status	Status Notes
Avian Focal Species	Focal species were selected as representatives of diverse habitat elements, species of weighted importance to the Central Coast relative to their range-wide distribution (e.g., endemics), and species which represent good indicators for monitoring management interventions and ecosystem functions, among other criteria. Further description of the focal species can be found below. With renewed focus on expanding regenerative and Indigenous food practices and systems, including reducing barriers to adoption and strengthening incentives, agriculture can provide rich habitats for birds, other wildlife and people. Similarly, our urban landscapes provide opportunity for species recovery alongside the recovery of relationships with water, land, wildlife and people.	1. Focal species occupancy	Green	Some species are experiencing local extirpation from former breeding range.
		2. Focal Species population trends and relative abundances	Yellow	Significant concern across some focal species, though many are stable/increasing
		3. Priority Conservation Focal Species demographic information (productivity, survivorship and dispersal rates of the bird community.)	Red	Significant concern across priority species, including rapid declines and extirpation.
	Given the importance of urban and agroecosystems, both as habitats for birds themselves (Glynn 2019), and as important pressures for other conservation targets, the C3JV is committed to monitoring changes to habitat extent and condition over time. Area of habitat (quantity) is a measure of both the overall extent of urban and agricultural footprints (conversion of intact habitats to urban and agricultural uses or the encroachment of urban into agriculture), as well as change in cover-types within agriculture and urban settings (conversion of alfalfa to row-crops, or	1. Size of system (acreage change)	Yellow	Extent of urban and agricultural footprint continues to grow, with increasing pressure for new development.
		2. Area of suitable habitat (habitat changes within system footprint)	Red	Continued loss of water-intensive crops like alfalfa converted to grapes, loss of riparian buffers,

Habitat quality and quantity	<p>development of pocket parks or weedy lots within urban ecosystems). Additionally, limiting factors for birds and wildlife urban and agricultural ecosystems often boils down to habitat capacity- the ability for these altered habitats to support birds. Measures of landscape diversity, or the relative proportion of croplands, woodland, riparian habitats and other semi-natural habitats at a given site provides contextualization key to suitability. Similarly, corridors between unsuitable habitats and overall connectivity between and among sites plays a role in capacity. The adoption and extent of agroecosystem diversification practices is a measure of habitat quality change, where practices that support greater avian diversity, once implemented, strengthen the viability of agriculture to support wildlife (Gonthier et al. 2019). In both urban and agroecosystems, the reduction of invasive species and cultivation of native flora strengthens pollinator, insect, bat and bird habitats (Landis 2017). Finally, tracking the adoption and effectiveness of urban hazards reduction programs coupled with monitored bird responses (e.g., focal species demographics) can provide insight into improved habitat quality and capacity.</p>		<p>wildlife trees, and urban-interstitial habitats</p>
	<p>3. Landscape heterogeneity and connectivity</p>		<p>Incentives exist to reduce complexity in urban and agricultural lands, for safety concerns and other reasons.</p>
	<p>4. Extent of agroecosystem diversification</p>		<p>Slow uptake of crop diversity, hedgerows, floral strips, integrated livestock practices.</p>
	<p>5. Avian species richness (number of species present in a given monitoring site)</p>		
	<p>6. Urban hazard (e.g., cats indoors, collision reduction), management implementation</p>		<p>Absence of programs and awareness pervasive, and perverse policies in place</p>
	<p>7. Native species cover</p>		<p>Ornamental and invasive species pervade vast majority of crop and urban settings.</p>

Red= poor, orange= fair, green= good, dark green= excellent.



Clearing of oak woodland and savanna for agriculture, San Luis Obispo Co, CA. Photo taken July 2022

5.7.2 FOCAL SPECIES OF URBAN AND INTENSIVE AGRICULTURE

Following the Focal Species Selection Method described in Chapter 3, 16 species were selected as “Avian Focal Species” of the Urban and Intensive Agriculture Conservation Target, representing species of conservation concern, species with an outsized dependence on the C3JV region during all or a portion of their annual lifecycle (Stewardship Species), diverse habitat elements (Table 5.7.4) species of key cultural significance, and good indicators for monitoring management interventions and ecosystem function among other factors. Table 5.7.3 shows the Urban and Intensive Agriculture Focal Bird Species, including their principle habitat associations, limiting factors (if known), population trends, and species-specific directional population objectives. Of 16 focal species, one (1) is listed as state-threatened and thought to be extirpated from the C3JV region, another designated a 3rd Priority California Bird Species of Special Concern, and one (1) a USFWS 2021 Species of Conservation Concern. As further described in Chapter 3, focal species are organized into three categories; 1) **Conservation Priority Species**; 2) **C3JV Stewardship Species**; and 3) **Indicator Species**. The focal species range from regionally extirpated species to some of our most common and well-known birds, hinting at the diversity of goals within the urban and agricultural conservation target. The Swainson’s Hawk offers opportunities for reintroduction to a former range, the Barn Owl an entry-point into bird-friendly agriculture, and the Red-shouldered Hawk an anthem of our urban parks. Though many focal species here are exhibiting stable or increasing trends, at least nine (9) are known to be declining. Links to species profiles for individual focal species, where available, can be found in the [Appendix I](#) of this plan.



Birds and Agriculture

Large-scale, conventional agroecosystems can be significant drivers of habitat and biodiversity loss, some arguing the single largest threat to bird populations worldwide. With the addition of herbicides and pesticides, persistent disturbance and other management activities, agriculture has certainly driven population declines of many birds and other wildlife (Rosenberg et al 2019). In a recent example, in the 5 years after an *E.coli* outbreak in leafy greens brought national attention to the Central Coast, it is estimated that over 13% of the **remaining** riparian habitat in the Salinas Valley was destroyed as a preventative measure to dissuade birds and other wildlife from entering agricultural habitats thought to source contamination and drive crop losses (Gennet et al., 2013). This despite evidence that adjacent semi-natural habitats in fact reduces depredation risks and at the very least, neutralizes contamination (Karp et al., 2015). In short, with growing evidence of neutral or beneficial outcomes of birds on-the-farm (Garcia et al 2020), coupled with the recognition that incentives and outreach are needed to translate these findings to action, significant potential exists in transforming food systems that are more supportive of wildlife as well as agricultural communities at the frontlines of climate change and environmental injustice (Pywell et al. 2012, Gardali et al. 2021, Chaplin-Kramer et al. 2019). The C3JV is eager to support novel approaches where food, wildlife and people intersect for mutual benefit.

Mourning Dove, original photo: Dave Keeling

Table 5.7.3: C3JV Urban and Intensive Agriculture Conservation Target Avian Focal Species. Focal Species are organized by type: (red)- Conservation Priority, (orange)- C3JV Stewardship, (green)- Indicator

	Common Name	Scientific Name	Primary Habitat Association	Trend and PIF Score*	Listed Status **	Limiting factors	C3JV Importance	Population Objective ***	Notes
Conservation Priority Species	Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	Agricultural and urban generalist	Declining 9	R2R	Not well-known, though persecution, collisions and pesticides may be driving declines	+2%	Determine Status	A quintessential "Common bird in steep decline", populations have reduced by nearly 70% since the mid 1960's. Blackbirds are both beneficial and detrimental to crop systems depending on season and commodity variables. In the Central Coast, they are found year-round in agricultural and urban landscapes as well as beaches, wetlands and rangelands. In winter often form mixed flocks with Red-winged and Tricolored Blackbirds (Dolbeer and Linz 2016).
	Swainson's Hawk	<i>Buteo swainsoni</i>	Annual/perennial grasslands, pasture, alfalfa and hay, some irrigated crops	Declining 12	ST	Prey availability (rodenticides, conversion of suitable cropland cover, i.e., alfalfa), nesting habitat and nest disturbance	Nearly Extirpated?	Establish a viable population	Historically, the Swainson's Hawk was considered one of California's most common nesting buteos. With few exceptions, areas within the historical range, particularly along the Central Coast and southern regions, have not been reoccupied. The Swainson's Hawk was historically a species adapted to open grasslands and prairies, but it has become increasingly dependent on agriculture as native plant communities have been converted to agricultural lands.
	Northern Harrier	<i>Circus hudsonius</i>	Pasture, weedy fields, marshes, wetlands and wet meadow	Declining 11	3 rd Priority BSSC	Nesting and foraging habitat availability, nesting disturbance and predation	<1%	Determine Status	While still locally common throughout the C3JV region, breeding populations continue to decline in response to loss of suitable foraging habitat (such as alfalfa, weed fields, wet/irrigated grasslands), wetland and marshland degradation, and other factors. As a ground nester, fecundity is sensitive to disturbance by livestock, agricultural operations, as well as an influx of over-abundant predators (including non-native species). Rodenticides reduce prey populations, and predator-control programs for endangered species like the Snowy Plover persecute harriers occasionally.
	American Kestrel	<i>Falco sparverius</i>	Savannah, pasture/hay/croplands, including orchards and vineyard	Declining 11		Not well known, but prey availability, suitable nesting habitat, and loss of foraging habitat to intensified uses commonly cited	+1%	Determine Status	The kestrel is a common resident wherever suitable habitat is found. They favor grasslands, pastures, oak savannas, weedy fields, mixed areas of shrubs and brushlands and typically seek small trees/shrubs, poles, wires or fence posts to perch on and hawk from. Habitat changes, such as intensifying agriculture, may be driving declines. In the Central Coast, hatching success was nearly 20% lower on agricultural sites vs non, indicating a possible ecological trap for kestrels in intensifying agricultural habitats (Tomes 2019).
C3JV Stewardship Species	Anna's Hummingbird	<i>Calypte anna</i>	Urban gardens, scrub and chaparral	Increasing 8		Expanding its range with artificial feeders	10-14%	Maintain	With the C3JV region representing a significant portion of the species range, Anna's Hummingbird have adapted well to urban and suburban landscapes. The most common hummingbird on the West coast, populations continue to increase, and the species has significantly expanded its range over the last century into Oregon, Washington and British Columbia. The species has substantially benefited from artificial nectar sources and the expansion of eucalyptus trees, and in some cases may exclude other native hummingbirds.
	Bushtit	<i>Psaltriparus minimus</i>	Understory generalist in urban, agricultural and native plant communities	Stable 11		Understudied	+10%	Maintain	A common bird occupying scrub, oak woodland, suburban and agricultural habitats. The C3JV represents a significant portion of the global population, and therefore is included here as a stewardship species. It can be considered both beneficial and detrimental to agricultural operations.

	Black Phoebe	<i>Sayornis nigricans</i>	Open riparian edge, suburban gardens, agricultural lands	Stable 8		Highly adaptable, though almost always found in proximity to water, be it coastal estuaries, stock ponds, irrigation infrastructure or even backyard water features.	+/-10%	Maintain	An abundant yearlong resident comfortable among humans, and a C3JV stewardship species. While often associated with water, and therefore potential to provide a relatively easily measured, ubiquitous barometer of wetland conditions and water quality, the Black Phoebe is an equally common resident of urban, suburban and agricultural habitats. As an abundant aerial insectivore, long-term monitoring of the species may provide indicators of ecosystem drivers impacting the entire guild which is experiencing dramatic declines nationwide.
	Lesser Goldfinch	<i>Spinus psaltria</i>	Urban/suburban hedges, agricultural edge and weedy pasture/grain fields	Stable to Increasing 7		Understudied	+/-4%	Maintain	With approximately 45% of species' global population occurring in BCR32, the Lesser Goldfinch is a relatively ubiquitous visitor of urban hedges, backyard feeders, weedy lots, farmsteads and agricultural edge.
	California Red-shouldered Hawk	<i>Buteo lineatus (elegans)</i>	Urban woodlands and eucalyptus groves, oak and riparian woodland	Increasing 8		Suitable nesting habitat may limit species. May be sensitive to pesticides/rodenticides	+/-1% overall (+/- 15% of subspecies)	Maintain	The pacific population of Red-Shouldered Hawk, subspecies <i>elegans</i> , has adapted relatively well to urban and suburban habitats, and continues to expand its range along the West Coast. Though loss of riparian woodland continues to threaten the species, urban woodlands can provide suitable habitat depending on forage availability. Often in proximity to riparian, wetland, or marshland foraging habitats.
Indicator Species	Barn Owl	<i>Tyto alba</i>	Farmyards, orchards, and vineyards	Stable to Increasing 9		Suitable nesting sites, potential interactions with rodenticides/pesticides	~3%	Maintain	As an orchard/vineyard beneficial, owls are opportunities to engage with farmers. Barn Owls are threatened by the conversion of agricultural land to urban and suburban development, and the loss of suitable nesting sites such as large, hollow trees and old buildings. Changes to agricultural fields and grasslands can also affect Barn Owls through changes to their prey populations. Barn Owls were affected by the use of pesticides, and they may be susceptible to poisons used against rodents. Because Barn Owls hunt by flying low over fields, they are often hit by cars; planting hedgerows alongside roads can help prevent this from happening. Nest boxes have helped populations recover in areas where natural nest sites were scarce.
	Barn Swallow	<i>Hirundo rustica</i>	Farmyards, agricultural fields, suburban parks	Declining 8		While range of the species has greatly expanded with human infrastructure, current limiting factors not well known though insecticides are of concern	<1%	Determine Status	Barn Swallows, one of the most widespread bird species on Earth, have experienced significant declines in North America over the past fifty years. As an aerial insectivore, this trend tracks other species within the guild, a possible indicator of ecosystem disfunction. Barn swallows are common, abundant, and accessible for monitoring. They are also adapted to urban, suburban and agricultural environments, a favored bird in agriculture and a truly charismatic species.
	Bullock's Oriole	<i>Icterus bullockii</i>	Suburban deciduous parks and woodland, agricultural and riparian edge	Declining 11	USFWS BCC	Not well understood, but loss of riparian habitats, pesticide use and grazing activities may contribute	+/-2%	Determine Status	A new listing as a USFWS Species of Conservation Concern 2021 due to continuing declining trends. potential to facilitate orioles with urban and agricultural practices. The Bullock's Oriole also declined significantly in our study area. While there are no concerns for the species range-wide, habitat destruction and pesticides are believed to affect local populations. Livestock grazing may affect abundance of this species. Results from 10 years of spot-mapping censuses in grazed and ungrazed plots at SJER revealed that Bullock's Orioles were less abundant on the grazed site (Verner et al. 1997). BBS results show a significant decreasing trend for California (1.58% decrease per year from 1968 to 2012; Sauer et al. 2014, Purcell and Mori 2018), in agreement with our results, and suggest further investigation of this poorly studied species is needed.

White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	Suburban gardens, winter row crops	Declining 8	Poorly understood. Aside from vegetational succession influencing breeding habitats, pesticide use and changes to winter crop productions have been suggested.		Determine Status	Though a coastal nonmigratory population occurs within the geography (subspecies <i>Z. l. nuttalli</i>), most are migratory, and in fact represent one of the most common birds in winter in the C3JV region (Bacchetti 2015). White-crowned Sparrows can concentrate in large flocks, often mixed with other sparrows, and may be problematic in cereal and grain crops (Brennan 2020). Sparrows are equally common at backyard feeders, and in ornamental plantings in urban parks and gardens.
Brown-headed Cowbird	<i>Molothrus ater</i>	Cropland, riparian edge, confined livestock operations,	Declining 7		<1%	Determine Status	The Brown-headed Cowbird plays an important role in conservation of several C3JV focal species. A native species which has expanded its historic range with the expansion of agriculture and livestock production, it is now a year-round resident of the Central Coast, and may be an important limiting factor for declining landbirds in the region, including Least Bell's Vireo and Warbling Vireo. Prefers riparian and forest edge habitats for breeding, where passerine populations are highest, and parasitism rates highest where forage habitats coexist (e.g., farmlands, dairies, urban lawns and birdfeeders, etc.). Overall, favored hosts include warblers, other blackbirds, vireos, flycatchers, phoebes, song sparrow, other sparrows, and finches.
Killdeer	<i>Charadrius vociferus</i>	Cropland edge, fallow fields, irrigation ditches, urban parks, coastal sandbars/beaches	Declining 11	Poorly understood, though mortality from pesticides, collisions, as well as nest disturbance are concerning		Determine Status	The Killdeer is one of the most successful of all shorebirds because of its adaptation to, and even selection of, human modified habitats. However, long term declines in populations have been observed, particularly in the west.
American Robin	<i>Turdus migratorius</i>	Lawns and urban gardens, row crops and orchards	Stable 5		<1%	Maintain	The American Robin is a ubiquitous representative of urban and agricultural landscapes, as an important competitor in berry and fruit crops in the central coast, a common visitor of parks and urban greenspaces, and a <i>spark bird</i> for engaging interest in avian conservation.

* PIF Score: Partners in Flight (PIF) scores the relative vulnerability of all landbirds according to the following six factors: population size, breeding distribution, non-breeding distribution, threats to breeding, threats to non-breeding, and population trend. Refer to the [Avian Conservation Assessment Database Handbook](#) for specific methodology.

** Status codes: FE: Federally Listed - Endangered, FT: Federally Listed – Threatened, SE: State Listed – Endangered, ST: State Listed – Threatened; 1st, 2nd and 3rd Priority birds included in California Bird Species of Special Concern, representing regionally specific species of conservation need (<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=84247&inline>).

*** Population Objectives offer directional goals based on regional population trends (trends derived from PIF assessments, CDFW species accounts and/or expert opinion of trend if actual trends are not known). Population objectives will be modified as JV-regional population measures/monitoring systems are developed.



The Santa Maria River mouth at Guadalupe, showcasing the textured juxtaposition of wetland and riparian habitats, rare sand-dune formations, intensive row crop agriculture and dense urban edge. Original photo: Jim Dougherty

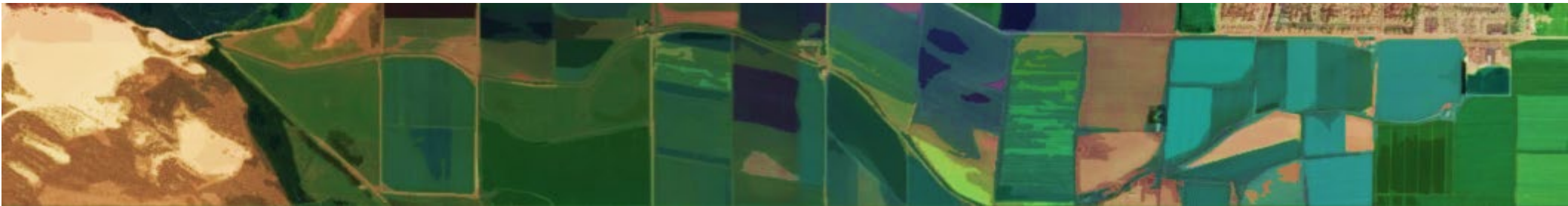


Table 5.7.4: Essential Habitat Elements for C3JV Urban and Intensive Agriculture Conservation Target avian focal species

Common Name	Human-made structures	Barren/Fallow fields	Dense scrub/sub-shrub canopy	Mature Trees/Woodlots	Dense, herbaceous cover	Cavities/nest boxes	Ponds/Impoundments and wetlands	Riparian/Weedy edge	Forest openings, low-cropped open areas
Brewer’s Blackbird		X		X			X	X	X
Swainson’s Hawk				X	X			X	X
Northern Harrier					X			X	X
American Kestrel				X		X			X
Anna’s Hummingbird			X					X	
Bushtit			X						
Black Phoebe								X	
Lesser Goldfinch			X					X	X
Red-shouldered Hawk				X	X			X	
Barn Owl	X	X				X			X
Barn Swallow	X	X					X		X
Bullock’s Oriole				X				X	
White-crowned Sparrow		X	X						X
Brown-headed Cowbird		X	X					X	X
Killdeer		X					X		
American Robin		X	X	X					X



5.7.3 PRESSURES ON URBAN AND INTENSIVE AGRICULTURE

While processes of urbanization and land use intensification are identified as important pressures on other conservation targets, within existing urban and agricultural landscapes, a suite of pressures and threats reduce the capacity of these habitats to support birds, other wildlife and people. Moreover, the interactions between urban and agricultural land uses can be neutral, synergistic or antagonist to one another in addition to influencing downstream and adjacent ecosystems, adding complexity to strategy development. For instance, unplanned or poorly planned growth is encroaching on rich agricultural and grazing lands, reducing the viability of farms and ranches. In contrast, agriculture continues to strain availability, and quality, of surface and groundwater for domestic and municipal water needs, a tension anticipated to heighten under climate change.

Conservation hinges greatly on the future of urban and agricultural landscapes. These spaces are not only significant drivers of climate change, habitat loss, resource consumption, air pollution, water scarcity, ocean nitrification, and wildlife disturbance; but increasingly, these are also the spaces people live, work, recreate, and build relationships with their

environment. The C3JV therefore recognizes an important role in supporting partnerships that address these pressures within developed ecosystems, not only to enhance the livability of cities for people and wildlife, but to mitigate the spillover effects into intact habitats adjacent to and integrated within our built environs.



Barn Swallows: Dave Keeling

Table 5.7.5. Summary of overall pressure ratings perceived to be acting on the Urban and Intensive Agriculture Conservation Target in California’s Central Coast.

Pressure	Rating*
Drought and changes in temperature and precipitation regime **	Very High
Urbanization and land-use Intensification (and associated direct and indirect impacts)	Very High
Incompatible farming and livestock practices (e.g., food safety mitigation)	High
Incompatible infrastructure and activities (glass strikes, lighting, vehicle impacts, etc.)	High
Effluence and contamination (agricultural, household, urban, commercial/industrial)	High
Invasive and problematic species (e.g., outdoor cats)	High

* Ratings are derived from a qualitative index whereby a given pressure is evaluated based on its scope (i.e., scale impact), severity (within the scope, how severe is the potential destruction/degradation), and irreversibility (whether the impact can be reversed, and anticipated length of recovery). See Chapter 3 for thorough description.

** denotes a climate change-induced pressure, where the C3JV may have limited capacity to address the direct cause.

Climate Induced changes to water, temperature and drought intervals:

The Central Coast is water challenged given its significant reliance on subsurface basins for both municipal and agricultural water needs. While there are some communities that utilize imported surface water (for example in Santa Barbara and San Benito Counties), the vast majority of towns, cities and major metropolitan areas, not to mention agricultural valleys, depend on aquifer basins, many of which are critically over drafted, where extraction exceeds recharge (DWR 2019). With most climate models forecasting warmer winters, hotter summers, and more unpredictable and stochastic rainfall events, evapotranspiration is likely to contribute to an overall reduction in the water budget for the Central Coast (Wilson et al. 2020). This, coupled with the potential for doubling water demand over the next century given current rates of development and associated domestic needs, and in particular the continued expansion of perennial orchards and vineyards often requiring irrigation year-round, the growing uncertainty and vulnerability of water-availability has important implications for birds, other wildlife and people. Increasing water costs are driving crop selection and management changes, particularly away from commodities like alfalfa which support some of the highest small mammal prey densities of any crop, as well as loss of wetlands created or maintained by inefficient water use (e.g., flood irrigation) which is often the most available wetland type for wetland-dependent wildlife (Donnelly et al. 2020). While the implementation of the [Sustainable Groundwater Management Act](#) may help shift the trajectory of future water supplies, current trends toward perennial crop expansion, conversion of agricultural lands to development, the continued lowering of water tables and reduction in surface flows, and on-farm water-efficiency technologies generally results in less habitat suitability for birds and other wildlife (King et al. 2021).

Urbanization and Intensification: By 2060, the Central Coast anticipates adding over 300,000 more people to a region already beset by inaccessible housing costs, and the juxtaposition of some of the wealthiest and poorest communities in California (CDF 2018). Legitimate demand for more affordable

housing continues to mount, intensifying pressure on the urban-agricultural interface where housing is often best suited. Furthermore, in-fill efforts to consolidate urban housing may conflict with greenspace initiatives to strengthen access to nature and wildlife habitat within city limits (Tiitu et al. 2018). With a continuation of the current trends in new development, and the persistence of a dearth of urban hazard mitigation within existing built environments, the impacts of light pollution, collisions, artificially inflated meso-predator populations, continued cultivation of non-native landscaping, and the conversion of underdeveloped riparian corridors, corner lots, urban gardens, and pocket open spaces will continue to strain bird populations.

On the farm, ecosystem simplification and agricultural intensification practices including clearing of crop borders to satisfy food-safety demands, removal of riparian buffers, hedgerows and mature shade trees to dissuade wildlife or manage fire hazards, removal of agricultural wetlands to improve irrigation efficiencies, wildlife fencing, trapping and poisoning, the cultivation and/or mowing of marginal lands, and most notably, the conversion of rangeland to orchards, vineyards and crops- all impact habitat suitability for focal birds (Landis 2017, Pywell et al. 2012).

Pollutants, effluence and contamination: While certainly related to the pressures of urbanization and land-use intensification, environmental contamination in our airways, waterways, soils, coastal shorelines and bays impact the ability of urban and agricultural habitats to support people, not to mention birds and other wildlife. The Central Coast has long suffered from environmental contamination (consistently ranked at or near the top for percentage of highly toxic surface waterways in the state, Anderson et al. 2010), and while policy improvements have been made, herbicides, rodenticides, pesticides, chemical fertilizers, animal waste and other nitrate-sources of contamination, in addition to municipal and industrial pollution and growing seawater intrusion all continue to strain these ecosystem's ability to support healthy communities, people and birds alike.

5.7.4 IMPLEMENTATION ACTIONS

Achieving our vision of resilient Urban and Intensive Agriculture Systems shared by thriving populations of birds, other wildlife, and people will in part depend on effective implementation, adaptation and modification of several key initiatives. As strategies are further developed and adjusted over time, the efforts of the JV to advance conservation will be guided and evaluated by the achievement of the following goals:

Urban and Intensive Agriculture BENCHMARK GOALS

- **By 2035, bird-friendly agriculture, or agricultural habitats managed* for birds, have increased by at least 5%, or approximately 30,000 acres.**
- **By 2035, Urban habitats managed** for birds have increased by at least 5%, or approximately 10,000 acres.**
- **By 2040, Conservation Priority focal species' populations have stabilized and/or increased in the C3JV geography.**
- **By 2040, 90% of desirable focal species (with expectation of occurrence) are present on 75% of monitored Urban and Intensive Agriculture sites.**

* Implementation of management practices designed to support birds and wildlife, such as hedgerows, riparian buffers, pollinator or bee pastures, vegetated water impoundments, pesticide/rodenticide alternatives, etc.

** Implementation of urban habitat management practices including urban hazard reduction programs (window collisions, cat indoors, etc.), greenspace development and restoration, and urban community gardening.

Table 5.7.6 offers a description of possible Implementation Strategies identified and rated in accordance with the C3JV Strategy Ranking Criteria ([Appendix F](#)). Among these, a sub-set of strategies was identified as having potential for high-impact value strengthening the viability of the Urban and Intensive Agriculture Conservation Target *and* in addressing one or more human wellbeing domains (refer to [Chapter 5.1](#)). These *synergistic strategies* are outlined in [green in Table 5.7.6](#).

Synergistic strategies, although prioritized, will not necessarily exclude implementation of other strategies depending on partner goals, conservation urgency and other factors.

Here, strategies are organized under broader Initiatives based on thematic commonality, and while specific strategies will necessarily adapt over time, these Initiatives offer continuity as overarching approaches the JV will take to address contributing factors, reduce key pressures, and decrease biophysical stresses to achieve desired Urban and Intensive Agriculture habitat conditions. The strategies in Table 5.7.6 will in turn form the basis for our annual operating plans that build specificity to short, midterm and long-term objectives and the explicit conservation actions that deliver conservation outcomes.

Table 5.7.6: C3JV Urban and Intensive Agriculture Conservation Target Implementation Strategies

Strategies	Description	Rating*
Initiative 1: Strengthen and expand conservation on Public and Private lands		
1.1 Engage, support and participate in State and Federal 30x30 initiatives in the Central Coast to steer and/or lead regional implementation	<ul style="list-style-type: none"> - Work with Partners to prioritize easement and fee acquisitions on prime agricultural lands at most risk of development, or farmlands with greatest potential for restoration to native cover. -Emphasize expanded greenspace and natural area establishment that supports urban gardens, native plant restoration, community-led initiatives and educational outreach - Develop and/or support mechanisms for Indigenous land-transfer and/or co-management arrangements, particularly on productive lands where revitalized Indigenous farming and food systems may develop. 	VERY HIGH
1.3 Increase scale and pace of restoration and wildlife habitat delivery in urban and agricultural landscapes	<ul style="list-style-type: none"> -Through partnerships with NRCS and other federal agencies, producers, agricultural researchers, producer-organizations, consumer advocates, and others, expand educational tools, outreach and cost-share opportunities to landowners, managers and land stewards to broaden implementation and maintenance of bird and wildlife-friendly farming techniques and activities, including incentives to maintain semi-natural cover and spur farm diversification. Successful implementation will require coordinated landscape design among neighboring farmers and landowners beyond single farm entities. - Support and strengthen efforts to restore vacant lots to pocket parks, enhancing habitat in local parks, schoolyards, places of worship, corporate building lots, backyards, rights-of-way, sidewalks, road islands, and other “leftover areas” 	HIGH
Initiative 2: Address focal priority species conservation needs		
2.1 Increase populations of priority focal species and stabilize populations of declining species	<p>Partner with land managers to implement site-specific habitat actions designed to increase populations of priority focal species. This includes identification of source and sink populations.</p> <ul style="list-style-type: none"> - Develop JV geography-specific recovery and monitoring programs for all conservation priority focal species, including establishing working groups where absent, prioritizing assessment of reproductive success and survival rates, Full Annual Cycle conservation actions and needs, and conducting limiting factor research to inform recovery efforts. - Advance Central Coast Avian Monitoring Network (Enabling Strategy #1, see Chapter 6). Emphasis should include monitoring across different farm management systems and crops, sites that could inform urban/suburban edge impacts, and factors influencing nest success for Urban and Intensive Agriculture focal species. 	HIGH
2.2 Reduce direct mortality	Strengthen and/or support programs to address:	HIGH

	building glass, lighted structures, free-roaming cats, pesticides, hazardous trash, and invasive species among other sources of direct mortality.	
Initiative 3: Inform agricultural and urban land management and policy		
3.1 Partner with public utilities, county supervisors, local governments and insurance companies to help inform development patterns and policy	- Develop JV-wide and regional green prints (Enabling Strategy #2, Chapter 6) that identify urban greenspace opportunities and needs, considers wildlife connectivity within developed landscapes, and identifies natural fire buffers for improved safety. -Evaluate climate change mitigation planning for assumed migration from coastal to inland communities -Engage in robust planning for rural areas, including scaling of programs like "SOAR" implemented in Ventura County.	MED
3.2 Expand and support certification schema for bird-friendly commodities in Central Coast	-Encourage Bird-Friendly agricultural production practices and products through support and expansion of existing and new certification schema including beef and wine. Consideration of berry, leafy green and other intensive crop production systems.	MED
Initiative 4: Strengthen knowledge and awareness of Urban and Intensive Agriculture		
4.1 Strengthen understanding of bird-agricultural interactions	-Improve knowledge of edge effects from urban, suburban and agricultural development, including habitat configuration and connectivity, predation rates, invasive species incursions, and pollution among others. -Strengthen understanding of food safety and wildlife interactions, on-farm wildlife enhancement practices and effectiveness, as well as impacts of different agricultural management regimes (organic, diversified, regenerative, Indigenous, on birds and other wildlife.	MED
Expand Urban Bird Treaty, Bird Cities and other programming to the Central Coast	-Partner with ABC, USFWS and municipalities to develop bird-friendly urban programs such as, Bird Cities America, and projects in Salinas, Santa Barbara, and other larger cities. -Partner with landscaping companies to develop backyard bird habitat certificates and native plant restoration in urban and suburban gardens	MED

* Ratings provide a measure of effectiveness for each strategy based on a number of criteria including its expected impact on a pressure or conservation threat, whether the strategy is resilient to climate change, and if the strategy is feasible, etc. Low= not effective, Med=less effective, High= effective, Very High= very effective.

Direct mortality of birds in urban and intensive agricultural systems results in ecological traps for many species. Powerlines, industrial equipment, toxins, glass and collisions with infrastructure and cars, cats, mesopredators, light pollution, among other drivers of mortality can add significant pressure to populations, particularly in migration. Thoughtful design and retrofitting of urban and agricultural settings can help to mitigate these impacts. Pictured: Great horned owl found under a transformer, San Luis Obispo County.



6. ENABLING STRATEGIES

Strengthening the C3JV partnership and foundation

One intended outcome of this Plan is to spotlight the Central Coast as a region underrepresented in migratory bird, and landscape-scale conservation efforts despite its importance as a habitat and climate refugia. This socio-ecological need, coupled with multi-partner appeals to strengthen coordination and integration of existing and nascent conservation, research and monitoring efforts has heightened the urgency to steer greater attention to the region. While Chapter 5 has laid out goals and strategies geared toward addressing the needs of birds, other wildlife and people, the *success of the C3JV* as an emerging partnership in achieving landscape-scale impact will depend upon foundational structures and systems to enable conservation success. These **enabling strategies** are intended to elevate initial C3JV partner capacities to bridge research, monitoring and conservation results while also furthering new and existing partnerships. As next steps in conservation planning and implementation, these strategies form important bedrock tools for decision-making, long-term tracking and monitoring of impacts, strengthening of project design, and improving our effectiveness at achieving desired outcomes for the habitats and communities we have committed to. Our enabling strategies include:

1. **Prepare a Central Coast State of the Birds Report**
2. **Develop a Blue and Green Print of Priority Implementation Sites**
3. **Build an Integrated Monitoring/Research Network**
4. **Strengthen C3JV Capacity and Partnerships**

Together, these enabling strategies form our *Phase 2* as an emerging Joint Venture: that is the launch of our **BIRDS (Bridging Information for the Recovery of Declining Species) Initiative**. The BIRDS Initiative is a collaborative and integrative *Information-to-Implementation* program that capitalizes on existing and emerging research, restoration, protection and

recovery efforts to measure effectiveness of conservation project impacts, assist in prioritization of conservation-action priorities, and inform applied and adaptive stewardship activities on the ground. Our BIRDS Initiative folds our four enabling strategies into one initiative that will aid the C3JV and its growing partnership to more effectively address species declines and the inextricable linkages to human wellbeing while advancing both state and federal goals in addressing the climate and biodiversity crisis.

BIRDS INITIATIVE

—Elements and Outcomes—




A State of the Birds Report (SBR) for the Central Coast, pooling existing knowledge compiled by academic institutions, federal, state, tribal and NGO partners to provide a baseline conditional assessment of the Central Coast's role in the overall decline of resident and migratory birds. This directly addresses Enabling Strategy 1. The SBR is also designed to convene knowledge holders across the region, forming the C3JV's Knowledge Technical Committee to steer science and decision-making, and so also addresses Enabling Strategy 4 in part. The SBR will be used to refine our focal species population objectives, and corresponding habitat objectives, in concert with Enabling Strategies 2 and 3. Finally, the SBR will include a GAP analysis exposing missing knowledge, information, and indices for species and human wellbeing indicators, helping to direct monitoring network design discussed further below.

Central Coast Land and Seascape Priority Green/Blue Print indicating highest priority conservation spaces across seven habitat systems, in conjunction with state [Pathways to 30x30](#) regional implementation and informed by specific habitats or landscapes selected for their importance to focal species, as well as other key wildlife and human-wellbeing needs, including outdoor access and park-poor communities, expansion of Indigenous stewardship opportunities, and sites addressing environmental and climate justice. **This landscape prioritization effort will help inform our conservation target and human wellbeing domain goals** (e.g., identifying and ranking beaches of

importance to breeding, migrant and wintering shorebirds and/or prioritizing oak woodland and savanna sites for protection), but it will also form the basis for our spatially-explicit implementation focus areas, in collaboration with Birdscapes and IBAs, including Big Sur, the Santa Cruz Mountains, Gaviota Coast, Santa Lucia Range, Pinnacles region, Santa Ynez Mountains, and Point Conception, all with varying degrees of protection. This forms Enabling Strategy 2.

A durable and robust Central Coast **Avian Integrated Monitoring (AIM)** network built upon existing monitoring nodes (i.e. [Avian Knowledge Network](#)) to provide a regionally informed and regular assessment of status and trends for birds in the Central Coast. Such a network, modeled in part on successful examples in other parts of the state (e.g., Klamath Basin) and around the country, as well as integrating new tools and methodologies (e.g., [Motus](#), [eBird](#)), will provide effectiveness-monitoring of conservation efforts, support listing and recovery decisions, track climate-change induced impacts and movement and identify drivers of species decline. These data will also address local and stewardship-specific activities and questions, helping to fill the information-to-implementation gap that so-often plagues land stewardship efforts. An effective monitoring network is an essential tool to aid federal (e.g., Bureau of Ocean and Energy Management’s Offshore Renewable Energy Development efforts), state (e.g., California Wildlife Conservation Board-supported restoration and conservation outcomes) and local (e.g., Audubon’s Conservation Ranching Initiative) decision-makers in leveraging limited resources. An AIM network is a fundamental to assessing pressures and strategy implementation effectiveness on all conservation and wellbeing targets. The design of the network will include nested levels of intensity, utilizing large community science platforms, employing [Monitoring Avian Productivity and Survivorship \(MAPS\)](#) stations to understand reproductive success and survival rates, and intensive, long-term monitoring at selected sites where appropriate for species recovery. From our gap analysis, the AIM network will help fill knowledge gaps in population status and limiting factors through targeted monitoring and research. In addition to

avian focal species monitoring, the AIM network will also assess habitat values, tracking net landscape trends – track gains, losses, and net change of key habitats, and helping to set appropriate habitat objectives, particularly in the context of changing present and future habitat conditions and the impact. In the short term (1-3 years), our goal is to have a toolkit in place to monitor key attributes of each target and domain as identified in Chapter 5. This forms Enabling Strategy 3.

Priority Research Foci to inform AIM	
	Present and future habitat modelling and prioritization
	Research linking bird populations, habitat responses and stewardship practices to socio-ecological drivers like fire, urban effects, livestock and agricultural practices, drought conditions and other climate change indices
	Population and habitat objectives for focal species and establish baselines for Benchmark Goals
	Demographics and limiting factor research for conservation priority focal species and habitats.
	Social science research to inform decisions and actions that intersect wellbeing and conservation goals.

Build C3JV Capacity through Improved coordination, collaboration and partnerships to improve conservation effectiveness and strengthen community. As a new partnership, critical resources are needed to formalizing new relationships while also strengthening existing ones. Priority partnership development includes:

- Social Justice, Environmental Justice and Farmworker Rights Groups and advocates
- Indigenous Nations, Bands, Communities and liaisons
- Avian knowledge partners across academic, NGO, and Federal/State agencies
- Undergraduate and graduate students

The relationships that can bridge the scope of impact designed to increase the C3JV’s human resource, infrastructure, and information delivery capacities.

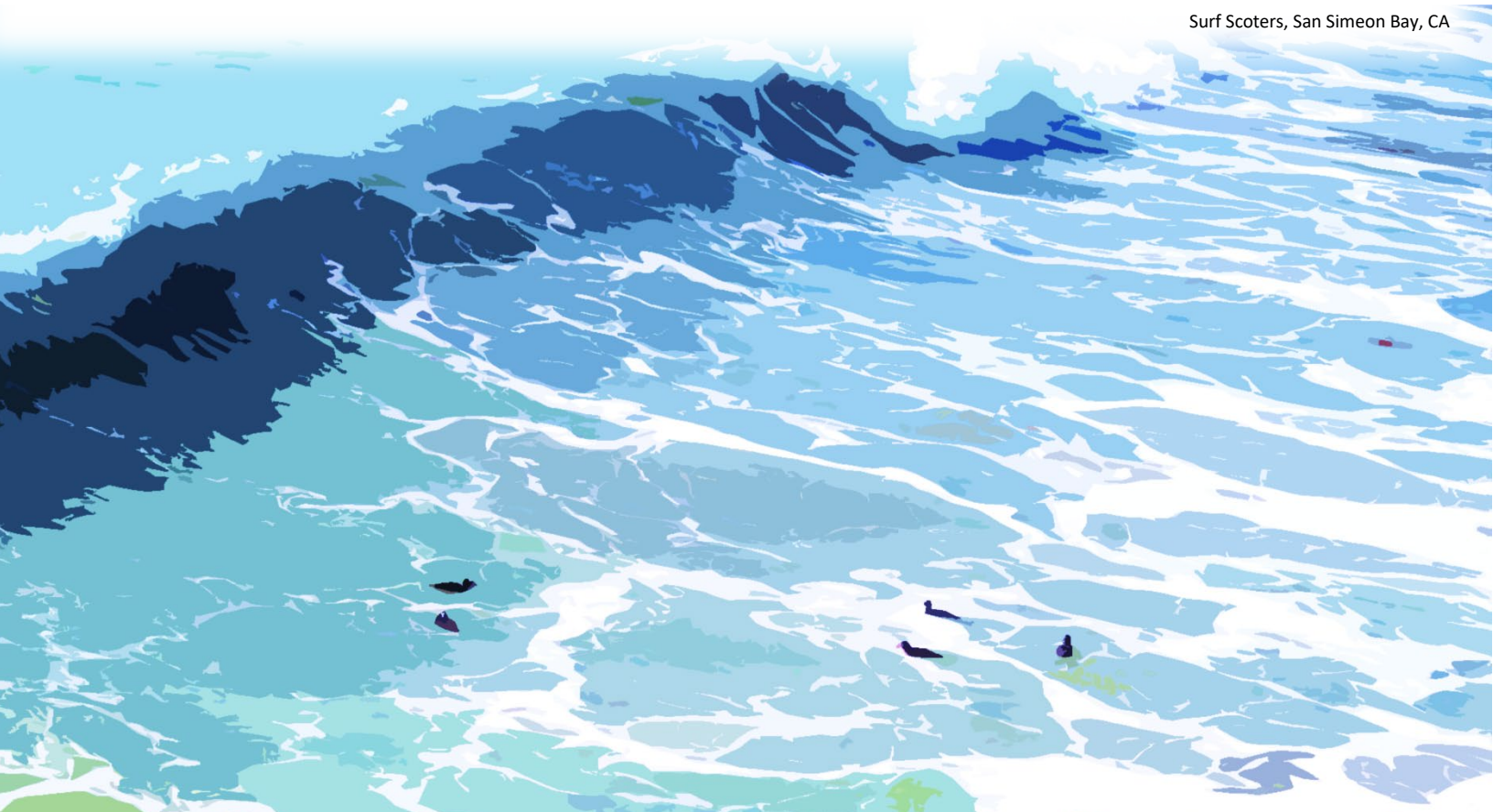
7. CONCLUSION

This Implementation Plan is phase I in bringing the Joint Venture model to California's Central Coast. Future efforts will supplement this plan through land and seascape prioritization, monitoring and research, strengthened engagement and coordinated implementation of landscape-scale projects. Our partnership is eager to implement the proven Joint Venture model:

- **Track Record.** Migratory Bird Joint Ventures have an excellent track record of delivering conservation across a diversity of habitats continent-wide. Since 1986, JVs have helped enhance, conserve and restore over 28 million acres of essential habitat across North America for people and wildlife, leveraging \$31 non-federal partner dollars for every federally appropriated dollar.
- **The Power of Partnerships.** JVs have a proven ability to work with a wide range of collaborators. This broad foundation and diversity of participation magnify the impact of each action.
- **Focus on Results.** The collective wisdom of the JV partnership is focused on agreed upon common goals and how best to achieve them.

- **Expertise.** JVs have proven they can deliver habitat to benefit birds. Each partner brings a special expertise to the table that contributes to developing solutions for problems.
- **Uniqueness.** Each JV is uniquely adapted to the cultural conditions within their boundaries. There is no single JV template.
- **Dedicated Staffing.** JV staff compile and organize information, coordinate meetings and actions and cultivate mutual partner support to allow each organization to focus on what it is they do best.
- **Support and Recognition.** JV staff work predominately in the background in support of their partner organizations. Credit and recognition are more readily broadcast and amplified through the JV partnership.
- **Accountability.** Work is planned, completed and reported based on objectives, priorities and accomplishments. It is opportunistic but not random.
- **Timeliness.** It is time to bring resources, recognition and coordination to the one and only area on the US map not currently supported by a JV; a region with urgent conservation challenges and some key implements missing in the conservation toolbox.

Surf Scoters, San Simeon Bay, CA



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[Riparian and Freshwater Wetland](#) Benchmark Goals

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APPENDIX A: SELECTION OF CONSERVATION PLANS/RESOURCES REVIEWED IN PREPARATION OF THIS DOCUMENT

California Partners In Flight Bird (CALPIF) Conservation Plans- [conifer](#), [grassland](#), [oak](#), [riparian](#), [scrub](#), and [desert](#)
[Pacific Americas Shorebird Conservation Strategy](#)

[Seabird Conservation Plan](#)

[North American Waterbird Conservation Plan](#)

[Southern Pacific Shorebird Conservation Plan](#)

[Partners in Flight Landbird Conservation Plan 2016 Revision](#)

[Coastal California \(BCR 32\) Waterbird Conservation Plan](#)

[2018 North American Waterfowl Management Plan 2018 Update](#)

[California State Wildlife Action Plan - Marine Province](#) and [Bay Delta and Central Coast Province](#)

[The California Current Marine Bird Conservation Plan](#)

[Resource Conservation Investment Strategy for Santa Cruz County](#)

[Resource Conservation Investment Strategy for Monterey County](#)

[Carrizo Plain National Monument Resource Management Plan](#)

[Upper Salinas River Watershed Action Plan](#)

[California Nature-Based Climate Solutions – Natural and Working Lands Climate Smart Strategy](#)

[Conserving California’s Coastal Habitats: A Legacy and Future with Sea Level Rise](#)

[Sonoran Joint Venture Bird Conservation Plan](#)

[Central Valley Implementation Plan 2020](#)

[Restoring the Estuary: an Implementation Strategy for SFBJV](#)

[Monterey Bay National Marine Sanctuary Management Plan 2008](#)

[KSON Klamath Siskiyou Oak Network Strategic Action Plan](#)

[USFWS Birds of Conservation Concern 2021](#)

[California Bird Species of Special Concern](#)

[Salt Marsh Bird Conservation Plan](#)

[Southern California Wetlands Recovery Project Plan](#)

[California Water Plan](#)

[Jack and Laura Dangermond Preserve Integrated Resources Management Plan](#)

[Marbled Murrelet Landscape Management Plan for Zone 6](#)

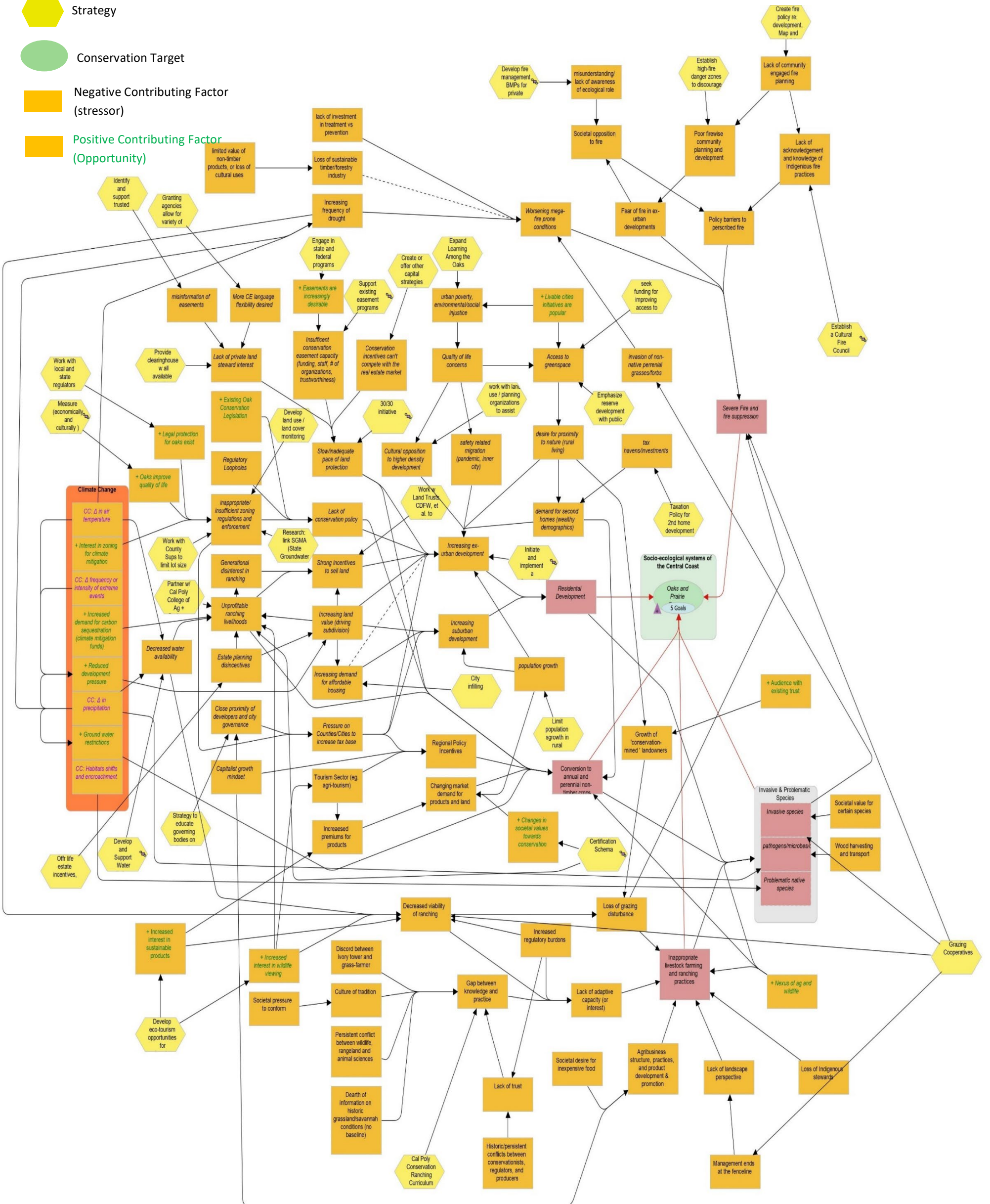
[Amuh Mutsun Land Trust Five-year Strategic Plan](#)

APPENDIX B: SITUATION ANALYSIS

Employing our Conservation Model Framework shown in Chapter 3, this example Situation Model of our Oak and Prairie Conservation Target uses Miradi desktop software to construct a more comprehensive look at the target, pressures, drivers, and strategies that form our understanding of the target context. By building this model, we can then employ the software's Results Chain-builder to theorize strategies addressing key pressures and the intermediate steps needed to achieving our objectives; and importantly, a mechanism to track success and failures that inform adaptation. Zoom into the frame to explore the model in detail.

Situation Model Key

- Threat or Pressure
- Strategy
- Conservation Target
- Negative Contributing Factor (stressor)
- Positive Contributing Factor (Opportunity)



APPENDIX C: THREAT RATINGS AND VIABILITY IN CONSERVATION STANDARDS



APPENDIX D: DEFINITIONS OF POPULATION OBJECTIVES:

As the first iteration of the C3JV Implementation Plan, population and habitat objectives have not been explicitly quantified. Instead, we employ four common objectives that reflect the current knowledge of each focal species and its conservation urgency and need, each of which are defined below. These are borrowed and adapted from the Sonoran Joint Venture Bird Conservation Plan. We also note for some species the initial objective is simply to establish a breeding population within the JV region. Our enabling strategies will help the partnership quantify more explicit habitat and population objectives, noting most focal species are identified as *Determine Status*.

Population Objective of **Maintain**: Protect existing habitat allowing for no net loss of habitat (allowances for habitat succession and habitat shifts due to climate change). Maintenance typically requires active protection and stewardship activities, and is not considered a passive status.

Population Objective of **Determine Status**: while concurrently following similar actions to Maintain, this category requires implementing a program to determine the population trend, limiting factors and key threats, distribution, and relative density of the species. In other words, baseline conditions and trend are unknown and require further information.

Population Objective of **Increase by 50%**: protect existing habitat while increasing the amount of suitable habitat such that the population of the target species increases 50%, and/or increasing the carrying capacity of existing suitable habitat such that the population of the focal species increases by 50%. Activities may include habitat restoration or enhancement to increase the carrying capacity of an area, addressing limiting factors for the target species that have or are actively depressing populations.

Population Objective of **Double**: for species which have experienced sharp historic losses, or which are continuing to show significant declines, a doubling objective requires activities to protect existing habitat while increasing the

amount of suitable habitat such that the population of the focal species increases by 100%. Activities might include habitat creation (i.e. inundating floodplains to create tidal flats), restoration (dam removal) and enhancement (invasive species removal) efforts.

APPENDIX E: FOCAL SPECIES SELECTION CRITERIA

Focal species selection criteria elements

Extent of Knowledge

Biology and life history information known (e.g., are there greater than 30 academic articles for the species)

Tolerance levels (or limiting factors) known (how sensitive is a given species to human disturbance)

Ecosystem Correlation

Change in bird correlates to change in ecosystem (quick, strong or consistent response to habitat attributes/management/restoration)

Measurability

Easy to measure (e.g., nests are easy to locate)

Large enough sample size (e.g., abundant breeders)

Cost effective (e.g., existing monitoring protocols/population measures have been established)

High detection probability

Location/distribution

C3JV represents a significant proportion of species range (in at least one stage of the life cycle)

Global vs local distribution (is it endemic or ubiquitous)

Area

Home range size (a measure of habitat blocks, e.g., species requiring large habitat blocks, or key connectivity needs)

Proportion of landscape occupied (e.g., is this species found across the C3JV, or in one isolated pocket?)

Breeding or wintering use in the C3JV (migratory status)

Heterogeneity

of habitat types a species must use (overlap across conservation targets?)

Overlap across jurisdictional/management units (partner considerations)

Vulnerability

Threat severity, urgency

Spatial extent, recovery time

Species at risk

Population declines

Warrant special management status

Reduced breeding range

Functionality

Key ecological role (predation, seed dispersal, seed predation, pollination, disturbance, competitive interaction, prey base, cavity builder)

Food or habitat specialist

Umbrella status (strongly associated with a habitat, habitat characteristic, or complex of cover types important to a community of species)

Negative indicator (e.g., cowbird)

Socio-economic significance

Cultural role (flagship species)

Economic value

Conflicts (negative value)

Guild

Represents different bird guilds

Variability

Low population fluctuations (e.g., perturbation is more 'readable')

Trends detectable (e.g. from a low or medium trophic level)

APPENDIX F: STRATEGY RANKING CRITERIA

	Urgency (conservation need)	Includes human wellbeing target(s)	Partner Interest	Effectiveness (Impact on Target and probability of success)	Climate Robustness	Multiple Conservation Targets	Total Score	Weighted Scores
General key: 3 = high, 2 = in between, 1 = less								
Funding key: 3 = funders identified, 2 = suspect there are funders, 1 = no known funders								
Wellbeing key: 3 = HW target is part of the strategy, 2 = indirectly (i.e. through ES), 1= No linkages to HW known								
Partner Interest key: 3 = many partners identified, 2 = at least 1, 1= none identified								
Criteria weighting	X2	X2						
							0	0
							0	0
							0	0
							0	0
							0	0
							0	0
							0	0

								0	0
								0	0
								0	0
								0	0
								0	0
								0	0

APPENDIX G: SJV-CVJC-C3JV STATEMENT OF ALLIANCE

Geographic Alliances between the California Central Coast Joint Venture and neighboring Sonoran and Central Valley Joint Ventures

In 2020 partners on the Central Coast, in a long-standing effort to fill the last, remnant geography in the continental United States unrepresented by a Joint Venture, established the California Central Coast Joint Venture (C3JV) with the naming of a Board, approval of bylaws and the hiring of a full-time coordinator to propel the emerging partnership. This launch was a feat of commitment by partners, and advanced by the support of neighboring Joint Ventures, including the San Francisco Bay Joint Venture, the Central Valley Joint Venture and the Sonoran Joint Venture.

As the C3JV enters its planning process, and as part of the necessary steps towards formal recognition by the US Fish and Wildlife Service Migratory Bird Program as a US Habitat Joint Venture, conversations have taken place between Coordination staff and Board members of the respective JVs with the goal of refining the planning geography of the C3JV. In particular, overlapping areas of interest between the C3JV, SJV and the CVJV in the southern and eastern margins of the ‘void’ were discussed, each elaborated below:

C3JV-SJV overlapping space of interest

The Point Conception region of northern Santa Barbara County includes an incredibly important transition zone with the Transverse Range demarcating an ecological shift terrestrially, and the Southern California Bight mirroring this transition in the marine system. As part of the USGS Central Coastal Hydrologic Unit, this region also includes important waterways such as the Santa Ynez River, one of the most northerly strongholds for the Least Bell’s Vireo, as well as the Santa Maria River Valley, an incredibly rich floodplain with significant conservation needs. The C3JV has established partnerships with the Department of Defense, The Nature Conservancy, Santa Ynez Band of Chumash Indians, as well as the Western Museum of Vertebrate Zoology, all of whom have interest in this region. The Sonoran Joint Venture also keenly recognizes the importance of this region, and while historically has not been significantly active here, finds huge potential in working to advance the myriad needs of their most northerly reach of the California Coast. During a meeting between the two Coordinators on April, 15th 2021, this overlapping interest was reconfirmed, and using the HUC10 Central Coastal Boundary as the unit of measure (refer to Figure 1), an initial agreement was made to advance this goal of working cooperatively and collaboratively in the overlapping space in northern Santa Barbara.

C3JV-CVJV overlapping space of interest

During the Implementation Plan revision process for the Central Valley Joint Venture, it was recognized that previous CVJV plans did not include some of the historic riparian and grassland areas in their primary focus area because the original boundary was based solely on elevation. The Jepson geographic system was chosen as a suitable replacement for elevation, providing an ecologically informed determinant of a new boundary, which resulted in a proposed geography that included portions of the adjacent Sonoran JV and what was still being developed as the Central Coast JV. Ultimately, as a product of these discussions, and utilizing watershed boundaries, an expanded region was agreed upon by all parties and adopted in the 2020 CVJV Implementation Plan.

As a follow-up to initial discussions in 2015 between the C3JV and CVJV coordinators, a meeting between the Coordinators, C3JV Board Chair, and the CVJV Science Coordinator was convened on April 29, 2021 to discuss how the JVs would move forward in treating the resulting overlapping space from the new 2020 boundary. In similar fashion to the SJV-C3JV Alliance Region, the C3JV-CVJV overlapping area-of-interest includes portions of San Luis Obispo and Monterey Counties in which partners in the C3JV are actively working. This is best exemplified by the Carrizo Plains, where California Polytechnic State University has long been engaged in both research and conservation efforts in this ecologically rich ecosystem.

Knowing the original intent of the CVJV expansion was in the nature of strengthening conservation and collaboration, the conclusion of the discussion recognized the benefits of working together to advance outcomes of interest for all. As in the case of the SJV, the parties agreed to treat the overlapping C3JV-CVJV space (based on the HuC10 Central Coastal Hydrologic Unit) as an 'Alliance Region' where both JVs can work independently, cooperatively and/or collaboratively to advance conservation. In future planning efforts the JVs may return to the table to discuss changes to boundaries if deemed appropriate by both parties.

Given those introductions, the following statement is intended to be memorialized in each respective Joint Venture Board Minutes, and if deemed necessary, MOU's may then be entered into between the SJV-C3JV and the CVJV-C3JV.

Statement of Alliance:

Within the SJV-C3JV and the CVJV-C3JV Alliance Regions, the respective JVs agree to work in a collaborative, cooperative, communicative and friendly manner to support the needs of current and future partner organizations in an effort to optimize attainment of the mission, goals and objectives of the U.S. Fish and Wildlife Service Joint Venture program. JV Partner organizations, as well as candidate organizations, whose project areas are located on respective JV shared boundaries may elect to work with one, the other or both regional JVs, as agreed to by the partner or candidate organizations and the partnering regional JV(s). The JVs are free to provide a variety of services to partner organizations, at the request of the partner organization(s), that involve lands within the Alliance Regions. The respective JVs are encouraged to collaborate in the provision of services to partner organizations, at the request of the partner. The JVs agree to notify one another should they be asked by a prospective partner organization to consider collaboration on or sponsorship of a project. Partner services to be provided by regional JVs include all those offered to other JV partners that are not located on shared boundaries. Those include: assistance with fundraising; technical assistance, such as biological planning and design review; among others. For projects/partners receiving services from both partnering JVs, staff from each JV will coordinate on how best to track and count the habitats, acres and species affected by partner projects. Each JV will continue to track and provide services on projects in which it has historically been involved through completion of the project or phase of a project. A regional JV may elect, at its discretion, to enter into a partnership with an interested organization, or it may decline to enter a partnership. There is no affirmative obligation for a regional JV to enter into a partnership that it deems to be inconsistent with its mission or interests.

Figure 1. Proposed Alliance Map for the California Central Coast Joint Venture Planning Region.



Bylaws of the California Central Coast Joint Venture

ARTICLE I- NAME, STRUCTURE & PURPOSE

As last amended 5_31_2021

Section 1. Name

This organization shall be known as the CALIFORNIA CENTRAL COAST JOINT VENTURE (“C3JV”).

Section 2. Background of the C3JV

The C3JV was established with the adoption of these bylaws and the establishment of its Management Board on January 29, 2020 at Cal Poly, San Luis Obispo.

Section 3. C3JV Organization

The organizational structure of the C3JV shall include a Management Board, as identified in Article II, a Joint Venture Coordinator, whose role is identified in Article III Section 1, and other staff and committees as the Board determines necessary.

Section 4. Vison of the C3JV

California’s Central Coast is a thriving community where our lands and waters are shared among birds, other wildlife, and people in a relationship of mutual wellbeing.

Section 5. Mission of the C3JV

The mission of the California Central Coast Joint Venture is to work in inclusive partnerships to steward healthy and resilient habitats for birds, other wildlife and people.”

ARTICLE II- MANAGEMENT BOARD

Section 1. Board Responsibility

The Management Board (“Board”) is responsible for overall policy and direction of the C3JV, and delegates responsibility for day-to-day operations to the C3JV Coordinator, other C3JV Staff and standing committees. The primary responsibility of the Board is to maintain leadership, guidance, resources, commitment, and support to accomplish the goals and objectives of the C3JV’s Implementation Plan. The Board will do this through the following:

- a. Provide guidance on organizational policy, program priorities, and long-range planning;
- b. Review, provide input, and approve the organizational plans;
- c. Hire, review and supervise the C3JV Coordinator;
- d. Work with the C3JV Coordinator to create an Implementation Plan which will identify measurable habitat and conservation objectives in accordance with the C3JV’s mission. The implementation will span approximately fifteen years into the future and may be updated at five-year intervals;
- e. Identify and help secure potential partnerships and funding sources;
- f. Approve the list of C3JV Awards and proposals submitted to NAWCA (North American Wetlands Conservation Act);
- g. Endorse significant budget changes;
- h. Endorse significant changes in the duties of C3JV staff and new C3JV staff positions;
- i. Recruit new board members and select new chairpersons;
- j. Appoint members to various committees;
- k. Determine how the members’ agencies/organizations can contribute to the C3JV partnership;

- l. Work with staff and committees to ensure that C3JV partnership accomplishments of their agencies/organizations are reported to the C3JV;
- m. Keep Congressional (U.S.) members informed of accomplishments and needs;
- n. Revise and update the Implementation Plan every five years to reflect new information and habitat needs; and
- o. Work with the Coordinator to develop and approve an Annual Work Plan.

Section 2. Board Composition

There shall be at least 12 members of the Board, and they will include volunteer representatives from federal, state, corporate, nonprofit conservation organization partners, and private individuals who are dedicated to promoting and supporting the goals and objectives of the C3JV and the conservation of birds and their habitats within the boundaries of the C3JV. The Board shall be guided by a Chair and Vice-chair and assisted by a Secretary and Treasurer as the elected officials of the C3JV. There is no maximum number of members who can serve on the Board.

Section 3. Board Member Qualifications

Persons who desire to serve on the Board should have demonstrated commitment to and advocacy for the C3JV mission and have the ability to represent C3JV interests across the entire C3JV planning area. Board members should serve the C3JV as a whole rather than any special interest group or constituency. Members should represent their organizations at a level sufficient to make commitments on policies and allocate resources to advance the objectives of the C3JV. Board members must be willing to actively participate in review of resource and management strategies, conference calls, scheduled Board meetings, committees, or other assignments and responsibilities required for the furtherance of the C3JV and its goals.

Section 4. Alternate Board Members

One alternate Board member may be pre-identified by each Board member. The role of the alternate Board member will be to serve as a proxy for the Board member in their absence. Alternate Board member will be identified no less than 24 hours prior to a meeting or required vote.

Section 5. Membership Dues

There are no dues to be a member of the Board, but the Board members are encouraged to support the operations of the C3JV within their respective organizational capacities, including in-kind services and mutually agreed upon financial contributions.

Section 6. Selection of the Board

The primary consideration in member recruitment is attracting Board members from organizations or individuals who best serve the C3JV mission and contribute to high-functioning leadership. New members may volunteer, be nominated by an active member, or be recruited by the Board to fill a vacancy. In addition, an agency, organization or entity may recommend an individual for Board membership. Candidate(s) shall be required to apply by submitting a letter of interest and qualifications to the Chair for Board review. A majority of Board quorum shall approve the candidate for membership. Any candidate not receiving a majority recommendation shall not receive any further consideration during that board meeting but may be reconsidered for membership in future meetings.

Section 7. Board Member Responsibilities and Expectations

While serving on the C3JV Board, members are expected to pursue the interests of the C3JV and not the interests of their organization. A member's first obligation is to avoid any preconceptions that they "represent" anything but the C3JV's best interests. As a general rule all Board members should:

- a. Know the mission, purposes, goals, policies, programs, services, strengths, and needs of the C3JV and promote the purposes, objectives and accomplishments of the C3JV to partners and the general public to enhance the C3JV's public standing;
- b. Be responsive to the needs of the C3JV partnership by replying to phone calls and emails from members and coordination office staff in a timely manner;

- c. Prepare for and participate in board and applicable committee meetings. Ask timely and substantive questions at those meetings consistent with their conscience and convictions and support the decisions of the governing bodies. Maintain the confidentiality of executive sessions. Periodically suggest agenda items for board and committee meetings to ensure that significant matters are addressed;
- d. Promote unity among members and seek alignment; respect and support majority decisions as the will of the organization. Bring good will to deliberations;
- e. Be willing to serve in leadership positions and undertake special assignments willingly and enthusiastically;
- f. Keep the coordination office apprised of activities that relate to bird habitat conservation and activities that would be of interest to the C3JV. When representing the C3JV at events and meetings, be able to distinctly differentiate when they are representing the C3JV and when they are representing their individual organizations.

Section 8. Board Member Term Limits

Board membership term limits will be determined based on the elected title of each Board Member.

- a. **Chair and Vice Chair** – individuals elected to these positions will serve a two-year term with the potential of reelection for one additional term thereby serving a maximum of four (4) consecutive years in that particular position. Individuals who have served as Chair or Vice Chair may be reelected to the same position after an absence from that position of at least twelve (12) consecutive months. Individuals who have served in Chair or Vice Chair positions may serve as general Board Members without restrictions.
- b. **Treasurer** - individuals elected to this position will serve three-year terms with no restrictions on the number of reelections. Individuals who have served as Treasurer may serve in any other elected Board position. The American Bird Conservancy (ABC) will serve as the fiscal agent for the C3JV, and thus all funds will be managed by ABC's Director of Finance and according to ABC financial rules and structure. Therefore, the role of C3JV Treasurer could be fulfilled by ABC's Director of Finance, who potentially may not be an official member of the C3JV board. The C3JV may choose to have a designated Treasurer to serve on the C3JV board and, if so, the C3JV Treasurer will work closely with ABC's Director of Finance.
- c. General Board Members and **Secretary** – Individuals elected as "general" Board Members or Secretary will serve three (3) year terms with no limitations on the number of consecutive terms served. Any general Board Member or Secretary may be elected to serve as Chair, Vice Chair, or Treasurer following the described schedules for those positions.
- d. Election of Officers: At the completion of each board officer's term, the election of the officers (Chair, Vice Chair, Treasurer and Secretary) - and any Committee Chairs and Vice Chairs - shall be proposed by the nominating committee and elected by the full board at the end-of-the-year board meeting, defined as the board meeting that occurs closest to December 31 (I.e. November, December, January or February).

Board terms are calculated from January - December, and the terms of Board members elected in the middle of any year are calculated as beginning that January. To the extent practicable, the Board shall have staggered terms so approximately equal number of members are eligible for election each year.

Section 9. Resignation and Removal

Any organization or individual may resign by giving written notice of his or her resignation to the C3JV Coordinator and Board Chair. The Board may replace the Board member at its discretion.

Any member organization or individual may be removed, with or without cause, by a vote of two-thirds of the Board based on a quorum. Two-thirds of the voting Board members shall be required to constitute a quorum when considering Board member removal.

Section 10. Leave of Absence

A Board member may receive a leave of absence of up to one year. In this situation, a pre-designated Board alternate would fill in for the absent Board member and be subject to following the member responsibilities. If after a full year's leave of absence, a Board member is unable to return, that Board member may recommend a permanent replacement to complete the absentee Board member's term; on which the full Board will hold an up or down vote.

Section 11. New Board Member Orientation

It shall be the [OB] responsibility of the Coordinator working with the Chair to provide a copy of the C3JV bylaws [OB] and Implementation Plan and inform new members about the general organization and administration of the Board, its mission, policies and programs, any major problems it faces, programs of development in progress, and members' responsibilities. Such orientation shall be planned and carried out whenever a new Board member is appointed.

Section 12. Board Meetings

A) Regular Meetings

The Board will meet three (3) times per year; one of which may be held via teleconferencing. Date and location of regular board meetings shall be determined by the Board and made available to all Board members. It is expected of all members to give ample notice of their intent not to participate. Any regular board meeting may, due to unforeseen circumstances, be rescheduled or cancelled or be waived by a majority vote of the Board.

B) Non-member Participation in Regular Board Meetings

Non-members are welcome to attend meetings of the Board and may address the Board during sections of the agenda designated for comments. Defamatory or abusive personal remarks are always out of order. The Chair may terminate the speaker's privilege if, after being warned, the speaker persists in improper remarks. The Chair may also order the removal of any person who persists in improper conduct during a meeting of the Board, by Police and Public Safety Officers or any lawful means.

C) Executive Session

The Board, at its discretion during any regular board meeting, may enter into executive session, whereby the Board may request non-members, C3JV staff or others to remove themselves from the meeting.

D) Quorum & Voting

At any meeting of the Board a quorum shall be more than one-half of the total number of Board members at that time, except when the Board may be determining potential removal of a Board member which requires a quorum of two-thirds of the Board members. The quorum for a vote will be based upon the number of members present who have not recused themselves from a vote.

E) Place and Method of Voting

Voting shall normally take place at board meetings. Between board meetings votes may be conducted by facsimile, electronic mail, or by telephone during a conference call. Non-meeting votes shall be conducted by the Chairperson and shall be conducted not less than one week after all Board members have been notified about the vote by mail, electronic mail or telephone.

F) Meeting Agenda

The Coordinator, in collaboration with the Board chair and committee chairs, is responsible for drafting an agenda with necessary supporting reports and documents for each regular meeting. The chair shall revise and/or approve the agenda. The agenda, with supporting materials, shall be made available to each member of the Board at least one week in advance of a meeting. All Board members are encouraged to bring forth agenda items in advance of meetings. All agendas will include clear framing of the meeting target(s) and objectives and each item will be tagged with what action (if any)

needs to be taken (e.g., a vote, informational only, etc.). Hard copies of the agenda or supporting materials will not be provided at the meeting. The agenda may be modified at a board meeting with consent of the Board. The chair shall call the meeting to order upon the arrival of a quorum.

G) Meeting Minutes

The Coordinator, in coordination with the secretary, shall keep a written record of each regular meeting of the Board. Draft minutes of a board meeting shall be made available to members within thirty days of the meeting for review and comment. Committee chairs reporting at the board meeting will provide the Coordinator with a digital copy of their report notes no later than one week after the board meeting. Minutes shall be approved at the beginning of the next board meeting. Members may, upon notification to the Coordinator, request a copy of any past board meeting minutes. All books and records of the corporation may be inspected by any Board member, or his agent or attorney, for any proper purpose at any reasonable time.

H) Board Meetings and Attendance

It is an expectation of every Board member to fully participate and contribute at all C3JV Board meetings. When a member cannot attend a board meeting, they should coordinate with their designated alternate to arrange for them to attend as a proxy. A concern about attendance is prompted if any of the following conditions exist in regard to a member's attendance at board meetings: a) The member has two un-notified absences in a row. 'Un-notified' means the member did not contact the Coordinator prior to the board meeting to indicate they would not be present at the meeting; b) The member does not attend at least two meetings per year; or c) The member has three notified absences in a row. When an attendance concern is identified, the Coordinator shall contact the member to discuss the situation and share the member's response with the Board. The Board shall then determine what action, if any, should be taken. Should a member not be able to fulfill the requirements of board meeting attendance, it is reasonable to accept and/or request the member's resignation from the Board.

Section 13. Board Conduct

A) Board General Conduct

The Board acknowledges its responsibility, collectively and individually, to act in a manner consistent with these rules and bylaws as well as with other Board policies and practices. The Board recognizes that it has authority to act only as a unit and that individual member or groups of members have no authority to act in matters or represent themselves under the C3JV name. Members may not engage in outside activities or discussions with any person which would create a risk of disclosing confidential or proprietary information or hinder furtherance of the mission of the C3JV. The Board shall enforce upon itself whatever disciplinary action is needed to govern and discharge its duties effectively and efficiently. The Board and individual member self-discipline shall apply at all times and to such matters which include, but are not limited to, attendance, respect of others, proper decorum, confidentiality with sensitive information, speaking with one voice, and adherence to the policies and rules of the C3JV and the Board. The Board shall not allow any member or committee of the Board to hinder or be an excuse for not fulfilling the Board's responsibilities in a professional and responsible manner. Each member shall conform his or her behavior in accordance with Board and general policies regarding ethical and professional conduct. The Board may terminate membership for any organization or individual whose conduct is deemed inappropriate.

B) Parliamentary Procedure & Authority

In general, and unless otherwise required by these bylaws, the Board shall act by resolution or motion brought by a member, seconded by another member, and approved by a majority of the Board. A motion to call the question, if seconded and approved by majority, shall end debate and require a vote on the main motion or resolution. A motion to table may be made at any time. A motion to adjourn may be made at any time and takes priority over any other motion. When there shall be any question regarding procedure not addressed by these bylaws, the current edition of Robert's Rules of Order

Newly Revised for deliberative bodies (not the more limited Procedures in Small Boards) shall govern in all cases to which they are applicable and in which they are not inconsistent with these bylaws.

C) Receipt of Confidential Information

At times, members may receive confidential or sensitive information concerning C3JV affairs, including information which, if disclosed, could have adverse consequences to the C3JV. For example, information received in a closed session of the Board that is disclosed to the public or any individual or group by a member could result in the waiver of the attorney-client privilege. Accordingly, members shall keep confidential all information of a confidential or sensitive nature provided to the Board, the disclosure of which would violate the fiduciary obligations of the Board, compromise the attorney-client privilege, or violate any law or court order, and shall not disclose any confidential information received during closed sessions of the Board or otherwise.

D) Board Communications Outside of C3JV

Board members may not engage in outside activities or discussions with any person which would create a risk of disclosing confidential or proprietary information or hinder furtherance of the mission of the C3JV. The Board may develop more specific guidelines on private policy.

Communication with Legislators, Public Officials and Community Leaders: When in contact with legislators, public officials and community leaders, Board members should only discuss items that are included in the Implementation Plan or Annual Work Plan and maintain consistency with established Board decisions, policies and plans, and coordinate contacts with the Board Chair and the C3JV Coordinator and any appropriate committees. Members, when acting as individuals, should take reasonable care to clarify that they are acting as individuals and not on behalf of the Board or C3JV.

Relationship with the Media: Members of the Board are encouraged to promote and further the mission of the C3JV when interacting with members of the press. The goal is to speak with one voice and to remove potential of conflicting statements. Only the Chair, Vice Chair, C3JV Coordinator, or those authorized by the Board may speak for or represent the C3JV with the media. Where advance notice is provided, all outside communications shall be approved by the Board.

E) Conflict of Interest

All Board members are required to disclose any personal or organizational interest in a transaction or project under consideration by the Joint Venture. In addition, all potential conflicts of interest must be disclosed so that decisions made by the Joint Venture are not interpreted to be influenced by the appearance or fact of personal, material financial benefit to individuals.

Definition - A conflict of interest exists whenever a member of the Board (including a spouse, sibling, parent or child of a Board member) has a personal, material financial interest in a transaction or project under consideration by the Board.

Board Members Obligation - Each Board member has the obligation to avoid a conflict of interest and must disclose to the Board the existence of any real or potential conflict of interest.

Board's Obligations - If the Board determines that a transaction or project of the Joint Venture involves a conflict of interest, whether real or apparent, by a member of the Board, the Board shall, at a minimum, require the Board member to abstain from voting on any such issue. The Board may approve of such project or transaction only if the Board makes specific findings that the transaction or project is: (a) fair and benefits the Joint Venture and its objectives; and (b) approved with full knowledge of the economic benefit to the Board member involved in the conflict of interest. This interest could involve: benefit to the professional or personal interests of the member; the appearance of divided loyalties; the advancement of self-interest; or creating a risk of disclosing confidential or proprietary information of the C3JV. A former or current Board member shall not apply for a contracted staff position with the C3JV nor be compensated for individual work performed on behalf of the Board until he or she has resigned from the Board. Similarly, contracted individuals, regardless of the type of compensation received or scope of work agreed upon, shall be excluded from membership on the Board while maintaining a contractual agreement with the C3JV.

F) Compensation and Reimbursement of Expenses

1. *Compensation.* No member of the Board shall receive any compensation for services rendered to the C3JV. It is a voluntary position.

2. *Travel Expenses.* The Board recognizes the value of membership and attendance at conferences, workshops, and meetings. If not already included in the annual budget, the Executive Committee shall pre-approve reimbursement of reasonable and necessary required travel expenses for members and non-members to carry out C3JV business. Reimbursements shall be subject to any/all applicable rules, regulations and guidelines of the funding source utilized for said reimbursement.

G) Written Correspondence

If the staff or Board receive a request to comment or provide letters of support for habitat projects, policy issues or other issues of interest to the C3JV, then the C3JV Coordinator and the Board Chair will discuss the merits and how it advances the mission of the C3JV. If, in their judgement, the issue is non-controversial and will advance the mission of the C3JV then they may provide the requested letter and will send copies to the full Board. If the Coordinator and Chair believe the action is potentially controversial, then they will forward the proposed action to the full Board for their review and approval before taking action. More extensive comments on issues, policy or legislation that are beyond the immediate scope of the C3JV will be left to the discretion of individual member organizations.

ARTICLE III- ROLES OF BOARD POSITIONS

Section 1. Role of the Board Chair

Duties of the Chair are to (1) Plan, chair, and facilitate board meetings to assure full participation, abide by by-laws to reach group decisions, and keep discussions on track and on time; (2) Chair the Executive Committee and request, plan, and facilitate Executive Committee calls or meetings in conjunction with the Coordinator, (3) Lead voting as described in Article II Section 12 and adopted processes (4) Be available to make decisions that can affect or enhance the goals of the C3JV and support the decisions of the Board (5) Be the Board liaison with Staff. Therefore be available for phone calls/email exchanges with Staff on a regular basis, sometimes daily or weekly when issues are pressing or timely; schedule periodic in-person meetings with Staff; alert staff and vice chair regarding periods of unavailability to ensure continuity, (6) Work with Staff and other C3JV partners to strategize and craft annual goals in concert with the Board (7) Have the time and ability to travel locally and nationally on behalf of the C3JV and be able to travel, help set up meetings, and represent the perspectives of the C3JV with elected and agency leaders in Washington, DC and Sacramento, CA (8) Represent the C3JV and contribute to strategy development and decision-making at the national and state level, including with the Association of JV Management Boards, US Fish and Wildlife Service, Federal and State Agencies, and State and Federal appropriations processes. (9) Represent the C3JV to funding agencies on behalf of C3JV goals and advocate priority projects in coordination with the Board (10) Sign endorsement and other letters on behalf of the C3JV Board; Work closely with the Vice chair on all pertinent matters (11) Provide reasonable advance notice to the Vice Chair and Coordinator when unavailable and the Vice Chair is needed to assume the C3JV Chair responsibilities.

The Board Chair may not appoint any committee chairs, committee members (standing or ad hoc), or assign members duties or responsibilities without approval by the Board or relevant committee.

Additional Commitments Expected of the Chair: (A) A significant time commitment is required. Although time may average 2 hours/week, there are times (such as for travel to JV Association meetings or Washington DC) where several days are required simultaneously. (B) The Chair should be able to contribute to travel and other C3JV related expenses, including through in-kind support (C) The Chair is accountable to the Board and serves at the pleasure of the Board.

If the Chair cannot fulfill this duty, the Board would be responsible for selecting a member to assume this responsibility. The Board Chair is responsible for providing feedback to the Coordinator on

Implementation Plan development based on feedback received from the Board members. The chair shall also provide feedback to the Coordinator's direct supervisor on the Coordinator's performance prior to the completion of his or her annual review. the Chair of the Board may make recommendations to the Board to establish and/or dissolve committees as may be necessary to further the mission of the C3JV. Such committee recommendations shall be approved by the Board.

Section 2. Role of the Board Vice-Chair

The position of Vice Chair provides back-up and support to the Chair. The time serving as Vice Chair provides a period of training to potentially become Chair, during which the incumbent steps in for and assists the Chair in any matters of the C3JV.

Section 3. Role of the Board Secretary

The Secretary shall work with the Board and the C3JV Coordinator to ensure that the proceedings of Board meetings are recorded, distributed, and approved.

Section 4. Role of the Board Treasurer

The Treasurer shall ensure that all activities concerning the financial health of C3JV are properly maintained, that financial audits are performed annually in accordance with federal guidelines with results reported to the Board, and that the annual tax return is filed with the Internal Revenue Service. ABC will serve as the fiscal agent for the C3JV, and thus all funds will be managed by ABC's Director of Finance and according to ABC financial rules and structure. Therefore, the role of C3JV Treasurer could be fulfilled by ABC's Director of Finance, who potentially may not be an official member of the C3JV board. The C3JV may choose to have a designated Treasurer to serve on the C3JV board and, if so, the C3JV Treasurer will work closely with ABC's Director of Finance.

ARTICLE III- COORDINATOR & STAFF POSITIONS

Section 1. Role of the Coordinator

The C3JV Coordinator is selected by the Board, reports to the Chair and the Board and works on a day-to-day basis with the Executive Committee to implement the Board's directions. The Coordinator serves as a liaison between Board and Committees and helps coordinate the Committees' activities. The Coordinator works with conservation professionals and advocates, and forges working partnerships among public agencies, environmental organizations, business groups and landowners to achieve the Joint Venture's goals. The Coordinator has a leadership role in shaping the C3JV's operations, policies, and growth. The Coordinator oversees the program that helps the C3JV members pursue Board-approved goals and work plans. The Coordinator supervises other C3JV staff persons and/or contractors who manage specific Joint Venture programs. The Coordinator reports to the Board with oversight by the Executive Committee. She/he will take the lead role in coordinating with Federal, State, municipal, and private groups to focus activities toward meeting the objectives and priorities of the C3JV. The Coordinator will administer the C3JV annual budget.

Section 2. Staff

The Coordinator may hire additional C3JV staff with approval of the Board. Staff will be supervised and report to the Coordinator.

ARTICLE IV- COMMITTEES

Section 1. Committee Membership

The Board Chair appoints the chairs of all committees, subject to ratification by the Board. It is the desire of the Board to benefit from the diverse skills and experience each member brings, and thereby encourages members to participate on standing or ad hoc committees.

Section 2. Executive Committee

The primary function of the Executive Committee is to facilitate important C3JV issues which require a definitive action in the time between Board meetings. The Executive Committee will include at the least the Chairperson, the Vice-Chairperson, Past Chairperson(s), and committee chairs. Issues resolved by the Executive Committee will be submitted to the Board as soon as possible by email or at the next board meeting. The Board may identify other Board members to serve on the Executive Committee for specific terms.

Section 3. Working Committees

Initially the C3JV will establish a Science and Conservation Working Committee with membership open to all interested individuals dedicated to supporting the goals and objectives of the C3JV. Other working committees may be formed by the Board in the future.

It is the desire of the Board to benefit from the diverse skills and experience each member brings, and thereby encourages members to participate on standing or ad hoc committees. Committee chairs shall be from staff of Board members, shall be approved by the Board, and be willing to serve a three-year term with no term limits. The Coordinator or designates will work closely with the committees and will be included on all committee correspondence and will be invited to attend committee meetings.

Section 4. Ad Hoc Committees

The Chair may establish and appoint ad hoc committees for specific purposes, subject to ratification by the Board.

ARTICLE V- FISCAL MANAGEMENT & RECORDS

Section 1. Annual Operating Budget

The fiscal year of the C3JV shall be from January 1st to December 31st. The Board shall review and adopt a draft Annual Operating Budget, as presented by the Coordinator at the first meeting of the calendar year contingent upon allocation of funding from the USFWS. Once an annual budget is approved, the Executive Committee has authority to make amendments to the budget but must inform the entire Board within 30 days of any amendments, including rationale. The Board shall first approve any expenditure in excess of an approved budgetary limit.

Section 2. Awarding Contracts & Agreements

ABC will serve as the fiscal agent for the C3JV and thus ABC's financial protocols and regulations will take precedence, when applicable, over the following: The Board may authorize any Board member or the C3JV Coordinator to enter into any contract or execute and deliver any instrument in the name of and on behalf of the Joint Venture. No loans shall be contracted on behalf of the C3JV and no evidences of indebtedness shall be issued in its name unless authorized by a resolution of the Board. Such authority may be general or confined to specific instances. All checks, drafts, or other orders for the payment of money, notes, or other evidences of indebtedness not exceeding \$1,000 in value shall be drafted and executed by the C3JV Coordinator. Values exceeding \$1,000 in value will require signature by the Coordinator and one other person from a list designated by the Board. All funds of the Organization not otherwise employed shall be deposited from time to time to the credit of the C3JV in such banks, trust companies, or other depositories and by persons the Board shall select.

Section 3. Financial Management/Fiscal Agent

With approval of an annual budget, the Executive Committee also shall approve one or more designated entities responsible for providing financial services to ensure that C3JV accounts are accurate and properly administered. These services shall include maintaining general accounts of receipts and expenditures, processing grants and revenues received, processing approved payments of salaries and invoices for goods and services, maintaining financial documentation of transactions, and ensuring accessibility of information for audits and tax requirements.

ARTICLE VI- INTERNAL REVIEW

Section 1. Reviews and Evaluations

The Board or a designated subgroup will evaluate C3JV staff at least annually. The Board and Committees will conduct annual “self-evaluations” and report any findings to the full Board. The Implementation Plan shall contain performance measures through which the continuous improvement of the C3JV can be evaluated.

ARTICLE VII- IMPLEMENTATION PLAN MANAGEMENT

Section 1.

An Implementation Plan shall be developed a by the C3JV Coordinator and approved by the Board. The Implementation Plan will provide long-range guidance for the C3JV’s work and conservation actions, including a) Biological planning and prioritization, b) Project development and implementation, c) Monitoring, evaluation, and applied research activities, d) Communications and outreach, e) Fund raising for projects and f) other activities. The Implementation Plan will be updated and revised periodically.

ARTICLE VIII- AMENDMENTS

Section 1. Authority to Adopt, Revise, and Distribute Bylaws

These bylaws may be adopted, altered, amended, or repealed, including any new bylaws adopted at any regular or special Board meeting, by two-thirds majority vote by quorum; provided that the proposal has been presented in a previous meeting of the Board. Two-thirds of the voting Board is required to constitute a quorum. Any properly adopted new or amended bylaw shall take immediate effect unless otherwise stated by the Board at the time of adoption. Copies of the C3JV bylaws shall be provided to each current Board member and to each new Board member and maintained by the coordination office.

Approved and adopted by the attendees of the January 29, 2020 C3JV Launch Meeting held at Cal Poly, San Luis Obispo.

Amended: Month day, Year

Amended: April 7, 2020: Article II. Management Board; Section 8. Board Member Term Limits: “Paragraph d. Election of Officers” was added.

Amended: May 8, 2021:

- Article I. Name, Structure & Purpose; Section 5. Purpose of the Bylaws: Delete section “5”.
- Article I. Name, Structure & Purpose; Section 4. Mission and Purpose of the C3JV: Rename section “4” to Section “5” and modify text to read, “Mission of the C3JV.” Modify the Mission Statement to read, “***The mission of the California Central Coast Joint Venture is to work in inclusive partnerships to steward healthy and resilient habitats for birds, other wildlife and people.***”
- Article I. Name, Structure & Purpose; Add a new “Section “4” to be named “Vison of the C3JV” and add the following vision statement, “***The many partners that together construct the California Central Coast Joint Venture collectively imagine the future California Central Coast as a thriving community where our lands and waters are shared among birds, other wildlife and people in a relationship of mutual wellbeing.***”
- Article II. Management Board; Section 6. Selection of the Board: “The vote shall take place at the next board meeting with or without the candidate present.” was removed
- Article II. Management Board; Section 8. Board Member Term Limits: Paragraph b. “four” was removed and “three” was added
- Article II. Management Board; Section 8. Board Member Term Limits: Final paragraph, “To achieve this during the creation of the Board during the C3JV launch in 2020, one-third (1/3) of Board members nominated will begin with 1-year terms, one-third (1/3) will begin with 2-year terms, and one-third (1/3) will begin with 3-year terms” was removed.

Riparian and Freshwater Wetlands

Bald Eagle: [Cornell Lab](#), [CDFW](#), [VWS](#), [CAL Nature Map](#), [Sorenson et al 2017](#), [Life History](#)

Bank Swallow: [CalPIF](#), [Audubon](#), [Cornell Lab](#), [CDFW](#), [Bank Swallow Portal](#), [Recovery Plan 1992](#)

Black Swift: [Cornell Lab](#), [Audubon](#), [CDFW](#), [UNM](#), [Nest selection](#), [behavior](#),

Black-headed Grosbeak: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [USGS](#), [Habitat selection](#),

Common Yellowthroat: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#),

Great Blue Heron: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS-distribution and abundance](#), [CAL Nature Map](#), [ACR](#),

Least Bell's Vireo: [CalPIF](#), [Cornell Lab](#), [CDFW](#), [FWS](#), [Center for Biological Diversity](#), [USGS: Habitat modelling](#), [1998 Recovery Plan](#), [1989 FWS Ecology and Conservation Report](#),

Least Bittern: [Cornell Lab](#), [Audubon](#), [CDFW](#), [IUCN Heron Conservation](#), [Breeding biology](#), [Survey Protocol](#)

Long-eared Owl: [Cornell Lab](#), [Audubon](#), [CDFW](#), [ABC](#), [CAL Nature Map](#), [Diet](#), [Biology and status in California](#),

Pacific-slope Flycatcher: [Cornell Lab](#), [Audubon](#), [CDFW](#), [USFS](#), [USGS](#), [Avibase](#), [Response to fire](#),

Purple Martin: [Cornell Lab](#), [Audubon](#), [ABC](#), [CDFW](#), [VWS](#), [CAL Nature Map](#), [Purplemartin.org](#), [California Birds](#), [Airola and Kopp 2009 Decline in California](#), [Martins in Oak Woodlands- USFS](#), [Regional declines](#), [Importance of snags](#),

Southwest Willow Flycatcher: [CalPIF](#), [Cornell Lab](#), [CDFW](#), [FWS](#), [NPS](#), [NRCS](#), [Los Padres Forest Watch](#), [Center for Biological Diversity](#), [Distribution in California](#), [Natural History and survey protocol](#), [California survey protocol](#), [USFWS 2002 Recovery Plan](#)

Swainson's Thrush: [Cornell Lab](#), [Audubon](#), [Adult and Juvenile Survival](#), [SD Plant Atlas](#), [Range in California](#), [migration patterns](#),

Tricolored Blackbird: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [Center for Biological Diversity](#), [UCDavis Tricolored Blackbird Portal](#), [ABC](#), [Xeno-canto](#), [CDFW](#), [FWS](#), [CAL Nature Map](#), [Conservation Plan](#)

Western Yellow-billed Cuckoo: [CalPIF](#), [Southern Sierra Research Center](#), [Cornell Lab](#), [CDFW](#), [FWS](#), [Center for Biological Diversity](#), [Dettling 2015 Current Status](#), [Wohner et al. 2020 habitat needs](#), [Stanek et al 2021 nest selection](#), [Breeding habitat Johnson et al 2017](#),

Yellow Warbler: [Grinnell 1903](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [Life history](#), [USGS](#), [SD County Plant Atlas](#), [FWS](#), [Timmer Habitat Associations](#)

Yellow-breasted Chat: [CalPIF](#), [Audubon](#), [Cornell Lab](#), [CDFW](#), [SD County Plant Atlas](#), [FWS](#), [USGS](#), [Migration and Ecology Mancuso et al 2022](#), [Green et al 2020 brood parasitism](#), [USGS habitat map](#)

Scrub and Chaparral

Allen's Hummingbird: [Cornell Lab](#), [Audubon](#), [CDFW](#), [USGS](#), [ABC](#), [FWS](#), [Clark 2017 ebird expansion](#), [Woods 1927 historic account](#), [hummingbird guide](#),

Bell's Sparrow: [Cornell Lab](#), [Audubon](#), [CDFW](#), [USGS](#), [Sparrows and fire Akcakaya et al. 2005](#),

Black-chinned sparrow: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [USGS](#), [Avian Conservation Partners](#), [Hargrove 2010 Breeding behavior](#)

California Quail: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [CAL Nature Map](#), [Starker Leopold's The California Quail](#), [Comparative ecology Gutierrez 1997](#), [Quail and vineyards from Tietje 2008](#)

California Thrasher: [Cornell Lab](#), [Audubon](#), [CDFW](#), [SD County Plant Atlas](#), [USGS](#), [Grinnell niche relationships](#)

California Towhee: [Cornell Lab](#), [Audubon](#), [CDFW](#), [USGS](#), [FWS](#)

Common Poorwill: [Cornell Lab](#), [Audubon](#), [Beauty of birds](#), [NPS](#), [CDFW](#)

Costa's Hummingbird: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [ABC](#), [FWS](#), [Avian Conservation Partners](#), [Western Hummingbird](#),

Greater Roadrunner: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [USGS](#), [FWS](#), [Grinnell](#), [Home Range Dynamics Kelley et al 2011](#)

Le Conte's Thrasher: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [Point Blue- Carrizo Plain](#), [Carrizo Plain Monitoring and conservation](#), [CSU San Joaquin Valley Population](#), [USFS](#), [DoD Meta Population Dynamics Blackman and Diamond 2015](#), [AZ Game and Fish survey protocol](#),

Mountain Quail: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [FWS](#), [Western Quail Management Plan](#),

Phainopepla: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [Desert Museum](#), [distribution and habitat](#), [Crouch 1943](#), [breeding biology Texas A&M](#),

Rufous-crowned Sparrow: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [NPS](#), [USGS](#)

Spotted Towhee: [Cornell Lab](#), [Audubon](#), [CDFW](#), [ABC](#), [NPS](#), [USGS](#), [FWS](#), [Mortality factors](#), [Small 2005](#), [Survival rates](#), [Gardali and Nur 2006](#), [Population dynamics](#), [Small et al. 2007](#),

Wrentit: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [San Diego Plant Atlas](#), [Population history Burns 2006](#),

[Effects of mist netting on reproduction, Jennings et al 2009](#),

Oaks and Prairie

Acorn Woodpecker: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [VWS](#), [USFS](#), [ABC](#), [UCOaks](#), [Nest site selection](#), [Hooge et al. 1999](#), [What we don't know about Acorn Woodpeckers](#), [Koenig and Walters 2014](#),

Ash-throated Flycatcher: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [USFS](#), [USGS](#), [Texas A&M](#), [Bird Communities of Chaparral and Oak Woodlands](#), [Avery 1989](#), [Habitat and nest-box occupancy](#), [Milligan and Dickinson 2016](#),

Band-tailed Pigeon: [Cornell Lab](#), [CDFW](#), [Audubon](#), [San Diego Plant Atlas](#), [FWS](#), [Avian Conservation Partners](#), [BT Pigeon in California](#), [Smith 1968](#), [2021 Population Status](#),

Burrowing Owl: [CalPIF](#), [Cornell Lab](#), [CDFW](#), [Stanford](#), [CAL Nature Map](#), [FWS](#), [USFS](#), [Center for Biological Diversity](#), [Burrowing Owl Conservation Network](#), [California Chaparral Institute](#), [UCDavis- status in California](#), [California Burrowing Owl Consortium](#), [Changes in distribution and abundance in California](#), [Wilkerson and Siegel 2010](#), [Dispersal in California grasslands](#), [Rosier et al. 2006](#), [owls and pesticides Gervias et al. 2000](#), [Natural history](#), [Winchell 1994](#), [Habits of the burrowing owl in CA](#), [Canfield 1869](#),

California Scrub Jay: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [USGS](#), [Cooperative Breeding](#), [Carmen 2004](#), [Density Estimates in California](#), [Crosbie et al. 2011](#),

European Starling: [Cornell Lab](#), [Audubon](#), [CDFW](#), [VWS](#), [CAL Nature Map](#), [USGS](#), [San Diego Plant Atlas](#), [Nest site competition](#), [Olsen 2001](#), [Avian population trends in oak woodlands](#), [Purcell and Mori 2018](#),

Grasshopper Sparrow: [CalPIF](#), [Cornell Lab](#), [CDFW](#), [USGS](#), [FWS](#), [San Diego Plant Atlas](#), [Avian Conservation Partners](#), [Conservation Plan](#), [Ruth 2015](#), [fire, grazing and nest survival](#), [Hovick et al. 2012](#), [California Native Grasslands Association](#), [Sterling 2013](#),

Hutton's Vireo: [Cornell Lab](#), [Audubon](#), [San Diego Plant Atlas](#), [response to fire](#), [Bagne and Purcell 2011](#), [winter vegetation association in oak woodlands](#), [Hardy and Vreeland 2013](#), [exurban development impacts](#), [Merenlender et al. 2009](#),

Lark Sparrow: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [USGS](#), [FWS](#), [Texas A&M](#), [Nest-site selection and success](#), [Lusk et al 2003](#), [Effects of Management Practices on Lark Sparrows](#), [Dechant 1999](#)

Lawrence's Goldfinch: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [CAL Nature Map](#), [historic observations](#), [Lindsale 1950](#), [Overwintering](#), [Yancey 2017](#),

Loggerhead Shrike: [Cornell Lab](#), [Audubon](#), [CDFW](#), [USGS](#), [FWS](#), [NPS](#), [USFS](#), [California Native Grassland Association](#), [breeding density and wind turbines](#), [Smallwood 2021](#), [predation of herps](#), [Clark and Shields 2012](#),

Mountain Plover: [CalPIF](#), [Cornell Lab](#), [CDFW](#), [The Mountain Plover](#), [Knopf and Wunder 1996](#), [USFS](#), [Texas A&M](#), [Wildlife Habitat Management Institute NRCS](#), [distribution in California](#), [Fitton and Edson 2001](#), [food in winter](#), [Knopf 1998](#),

Nuttall's Woodpecker: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [USGS](#), [Natural History](#), [Miller and Bock 1972](#), [Sudden oak death and birds](#), [Monahan and Koenig 2006](#),

Oak Titmouse: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [USGS](#), [FWS](#), [Birds in Coastal Oak Woodlands](#), [Winslow 2004](#)

Western Bluebird: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [California Bluebird Recovery Program](#), [Nestwatch](#), [Avian conservation and vineyards](#), [Jedlicka et al. 2011](#), [noise and light](#), [Ferraro et al 2020](#),

Western Screech-owl: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [CAL Nature Map](#), [The Peregrine Fund](#), [USFS](#) [Western Screech-owl](#), [Gehlback and Stoleson 2010](#),

White-breasted Nuthatch: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [USGS](#), [Santa Clara Audubon Society](#), [California subspecies](#), [Garrett 2017](#),

White-tailed Kite: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [USGS](#), [White-tailed kite in California](#), [Waian 1970](#), [Natural history](#), [Dixon 1957](#), [nesting patterns in agriculture](#), [Erichsen and Smallwood 1996](#), [Landscape characteristics around nest](#), [Niemela 2007](#), [foodweb dynamics](#), [Iko et al. 2003](#), [Foraging ecology](#), [Mohan 2004](#), [kite decline](#)

Yellow-billed Magpie: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [CAL Nature Map](#), [Cal Climate Commons](#), [Abundance and distribution](#), [Crosbie et al. 2014](#), [West Nile virus](#), [Crosbie 2009](#), [Reproductive success](#), [Reynolds and Koenig, 1997](#), [genetic diversity](#), [Vazquez and Gustafson 2019](#),

Conifer and Mixed Hardwood

Black-throated Gray Warbler: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [DigitalAtlas](#), [San Diego Plant Atlas](#), [FWS](#), [USGS](#),

Brown Creeper: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [NPS](#), [FWS](#), [USGS](#), [DigitalAtlas](#), [Habitat Suitability Model](#), [ABC](#), [taxonomy of the Brown Creeper in California](#), [forest edge and elevation](#), [Purcell et al. 2012](#), [coastal redwood forest edge](#), [Brand and George 2001](#),

California Spotted Owl: [Cornell Lab](#), [Audubon](#), [CDFW](#), [VWS](#), [CAL Nature Map](#), [CDFW observations database](#), [Lost Padres Forest Watch](#), [USFS State of Knowledge](#), [Gutierrez et al. 2017](#), [USFWS State of Knowledge](#), [USFWS Proposed Rule 2019](#), [Habitat characteristics and use](#), [Roberts 2017](#), [demography and conservation](#), [Center for Biological Diversity](#), [postfire habitat use and selection](#), [Bond et al. 2009](#), [tree cover habitat predictability](#), [North et al. 2017](#),

Chestnut-Backed Chickadee: [Cornell Lab](#), [CDFW](#), [FWS](#), [DigitalAtlas](#), [CAL Nature Map](#), [NPS](#), [ABC](#), [long-term trends](#), [Brennan and Morrison 1991](#), [foraging behavior in Monterey Pine](#), [Kleintjes and Dahlsten 1994](#),

Dark-eyed Junco: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [Santa Clara Audubon](#), [Habitat Suitability Model](#), [San Diego Plant Atlas](#), [breeding behavior](#), [LeBarbera and Lacey 2018](#),

Flammulated Owl: [CalPIF](#), [Cornell Lab](#), [CDFW](#), [FWS](#), [Partners in Flight](#), [USFS Current Management Situation](#), [Southern Sierra Research Center](#), [Distribution in California](#), [Winter 1974](#), [Owl Research Institute](#),

Golden-crowned Kinglet: [CalPIF Conifer Plan](#), [Cornell Lab](#), [Audubon](#), [ABC](#), [San Diego Plant Atlas](#), [Habitat Suitability Model](#),

Marbled Murrelet: [Cornell Lab](#), [Audubon](#), [Cal State Parks](#), [Zone 6 Management Plan](#), [CDFW](#), [FWS](#), [Center for Biological Diversity](#), [abundance and productivity](#), [Felis 2020](#), [Offshore occurrence patterns in Central California](#), [Ainley et al. 1995](#)

Olive-sided Flycatcher: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [ABC](#), [Partners in Flight](#), [Olive-sided flycatcher in Western North American](#), [Altman 1997](#), [forest harvest and ecological traps](#), [Robertson and Hutto 2007](#),

Purple Finch: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [USGS](#), [Subspecies](#), [Rutt et al. 2014](#), [Habitat Suitability Map](#),

Pygmy Nuthatch: [Cornell Lab](#), [CDFW](#), [FWS](#), [USFS](#), [USGS](#), [DigitalAtlas](#), [Texas A&M](#), [forest structure and behavior](#), [Cloyed 2014](#),

Steller's Jay: [Cornell Lab](#), [Audubon](#), [CDFW](#), [VWS](#), [San Diego Plant Atlas](#), [Habitat Suitability Model](#), [Texas A&M](#), [CAL Nature Map](#), [campgrounds and coastal redwood forests](#), [Goldenberg et al. 2016](#), [Marbled Murrelet and Steller's Jay interactions](#), [Brunk 2021](#)

Vaux's Swift: [CalPIF](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [Life History](#), [FWS](#), [San Diego Plant Atlas](#), [USGS](#), [breeding distribution in California](#), [Sterling and Paton 1996](#), [population decline and diet quality](#), [Pomfret et al. 2012](#),

Coastal and Marine

Ashy Storm-Petrel: [Audubon](#), [CDFW](#), [FWS](#), [CAL Nature Map](#), [USGS](#), [ABC](#), [Center for Biological Diversity](#), [conservation and science of the ASP](#), [Carter et al. 2016](#), [distribution and population](#), [Ford et al. 2021](#), [Potential new colony in Central Coast](#),

[Brown et al. 2003](#), [owls, mice and petrels](#), [Nur et al 2019](#),

Black Brant: [Cornell Lab](#), [CDFW](#), [CAL Nature Map](#), [Black Brant Group](#), [winter movements](#), [Lindberg et al. 2007](#), [eelgrass and brant](#), [Shaughnessy et al. 2012](#), [staging and eelgrass](#), [Moore et al. 2004](#), [population decline](#), [Sedinger et al. 2019](#),

Black Oystercatcher: [Cornell Lab](#), [Audubon](#), [CDFW](#), [NPS](#), [FWS](#), [California Audubon](#), [Pacific Grove NH Museum](#), [Bay Nature](#), [conservation action plan](#), [Tessler et al. 2007](#), [Population assessment](#), [Weinstein et al. 2014](#), [reproductive performance in California](#), [Harvey et al. 2017](#), [seasonal movements and winter range use](#), [Johnson et al. 2010](#),

Black-footed Albatross: [Cornell Lab](#), [Audubon](#), [FWS](#), [San Diego Plant Atlas](#), [Databasin distribution and utilization](#), [Agreement of the Conservation of Albatrosses and Petrels](#), [post-breeding movements](#), [Hyrenbach and Dotson 2001](#), [long-ling fisheries](#), [Hyrendback and Dotson 2003](#), [Status assessment 1923-2005](#), [Arata et al. 2009](#), [BOEM: collision risk](#),

Brandt's Cormorant: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [NPS](#), [ecosystem-based management](#), [Ainley et al. 2018](#), [forage fish community and diet](#), [Elliot et al. 2015](#), [breeding phenology](#), [Jones et al. 2008](#),

California Brown Pelican: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [NPS](#), [California Audubon](#), [Lost Padres Forest Watch](#), [Range map](#), [Monterey Bay Aquarium](#), [population size and distribution](#), [Anderson et al. 2013](#),

California Least Tern: [Cornell Lab](#), [CDFW](#), [FWS](#), [USGS](#), [Center for Biological Diversity](#), [San Diego Plant Atlas](#), [conservation challenges - SJV](#), [biology and conservation of the least tern](#), [Whitman, 1988](#), [foraging ecology](#), [Kean et al 2016](#), [predator control strategies](#), [Butchko et al. 1992](#),

Cassin's Auklet: [Cornell Lab](#), [Audubon](#), [CDFW](#), [Oikonos](#), [FWS](#), [datazone](#), [at-sea distribution](#), [Adams et al 2010](#), [foraging and home range](#), [Adams et al. 2004](#), [trophic relationships](#), [Sydeman et al. 1997](#), [climate and demography](#), [Lee et al. 2007](#), [distribution and diet](#), [Briggs et al 1988](#),

Common Murre: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [USGS](#), [biology and conservation](#), [Manuwal et al. 2001](#), [CDFW Colony monitoring in Central California](#),

Long-billed Curlew: [Cornell Lab](#), [CDFW](#), [FWS](#), [California Audubon](#), [Monterey Bay Aquarium](#), [Calrice](#), [Bay Nature](#), [conservation action plan and status assessment](#), [Fellows et al 2009](#), [coastal pasture use](#), [Leeman et al. 2005](#), [habitat use in Central Valley](#), [Sesser 2013](#),

Pacific Loon: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [San Diego Plant Atlas](#), [populations in Morro Bay](#), [Long 2006](#)

Pigeon Guillemot: [Cornell Lab](#), [Audubon](#), [NPS](#), [Monterey Bay Aquarium](#), [Pigeonguillemot.org](#), [CDFW](#), [FWS](#), [CAL Nature Map](#), [climate change and reproduction](#), [Sydeman et al. 2001](#), [sentinel species](#), [Prichard et al. 1997](#), [breeding ecology](#), [Seher 2016](#)

Red-necked Phalarope: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [USGS](#), [Monterey Bay Aquarium](#), [migration](#), [Duncan 1996](#), [migration and wintering strategies](#), [Van Bemmelen et al. 2019](#)

Sanderling: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [USGS](#), [NPS](#), [ABC](#), [Conservation plan](#), [Payne 2010](#), [human activity effects](#), [Thomas et al 2003](#),

Savanna Sparrow (subspecies Belding's and Bryant's) : [Cornell Lab](#), [Audubon](#), [CDFW](#), [Avibase](#), [FWS](#), [CAL Nature Map](#), [CDFW Survey of Belding's](#), [San Diego Plant Atlas](#), [Sibley's Guide](#), [SJV](#), [Point Blue Conservation Science](#), [Socialwild](#), [pedestrian disturbance](#), [Juricic et al. 2009](#),

Secretive Marsh Rails: [Cornell Lab](#), [CDFW – Black Rail](#), [FWS-Light-footed](#), [FWS- Black Rail](#), [FWS black rail profile](#), [Ridgeway Rail conservation - Berkeley](#), [Bay Nature](#), [Black rail distribution](#), [Evens et al. 1991](#), [literature of the black rail](#), [Wilbur 1974](#), [black rail in SFB](#), [Spautz et al. 2005](#), [distribution and habitat association of black rail](#), [Tsao 2015](#), [detection probability](#), [Conway et al. 2004](#), [Nesting habitat of light-footed rail](#), [Massey et al 1984](#), [Light-footed rail management](#), [Zemba et al. 2016](#), [sea-level rise and refuge habitats](#), [Overton et al. 2015](#),

Snowy Plover : [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [NPS](#), [CAL State Parks](#), [FWS Recovery Plan](#), [Center for Biological Diversity](#), [Westernsnowyplover.org](#), [California Audubon](#), [Monterey Bay Aquarium](#), [Golden Gate Audubon](#), [Santa Monica Audubon](#), [habitat use and nesting success](#), [Powell et al. 2000](#), [remote monitoring](#), [Demers et al. 2012](#), [disturbance to wintering plovers](#), [Lafferty 2001](#), [habitat suitability model](#), [MacDonald 2010](#),

Sooty Shearwater: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [Monterey Bay Aquarium](#), [Pacific Grove Museum](#), [Sooty Shearwaters in California](#), [Briggs 1986](#), [summer-time use](#), [Adams et al. 2012](#), [ocean warming and change in pelagic abundance](#), [Veit et al. 1996](#), [migration routes in the Pacific](#), [Spear et al. 1999](#),

Surf Scoter: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [NPS](#), [California Audubon](#), [USGS](#), [San Diego Plant Atlas](#), [breeding distribution and ecology](#), [Takekawa et al. 2011](#), [foraging behavior](#), [Lewis et al. 2005](#), [spring migration routes](#), [De La Cruz et al. 2009](#), [San Francisco Estuary Partnership Species profiles](#),

Western Grebe: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [NPS](#), [USGS](#), [California Audubon](#), [shift in winter distribution](#), [Wilson et al. 2013](#), [habitat suitability models](#), [Biological characteristics- USGS](#),

Western Gull: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [USGS](#), [Monterey Bay Aquarium](#), [Cal Nature Map](#), [mercury concentrations](#), [Clatterbuck et al. 2021](#)

Western Sandpiper: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [Conservation Plan](#), [Fernandez et al. 2010](#), [Simon Fraser University](#), [migration routes](#), [Butler et al. 1996](#), [Spring Sandpiper migration](#), [Warnock et al. 2004](#),

Urban and Intensive Agriculture

American Kestrel: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [USGS](#), [Golden Gate Audubon](#), [Peregrine Fund](#), [Bay Area Naturalist](#), [patch size and breeding habitat](#), [Smallwood et al. 2009](#), [summer habitat use in Central Coast](#), [Tomes 2019](#), [nestbox conservation](#)

[program](#), [Katzner et al. 2005](#), [declining kestrels](#), [Smallwood et al. 2009](#),

American Robin: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [CAL Nature Map](#), [San Diego Plant Atlas](#), [USGS](#), [effects of urban sprawl](#), [Blair 2004](#), [nest parasitism](#), [Turner and Hauber 2021](#)

Anna's Hummingbird: [Cornell Lab](#), [CDFW](#), [FWS](#), [CAL Nature Map](#), [USFS](#), [Celebrate Urban Birds](#), [Effects of fire and restoration on hummingbirds](#), [Alexander et al. 2020](#),

Barn Owl: [Cornell Lab](#), [Audubon](#), [CDFW](#), [VWS](#), [CAL Nature Map](#), [California Audubon](#), [Barn Owl Box](#), [owls in California vineyards](#), [Tillmann 2012](#), [agricultural land use and diet](#), [Kross et al. 2016](#), [habitat selection in winegrowing regions](#), [Casteneda et al. 2021](#),

Barn Swallow: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [ABC](#), [CAL Nature Map](#),

Black Phoebe: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [CAL Nature Map](#), [USGS](#), [reproductive biology in central California](#), [Wolf 1991](#),

Brewer's Blackbird: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [Texas A&M](#), [DigitalAtlas](#), [breeding behavior](#), [Williams 1952](#), [fire and grazing regimes' impacts to blackbirds](#), [Duquette et al. 2020](#),

Brown-headed Cowbird: [Cornell Lab](#), [Audubon](#), [CDFW](#), [CDFW Species Account](#), [CAL Nature Map](#), [Stanford](#), [Brown-headed Cowbirds in California](#), [Laymon 1987](#), [San Diego Plant Atlas](#), [BHC Management](#), [Peer 2021](#), [density and distribution in Central Coastal California](#), [Farmer 1997](#),

Bullock's Oriole: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [USGS](#), [Celebrate Urban Birds](#), [Avian population trends in oak woodlands](#), [Purcell and Mori 2018](#), [Avian use in oak savanna](#), [Wood et al. 2013](#),

Bushtit: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [CAL Nature Map](#), [IBP Vital Rates](#),

Killdeer: [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [CAL Nature Map](#), [USGS](#), [population trends](#), [Sanzenbacher and Haig, 2001](#),

Lesser Goldfinch: [Cornell Lab](#), [Audubon](#), [CDFW](#), [CAL Nature Map](#), [Texas A&M](#),

Northern Harrier: [CalPIE](#), [Cornell Lab](#), [Audubon](#), [Peregrine Fund](#), [CDFW](#), [FWS](#), [CAL Nature Map](#), [Effects of Management practices on grassland birds: Northern Harrier](#), [Dechant et al. 2002](#),

Red-shouldered Hawk: [Cornell Lab](#), [CDFW](#), [Peregrine Fund](#), [FWS](#), [USFS Bird Atlas](#), [Pacific Coast race](#), [Wilbur 1972](#), [home range and habitat use](#), [Bloom et al. 1993](#), [nest site selection in urban California](#), [Rottenborn 2000](#), [adaptation in suburbs](#), [Dykstra et al. 2018](#), [urbanization impacts on diet and reproduction](#), [Fisher 2020](#)

Swainson's Hawk: [CalPIE](#), [Cornell Lab](#), [CDFW Home Page](#), [FWS](#), [USGS](#), [Los Padres Forest Watch](#), [Wildlife Heritage Foundation](#), [California Rice](#), [Conservation Strategy for Swainson's Hawk in California](#), [Population and Distribution in California's Great Valley](#), [Battistone et al. 2019](#),

White-crowned Sparrow: [CalPIE](#), [Cornell Lab](#), [Audubon](#), [CDFW](#), [FWS](#), [USGS](#), [CAL Nature Map](#), [Annual Cycle Mewaldt 1977](#),

Human Wellbeing

California Condor: [Cornell Lab](#), [CDFW](#), [FWS profile](#), [FWS Recovery Program](#), [Peregrine Fund](#), [VWS](#), [USGS](#), [Status of the Condor](#), [Walters et al. 2010](#), [demography](#), [Meretsky et al. 2000](#), [lead poisoning](#), [Finkelstein et al. 2012](#), [condor genome](#), [Robinson et al. 2021](#), [wind turbines and condor risk](#), [Poessel et al. 2018](#), [home range size](#), [Rivers et al. 2014](#), [Northern California expansion of the range](#), [West et al. 2017](#),