EARTH ECONOMICS

The Land Trust For Santa Barbara County

THRIVING OPEN SPACES SUPPORT HEALTHY ECONOMIES

NATURE'S VALUE IN SANTA BARBARA COUNTY

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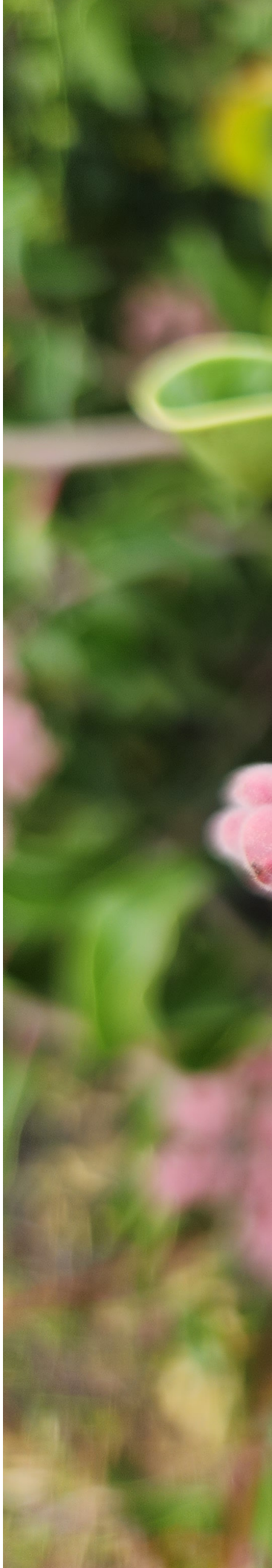
Earth Economics is a leader in ecological economics and has provided innovative analysis and recommendations to governments, tribes, organizations, private firms, and communities around the world. **eartheconomics.org**



SUGARBUSH BERRIES, RHUS OVATA, CREDIT: ALISON PETRO

FOREWORD

By Meredith Hendricks, Executive Director
The Land Trust for Santa Barbara County

There is truly no place on earth that compares with Santa Barbara County. Our region is host to some of the most important biodiversity hotspots in the world. Located precisely at the intersection of northern and southern California, there are unique plants and animals that live and thrive only here. The same can be said for people, many of whom find in our region a combination of magnificent natural places and cultural richness that inspire a sense of both awe and wellbeing.

Santa Barbara County is one of the last areas of coastal-influenced central California with large-scale landscapes still available for conservation. Santa Barbara County is a moderately large county, ranking 21st of 58 counties within the state, and supports relatively lower levels of population. As such, it has not historically struggled with land use constraints as compared to the more populous San Franscisco Bay or Los Angeles areas. This has afforded the county more time to strategize how to conserve important landscapes. However, recent developmental pressures and cost of living have created a new sense of urgency to preserve open spaces and design more publicly accessible parks that support economically thriving communities.

Our county sits at the confluence of four unique ecoregions. These landscapes support an exceptionally diverse range of plants and animals, placing the county in one of 36 global biodiversity hotspots. These regions are defined as both irreplaceable and threatened, having significant portions of unique plant life found nowhere else on the planet but currently extend less than 30 percent of their historical coverage. We are home to incredibly productive soils that make our county an important part of the state's agricultural economy. With over 720,000 acres of grazing and croplands, the area is essential to the regional and national food systems.

The Land Trust for Santa Barbara County is continuously refining our understanding of the region's most important and resilient wildlife habitats and corridors. We proactively reach out to landowners to engage in collaborative efforts that target the protection of high quality agricultural and grazing lands, especially those that simultaneously preserve existing habitat.

Santa Barbara County is widely known for its exceptional landscape, beauty, and park systems, though not all residents have equal access to these resources, which is further described in the county's blueprint. This inequity is particularly challenging and impacts the Santa Maria Valley, which supports the fastest rate of population growth but contains the fewest number of trails. Low-income communities in our region are disproportionately impacted by climate-related natural hazards and historically have not been equally included within conservation priorities, further exacerbating their climate pressures. By collaborating with the organizations and people that represent these communities, the Land Trust is working to close these gaps in sufficient outdoor access and climate resilience.

For forty years, the Land Trust for Santa Barbara County and our partners have worked to conserve more than 57,000 acres of land for current and future generations. Our challenge and opportunity is to strike a balance between protecting land that provides essential services while ensuring the economic vitality of all communities in our region. This report explores the relationship between these two concepts and shows that they are more complimentary than they may first appear.

My thanks to our anonymous donor who made this report possible, ensuring that we are using the best possible data to drive landscape scale decisions that sustain and improve our communities. Additionally, thank you to Supervisors Joan Hartmann and Bob Nelson for their time working on this report to create a more complete understanding of the myriad value of open spaces and for working in partnership on the best possible outcome for Santa Barbara County.

LAZULI BUNTING AT ARROYO HONDO PRESERVE, CREDIT: KYLE KUSA

EXECUTIVE SUMMARY

Santa Barbara County is a uniquely spectacular place, in no small part due to the abundance of open space, natural lands, waters, and agricultural resources. While residents and visitors to Santa Barbara County inherently understand this quality, it can be difficult to appreciate just how valuable these parts of the county are. Recognizing the economic benefits and contribution of the natural world is an essential part of considering the overall vitality of a region and is easy to overlook. The purpose of this report is to do just that: help our community understand the economic value of the natural world by estimating the value of ecosystem system services and the economic contributions of the outdoor recreation industry generated by the lands and waters of Santa Barbara County.

Ecosystem services, defined as the benefits nature provides to people, come from "natural capital", the planet's stock of natural resources, including the geology, soil, water, air, plants, and animals. These natural assets provide beneficial ecosystem services that enrich people's lives—supplying clean air and water, protecting infrastructure from disasters, providing spaces for people to recreate, and more. It is a growing best practice to translate the real-world benefits of ecosystem services into dollars to ensure they are properly accounted for in decisions, especially since they are increasingly recognized as more cost-effective alternatives to conventional infrastructure. Outdoor recreation alone contributes much to local economies—analyzing the current visitation to open spaces and case studies of the economic benefits expected from investing in the outdoor recreation industry could garner support for increased environmental conservation and expansion of recreational opportunities. This data, when considered alongside the disaster reduction function of land and the County of Santa Barbara's annual Crop & Livestock Report helps paint a more complete picture of the wide array nature-based economic benefits communities receive. The intention is that this report will be used to engage and inform stakeholders in Santa Barbara County including decision-makers in both the public and private sectors by clearly communicating the economic value of nature and open spaces in the county. Furthermore, understanding the scale of these impacts is an important step for managing current recreational lands and garnering support for their expansion.

We know from experience with local natural disasters just how expensive interaction with the natural world can be, but we do not often think about the value outside of that. Santa Barbara County's natural lands and waters provide considerable value to residents and visitors and appeal to tourists from around the world, as well as contribute to public health and support local jobs. When the benefits of nature are not quantified, they are effectively valued at zero, leading to inefficient investments, higher costs, and poor asset management. **This report estimates that the benefits produced by the county's natural capital and ecosystem services are estimated to have a value of at least $2.96 billion each year** (for comparison, Santa Barbara County's Gross Domestic Product in 2023 was upwards of $38.5 billion). This estimate was derived from 42 scholarly studies on the benefits provided by the natural areas found across Santa Barbara County and is based on conservative assumptions. Yet, because many of the services known to be produced by local ecosystems could not be estimated due to limited research on the benefits produced within Santa Barbara County, this huge number still likely underestimates nature's full value. **Healthy ecosystems are the foundation of the county's exceptional quality of life and significantly contribute to its economic activity.**

If we were to consider the County's natural capital as asset, its net present value would be at least $138.9 billion over 100 years (discounted at 2 percent, see Asset Valuation on page 27 for more detail). However, unlike buildings and roads, this natural capital is largely self-sustaining, renewable, and long-lived. In other words, the benefits produced by healthy ecosystems can be expected to continue in perpetuity and not depreciate in the way a building does over its useful life. Protecting these natural areas sustains their quality, which helps prevent them from depreciation—and using this value as a benchmark shows the immense benefits that safeguarding this natural capital has on the local economy.

Such value is central to two industries in particular: outdoor recreation and agriculture. Santa Barbara County's open spaces are globally renowned for their recreational opportunities, drawing significant numbers of tourists each year. While visiting these lands, tourists spend money on goods and services creating vast economic ripples that reverberate through the county supporting both employment, economic activity, and taxes. **The outdoor recreation industry currently supports $880 million in economic activity each year, including 5,500 jobs paying $290 million in wages.** Expanding recreational assets, for example, the Santa Maria Valley Regional Preserve (see page 33), could generate $2.6 million in annual visitor spending, which would in turn support an additional $4.2 million in economic activity throughout the county. The proposed Gaviota Coastal Park (see page 35) would generate $23 million in new economic activity, and the proposed Harvest to Coast Regional Trail (see page 37) would generate an additional $20.4 million across the county each year.

As a pillar of the Santa Barbara County economy, the county's agricultural output reached $1.87 billion in 2023, with strawberries alone contributing $775 million. This is in addition to the $2.96 billion generated by other ecosystem services. Other valuable crops, including wine grapes, broccoli, and cauliflower, further underscore the importance of the sector. Continued support for favorable agricultural policies is important to maintain this economic engine for the county and can be accomplished through the preservation of farms and ranchlands.

The valuation of nature-based solutions also has the potential to improve the competitiveness of applications for federal and state funding, including FEMA funding for hazard mitigation projects and planning. **The recent passage of California's proposition 4 establishes a $10 billion state bond to support safer drinking water, wildfire prevention, and help communities and landscapes adapt to the challenges presented by climate change.** Proceeds will be distributed to local governments, tribes, non-profit organizations, and businesses. This bond represents a historic opportunity for Santa Barbara County to secure funding to conserve its natural assets and expand its recreational facilities.

The results of this analysis support the following conclusions, as well as specific recommendations for local, state, and federal policy makers, as well as public and private investors:

- **Santa Barbara County's lands and waters produce highly valuable ecosystem services that are the foundation of the local economy.**
- **The county's natural assets provide enormous benefits, supporting the health and well-being of both residents and visitors.**
- **Investing in open space provides significant economic and social benefits that ensure continued prosperity and a high quality of life for the people of Santa Barbara County.**

General recommendations:

1. **Incorporate the value of ecosystem services into planning and development decisions to improve their effectiveness,** especially for wildfire and flood management.
2. **Include the value provided by natural capital in benefit-cost analyses to improve local quality of life** (and appeal to visitors) while reducing overall maintenance and replacement costs.
3. **Encourage zoning that prioritizes conservation of areas known to provide critical ecosystem services** (e.g. wetlands for flood control, grasslands for carbon sequestration, and agricultural lands for food production).
4. **Require that ecosystem service benefits be included in project impact assessments** within local decision making procedures to ensure that the broader impacts of proposed projects on community wellbeing are more fully considered.
5. **Establish new funding mechanisms to incentivize the continued and expanded production of ecosystem services** while diversifying income sources for land stewards.

Investing in Santa Barbara County's green spaces can safeguard its high quality of life and appeal as a recreational destination, providing abundant ecosystem goods and services to benefit residents and visitors in perpetuity. Santa Barbara's economic health is founded on its unique and vibrant natural environments.

SANTA BARBARA COUNTY COASTLINE, CREDIT: MEREDITH HENDRICKS

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PURPLE OWLS CLOVER, CREDIT: MEREDITH HENDRICKS

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1. INTRODUCTION

1.1 PURPOSE OF THIS REPORT

Understanding the economic contribution of the natural world is important when considering the overall vitality of a region. The purpose of this report is to estimate the economic value of ecosystem system services generated by the lands and waters of Santa Barbara County. The valuation of ecosystem services underscores the multiple advantages derived from preserving and managing natural capital within the county. This assessment is important for guiding policy decisions, promoting sustainable economic development, and prioritizing conservation initiatives.

This analysis connects the conservation of open spaces to economic gains such as securing local water resources, enhancing water quality, mitigating fire and flood risks, supporting the sustainability of local food systems, and bolstering the resilience of urban areas against the impacts of population growth and more frequent natural disasters.

Additionally, the report explores the economic justification for conserving more land through case studies on proposed new recreational areas. The report also discusses the economic benefits of conserving farmland through the lens of ecosystem services and farm revenues.

1.2 REPORT STRUCTURE

INTRODUCTION: Covers the purpose of the report and describes the area of the report.

NATURE'S ECONOMIC VALUE: This section provides a primer on definitions of ecosystem services and natural capital. As well as why and how natural systems are valued.

NATURE'S ECONOMIC VALUE IN SANTA BARBARA COUNTY: This section provides the results of the non-market ecosystem services valuation for Santa Barbara County, as well as the asset valuation.

HOW OPEN SPACE STRENGTHENS THE RECREATION ECONOMY: This section establishes a baseline of outdoor recreation in Santa Barbara County, discussing existing parks and their economic contributions, including visitor spending. It also specifically examines three potential recreational sites: Santa Maria Valley Regional Preserve, Gaviota Coastal Park, and the Harvest to Coast Pathway concept.

THE VALUE OF CONSERVING AGRICULTURAL LANDS: This section describes the diverse ways to recognize the economic value of farmland conservation in Santa Barbara County.

THE FUTURE OF OPEN SPACE IN SANTA BARBARA COUNTY: This section summarizes the findings and provides recommendations and next steps.

APPENDIX: Appendices cover the limitations of this report, sources used for valuation, and further reading pertaining to the non-monetary benefits provided by natural capital in the study area.

HERMIT WARBLER, CREDIT: PAM VIALE

SANTA BARBARA LANDSCAPES' EXCEPTIONALLY DIVERSE RANGE OF PLANTS AND ANIMALS PLACE THE COUNTY IN ONE OF 36 GLOBAL BIODIVERSITY HOTSPOTS.

1.3 SANTA BARBARA COUNTY

Home to 448,000 residents, Santa Barbara County spans 3,797 square miles (just over 2.4 million acres), including approximately 668,000 acres of surface water, mostly along the coast. Residents enjoy a Mediterranean climate, with hot, dry summers and cool, moist winters. The county's geography is shaped by three major mountain ranges: the Santa Ynez Mountains to the south, the San Rafael Mountains in the northeast, and the Sierra Madre Mountains along the northern boundary. This terrain supports diverse ecosystems, with chaparral, oak woodlands, and coastal sage scrub interspersed with grasslands in the lower elevations, while pine species are more common in the mountains (Griffith, 2016).

The County strives to balance its agricultural heritage and conservation efforts with sustainable development. With about 85,700 acres of farmland, agriculture is central to the county's economy. There is extensive cattle grazing throughout the county's grasslands which can play a role in fuel management. Overgrazing, wildfire, and land clearing for agriculture and development can present severe erosion and landslide risks (Griffith et al., 2011). The Channel Islands National Park is home to several endemic species, and the Vandenberg Space Force Base (formerly known as Vandenberg Air Force Base) is known for its extensive wildlife habitat, including the Santa Ynez Estuary and the Vandenberg State Marine Reserve (National Audubon Society and BirdLife, 2024). The Santa Barbara Channel is protected by a network of 19 Marine Protected Areas (NOAA, 2021), and this year, the Chumash Heritage National Marine Sanctuary added more than 4,500 square miles of protected area off the county's coast (NOAA, 2024).

AG LAND IN LOS ALAMOS, CREDIT: MEREDITH HENDRICKS

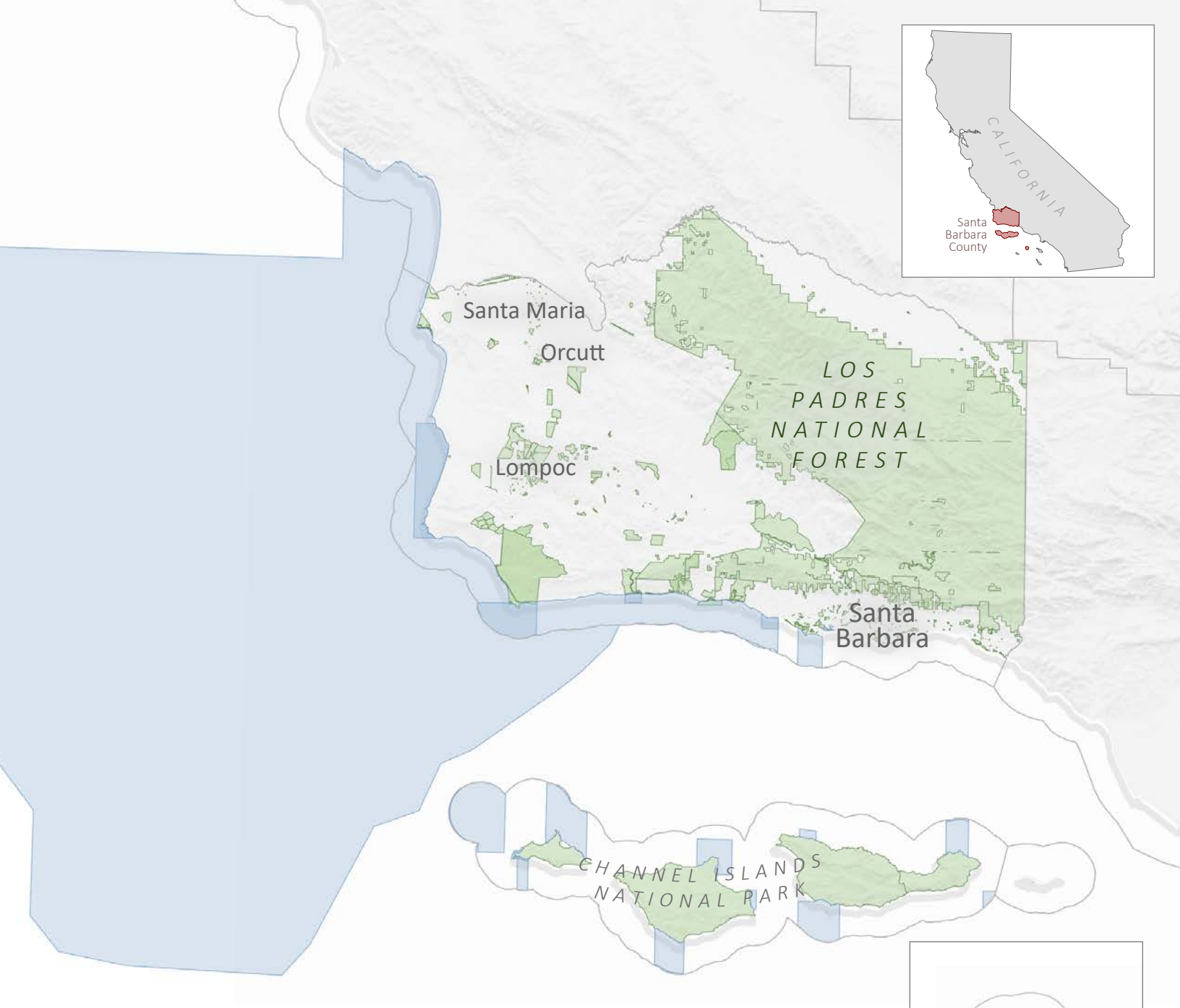

FIGURE 1. MAP OF SANTA BARBARA COUNTY

Terrestrial protected areas

Marine protected areas

SOURCES: USGS, CDFW, US Census Bureau, Natural Earth

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MILES

2. NATURE'S ECONOMIC VALUE

2.1 NATURAL CAPITAL AND ECOSYSTEM SERVICES

Natural capital provides the foundation for all human societies, yet is frequently overlooked. It consists of any "minerals, energy, plants, animals, ecosystems, [climatic processes, nutrient cycles, and other natural structures and systems] found on Earth that provide a flow of natural goods and services" (Daly and Farley 2004). As forests, wetlands, and rivers intercept rainfall and filter water, those natural storage and filtration processes support clean water supplies. The flows of ecosystem goods and services from natural capital are illustrated in Figure 2.

Healthier landscapes support thriving economies and communities as the flow of ecosystem services provide resources for industries and improve the quality of life of people. Ecosystem services can be categorized into four basic categories including provisioning, supporting, regulating, and information services. The table below provides their definitions of each category and example services.

Provisioning goods and services provide materials and energy resources: forests produce lumber, agricultural lands support food production, and rivers supply water for drinking and irrigation. Regulating services are biological and chemical processes that tend to moderate natural phenomena. **Healthy, intact ecosystems can limit the spread of disease, maintain or improve water quality, regenerate soils and limit erosion, reduce risk of wildfire and flooding, and regulate climate.** Supporting services characterize the habitat of living organisms throughout their lifecycles and are critical for supporting most other ecosystem services. Information services are associated with meaningful interactions between humans and the rest of nature. They are often associated with spiritually and aesthetically significant natural features, spaces for outdoor recreation, as well as opportunities for scientific research and education.

FIGURE 2. NATURAL CAPITAL, ECOSYSTEM FUNCTION, AND ECOSYSTEM GOODS AND SERVICES

TABLE 1. ECOSYSTEM SERVICE CATEGORIES, DEFINITIONS, AND EXAMPLES

CATEGORY	ECOSYSTEM SERVICES	EXAMPLES
Provisioning	Materials and/or energy outputs, often sold as market goods	Crops, forage for livestock, fresh water supply
Regulating	Ecosystem functions that influence critical ecosystem processes	Air and water quality improvements, erosion control, disaster risk reduction, pollination
Supporting	Habitat, nursery, refugia	Fish and wildlife habitat
Information	Non-material, non-consumptive benefits	Recreation, aesthetic benefits, cultural value

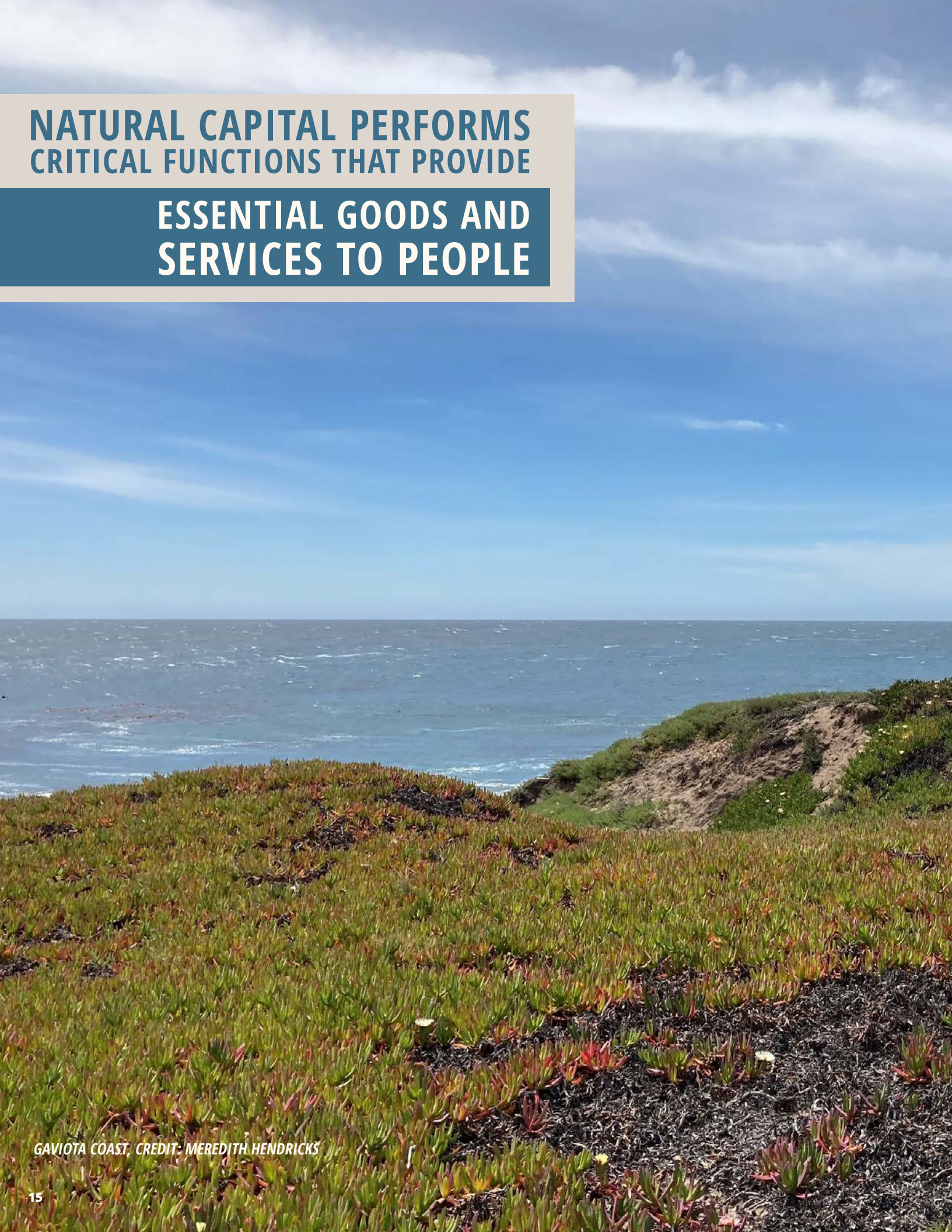
2.2 WHY VALUE ECOSYSTEM SERVICES

Many ecosystem goods are traded in markets, and as such are commonly understood to have economic value. These include traded foods and natural fibers, but also goods and services whose values are at least partly reflected in the price of other goods; fertile soils often support higher-priced agricultural land. However, for many other important ecosystem goods and services, there are relatively few market mechanisms to reflect their value—these are referred to as "non-market" benefits. **Due to insufficient information to account for their value, the benefits of maintaining healthy natural systems are often underrepresented in policy and planning decisions.**

Where functional natural systems are scarce, many of the benefits they would provide must be replaced by built infrastructure, often with greater total costs over time, accounting for construction, ongoing maintenance, and eventual replacement. Because ecosystems are living, adaptive systems, natural assets may be more resilient and less costly to maintain than built infrastructure—especially over the long-term. Moreover, most nature-based solutions produce co-benefits that support much broader community needs. By acknowledging the economic contribution of natural processes, the relative merits of investing in nature-based solutions and the conservation of natural systems can be compared with built infrastructure solutions. When incorporated into economic tools such as accounting, environmental impact statements, asset management, conservation prioritization, and return-on-investment calculations, inclusion of these values ultimately strengthens decision making. **When natural capital and ecosystem services are not included, they are effectively valued at zero, which can lead to inefficient investments, higher costs, and poor asset management.**

LA PURISIMA HILLS, CREDIT: KYLE KUSO

NATURAL CAPITAL PERFORMS CRITICAL FUNCTIONS THAT PROVIDE ESSENTIAL GOODS AND SERVICES TO PEOPLE



GAVIOTA COAST, CREDIT: MEREDITH HENDRICKS

2.3 HOW THE ECONOMIC VALUE OF ECOSYSTEM SERVICES IS ESTIMATED

The understanding that natural systems can be viewed as economic assets which provide economically valuable goods and services is relatively new to economics. Yet, in the past few decades, considerable progress has been made in systematically linking functioning ecosystems with human well-being. Today, a broad range of economic methods are available to value natural capital and non-market ecosystem services (e.g. hedonic analysis, travel cost, willingness-to-pay). This has fueled a large and steadily growing body of research, with thousands of new studies published each year.

This report uses benefit-transfer methods (BTM) to identify appropriate economic values for ecosystem services produced by the lands and waters of Santa Barbara County. Broadly defined as "... the use of existing data or information in settings other than for what it was originally collected" (Rosenberger and Johnston 2013), BTM is frequently used to indirectly estimate the value of ecosystem goods and services, as it is often the most practical option available to quickly generate reasonable estimates at larger scales, and at a fraction of the cost to conduct local primary research. This process is similar to home appraisals, in which the recent sale prices of nearby homes with comparable features (e.g. two bedrooms, one acre lot, recently remodeled) are used to estimate the value of off-market properties. Home prices are generally recalculated in unit values (e.g. per-square foot, per-acre) and then rescaled by the dimensions of the property being appraised (referred to as the "transfer" site). Properly applied, BTM is a systematic means of pragmatically identifying and characterizing the magnitude of benefits provided by natural systems, at scale.

The BTM process began with identifying the variety and extent of landcover types across Santa Barbara County, based on geospatial data reported in the most recent National Land Cover Database dataset (USGS, 2024). To estimate the value of ecosystem services produced by these ecosystems, it is necessary to identify research on the value of similar services produced by similar landcover types in similar contexts (e.g. riparian, rural, or coastal sites in California). The studies used in this report were drawn from Earth Economics' Ecosystem Valuation Toolkit (EVT), one of the largest repositories of valuation studies in the world, with over 9,000 individual estimates. Each estimate in the EVT is tagged with up to 200 contextual factors, including primary study site and scale, a detailed description of the ecosystem and ecosystem service assessed, the methodologies applied, and the type of economic value produced. Each estimate has been converted to unit values (e.g. dollar per acre, per year), often by the original researchers as they report the results of their efforts. Each estimate has been reviewed for the appropriateness of the methodologies applied. Once the initial pool of studies was identified, it was reviewed by another analyst to ensure that each was appropriate for transfer to Santa Barbara County. The unit values from the primary studies were then scaled by the extent of each landcover type across the county, accounting for variations in context known to influence value (e.g. peri-urban forests, coastal wetlands).

3. NATURE'S ECONOMIC VALUE IN SANTA BARBARA COUNTY

3.1 THE HISTORY OF HABITAT CONSERVATION IN SANTA BARBARA COUNTY

Santa Barbara County's history of land conservation starts with the various tribes and bands of Chumash people who have called this place home for at least 10,000 years. Prior to the Spanish colonization of California, numerous Chumash villages thrived in the county and stewarded the natural landscape in accordance with traditional ecological knowledge. Today, Chumash communities remain actively involved in efforts to protect habitat and maintain their cultural heritage. The current landscape of conserved habitat in the county have been shaped by large scale cattle ranching evolving from the Mexican land grants of the mid-19th century, and the designation of public conservation land in the first half of the 20th century.

Today, nearly half of Santa Barbara County's terrestrial land cover is held by a form of public ownership which provides significant habitat protection. The Los Padres National Forest was established in 1907 as the Santa Barbara National Forest and contains three wilderness areas in Santa Barbara County. This includes the San Rafael Wilderness, which was the first primitive area designated as wilderness after the passage of the 1964 Wilderness Act. Around the same time, the state of California established several iconic recreation areas along Santa Barbara County's coastline including Refugio State Beach (1950), Gaviota State Park (1953), and El Capitan State Beach (1962). Furthermore, the Channel Islands National Park was established in 1980. Of the park's five islands, four fall within Santa Barbara County's borders.

Despite these public parks, more of the county's land is in private ownership and represents a significant opportunity to add to preserved lands. Private habitat conservation in Santa Barbara County has largely occurred though partnerships with land trusts, including with the Land Trust for Santa Barbara County created in 1985. To date, the Land Trust and other conservation partners including the Trust for Public Land, the California Rangeland Trust, and the Nature Conservancy have successfully conserved over 60 private properties and tens of thousands of acres. These conservation outcomes, often working with conservation-minded private landowners, have protected important wildlife habitat, agricultural productivity, and recreation resources for the county.

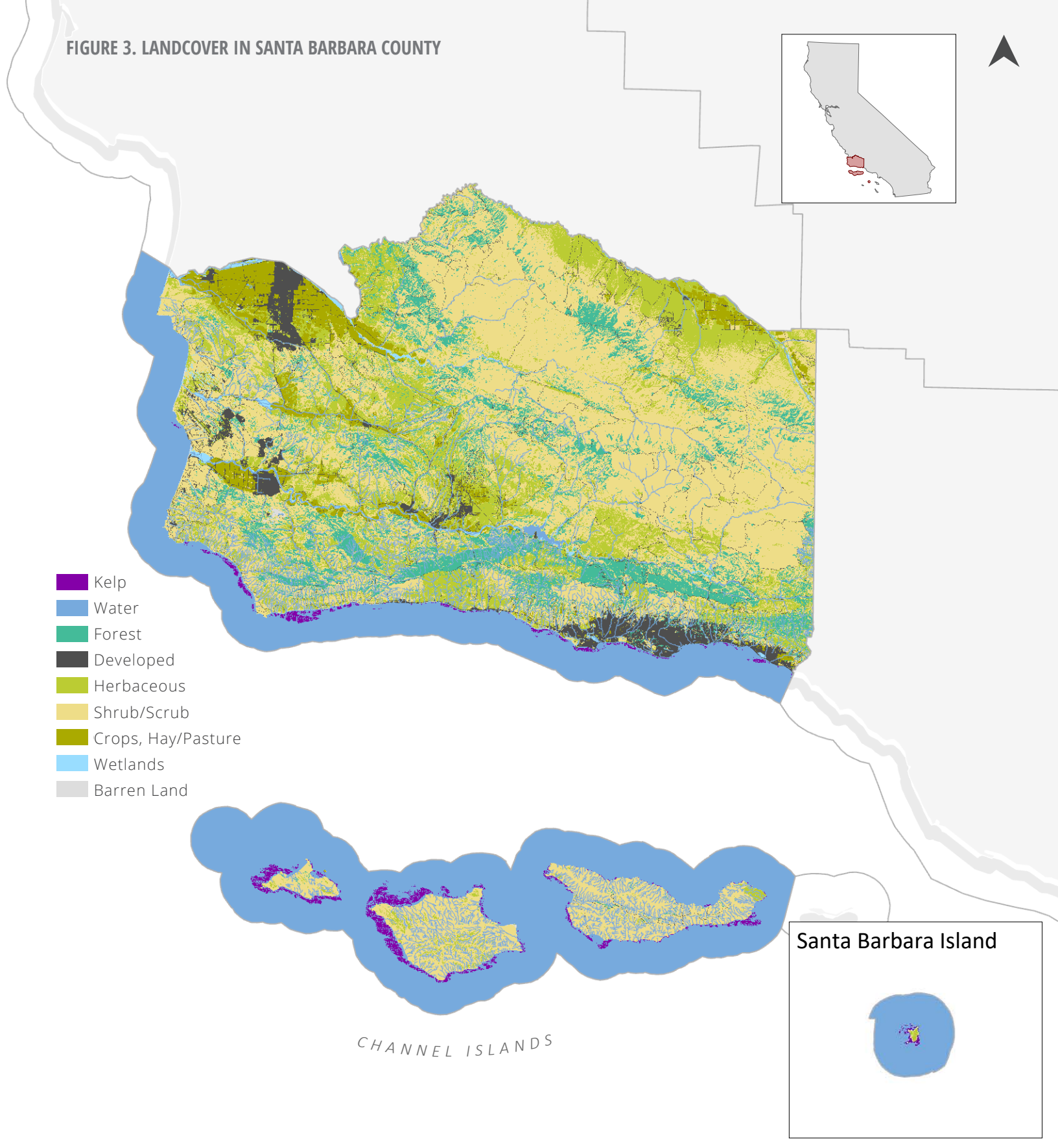
3.2 LANDCOVER AND LAND USE IN SANTA BARBARA COUNTY

Santa Barbara County's location along the Central California coast allows it a mild, warm-summer Mediterranean climate, although summer temperatures in the interior are higher. Nearly all its annual rainfall arrives in winter, with scarce summer rains, elevating the risk of wildfire in the autumn months. Sitting at the confluence of four distinct ecoregions, the county is part of the California Floristic Province, a global biodiversity hotspot (Hoffman et al., 2016). Much of the county is covered by native coastal scrub and chaparral, grasslands, and oak woodlands. Several oak species grow within the Santa Ynez Valley region; restoration efforts have focused on Blue Oak (Quercus douglasii), Coast Live Oak (Quercus agrifolia), and especially Valley Oak (Quercus lobata), a threatened species (Gaman, 2016; Tyler et al., 2006). Vandenberg Space Force Base (formerly known as Vandenberg Air Force Base) is known for its rich biodiversity; the base occupies roughly 7 percent of the county's total land area, making it a major landholder. Offshore, the newly established Chumash Heritage National Marine Sanctuary protects a vast expanse of marine ecosystems and cultural resources (NOAA, 2024). Santa Barbara County comprises unceded lands of Chumash Indians.

TABLE 2. SANTA BARBARA COUNTY LANDCOVER TOTALS

REPORT	ACRES	PROPORTION
Shrubland, chaparral	972,562	40.1%
Marine waters	664,983	27.4%
Grasslands	341,632	14.1%
Forests	227,862	9.4%
Developed land	109,024	4.5%
Crops or pasture	85,539	3.5%
Wetlands	18,938	0.8%
Rivers and Lakes	6,635	0.3%

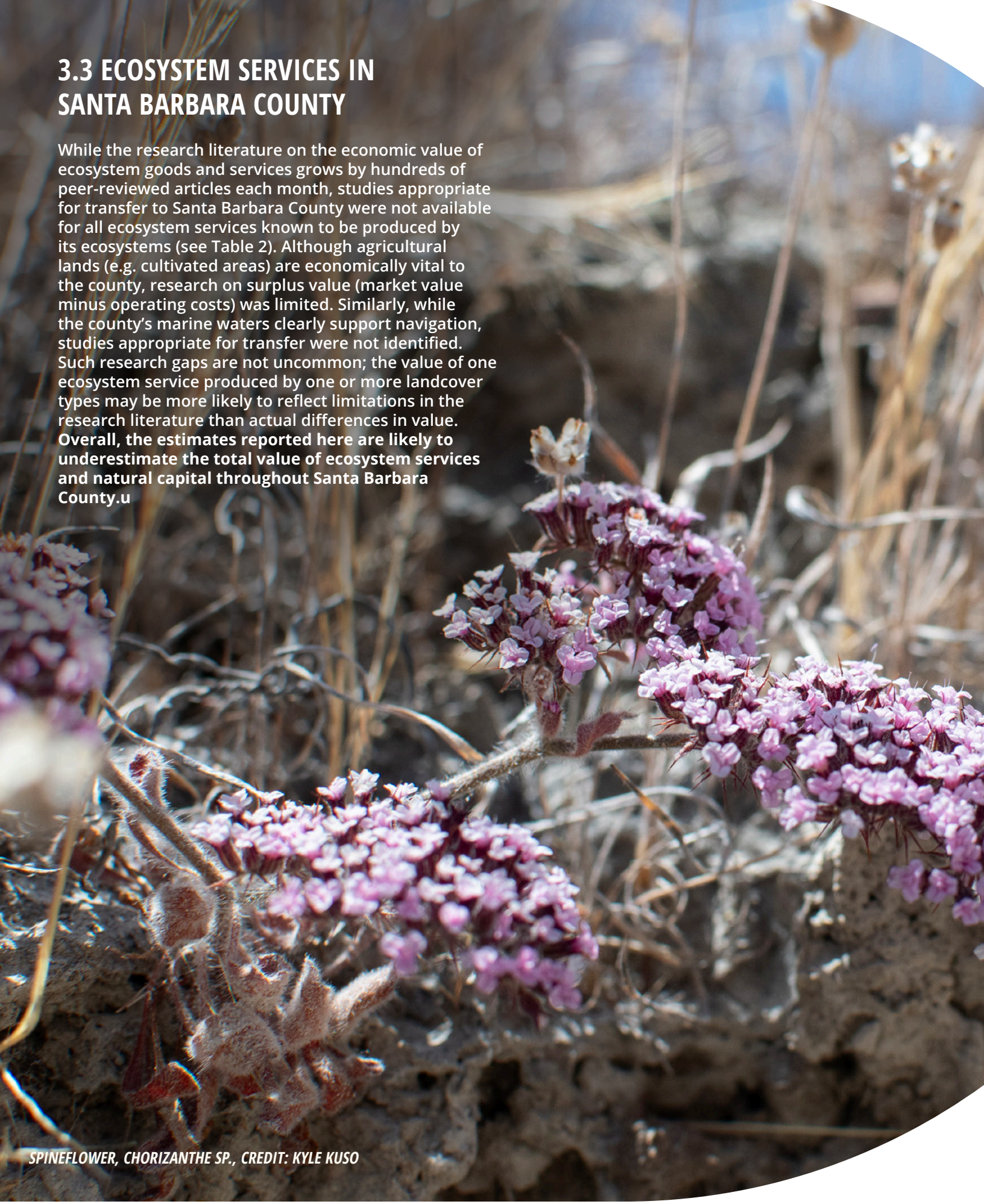
FIGURE 3. LANDCOVER IN SANTA BARBARA COUNTY



SOURCES: The Nature Conservancy, Multi-Resolution Land Characteristics Consortium, US Census Bureau, Natural Earth

3.3 ECOSYSTEM SERVICES IN SANTA BARBARA COUNTY

While the research literature on the economic value of ecosystem goods and services grows by hundreds of peer-reviewed articles each month, studies appropriate for transfer to Santa Barbara County were not available for all ecosystem services known to be produced by its ecosystems (see Table 2). Although agricultural lands (e.g. cultivated areas) are economically vital to the county, research on surplus value (market value minus operating costs) was limited. Similarly, while the county's marine waters clearly support navigation, studies appropriate for transfer were not identified. Such research gaps are not uncommon; the value of one ecosystem service produced by one or more landcover types may be more likely to reflect limitations in the research literature than actual differences in value. **Overall, the estimates reported here are likely to underestimate the total value of ecosystem services and natural capital throughout Santa Barbara County.u**



SPINEFLOWER, CHORIZANTHE SP., CREDIT: KYLE KUSO

TABLE 3. ECOSYSTEM GOODS AND SERVICES PRODUCED BY THE LANDCOVERS OF SANTA BARBARA COUNTY

Ecosystem Service	Cultivated	Forests	Grasslands	Kelp	Lakes and Reservoirs	Marine	Pasture	Rivers	Shrublands	Wetlands
Energy, raw materials	○	○	○	○	–	○	○	○	○	○
Food	○	○	●	○	○	○	●	○	●	○
Medicinal resources	○	○	–	○	–	○	–	–	–	–
Ornamental resources	○	○	–	○	–	○	–	○	○	○
Water supply	○	●	●	–	●	–	–	○	–	–
Air quality	○	●	●	–	–	○	○	○	●	○
Biological control	●	○	●	○	–	○	○	–	○	–
Carbon sequestration and storage	●	●	●	●	–	○	○	○	○	●
Stormwater runoff reduction	–	●	●	–	–	○	–	○	○	●
Navigation	–	–	–	–	○	○	–	○	–	–
Pollination, seed dispersal	○	○	○	○	–	○	○	○	○	–
Soil formation	○	○	○	–	–	–	○	○	○	–
Soil quality	○	○	●	–	–	○	○	○	–	–
Soil retention	●	●	●	–	–	–	○	○	○	○
Water capture	○	○	●	–	○	○	○	○	●	●
Water quality	○	●	●	●	–	○	○	○	○	●
Habitat	○	○	●	●	●	○	○	○	○	●
Aesthetic information	○	●	○	–	●	○	○	○	–	●
Existence (non-use) value	○	●	●	○	○	●	●	●	○	●
Recreation, tourism	●	●	●	●	●	●	○	●	●	●
Science, education	○	○	○	○	○	○	○	○	○	○

KEY

- ○ Produced by ecosystem
- ● Valued within this analysis
- – No value reported in the literature

BLUEBERRIES IN THE SANTA MARIA VALLEY, CREDIT: MEREDITH HENDRICKS

DESCRIPTIONS OF ECOSYSTEM SERVICES

IN SANTA BARABRA COUNTY

PROVISIONING SERVICES

PROVIDE GOODS TO PEOPLE, INCLUDING FOOD, WATER, AND MATERIALS

FORAGE

Santa Barbara County has an abundance of high-quality rangeland in many parts of the county, especially in the Eastern Solomon Hills and the Lower Santa Maria Valley (Gatewood et al., 2017). Grazing can be effective at reducing fuel loads, thus lowering the risk and spread of wildfires (USDA, 2024b), and can stimulate native species (e.g. bunch grass) which offer a healthier source of forage for both livestock and wildlife. Well managed grazing lands can support multiple ecosystem services, including wildfire risk reduction, erosion control, nutrient cycling, soil health, and habitat provision (Franzluebbers, 2013). Livestock grazing is one of the few forms of agriculture that is compatible with the life cycle of sensitive fossorial amphibians such as the California Tiger Salamander and Western Spadefoot.

WATER SUPPLY

Since almost all of the county's precipitation arrives during the winter months, the ability to store water throughout the year is critical for residents. About fifty percent of water provided to Santa Barbara County residents comes from groundwater (Gatewood et al., 2017) which enters shallow aquifers in recharge zones found under approximately a quarter of the county's land area (Conservation Biology Institute, 2015). The Upper Santa Ynez Watershed near Gibraltar Reservoir also stores a significant portion of the rain that falls within the county (Gatewood et al, 2017), and supplies about 40 percent of the water of the City of Santa Barbara in an average year (City of Santa Barbara, 2022). As summer temperatures continue to increase, the ability to hold water underground (where it is less likely to evaporate) will become increasingly important.

REGULATING SERVICES

REFER TO BENEFITS GAINED BY NATURAL CONTROL OF ECOSYSTEM PROCESSES

AIR QUALITY

In Santa Barbara County natural areas play an important role in improving air quality. Forests, shrublands, and even grasslands are able to filter particulate matter and other pollutants that can lead to higher risk of heart and lung diseases (Kinney, 2008). As the Santa Ana winds arrive after the long, dry summers, wildfires can be a significant source of air pollution, but the county's forests also help to mitigate health effects, especially relative to more intensely urbanized areas further south (Santa Barbara County Air Pollution Control District, 2024). By improving local air quality, natural areas reduce overall

healthcare costs and related impacts associated with illness (e.g. lost work or school days).

BIOLOGICAL CONTROL

Healthy ecosystems tend to limit populations of invasive species and diseases, protecting human health, crops, and livestock. Many predator species (e.g. birds, bats, insects) help to control pest species, limiting damage to agricultural crops, and even the spread of disease. In Santa Barbara County, efforts to maintain healthy ecosystems also help to manage invasive species and protect agriculture, livestock, and natural habitats. For example, invasive plants such as giant reed (*Arundo donax*), black mustard (*Brassica nigra*), and purple star thistle (*Centaurea calcitrapa*) threaten local ecosystems and agricultural areas by outcompeting native plants and degrading habitats (Conservation Biology Institute, 2017). Biological controls to reduce pest species are helping to limit such damage, reducing the need for chemical interventions.

CARBON SEQUESTRATION AND TEMPERATURE REGULATION

Natural ecosystems regulate climates at both local and global levels. Globally, the ability of both terrestrial and aquatic plants to sequester atmospheric carbon is a major factor in mitigating extreme weather. At a more localized level, green spaces reduce temperatures through transpiration and shading, lowering cooling costs for residents and reducing heat-related illnesses (Ettinger et al. 2024) that are often worse in highly developed areas with few trees, shrubs, and grasses (Eitelwein et al. 2024). The City of Santa Barbara's *Climate Action Plan* includes measures to increase carbon sequestration by implementing nature-based solutions to achieve the county and state's 2045 carbon neutrality goal (County of Santa Barbara, 2024).

RISK REDUCTION

Nature-based solutions have an important role to play in mitigating natural disaster risks. From drought, to floods, to wildfire, careful ecosystem management can help capture and store precipitation, building reserves for drier periods while reducing downstream flooding and supporting ecosystem resilience to wildfires. The flood risk reduction provided by riparian areas (especially wetlands) provides significant downstream benefits, reducing property damage, lost working time, and casualties (Diringer et al. 2020).

A significant example is the benefits of restored creek systems and flood control measures along the Santa Ynez River and Montecito Creek, where natural floodplains are used to mitigate flood risks and improve water retention. Urban parks not only offer recreational benefits, but are also essential to stormwater management, helping to mitigate flood risks and improve water quality by allowing stormwater to infiltrate the soil rather than flowing directly into storm drains (Santa Barbara County, 2012).

As the changing climate leads to more frequent and intense wildfires (Lenton et al. 2023), and development expands into wildlands, the role of healthy natural landscapes in reducing fire risk is increasingly vital (Heard and Franklin, 2023). Well-managed open spaces serve as natural firebreaks, slowing the spread of wildfires and reducing their intensity (Wang et al. 2021). Vegetation such as grasslands, wetlands, and forests can help absorb moisture, creating buffers that make areas less prone to ignition and rapid fire spread (Kattelmann and

VIEW TOWARD LOMPOC VALLEY, CREDIT: MEREDITH HENDRICKS

LICHEN ON ROCKS, CREDIT: ALISON PETRO

Embury, 1996). Additionally, preserving and restoring ecosystems like chaparral and coastal sage scrub can help reduce fire fuel loads (Allen et al., 2018; Riggan et al., 1986).

Notable fires in Santa Barbara County include the 2008 *Tea Fire*, which destroyed 210 homes, and the *Thomas Fire* of 2017, which became one of the largest wildfires in California's history, burning over 280,000 acres, destroying 1,063 structures, and causing over $2.2 billion in damages. The first five years after a wildfire is a critical time when heavy rains are more likely to trigger landslides. The scar of the Thomas Fire was the site of a massive debris flow on January 9, 2018 that caused $1 billion in economic losses, 500 more structures to be damaged or destroyed, and 23 deaths (Burns, 2022). This sort of coupled event is not rare—the southern coast has 36 debris flows and debris-laden floods documented since 1825, two-thirds of which happened in post-wildfire areas, though there are likely more undocumented instances (Gurrola and Rogers, 2022). Even as wildfire frequency is increasing, extreme rainfall within the year following a burn increases landslide risk by 50 percent in Southern California (Touma et al., 2022).

Investment in conservation and restoration of these lands can help lower the risk of catastrophic wildfires and the subsequent debris flows that cause extensive damage to communities and infrastructure. By maintaining natural landscapes and ecosystems, Santa Barbara can protect its residents, safeguard the economy, and reduce the costs associated with fire suppression, property damage, and public health impacts.

SOIL RETENTION AND FERTILITY

Living groundcover plays an important role in keeping soil in place, building new soil, reducing erosion, and preventing landslides (Rengers et al. 2020). Preventing erosion upstream enhances water quality by limiting sediment entering waterways (Hansen and Ribaudo, 2008). Soil loss can also remove important nutrients and minerals, thus reducing soil fertility (Novara et al 2018); conventional approaches to restoring soil fertility are associated with additional trade-offs, including higher farm costs (Lenhardt and Egoh, 2024). Santa Barbara's open space keeps soil in place by providing ideal conditions for plant growth that supports soil formation and sustains several other ecosystem services.

WATER CAPTURE

Freshwater is critical to all life on land. As precipitation falls into watersheds, it is captured by forests, soils, wetlands, and aquifers which provide sources of water for irrigation and direct human consumption to support downstream ecosystems, communities, and their economies. Natural areas create recharge zones, which replenish underground water reservoirs, known as aquifers, with water from the surface. About fifty percent of water provided to Santa Barbara County residents comes from groundwater (Gatewood et al., 2017). A good example of how recreation lands provide this benefit can be found at the Upper Santa Ynez Watershed near Gibraltar Reservoir. In addition to its abundance of trails, camping, and other recreation opportunities, this remote area is important for storing a significant portion of the rain that falls in the county (Gatewood et al., 2017). This water supplies the City of Santa Barbara with about 40 percent of its water supply in an average year (City of Santa Barbara, 2022).

WATER QUALITY

Wetlands and forests improve water quality by intercepting, filtering,

and metabolizing nitrogen, phosphorus, and other contaminants, and preventing sediment from reaching surface waters (Connor and Willoughby, 1996; Ferren Jr. et al., 1996). The ability of wetlands to neutralize pathogens is well-known (Hemond and Benoit, 1988), while the shade provided by riparian forests helps to moderate stream temperatures that often determine the survival of aquatic species (Faber et al., 1989). Each of these benefits downstream communities, safeguarding water supplies, enhancing recreational activities such as swimming or fishing, and enhancing natural beauty.

While wetlands overall provide a wide array of ecosystem services, and are worthy of protection and restoration, salt marshes (and the estuaries they often support) are an especially important habitat. Unlike other coastal regions of the United States where salt marshes are ubiquitous, California's geography and developmental history have made salt marshes rare and infrequent.

Up to 91 percent of California's coastal wetlands (about 5 million acres) were lost during the 150 years following statehood and settlement by European Americans, and nearly all that remain are altered or degraded (The California Department of Fish and Game, 2001). Land use changes like diking, draining, dredging, and filling for residential, commercial, and agricultural development eliminated about 85 percent of tidal wetlands in the San Diego region (Zedler 1996a) and at least 78 percent in the San Francisco Bay area (Nichols et al. 1986; Goals Project 1999).

Wetland restoration projects, such as the North Campus Open Space at the University of California Santa Barbara (UCSB), have increased Santa Barbara County's coastal wetlands by 11 percent (CCI, 2020) and produce a broad range of co-benefits. These and other nature-based solutions such as the Creek Restoration Program in the City of Santa Barbara enhance riparian vegetation, stabilize streambanks, and improve water quality by limiting sediment and other pollutants, all while improving local aesthetics and the recreational value of these ecosystems (City of Santa Barbara, 2024).

The Carpinteria Salt Marsh is a 230-acre property located in southern Santa Barbara County and is jointly owned by The Land Trust for Santa Barbara County, City of Carpinteria, the University of California Natural Reserve System, and private landowners. It provides water quality improvement and recreation benefits (wildlife viewing, hiking, and art-based nature programs) through restoration and conservation. The marsh is one of the largest and most ecologically important coastal estuaries in California—and it is among the last. In 2008, the Land Trust completed a four-year restoration project to provide better wildlife habitat, opportunities for scientific research, and ways for people to visit and learn about the coastal environment, further adding to the quality-of-life benefits provided to residents.

Not only are salt marshes rare within the state, but they are also especially an infrequent habitat within the county. The only recognized area in the county (excluding the Channel Islands) that is an officially designated salt marsh, besides Carpinteria, is at the mouth of the Santa Ynez River in Lompoc (The California Wildlife Habitat Relationship System, 2024). The conservation of this special place provides habitat for a rich assemblage of native plants and animals, including threatened species like Salt Marsh Bird's-beak (*Cordylanthus maritimus ssp. maritimus*), Light-footed Ridgway's Rail (*Rallus obsoletus levipes*), and Belding's Savannah Sparrow (*Passerculus sandwichensis beldingi*).

MONARCH BUTTERFLIES, CREDIT: KYLE KUSO

ARROYO HONDO PRESERVE, CREDIT: THE LAND TRUST FOR SANTA BARBARA COUNTY

SUPPORTING SERVICES

PROVIDE INDIRECT BENEFITS THROUGH PROVISION OF HABITAT, BIODIVERSITY, AND SUPPORT OF ALL OTHER ECOSYSTEM SERVICES

HABITAT AND BIODIVERSITY

Native plants and animals are adapted to local conditions that are often grouped by broad similarities of climate, hydrography, soils, terrain, and continuity, each of which are important influences on the predominant plant and animal communities (Hall et al., 1996). Such habitats characterize the living conditions of local animals and plants, including water cycles, food resources, and shelter from predators, and may vary by the lifecycle stages of individual species (Boughton et al., 2007). Habitat type and extent may also be influenced by disturbance and both natural and managed restoration (Andrus et al., 2021; Balantic et al., 2021). While the interaction of these factors supports additional ecosystem services (e.g. wildlife watching, fisheries, pollination), the extent and diversity of habitats can be critical to maintaining biodiversity at all levels, from landscapes to individual plant and animal populations (Aukema et al., 2017; Rogers et al., 2020).

Santa Barbara County is within the "California Floristic Province," a global biodiversity hotspot containing more than 1,500 endemic plant species which have shrunk to less than 70 percent of their original habitat extent. Because the county offers a unique range of microclimates within a relatively small area, it supports a stunning number of different species of plants, birds, and aquatic and terrestrial animals (Hoffman et al 2016). The areas around Barka Slough, Burton Mesa, Casmalia Hills, Point Sal, and northeast Vandenberg Space Force Base are especially recognized for their high-quality habitat and diverse plant and animal populations (Gatewood et al., 2017). These areas have many birding hotspots supported by habitat for breeding and migratory birds, including flycatchers, chickadees, buntings and grosbeaks (*North Coast*, n.d.). Point Conception and the Gaviota Coast are home to over 600 species of plants and 200 species of animals and are an important area for biodiversity (The Nature Conservancy, 2024)

Santa Barbara County is among the top regions for birdwatching in the United States. California has the highest number of species of birds observed on eBird, and Santa Barbara is tied with Marin County for the third highest number of observed species in the state: 510, as of 2024 (eBird, 2023). Endemic birds of Santa Barbara County include the Island Scrub Jay (*Aphelocoma insularis*). Other wildlife endemic to the county include the Island Fox (*Urocyon littoralis*), Island Spotted Skunk (*Spilogale gracilis amphiala*), and the distinct population segment (DPS) of California Tiger Salamander (*Ambystoma californiense*).

INFORMATION SERVICES

PROVIDE HUMANS MEANINGFUL INTERACTION WITH NATURE

AESTHETIC VALUE

Many people feel a strong connection to nature—anyone who appreciates a beautiful vista or goes on a scenic hike or drive has

experienced this benefit. Aesthetic beauty is an inherent aspect of many of Santa Barbara County's recreation lands, attracting visitors from around the world to visit sites like Inspiration Point, one of the most popular hikes in the county (Visit Santa Barbara, n.d.)). Proximity to open spaces like parks or lakes tends to be associated with higher property values (Crompton and Nicholls, 2020), further highlighting the importance people often place on experiencing natural beauty.

EXISTENCE (NON-USE) VALUES

Many people place value on the fact that an ecosystem exists, even if they may never visit it. This situation describes the concept of non-use value, which is recognized as an ecosystem service by several frameworks (Markandya, 2019). Nostalgia, preserving historical relics, or other sentimental bases are examples of how people gain satisfaction from simply knowing that a given natural ecosystem/resource exists. For example, the rich biodiversity in Santa Barbara County, including its unique confluence of multiple ecoregions, provides satisfaction to individuals simply knowing that these habitats and species continue to exist (Gatewood et al., 2017).

OUTDOOR RECREATION

In addition to contributing to the county's economy, outdoor recreation also provides non-market benefits to visitors. This benefit is called consumer surplus and represents a measure of how much benefit visitors gain from an activity beyond what they pay to participate. For example, if a person would be willing to pay $200 for a trip to the beach, but the actual cost of the trip was $100, then that person's consumer surplus would be measured at $100. This "cost savings" represents the satisfaction, enjoyment, or wellbeing the person gains from the experience. This differs from the economic contributions of recreation, as consumer surplus measures the value gained—not spent—by the visitor. A discussion of the economic contributions of recreation follows in Section 4.

SCIENCE AND EDUCATION

The natural environment provides opportunities to learn about natural processes, make scientific discoveries that can improve the lives of people, and teach future generations. The National Center for Ecological Analysis and Synthesis (NCEAS), based at UC Santa Barbara, has the mission to "accelerate scientific discoveries that will enhance our understanding of the world and benefit people and nature..." (NCEAS, 2024). NCEAS also houses the Cheadle Center for Biodiversity and Ecological Restoration, which works to preserve and enhance the natural heritage of Santa Barbara County through research, conservation, and restoration. For example, the Cheadle Center manages over 340 acres of open space between Ellwood Mesa and Goleta Slough (CCBER, 2024a). The Cheadle Center also houses UCSB's Natural History Collections, which investigates Earth's variety of life with the purpose of safeguarding this diversity for the future (CCBER, 2024b). Furthermore, the La Kretz Center at the Sedgwick Reserve provides unparalleled opportunities to expand USCB's graduate student research and education. The impressive 6,000 acre reserve contains pristine nature, which makes it the ideal location for ground breaking interdisciplinary research to study, identify, and innovate solutions for environmental challenges within California (Wong, 2017).

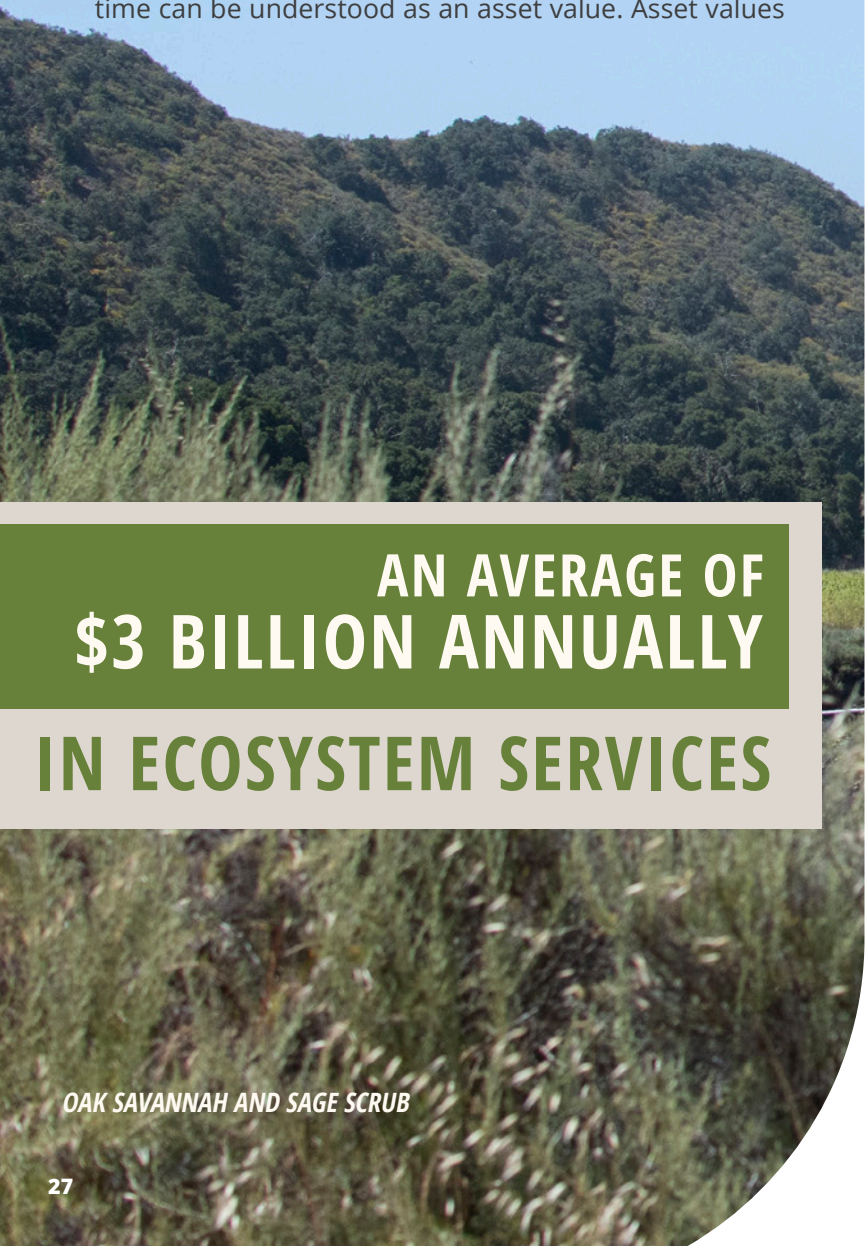
ARROYO HONDO PRESERVE, CREDIT: THE LAND TRUST FOR SANTA BARBARA COUNTY

3.4 THE ANNUAL VALUE OF ECOSYSTEM GOODS AND SERVICES

Overall, open spaces in Santa Barbara County provide an average of $2.96 billion in ecosystem service benefits each year, excluding the value of agricultural production (see Appendix for estimate ranges). Some benefits are localized (e.g. soil fertility), while others accrue downstream (e.g. flood risk reduction); others produce even broader benefits, both regionally (e.g. biological control) and globally (e.g. carbon sequestration). These figures represent the non-market economic benefits that are provided across these geographical dimensions, and are not related to the expenditures and contributions calculated earlier in the report. Although these benefits aren't represented in markets, the loss of these ecosystem services would result in both decreased benefits and increased costs to communities.

3.5 ASSET VALUATION

As with other forms of capital, the flow of ecosystem goods and services produced by natural capital over time can be understood as an asset value. Asset values



AN AVERAGE OF $3 BILLION ANNUALLY IN ECOSYSTEM SERVICES

OAK SAVANNAH AND SAGE SCRUB

TABLE 4. AVERAGE ANNUAL VALUE OF ECOSYSTEM SERVICES BENEFITS IN SANTA BARBARA COUNTY, BY SERVICE (2023 USD)

CATEGORY	ECOSYSTEM SERVICE	AVG $/YEAR
Provisioning	Forage	$3,732,000
	Water supply	$136,107,000
Regulating	Air quality	$7,324,000
	Biological control	$1,786,000
	Carbon sequestration	$114,104,000
	Flood risk reduction	$39,527,000
	Groundwater recharge	$90,544,000
	Soil fertility	$123,645,000
	Soil retention	$3,304,000
	Stormwater runoff reduction	$5,478,000
	Temperature regulation	$10,626,000
	Water quality	$818,947,000
Supporting	Habitat, biodiversity	$112,988,000
Informational	Aesthetic	$100,853,000
	Existence (non-use) values	$306,082,000
	Recreation	$1,085,439,000
	TOTAL*	$2,960,486,000

TABLE 5. AVERAGE ANNUAL VALUE OF ECOSYSTEM SERVICES IN SANTA BARBARA COUNTY, BY LANDCOVER (2023 USD)

LANDCOVER	$/YEAR
Crops and Pastures	$10,148,000
Forests	$1,042,488,000
Grassland	$427,417,000
Lakes	$47,203,000
Marine (including kelp)	$105,761,000
Rivers	$248,000
Shrublands	$44,174,000
Wetlands	$197,609,000
(Recreational Consumer Surplus)	$1,085,439,000
Total*	$2,960,486,000

provide a measure of the expected benefits flowing from capital over time and give policy makers a sense of an asset's total worth. Asset values are calculated by determining the present value of future benefits, which allows comparison of sums of money from different time periods by expressing the values in present terms. To do so, Earth Economics discounts future values using a discount rate, which shows how much future sums of money are worth today. Discounting adjusts for two major factors which influence the value of money over time:

- **Time preference:** People tend to prefer consumption now over consumption in the future, meaning a dollar today is worth more than a dollar received in the future.
- **Opportunity cost of investment:** Investment in capital today provides a positive return in the future.

The choice of discount rate is critical as it heavily influences the outcome of the present values of benefits that occur over a long period of time. While discount rates are often based on market interest rates, experts disagree on the appropriate discount rate for natural capital benefits (Arrow et al., 2004; Sterner and Persson, 2008). High discount rates cause benefits far in the future to be highly discounted and can tremendously affect projects that consider costs and benefits over long time periods. In the case of natural capital, which can continuously produce benefits for hundreds of years, consideration of a lower discount rate is warranted. For example, $100 received in 20 years under a zero percent discount rate (i.e. the undiscounted value) is still $100, but under a three percent discount rate, the same amount falls to $55.37 in year 20, and even farther to $25.84 using a seven percent rate.

Discount rates are a highly debated topic and the appropriate rate will depend on the context of the project. Here, Earth Economics adopts the Office of Management and Budget's current recommendation of a discount rate of 2 percent for riskless social investments (OMB, 2023). OMB states that the social time preference of money is best represented by the rate of return provided by 10-year treasury bonds which have average 2 percent over the last 30 years, when adjusted for inflation. This represents that rate of return that must be achieved for society to forgo current consumption for future consumption. Additionally, the Environmental Protection Agency (EPA) utilizes a 2 percent discount rate when estimating the social cost of carbon, which is another representation of an appropriate discount rate for public benefits. Finally, the US Army Corps of Engineers specify a 2.75 percent discount rate for investments, but do not differentiate between public and private investments. There are even existing arguments that ecosystem services should not be discounted over time due to the likely increase in future value bolstered by the presence of scarcity. **Over the next century, the net present value of all ecosystem services valued here amounts to $138.9 billion, with total estimates ranging from $108.5–185.2 billion (2023 dollars).**

$139 BILLION IN ECOSYSTEM SERVICES OVER THE NEXT CENTURY

4. HOW OPEN SPACE STRENGTHENS **THE RECREATION ECONOMY**

Conservation of open spaces in Santa Barbara County provides significant support to the local economy by providing spaces for residents and tourists to enjoy nature outdoors. Park visitors may spend money getting lunch at a local restaurant, and filling up on gas for their drive there, or at a bike shop for equipment, which all have a ripple effect through the local economy. The "outdoor recreation sector" supports local jobs, wages, and tax revenue, while also contributing to improved quality of life for residents. When new open spaces are conserved for outdoor recreation, like building trails, this expands the outdoor recreation economy by providing new opportunities for businesses in the surrounding areas. This report defines outdoor recreation as activities participated in for personal pleasure and health that occur in nature-based environments outdoors.

This section assesses the potential economic impacts of three conceptual projects to expand outdoor recreation and preserve natural areas in Santa Barbara County. **The project concepts presented here have been chosen to reflect how conserving open spaces in Santa Barbara County can both protect ecosystems and expand economic opportunity, while acknowledging the local importance of current land uses.** These project concepts include a new regional preserve to serve the Santa Maria Valley and beyond, a coastal park to increase access to recreational amenities along the Gaviota Coast, and a major expansion of the California Coastal Trail that would extend access from the interior to the coast.

An *economic impact analysis* estimates the effects of new or expanding industries on the county's economy in terms of additional employment and wages, overall economic activity, and tax revenues offered by adding new trails and parks. This is presented alongside a baseline economic contribution analysis of the current outdoor recreational economy. These models build on multiple data points: the geographical boundaries of both current and potential recreational sites; the total number of visitors to each per year; the average length of each visit; whether visitors are local to Santa Barbara County; average visitor spending across selected industries; and patterns of inter-industry spending throughout the local economy. Please review the appendix for more detailed information on how these data have been collected and estimated.

4.1 VISITATION

A visitor day is defined as one person visiting a site for any duration of time within a single day. For example, three visitors staying overnight at a given park would equal six visitor days. Visitors are further categorized by visitor type (see below).

VISITOR TYPES

LOCAL DAY VISITORS Those traveling less than 50 miles,[1] and not staying overnight.

LOCAL OVERNIGHT VISITORS Those traveling less than 50 miles who stay overnight in a park.

NONLOCAL DAY VISITORS Those who travel more than 50 miles, but do not stay overnight.

NONLOCAL OVERNIGHT VISITORS Those who travel more than 50 miles and stay overnight.

[1] The 50-mile threshold is intended to distinguish differences in expenditures by more distant than more local visitors, and is a standard practice in recreation analyses. Of course, it is possible to travel more than 50 miles within Santa Barbara County (i.e. some non-local visitors may still be county residents). This limitation is inherent in visitation reporting practices.

4.2 SPENDING

Estimates of how much each visitor spends in each industry (e.g. lodging, restaurants, fuel) were developed from the outdoor recreation research literature. Separate profiles were developed to distinguish spending between visitor types (local, nonlocal, day, overnight) and parks (e.g. national parks, county and municipal parks), because some visitors are likely to spend more in some industries than others (e.g. locals tend to spend more at grocers than nonlocals, overnight visitors incur lodging expenses). The total initial expenditures associated with outdoor recreation are calculated as the sum of total visitor days (by visitor type) and the associated spending profile. Total expenditures by industry are then used as inputs to economic contribution or impact models of the economic ties between local industries.

AL FRESCO DINING, CREDIT: MEREDITH HENDRICKS

VIEW FROM LOS ALAMOS HILL, CREDIT: MEREDITH HENDRICKS

4.3 ECONOMIC EFFECTS

The scale of employment, wages, and taxes that each sector supports for a given amount of expenditures is estimated using input-output (IO) models that are based on empirical data on the economic linkages between industries—how spending in one industry goes on to ripple throughout the local economy. This analysis was completed using the industry-standard IO platform IMPLAN, which estimates the effect of expenditures on multiple economic factors (see below).

With the exception of tax revenues, IMPLAN categorizes each factor as either a direct or a secondary effect. *Direct effects* measure the economic activity of industries directly supported by consumer spending (e.g. restaurants, recreation services, hotels). *Secondary economic effects* reflect how businesses in the local economy respond to that demand, and are further categorized as either indirect or induced effects.

Indirect effects concern the industries supporting businesses where visitors directly spend their money. For example, ranchers and farmers supply ingredients for restaurants, so increased restaurant spending drives demand in those industries. In other words, the agricultural industry indirectly benefits from outdoor recreation spending.

Induced effects are focused on spending by the employees of industries directly and indirectly affected by recreational expenditures. When a park employee spends her paycheck on rent and groceries, it benefits the local economy—to the extent that such spending remains local. Depending on the internal connectivity of the local economy, induced effects can recirculate multiple times.

ECONOMIC EFFECTS DEFINED

TOTAL ECONOMIC OUTPUT is the value of all sales in industries directly and indirectly supported by the initial expenditures. It can be useful for understanding the size of one sector relative to others. Comparing total expenditures by recreationists against total economic output reveals the magnitude of economic activity generated for every dollar spent—known as the *multiplier effect.*

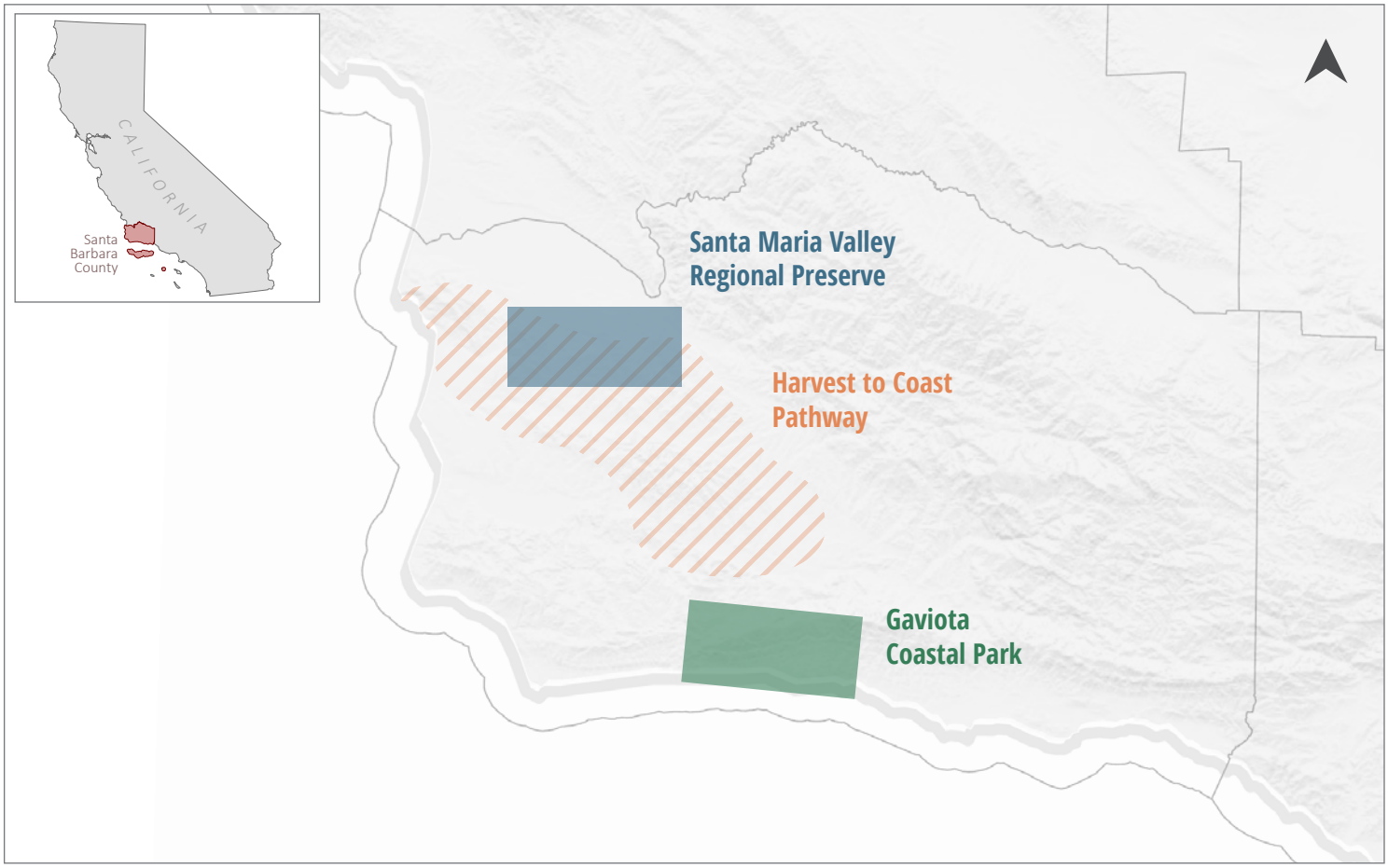
VALUE ADDED TO GDP is calculated by subtracting the value of intermediate inputs (e.g. raw materials, business-to-business services) from the total economic output. It reflects the additional value created by the initial expenditures to the economy.

EMPLOYMENT is supported by visitor spending at restaurants, hotels, and other businesses. Initial expenditures also indirectly support employment in connected industries (e.g. wholesalers, bookkeepers), as well as industries serving their workers (e.g. grocers, real estate, medicine).

WAGES are paid to retail and hospitality sector employees, but also those working in connected industries, as well as those which offer services to those workers.

TAX REVENUE are generated from initial and subsequent expenditures for both state and local governments, often through sales and property taxes.

FIGURE 4. GENERAL LOCATIONS OF PROPOSED NEW RECREATIONAL OPPORTUNITIES



SOURCES: USGS, US Census Bureau, Natural Earth

20 MILES

4.4 EXPANDING OUTDOOR RECREATION FEEDS THE ECONOMY

Santa Barbara County has the potential to gain significant economic benefits by developing new outdoor recreational areas. This chapter explores three concept opportunities to understand their potential value to the location economy. The concept opportunities include the Santa Maria Valley Regional Preserve, a new Gaviota Coastal Park, and a Harvest to Coast Pathway concept to extend the California Coastal Trail. Each site offers unique outdoor experiences—multi-use trails, wildlife viewing, coastal camping, and cultural education—that should attract new visitors. Such projects are expected to not only enhance public access to natural resources, but also drive substantial economic activity across the region.

The following sections report the results of an economic impact analysis of each case study. By drawing comparisons to similar parks and trail systems, this analysis provides insights into the transformative potential of outdoor recreation in Santa Barbara County. It is important to note that these estimates demonstrate how predicted visitation and the associated spending are expected to impact the county economy, rather than the profitability of any given site.

ECONOMIC IMPACT OF

SANTA MARIA VALLEY REGIONAL PRESERVE

The proposed Santa Maria Valley Regional Preserve will extend across 750 to 1,500 acres overlooking Orcutt and the Santa Maria Valley.

There is more access to open spaces and trails per capita in southern Santa Barbara County relative to its northern counterparts. Residents of the expansive Santa Maria Valley enjoy and heavily use the existing parks and trails. As such, there is demand for a larger and more connected open space system in the area that would add to the recreational and economic opportunities. The Land Trust has embarked on an ambitious effort to create regionally-important, destination-worthy open spaces in the Santa Maria Valley.

Currently, residents of the Santa Maria Valley lack enough regional open space to provide deep nature experiences close to home. While new development has created new neighborhood parks, these spaces are overused resulting in diminished quality of user experiences. Additionally, these parks tend to provide recreation amenities, such as playgrounds and courts, but not landscape experiences that allow the user to become immersed within the natural world.

The proposed Santa Maria Valley Regional Preserve will extend across 750 to 1,500 acres overlooking Orcutt and the Santa Maria Valley. Current infrastructure includes cattle fencing, oil wells, and ranch roads that could provide a foundation for future trail systems. The Santa Maria Valley Regional Preserve is intended to develop multi-use trails and open spaces supporting wildlife viewing, picnicking, outdoor education, camping, and conservation grazing. Potential new amenities include a small amphitheater for community events. If developed, this site has the potential to connect to other parks and trails by providing a safe crossing under a local highway.

The preserve is estimated to attract 105,000 new recreational visitor days per year, generating expenditures of $2.6 million, based on average daily visitor spending of $25. Figure 5 reports the expenditures flowing to each industry from preserve visitors. The Santa Maria Valley Regional Preserve is estimated to support 25 new jobs paying $1.4 million in wages, and add $2.1 million to the county GDP, resulting in $4.2 million in total economic activity, and generating $150,000 in county tax revenues, and $490,000 in state and federal taxes (see Table 6).

ANNUAL VISITORS:
105,000

AVERAGE SPENDING:
$25 PER PERSON PER DAY

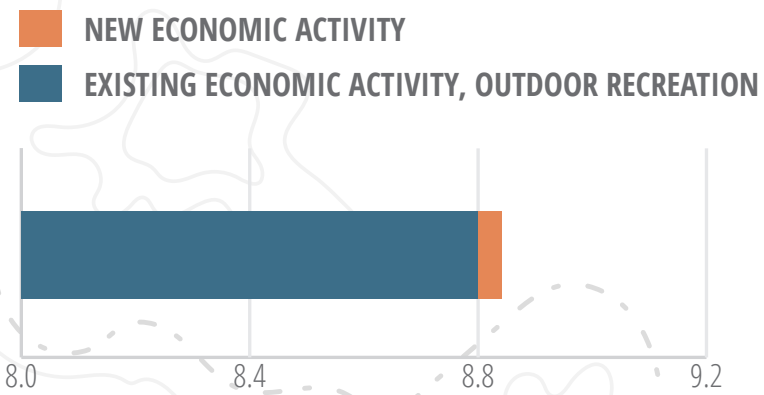


TABLE 6. ANNUAL ECONOMIC IMPACTS FOR THE SANTA MARIA VALLEY REGIONAL PRESERVE

IMPACT TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Direct	18	$870,700	$1,228,100	$2,600,100	$102,500	$310,200
Indirect	3	$267,400	$506,800	$894,200	$28,700	$99,300
Induced	3	$225,400	$411,200	$655,400	$22,700	$83,400
Total	25	$1,363,400	$2,146,200	$4,149,700	$153,800	$492,900

FIGURE 5. SANTA MARIA VALLEY REGIONAL PRESERVE DIRECT EXPENDITURES PER YEAR, BY INDUSTRY

TRIP-RELATED EXPENDITURES PER YEAR

- CAMPING AND OTHER ACCOMODATIONS • $145K
- RESTAURANTS • $590K
- ENTRY FEES (STATE) • $185K
- GAS AND OIL • $585K
- GROCERIES • $785K
- SOUVENIRS AND OTHER EXPENSES • $90K
- RECREATION AND ENTERTAINMENT • $125K
- HOTELS AND MOTELS • $95K

ECONOMIC IMPACT OF

GAVIOTA COASTAL PARK

The Gaviota Coastal Park would provide access to 88 acres along the Gaviota Coast, offering high-quality camping experiences and multi-use hiking trails.

Current infrastructure includes legacy oil wells that will be removed. Planned facilities include a visitor center emphasizing the natural history and cultural values of this segment of the California coast. It may ultimately include exhibits focused on Chumash history, agriculture, and local marine environments.

Gaviota Coastal Park is expected to attract an estimated 365,000 new visitors per year, resulting in $14.65 million in expenditures (Figure 6), based on average visitor spending of $40 per day. For more detailed methods and assumptions, please refer to the appendix.

As such, this park would have the greatest impact on the county economy, **supporting 145 jobs paying $8.2 million in wages, with $12.7 million added to GDP and $23 million in economic activity** (Table 7). Furthermore, the site is estimated to generate **$800,000 in county tax revenue and $2.9 million in state and federal taxes**.

ANNUAL VISITORS:
365,000

AVERAGE SPENDING:
$40 PER PERSON PER DAY

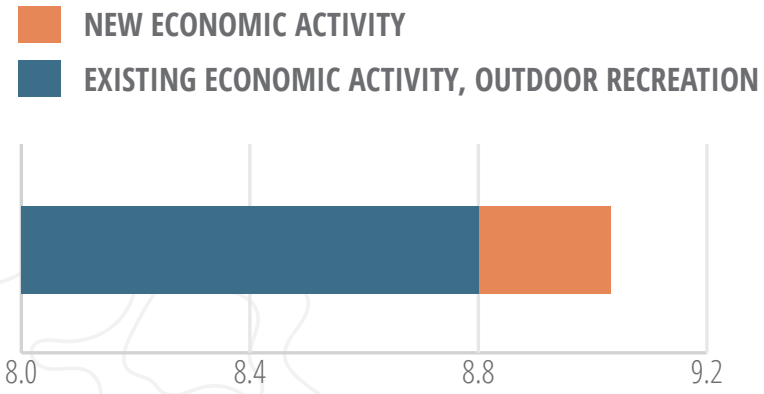


TABLE 7. ANNUAL ECONOMIC IMPACTS FOR THE GAVIOTA COASTAL PARK

IMPACT TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Direct	109	$5,429,600	$7,577,700	$14,648,000	$546,000	$1,866,500
Indirect	17	$1,437,100	$2,643,400	$4,673,600	$142,200	$522,300
Induced	21	$1,357,200	$2,476,600	$3,946,600	$136,500	$502,100
Total	147	$8,223,800	$12,697,700	$23,268,100	$824,600	$2,890,900

FIGURE 6. GAVIOTA COASTAL PARK DIRECT EXPENDITURES PER YEAR, BY INDUSTRY

TRIP-RELATED EXPENDITURES PER YEAR

- CAMPING AND OTHER ACCOMODATIONS • $2M
- RESTAURANTS • $2.6M
- ENTRY FEES (STATE) • $935K
- GAS AND OIL • $2.7M
- GROCERIES • $4.2M
- SOUVENIRS AND OTHER EXPENSES • $310K
- RECREATION AND ENTERTAINMENT • $630K
- HOTELS AND MOTELS • $1.3M

ECONOMIC IMPACT OF

THE HARVEST TO COAST PATHWAY

CONCEPTUAL EXTENSION OF THE CALIFORNIA COASTAL TRAIL WITH INTERIOR CONNECTIONS

The Harvest to Coast Pathway concept would be the largest extension to the California Coastal Trial in a generation.

Though the exact alignment of the trail is unknown, a potential multi-use trail could extend over 58 miles, from Buellton through Los Alamos, Orcutt, and Casmalia, likely finishing at Guadalupe Beach north of Point Sal. This trail would connect a network of existing recreational opportunities while expanding access to communities in the Santa Ynez, San Antonio Creek, and Santa Maria Valleys. This regional trail concept is a potential opportunity to connect interior communities to coastal landscapes along a stunning series of segments.

The Harvest to Coast Pathway concept is expected to draw the most visitors, with an expected 525,000 visitor-days per year, resulting in $12.7 million in spending (Figure 7), based on average spending of $24 per-visitor, per-day.

The proposed trail is predicted to support 120 jobs paying $6.7 million in wages, add $10.5 million to the county's GDP while generating $20.4 million in total economic activity. This would yield **$750,000** in tax revenues for the county, and **$2.4 million** in state and federal taxes (Table 8).

ANNUAL VISITORS:
525,000

AVERAGE SPENDING:
$24 PER PERSON PER DAY

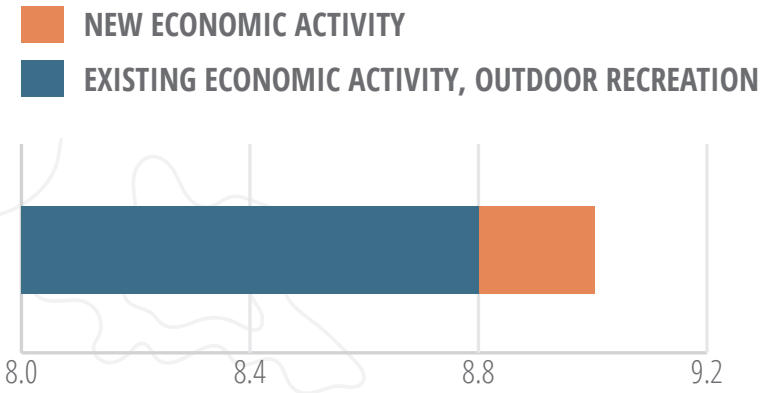


TABLE 8. ANNUAL ECONOMIC IMPACTS FOR THE HARVEST TO COAST PATHWAY CONCEPT

IMPACT TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Direct	90	$4,281,900	$6,039,700	$12,786,700	$503,900	$1,525,500
Indirect	15	$1,314,900	$2,492,400	$4,397,700	$141,000	$488,500
Induced	17	$1,108,400	$2,022,500	$3,223,000	$111,500	$410,000
Total	122	$6,705,100	$10,554,500	$20,407,500	$756,400	$2,423,900

FIGURE 7. HARVEST TO COAST PATHWAY CONCEPT DIRECT EXPENDITURES PER YEAR, BY INDUSTRY

TRIP-RELATED EXPENDITURES PER YEAR

- CAMPING AND OTHER ACCOMODATIONS • $725K
- RESTAURANTS • $2.9M
- ENTRY FEES (STATE) • $910K
- GAS AND OIL • $2.9M
- GROCERIES • $3.9M
- SOUVENIRS AND OTHER EXPENSES • $440K
- RECREATION AND ENTERTAINMENT • $615K
- HOTELS AND MOTELS • $465K

4.5 THE CURRENT OUTDOOR RECREATION ECONOMY

Santa Barbara County is world famous for its beauty, with considerable recreational resources, including more than 250 publicly accessible recreation sites accessing about 914,000 acres. A significant number of these sites are smaller urban parks managed by local municipalities that draw significant visitors each year, both residents and nonlocals. This section describes how the current outdoor recreation industry supports the Santa Barbara County economy.

Recreation lands within Santa Barbara County are estimated to support approximately 38 million visitor days annually. These visitors are estimated to spend $630 million per year on food, lodging, park entrance fees, transportation, and related recreation expenses. Table 9 breaks down total visitor days, total expenditures and average spending by visitor type. Again, non-local visitors are those who travel more than 50 miles, and overnight visitors spend at least one night within a park. Local day trips have the highest visitation numbers, due to the significant number of city-managed, day-use parks. Overnight visitation may also be lower than actual demand, owing to the limited availability of overnight accommodation across all park types.

Figure 8 reports the direct expenditures for each recreation-related industry. The largest share of spending (28 percent) is on food and beverages from grocery stores, totaling approximately $170 million annually. This is followed by gasoline purchases ($150 million) and spending at full-service restaurants ($135 million).

These initial visitor expenditures go on to ripple throughout the economy, supporting secondary (i.e. indirect and induced) spending across the region. Table 10 below shows the economic contributions currently supported by outdoor recreation in the county. When secondary industries are included, the sector generates $880 million in economic activity each year. **For every $1.00 spent by recreational users, $1.40 in additional economic activity is generated in the regional economy.**

A subset of the total economic activity is the contribution to Santa Barbara's GDP, which represents only the value of finished goods and services. **Approximately $470 million of the county's GDP is supported by recreational spending, or about 1.3 percent of the county's 2022 GDP.** In total, annual recreational spending is estimated to support 5,500 jobs (including part-time and seasonal positions) paying $290 million in wages. Tax revenues are estimated at $35.5 million within the county and $115 million to the state and federal governments. **For every $1 million in visitor spending, the county generates $56,000 in tax revenue.** Table 11 organizes this data by recreational site manager type (i.e. county, city, state, federal). County parks support a significant portion of economic contributions, **with $410 million in total economic activity.**

Contributions can also be summarized by visitor type to offer insight into how attracting different visitor types might affect the local economy (see Table 12). Again, these values are largely driven by total annual visitation. For example, 2,000 local day visitors spending $10 per person per day would have a greater economic contribution than 100 nonlocal-overnight visitors spending $100 per person per day. See Appendix for a more detailed breakdown of results, including average contributions per visitor-day.

TABLE 9. ANNUAL VISITOR DAYS AND EXPENDITURES BY VISITOR TYPE

VISITOR TYPE	ANNUAL VISITOR DAYS	DIRECT EXPENDITURES	AVERAGE $/DAY
Local day	32,000,000	$265,000,000	$8
Local overnight	1,500,000	$155,000,000	$94
Non-local day	4,000,000	$116,000,000	$30
Non-local overnight	500,000	$95,000,000	$163
Total	38,000,000	$630,000,000	

TABLE 10. ECONOMIC CONTRIBUTIONS

IMPACT TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Direct	4,500	$210,000,000	$305,000,000	$605,000,000	$25,000,000	$80,000,000
Indirect	500	$45,000,000	$100,000,000	$170,000,000	$6.5,000,000	$20,000,000
Induced	500	$35,000,000	$65,000,000	$105,000,000	$4,000,000	$15,000,000
Total	5,500	$290,000,000	$470,000,000	$880,000,000	$355,000,000	$115,000,000

FIGURE 8. VISITOR DIRECT SPENDING BY INDUSTRY

TRIP-RELATED EXPENDITURES PER YEAR

- CAMPING AND OTHER ACCOMODATIONS • $35M
- RESTAURANTS • $2.9M
- ENTRY FEES (STATE) • $910K
- GAS AND OIL • $2.9M
- GROCERIES • $3.9M
- SOUVENIRS AND OTHER EXPENSES • $440K
- RECREATION AND ENTERTAINMENT • $615K
- HOTELS AND MOTELS • $465K

TABLE 11. ECONOMIC CONTRIBUTIONS BY PARK TYPE

PARK TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
City	600	$30,000,000	$55,000,000	$105,000,000	$5,000,000	$12,000,000
County	2,500	$140,000,000	$220,000,000	$410,000,000	$17,000,000	$55,000,000
State	900	$50,000,000	$75,000,000	$130,000,000	$6,000,000	$20,000,000
Federal	1,500	$70,000,000	$120,000,000	$230,000,000	$8,000,000	$27,000,000
Total	5,500	$290,000,000	$470,000,000	$875,000,000	$35,000,000	$115,000,000

TABLE 12. ECONOMIC CONTRIBUTIONS BY VISITOR TYPE

PARK TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Local Day	2,000	$110,000,000	$190,000,000	$375,000,000	$17,000,000	$44,000,000
Local Overnight	1,500	$80,000,000	$120,000,000	$210,000,000	$8,000,000	$34,000,000
Nonlocal Day	1,000	$50,000,000	$80,000,000	$160,000,000	$6,000,000	$18,000,000
Nonlocal Overnight	1,000	$50,000,000	$80,000,000	$130,000,000	$5,000,000	$19,000,000
Total	5,500	$290,000,000	$470,000,000	$875,000,000	$36,000,000	$115,000,000

5. THE VALUE OF CONSERVING **AGRICULTURAL LANDS**

5.1 HOW AGRICULTURE FEEDS SANTA BARBARA COUNTY'S ECONOMY

Agricultural lands provide a broad range of economic benefits to county residents. **As discussed in Section 3, agricultural lands in Santa Barbara County support an average of at least $10.1 million in ecosystem goods and services every year. These benefits include biological control that protects crops, forage for livestock, carbon sequestered from the atmosphere, and the enjoyment residents derive from knowing these lands have been preserved.** Refer to Section 3 for further discussion on these services.

Agriculture is a pillar of the Santa Barbara County economy. In 2023, the county's agricultural output reached $1.87 billion, with strawberries alone contributing $775 million. Other valuable crops, including wine grapes, broccoli, and cauliflower, further underscore the importance of the sector (Santa Barbara County Agricultural Commissioner's Office, 2024).[2]

Beyond the direct farm revenues, agriculture in Santa Barbara County provides employment and supports local businesses. A 2011 economic contribution study of the county's agricultural sector found that 18 total jobs are supported by every $1 million in direct spending on farm production in the county (Agricultural Impact Associates, 2011). In 2023, the county exported over 90 million pounds of agricultural products to 38 countries (Santa Barbara County Agricultural Commissioner's Office, 2024). An updated economic contribution analysis is needed to understand how these contributions and exports have shifted in the present day. This robust sector is critical to the county economy, from local farmers' markets to regional exports.

Organic farming has grown steadily in prominence, with farm numbers tripling since 2006. This reflects a movement toward sustainable agriculture in the county (Gatewood et al., 2017). Santa Barbara County's 197 registered organic farms cultivate over 15,800 acres (2.4% of total harvested ag acres), leading the way towards producing environmentally friendly crops (Santa Barbara County Agricultural Commissioner's Office, 2024). The 3,300 acres of organic strawberries demonstrate the region's ability to respond to demand for organic products, while simultaneously protecting soil health and reducing agrichemical use. This increase in organic farming is an example of the nimble nature of the business. There is broad support for the long-term sustainability of local agriculture, spanning the conventional, organic, and regenerative practitioners even if their methods are different. Yet the sector faces a growing threat as urban development continues to expand. From 1950 to 2016, urban land expanded by 54,000 acres (from 9,556 urban acres in 1954; Osherenko et al., 2008), primarily by converting farmland along the South Coast and near cities like Lompoc and Santa Maria (Gatewood et al., 2017). Protecting farmland safeguards the county's identity as an agricultural powerhouse while ensuring that future generations can enjoy sustainable, local food production.

CREDIT: MEREDITH HENDRICKS

2 The reader is reminded that such values should not be compared to those reported in prior chapters of this report, as agricultural revenues represent gross direct output (i.e. market price), rather than producer or consumer surplus.

AG LANDS SUPPORT AN AVERAGE OF $10 MILLION EVERY YEAR IN ECOSYSTEM SERVICES

COWS ON RANGELAND. CREDIT: ALISON PETRO

5.2 THE STATE OF FARMLAND CONSERVATION IN THE COUNTY

Preserving agricultural land is essential to ensuring that Santa Barbara County continues to produce food locally, stabilizing the rural economy and protecting the county from reliance on external sources. Conservation efforts—land-use planning, conservation easements, and local policy initiatives—are key to maintaining this balance.

One such policy, the California Land Conservation Act of 1965 was established to reduce the tax burden for farmland. Also known as the Williamson Act, it offers property tax reductions to landowners who commit to maintaining their land for agriculture, open space, or recreation for at least ten years. This incentive helps to slow the sale or conversion of farmland and ranches for other land uses. Such favorable tax terms and a strong real estate market have meant that investing in farms and ranches in Santa Barbara County remains attractive. The Williamson Act enjoys strong local support, with over 80 percent of residents in favor, and only 5 percent opposed (Gatewood et al., 2017).

Land trusts, including the Land Trust for Santa Barbara County and the California Rangeland Trust, have actively conserved agricultural land in the county for nearly 40 years. To date, these land trusts have conserved over 35 agricultural properties throughout the county under agricultural conservation easements. Though, much of the productive agricultural land in the county is still threatened by developmental pressures and water scarcity. Agencies such as the Natural Resources Conservation Service, California Department of Conservation, and the Cachuma Resource Conservation District continue to partner with landowners and land trusts to conserve these important resources in the county.

6. THE FUTURE OF OPEN SPACE IN SANTA BARBARA COUNTY

6.1 CONCLUSION

Santa Barbara County's natural capital produces at least $2.96 billion in ecosystem goods and services each year (not including agricultural revenue). If treated as an asset, with a lifespan of 100 years, the net present value would be $138 billion. To be sustainable, the county must safeguard the ecosystems which freely provide these services as it pursues economic development strategies. Conservation and economic development do not have to be mutually exclusive; each can support the other. **The county's natural capital supports the large recreational economy that produces an estimated $875 million in economic activity within the county each year.** This suggests that the recreational industry could be further developed by supporting conservation and restoration goals, as was demonstrated through the case studies presented here. **That analysis suggests that conserving these three sites can provide economic benefits of $20 million in additional local spending each year.** By expanding open space protection in partnership with landowners through mechanisms such as conservation and trail easements or fee acquisition, the county can continue to expand the outdoor recreation economy, while safeguarding its natural capital and supporting its agricultural base. These findings demonstrate that conservation can be a sound investment in Santa Barbara County's future.

6.2 RECOMMENDATIONS

FUNDING OPPORTUNITIES

The valuation of nature-based solutions has the potential to improve the competitiveness of applications for federal and state funding. Programs such as **FEMA's Building Resilient Infrastructure and Communities (BRIC)** grant program provide funding for hazard mitigation projects and planning, including wildfire planning and wildfire mitigation strategies, such as hardening structures and critical facilities, fuels management, and establishing defensible spaces, such as open space fire breaks near communities.

The Inflation Reduction Act (IRA) also provides funding that may support restoration efforts and activities supporting participation in environmental markets (e.g. carbon credits). Note that the following programs are to remain available until September 30, 2031.

- **Vegetation and Watershed Management Projects (USFS):** $200 million for enhancing ecological integrity and restoration as prescribed in a Water Source Protection Plan or Watershed Restoration Action Plan.
- **Conservation Stewardship Program (NRCS):** $3.25 billion for technical and financial assistance to compensate agricultural and forest producers who agree to adopt additional conservation activities while maintaining conservation baselines.
- **Conservation Technical Assistance (NRCS):** $1 billion for conservation technical assistance to farmers, ranchers, forestland owners, and tribes for conserving and restoring natural resources, improving their future operations.
- **Conservation Technical Assistance—GHG Emission Quantification Program (NRCS):** $300 million to improve measurement, monitoring, reporting, and verification of GHG emissions and carbon sequestration in climate-smart agriculture and forestry. New investments advance priorities in the *Federal Strategy to Advance GHG Measurement and Monitoring for the Agriculture and Forest Sectors*.
- **Conservation and Ecosystem Restoration (BLM and NPS):** $250 million for conservation and ecosystem and habitat restoration projects on lands administered by BLM or the National Park Service.
- **Conservation and Resilience (BLM and NPS):** $250 million for conservation, protection, and resiliency of lands and resources administered by BLM or the National Park Service.
- **Domestic Water Supply Projects (Reclamation):** $550 million for providing domestic water supplies to disadvantaged communities or households without reliable access to domestic water supplies.

This November, California voters passed **Proposition 4**, which will establish a $10 billion state bond to support safer drinking water, wildfire prevention, and help communities and landscapes adapt to the challenges presented by climate change. Proceeds will be distributed to local governments, tribes, non-profit organizations, and businesses. Eligible projects (and total dedicated funding) include:

- **Drought, flood, and water supply:** Increased water availability and quality, reduce flood risk ($3.8 billion).
- **Forest health and wildfire prevention:** Promote forest health, protect communities from wildfires ($1.5 billion).
- **Sea-level rise and coastal areas:** Mitigate risks associated with sea-level rise by restoring coastal areas and protecting fish habitat ($1.2 billion).
- **Land conservation and habitat restoration:** Protect and restore natural areas ($1.2 billion).
- **Energy infrastructure:** Support California's shift towards renewable energy ($850 million).
- **Parks:** Renovate and expand local and state parks ($700 million).
- **Extreme heat:** Mitigate heatwave effects on communities ($450 million).
- **Farms and agriculture:** Support farmers as they mitigate and adapt to climate change ($300 million).

This bond represents a historic opportunity for Santa Barbara County to secure funding to conserve its natural assets and expand its recreational facilities.

STAKEHOLDER ENGAGEMENT

- This report can help to engage and inform decisionmakers and other stakeholders in both the public and private sectors by clearly communicating the economic value of nature, and the scale of the outdoor recreation industry.
- The case studies of the economic impacts expected from expanding the recreation industry within Santa Barbara County can be used to garner support for increased environmental conservation and expansion of recreational opportunities.
- These messages can be amplified by creating infographics and other illustrations to better communicate the economic and environmental impact of future recreational opportunities.

HONEYBEE ON ELEGANT CLARKIA, CREDIT: ALISON PETRO

6.3 NEXT STEPS

PLANNING

FOR LAND USE AND DEVELOPMENT DECISIONS

- The broader effect (and effectiveness) of land use planning and development decisions can be improved by incorporating the valuation of ecosystem services into those processes.
- The incorporation of ecosystem service benefits into wildfire and flood management plans, strategies, and funding allocations will ensure that nature-based solutions—often more cost-effective alternatives to conventional approaches—are given equal consideration in benefit-cost analyses.

POLICY

ZONING AND IMPACT ASSESSMENTS

- The county can maintain—and potentially improve—the wellbeing of its residents by encouraging zoning which prioritizes the conservation of areas known to provide critical ecosystem services (e.g. wetlands for flood control, forests for carbon sequestration, and agricultural lands for food production).
- Requiring that project impact assessments include anticipated effects on the provisioning of ecosystem services will ensure that the broader impacts of proposed projects on community wellbeing are more fully considered.

INVESTMENT

INCENTIVES AND FUNDING FOR NATURAL CAPITAL

- Incorporating natural capital valuation into funding decisions for water and natural resources incentivizes investment in nature-based solutions that operate at lower costs and appreciate over time, while offering multiple community benefits.
- Establishing new funding mechanisms to incentivize the continued and expanded production of ecosystem services–known as a payment for ecosystem services system–can provide an alternative source of income for land stewards.

RESEARCH

FILL GAPS AND UPDATE EXISTING ECONOMETRICS

- An economic analysis of the return-on-investment for conservation and restoration efforts would fill a critical gap in the research literature.
- This report has identified key gaps where primary research on the economic value of important ecosystems and services is not yet documented (see Table 3).
- The most-recent economic study of the agricultural sector in Santa Barbara County is nearly 15 years old. Updating that research could highlight shifts in the county's agricultural economy.

THE WORK OF THE LAND TRUST FOR SANTA BARBARA COUNTY

This is a time of great opportunity for the land and the people of Santa Barbara County. With community support, ***we can protect what makes our region uniquely vital*** and demonstrate that housing, business, agriculture, and conservation do not need to be in conflict.

The Land Trust for Santa Barbara County has the experience, expertise, relationships, and the track record to advance real solutions for:

- **Protecting the stunning natural landscapes** that make Santa Barbara County so precious.
- **Safeguarding healthy land and water systems.**
- **Preserving open spaces** for wildlife corridors, fire and flood mitigation, and healthy watersheds.
- **Championing sustainable agriculture** that protects local food systems.
- **Creating outdoor opportunities** for all regions of our county.

ARROYO HONDO, CREDIT: SALLY ISAACSON

APPENDIX A

GLOSSARY OF TERMS

Aesthetic information: Information ecosystem service defined as enjoying and appreciating the scenery, sounds, and smells of nature.

Air quality: Regulating ecosystem service defined as providing clean, breathable air.

Benefit-cost analysis: A common tool that compares the present-day cost of a project with its long-term benefits, often used by decision makers to determine whether or not a project will be funded.

Benefit Transfer Methodology (BTM): BTM is an ecosystem service valuation method that uses values derived from published studies for application in similar ecosystems. It resembles a house or business appraisal that is based on comparable characteristics of similar houses or businesses.

Biological control: Regulating ecosystem service defined as providing pest, weed, and disease control.

Carbon sequestration: The process by which plants drawn down carbon dioxide from the atmosphere through photosynthesis.

Carbon storage: Carbon held in soils and biological materials (e.g., plant matter) that has been drawn down from the atmosphere through carbon sequestration.

Climate stability: Regulating ecosystem service defined as supporting a stable climate at global and local levels through carbon sequestration and other processes.

Direct contribution effects: Economic activity of industries where expenditures are made. For example, garden supply retailers where equipment and supplies are purchased for a restoration project.

Disaster risk reduction: Regulating ecosystem service defined as preventing and mitigating natural hazards such as floods, hurricanes, fires, and droughts.

Discount rate: The rate at which people value current consumption or income, compared with later consumption or income. It determines the present value of future cash, due to uncertainty, productivity, or time preference for the present.

Economic activity: The direct, indirect, and induced contributions to a region's economic activity (e.g. sales, production and consumption of goods and services, employment, tax payments, etc.). Gross domestic product (GDP) is a common measure of economic activity.

Economic contribution: The portion of an initial expenditure that circulates throughout the local economy. Total economic contribution consists of three key elements: direct contribution, indirect contribution and induced contribution.

Economic contribution analysis: Examines how spending in one industry translates to additional spending in related industries, and the cumulative effect of that spending on the regional economy using input-output modeling.

Ecosystem goods and services: Benefits obtained from ecosystems. Goods are tangible, and often traded in markets (e.g., potable water, fish, timber). Services provide less tangible, often nonmarket benefits (e.g., flood protection, water quality, climate stability).

Ecosystem services valuation (ESV): Assigning dollar values to goods and services provided by a given ecosystem, allowing proposed management policies to be considered in terms of their ability to improve ecological processes that produce the full diversity of valuable ecosystem goods and services. Commonly employed valuation methods include: avoided cost, replacement cost, hedonic pricing, contingent valuation, group valuation, marginal product estimation, travel cost and factor income.

Habitat: Supporting ecosystem service defined as providing shelter, promoting growth of species, and maintaining biological diversity.

Indirect contribution effects: Secondary economic activity from sales to industries where expenditures are made (e.g. intermediary inputs bought in the supply chain). A gas station buying gasoline refined in-state, or a grocery store buying produce grown in-state creates an indirect contribution to the state economy.

Induced contribution effects: Secondary economic activity from sales of goods and services purchased by employees of directly and indirectly affected businesses. An employee who buys locally-produced milk is creating an induced contribution for the local economy.

Jobs: Organization—or company—spending supports local employment beyond those who work directly for the organization. Restoration project spending, for example, spurs construction companies and retailers (among others) to expand their full- and part-time positions. Expenditures from these industries support jobs in industries that provide necessary services to these sectors, such as facilities maintenance, government services, real estate, and medicine. In this report, job numbers are not full-time equivalents.

Labor income: Input-output models estimate the wages paid to workers whose jobs are supported by spending. Investments in restoration projects, for example, directly support wages in construction, forestry, and landscaping, as well as retail. As these employees pay

for necessities such as food and housing, workers in other industries are also supported. Finally, as firms use the income from project contracts to purchase the goods and services they need to function, the initial investment supports wages in other industries, such as wholesalers and business services.

Natural capital: Earth's stock of organic and inorganic materials and energies (renewable and nonrenewable) and living biological systems (ecosystems) which constitute the biophysical context for the human economy and human wellbeing.

Natural Climate Solutions: Conservation, restoration and improved land management actions that increase carbon storage or avoid greenhouse gas emissions in landscapes and wetlands across the globe.

Net present value: The measure of the total value in today's dollars of all future benefits derived from an investment minus the current costs of purchasing that investment, including future contributions which have been annually discounted (using a discount rate) over a pre-determined period of time (e.g., project period).

Recreation and tourism: Information ecosystem service defined as experiencing the natural world and enjoying outdoor activities

Riparian areas: Habitat which is immediately adjacent to freshwater areas (e.g. marshes, forests, etc.).

Social Cost of Carbon: A measure of the global impacts of every additional ton of atmospheric carbon, including damages to agriculture, public health, and property.

Soil quality: Regulating ecosystem service defined as maintaining soil fertility and capacity to process waste inputs (bioremediation).

Soil retention: Regulating ecosystem service defined as retaining arable land, slope stability, and coastal integrity.

Tax revenue: Spending supports additional state and local tax revenues, typically in the form of sales and property taxes paid by the contractors and their employees.

Value added: Also known as gross domestic product (GDP) – a subset of total economic output and is calculated by removing the value of intermediate inputs (e.g., raw materials, semi-finished goods, and business-to-business services) from the total economic output to better represent the value of final goods and services added to the regional economy.

Water capture, conveyance, and supply: Regulating ecosystem service defined as regulating the rate of water flow through an environment and ensuring adequate water availability for all water users.

Water quality: Regulating ecosystem service defined as removing water pollutants via soil filtration and transformation by vegetation and microbial communities.

BLUE-GREY GNATCATCHER, CREDIT: KYLE KUSO

APPENDIX B

DETAILED METHODOLOGY

This appendix provides more detailed information on the methods and data used in the economic contribution, economic impact, and ecosystem services valuation analyses.

B-1. ECONOMIC CONTRIBUTION ANALYSIS

B-1.1. RECREATION SITES

Santa Barbara County has ample recreational resources including approximately 251 publicly accessible sites. These sites are managed by many agencies which can be classified into four categories: federal, state, county, and city managed parks. Smaller city managed areas are most of the parks nearing about 150 individual sites with an area of approximately 5,500 acres. There are few federally managed parks, but they are significantly larger than other park types totaling about 888,000 acres. County managed parks are significant in both the number of sites and total available acres with about 83 sites and 15,000 acres. State parks number fewer sites than county parks (13), however, on average, state parks are approximately 2.5 times larger per site (460 vs 180 acres) totaling about 6,000 acres throughout the county. Overall, the county provides access to about 914,000 acres including both coastal and inland areas where individuals may participate in outdoor recreational activities.

B-1.2. DEFINING OUTDOOR RECREATION AND OPEN LANDS

This report defines outdoor recreation as activities participated in for personal pleasure and health that occur in nature-based environments outdoors. For example, individuals who travel to hike, camp, picnic, view wildlife, boat, or hunt within the county. The county's diverse landscape includes federal, state, county, city, and non-profit lands where public access is granted, and recreational activities are supported. These lands are identified using the California Protected Areas Database (CPAD). This geospatial dataset shows conservation lands owned or managed by over 1,000 agencies and non-profits (GreenInfo, 2024). Santa Barbara County boundaries are used to clip the dataset to show only open access lands in the county. Not all open access lands are outdoor recreation sites therefore the database was filtered to remove non-recreation sites such as cemeteries, airports, flood districts, and holding areas. The remaining lands considered outdoor recreation sites and are the basis for collecting and estimating annual recreational participation.

B-1.3. ESTIMATING VISITATION

Recreational land management agencies are identified and contacted to request annual visitation estimates for all sites managed within the county. Not all agencies record total visitation for each site they manage. If no raw visitation data is available, then site visitation is modeled using an agency's most recent visitor use statistical report or by projecting raw site visitation based on parks size. For example, Santa Barbara County Parks and Recreation Department collect observed visitation for only a portion of their managed sites. In this case, collected visitation data are used to calculate visitors per acre estimates to scale visitation by park size. Visitor per acre estimates are calculated for four park size categories including 0-20, 20-100, 100-1,000, and 1,000+ acres. This method is applied to all parks with no observed visitation data. Table 13 indicates park managers that were able to provide site visitation data. Overall, observed visitation data was available for 25 percent of sites, excluding city parks.

Recreational land managers record visitation data in many ways. Some collect the number of visitor parties, where more than one person is counted as a single visit, while others report individual person counts. In the case of

TABLE 13. VISITATION DATA SOURCES AND AVAILABILITY

MANAGEMENT AGENCY	VISITATION DATA FORMAT	PUBLICLY AVAILABLE
United States Forest Service	Statistical report	Yes
National Park Service	Statistical report	Yes
California Department of Parks and Recreation	Custom data extraction	By request
Santa Barbara County	Custom data extraction	By request

county parks, they use car counters at park entry points to record site visitation. Therefore, raw visitation data are standardized to annual counts of individual visitor days using agency specific statistical reports. For example, Santa Barbara County found that the average party size within vehicles attending county parks is 2.5 persons. The collected and scaled annual visitor days are used to estimate direct visitor spending. The following section overviews the methods used to model annual outdoor recreation visitor spending per site.

B-1.4. ESTIMATING VISITOR SPENDING

To estimate total recreation-related expenditures, spending profiles are collected from the literature. Spending profiles describe how much and where money from park visitors is spent, allowing for direct recreation-related expenditures to be estimated. Spending profiles vary between visitor types, trip types, and park types. For example, non-local users attending national parks may spend more money on fuel or within full-service restaurants when compared to local visitors attending a county park. Capturing this distinction is crucial to quantifying recreational economic contributions. Non-local visitors are visitors who travel 50 miles or more to participate in recreational activities and locals have traveled under 50 miles, while overnight visitors spend at least one night within a park during their trip compared to day visitors. Separate spending profiles are collected and used for national parks, national forests, state/county/city parks (National Park Service [NPS], 2024; White, 2017; White, 2018).

Annual visitor days are converted into four visitor/trip type categories including local day visitors, local overnight visitors, non-local day visitors, and non-local overnight visitors to align with collected visitor spending profiles. Visitor days are converted using statistical reports or scaled using observed visitation data. Federal and state agencies such as the National Park Service, United States Forest Service, and California Department of Parks and Recreation report day and overnight visitors, but not local or non-local visitors. Therefore, the percentage of day and overnight visitors are estimated via collected visitation and local and non-local visitor percentages are collected from statistical reports (NPS, 2023; White et al, 2013; Santa Barbara County Trails Division [SBCTD], 2014). County parks collect only total annual visitors and therefore visitor and trip type percentages are both collected from statistical reports (SBCTD, 2014; Strategic Planning and Recreation Services Division [SPRSD], 2022). It should be noted here that reports on county park did not specify visitor/trip types, therefore reports on state parks within Santa Barbara County are used. Additionally, city parks are assumed to not facilitate overnight visitors and are only attended by local users. Visitor type and trip type percentages are multiplied accordingly to estimate the percentage of local day, local overnight, non-local day, and non-local night visitors per park type.

The collected spending profiles must be adjusted to the 2023-dollar year using the Bureau of Labor Statistics' Consumer Price Index (U.S. Bureau of Labor Statistics, 2024). Spending profiles specific to California federal, state, and local parks are not available. Instead, state, county, and city spending profiles are collected from a report completed for Oregon State parks (White, 2018). It should be noted here that no spending profiles were available for city park visitors. Instead, the state park local day visitor spending profile was altered by keeping only expenditures on gas, groceries, and restaurants. National Park and National Forest spending profiles are collected from national reports (NPS, 2024; White, 2017). California's economy demands higher prices and higher wages when compared to Oregon and national averages, and therefore must be adjusted. Median household incomes are used to adjust spending profiles to reflect the price premiums associated with California (U.S. Bureau of Labor Statistics, 2024). Finally, spending profiles are reported as per party spending and must be adjusted to per person spending so they can be combined with annual visitation estimates. Each spending profile reports the average party size assumed and is adjusted appropriately. Annual visitation estimates by visitor and trip type are merged with the adjusted agency specific spending profiles to estimate total expenditures per economic industry. Below is the spending profile used to estimate direct expenditures from recreational visitors attending state parks.

TABLE 14. NON-LOCAL STATE PARK VISITORS SPENDING PROFILE

INDUSTRY NAME	IMPLAN CODE	EXPENDITURES PER TRIP PER PERSON
Restaurant	509	$8.84
Groceries	406	$5.42
Gasoline	154	$6.78
Entry fees (State)	531	$2.30
Other recreation and entertainment	504	$2.16
Souvenirs and other expenses	412	$1.33

Input-output multipliers are extracted from IMPLAN's proprietary software. These multipliers describe the linkages between economic industries which allows for secondary contributions to be estimated in connected industries. For example, when an individual spends money on groceries the grocer must purchase more items to replace what was sold. The initial spending on groceries indirectly supports secondary industries such as transportation or agriculture sectors. Through these multipliers the indirect and induced economic contributions are estimated. Multipliers are extracted for each economic industry described within each spending

profile. The extracted multipliers describe economic contributions per $1 million of direct spending within the industry of interest. This allows for easy scaling and application to the estimated recreational spending. Finally, the constructed spending profiles, direct visitor expenditures, and economic multipliers are merged to estimate the direct, indirect, and induced contributions made by current recreational participation within Santa Barbara County.

B-2. ECONOMIC IMPACT ANALYSIS

Economic impact analysis differs from economic contribution analysis. As described before, economic contribution analyses measure the state of an economy based on the current levels of production. On the other hand, economic impact analyses estimate the effects of a new or expanding industry on the economy. The proposed case studies would expand not only the industries that offer recreational services, but also the supporting industries that are connected via visitor spending. The increase in expenditures for these services would expand their industries and therefore economic impact multipliers are used. These multipliers differ in the sense that impact multipliers allow for feedback within the industry that initial spending occurs. This represents the goods and services (i.e. "inputs") required to fulfill the growth of the industry. For example, if a new window manufacturing company opens in a region, then they may need to purchase new windows for their corporate buildings or warehouses. Impact multipliers account for the change in demand within a new or expanding industry, allowing for more output than direct investment.

B-2.1. ESTIMATING VISITATION

As before, visitation data is scaled based on park acreage to estimate visitation for the three proposed case study sites. Furthermore, of the sites that visitation data is present, the most similar parks to each proposed site are identified. Park size, location, proximity to urban areas, facilities, and available programs are used to indicate similar parks. The identified similar parks' visitation data are combined with the scaled per acre estimates to construct an average visitation estimate. This captures the similarities between each park's facilities as well as park size.

B-2.2. ESTIMATING VISITOR SPENDING

The same steps are taken to model direct visitor expenditures within Santa Barbara. First, case study park types are established based on the projected function of the parks. Two parks are projected to function similarly to current county parks while the other may function closer to a state park. The same visitor/trip type ratios used in contribution analysis are used to estimate the number of local day, local night, non-local day, and non-local night visitors. Total annual visitor days are then multiplied by these ratios so that visitation estimates can be merged with the collected spending profiles. The previously adjusted spending profiles are merged with the visitor/trip type estimates to estimate total direct visitor spending. Economic impact multipliers are extracted in the same way and applied to direct visitor spending per economic industry.

B-3. ECOSYSTEM SERVICES VALUATION

B-3.1. IDENTIFYING LAND COVER

This study uses the National Land Cover Database (NLCD) for 2021 as the base of our land cover acreages. This is combined with other datasets to further characterize the land cover classes (Table 15). The resulting specificity of land cover types allows for more precise ecosystem service valuation estimates and additional services to be valued.

TABLE 15. LANDCOVER DATA

DATASET (SOURCE)	VARIABLE	DESCRIPTION
National Land Cover Database 2021 (MRLC)	Land cover	National land cover product forming basis of our acreages
Koppen Geiger climate zones	Climate	Major climate zones used to refine land cover types
National Hydrography Dataset (USGS)	Riparian zones	Applied 50ft (urban areas) or 100ft (rural areas) buffers to major streams to flag land cover within riparian zones
Urban Areas (US Census)	Proximity to urban areas	Boundaries of urban areas used to flag land cover within 1 mile of cities
Statewide crop mapping (CA DWR)	Proximity to agriculture	Statewide crop map used to flag land cover within 200 ft of agriculture areas
Groundwater recharge areas (RMC Water and Environment, County of Santa Barbara)	Groundwater recharge areas	Areas where groundwater recharge occurs, used to flag land cover that contributes
Farmland Mapping and Monitoring Program 2020 (CA Dept of Conservation)	Grazing land	Identifies farmland quality and importance as well as grazing lands

After merging, all layers are clipped to the boundaries of Santa Barbara County before tabulating acreages.

B-3.2. CALCULATING ECOSYSTEM SERVICE VALUES

Earth Economics uses Benefit Transfer Methods (BTM) to estimate the value of ecosystem services produced in the study site. BTM, broadly defined as "...the use of existing data or information in settings other than for what it was originally collected," (Richardson et al., 2015) is frequently used to indirectly estimate the value of ecological goods or services. BTM is often the most practical option available to quickly generate reasonable estimates at a large scale and at a fraction of the cost of conducting local, primary studies.

BTM is similar to home appraisals in which the value and features of comparable neighboring homes which have recently sold (e.g. two bedrooms, garage, one acre, recently remodeled) are used to estimate the value of an off-market home. In this analysis, Earth Economics identified published ecosystem service valuation estimates from comparable ecosystems and contexts and "transferred" them to Santa Barbara County ecosystems. As with home appraisals, BTM results offer a broad, high-level view of potential benefits in a timely and cost-effective manner.

Earth Economics' ability to conduct ecosystem service valuations using BTM is facilitated by its proprietary Ecosystem Valuation Toolkit (EVToolkit), which is one of world's most robust repositories of peer-reviewed studies, reports, and gray literature on the value of ecosystem services. The EVToolkit associates up to 200 data elements with each value estimated in a given study, including the location and scale of a study site, detailed descriptions of the ecosystems and ecosystem services assessed, methodologies, and the type of economic value produced. Studies within the EVToolkit have gone through multiple reviews and are standardized to units of dollar-per-acre-per year.

Earth Economics begins by identifying appropriate ecosystem services valuation estimates within the EVToolkit. Before a value is selected, the team examines the degree of similarity (e.g. location, elevation, climate, socioeconomic indicators) across primary and transfer sites (Plummer, 2009). A defensible benefit transfer requires a careful assessment of the commensurability of the primary study sites (as reported in the literature) and the transfer site (i.e. the site to be valued via BTM). For this study, the team started by limiting the data to studies conducted in California. Studies conducted outside this area were added on a case-by-case basis to fill gaps for ecosystem services values that could be reasonably applied to the transfer site (i.e. ecosystems similar to those at the study site). All studies included in the dataset were from the western US, except one value for Water Quality (see Appendix E for the list of studies used). For cases where Earth Economics was unable to identify a study suitable for transfer to the study area, no value was included. It is important to understand that this decision simply reflects the limitations of valuation research, not that those natural assets provide no value.

It was possible to adjust the outputs of several studies using function transfer, a benefit transfer method which uses statistical models estimated for individual study sites (aka "value functions") in conjunction with information on transfer site characteristics to estimate the unit value of an ecosystem service at the transfer site. This approach offers many advantages, including the ability to tailor value estimates to the transfer area. Some research suggests that function transfers can be more accurate than point estimates (Kaul et al., 2013). Where function transfers were not available, Earth Economics used the simpler point transfer approach, where a simple unit value is used instead of a function.

Finally, Earth Economics included several studies quantifying the mass of carbon captured by ecosystems. These were valued using the social cost of carbon (SCC). The social cost of carbon (SCC) represents the average societal costs associated with each additional ton of carbon emissions (measured in CO_2e), such as losses to agriculture, impacts to human health and increased disaster risk. In the context of actions that reduce carbon emissions (e.g. energy efficiency) or actively sequester carbon (e.g. forest restoration), the SCC represents the value of these actions in terms of avoided cost to society and is used by federal agencies in the U.S. and updated on a regular basis by the Interagency Working Group on the Social Cost of Greenhouse Gases (IWGSCGG). The value for carbon sequestration used was derived from the IWGSCGG—a result of Executive Order 13990 (IWGSCGG 2021). Specifically, the 2024 value was used: $55.36/metric ton CO_2e, or $217.28/metric ton C in 2022 USD.

All data was combined into a final dataset and adjusted to 2022 USD using GDP deflator data estimated by the World Bank (2023). For the final dataset, Earth Economics took the range of all values selected for each land cover type and ecosystem service combination.

Each ecosystem service value in the final dataset is then multiplied by the appropriate acreage of the associated land cover type to arrive at the annual value of each landcover-ecosystem service combination in the county. Earth Economics then aggregates values across all land cover types to estimate the aggregate value of ecosystem services in the county.

APPENDIX C

ECOSYSTEM SERVICE VALUE RANGES

TABLE 16. ANNUAL ECOSYSTEM SERVICES (RANGES)

CATEGORY	ECOSYSTEM SERVICE	RANGE $/YEAR
Provisioning	Forage	$574,000–$6,890,000
	Water supply	$88,629,000–$249,227,000
Regulating	Air quality	$1,638,000–$16,445,000
	Biological control	$892,000–$3,210,000
	Carbon sequestration	$36,409,000–$233,289,000
	Flood risk reduction	$17,189,000–$86,941,000
	Groundwater recharge	$13,255,000–$240,543,000
	Soil fertility	$123,645,000–$123,645,000
	Soil retention	$1,089,000–$6,983,000
	Stormwater runoff reduction	$1,321,000–$10,653,000
	Temperature regulation	$3,452,000–$19,812,000
	Water quality	$581,420,000–$1,091,715,000
Supporting	Habitat, biodiversity	$73,319,000–$214,466,000
Informational	Aesthetic	$11,839,000–$200,002,000
	Existence (non-use) values	$305,835,000–$307,120,000
	Recreation	$1,085,439,000–$1,085,439,000
	Total*	$2,345,946,000–$3,896,381,000

TABLE 17. TOTAL ANNUAL VALUE OF ECOSYSTEM SERVICES IN SANTA BARBARA COUNTY, BY LANDCOVER (2023 USD)

LANDCOVER	RANGE $/YEAR
Cultivated Crops	$9,105,000–$11,423,000
Forests	$658,579,000–$1,496,702,000
Grassland	$354,762,000–$553,117,000
Kelp	$4,783,000–$26,850,000
Lake	$35,593,000–$59,035,000
Marine	$92,299,000–$92,299,000
Pasture	$142,000–$157,000
River	$1,000–$1,286,000
Shrubland	$6,697,000–$112,985,000
Wetland	$98,544,000–$457,087,000
(Consumer Surplus)	$1,085,439,000–$1,085,439,000
Total*	$2,345,946,000–$3,896,381,000

TABLE 18. NET PRESENT VALUE OVER 100 YEARS, DISCOUNTED AT 2 PERCENT (2023 USD)

RANGE (BILLION $)
$108.51–$185.22

*Sums may vary due to rounding

APPENDIX D

LIMITATIONS

D-1. ECONOMIC CONTRIBUTION LIMITATIONS

The primary limitation within this study is the availability of observed visitation data. As stated, visitation data was only available for 25 percent of parks, excluding city parks. Park attendance is the primary driver of recreational related expenditures and therefore it is preferable to have observed visitation data for as many parks as possible. It is recommended that park managers begin to collect visitation data in a more comprehensive and stringent manner or sponsor park use surveys so that visitation may be extrapolated. At a minimum, this data should include visitor types (local vs non-local), trip types (day vs overnight), duration of stay, activities planned or participated in.

Park features/facilities data was not available in a manner that would allow the data to be appended to park visitation data and therefore could not be integrated within the dataset to aid in modeling visitation. Different agencies collect park feature data in different ways, but each collected in a way that would require significant transformations or transcriptions. For example, county park features were available in multiple webpages within the County's website. Each site page requires an analyst to manually transcribe the data into a database which on a large scale is not practical or efficient. Similarly, state parks recorded some park features, but it is stored in a format that is not conducive to a database format. These data can be altered to fit into a database, however doing so for all sites within the county was not feasible. The only attribute that was available for all sites was acreage as described by the CPAD. The limited observed visitation data combined with no way to efficiently append park attributes caused modeling to be a significant challenge. Some park features were able to be captured by using GIS or management agency data. Management agency names are used to indicate park type (federal, state, county, or city), GIS data is used to determine if a park is coastal or not, and multiple webpages were used to transcribe whether a park facilitates overnight stays. Various multiple linear regressions were estimated using these variables to model visitation for parks with no data. However, the variables did not explain a significant portion of the variability within the collected park visitation data. This could indicate that these variables do not influence park visitation data or that there is not sufficient data to draw significant correlations. It is recommended that park facility data be collected and stored in a format that is easily accessible and transferable.

Expenditure profiles by economic industry for recreational visitors to Californian parks are not available. Expenditure profiles describe how much and which industries spending occurs and are required for estimating direct recreational related spending. Different populations spend money in different ways, thus, it is important to collect spending profiles created as closely as possible to the parks being analyzed. The profiles collected for this study originate from Oregon State or are National averages, to the extent possible it would be ideal to have profiles that were constructed within California. Furthermore, spending depends on the activities a visitor chooses to participate in. The collected profiles did not specify spending by activity type and therefore some variance in spending is missing from the study. It is recommended that a survey be completed for California parks and visitors to determine spending profiles for visitor/trip types but also activity type.

D-2. ECONOMIC IMPACT LIMITATIONS

Forecasted visitation for each proposed site is based on observed visitation at similar existing parks, therefore, just as in the economic contribution analysis the availability of collected visitation is the primary limitation of this study. Modeling visitation for the proposed sites cannot be further refined without access to more robust observed visitation data. Similar parks, in terms of features and functionality, were used to average the per acre scaled estimates. This allows for the estimates to be adjusted for both park features and size. However, this approach assumes that park size is a main determinant of visitation and that the compared parks will be the same. To the extent that these assumptions hold true determines the accuracy of the estimates. It is recommended that park visitation be monitored more extensively so that visitation can be modeled in a more comprehensive extent.

Similarly, the proposed Harvest to Coast Pathway concept will effectively connect multiple parks and municipalities. It is unknown how the connection of these sites will impact their current visitation or the forecasted visitation of the trail itself. For example, the proposed trail will create additional access to recreational lands. This in turn may increase their current levels of visitation at the park, or the connection of multiple parks and services provided by cities may increase the total number of trail visitors. It is recommended that additional research be conducted on the indirect impacts of increased access to recreational sites.

Finally, the proposed Harvest to Coast Pathway concept is a unique design that will provide unparalleled access to the

county's natural features by connecting coastal landscapes to inland services in a way that is yet to be seen within the region. This opportunity to conveniently explore the county may draw more tourists (non-local visitors) when compared to other local parks. Essentially, the ability for visitors to lodge and take advantage of services offered by local cities and easily access the distinct landscape of the county may alter the distribution of visitor types to the county. For example, this study assumes that the distribution of visitor types will be the same as state or county parks within the region. It is recommended that research be conducted for other regional trails.

D-3. ECOSYSTEM SERVICES VALUATION

There are inherent challenges in accurately estimating the full value of anything, whether those limits stem from the (partial) value represented by market transactions, or from attempting to infer value indirectly (e.g. willingness to pay, replacement costs). Despite such uncertainties, it is clear that ecosystems produce significant economic value for society. There are known gaps in the primary research literature on the economic value of ecosystem services, and this ESV does not include all ecosystem services known to be influenced by future projects. For this reason, the values reported here may be underestimates. Caution should also be exercised when comparing total ecosystem services values across landcover types, as differences may reflect information gaps, rather than real differences in the level of benefits produced by specific landcover types, or the value of such services.

One significant omission is the value of wildfire risk reduction. At the time of this study, there was a gap in publicly available literature on the ecosystem service value for wildfire mitigation and prevention applicable to the study area, meaning the total value of ecosystem services provided by Santa Barbara open space is likely much greater than estimated in the present study since avoided wildfire damage is not included. The authors acknowledge that one of the most critical roles natural landscapes play in Santa Barbara County is mitigating the spread of wildfires, a growing threat in California due to extreme weather and land use pressures.

As with any form of economic analysis, BTM has strengths and weaknesses. One critique argues that every ecosystem is unique and produces a unique flow of ecosystem benefits. While this is surely true to some degree, it suggests that the only means of understanding the true value of a given ecosystem is to fund resource-intensive primary studies. In general terms, BTM is a systematic approach to generalizing knowledge learned about one place to predict characteristics of another, controlling for key contextual attributes—a widely accepted practice in a broad range of fields.

Consider the example of property assessment: governments periodically assess the value of real estate as the basis for property taxes. This is achieved not by sending assessors to visit every home, but by reviewing recent sales data of nearby homes with similar attributes, including square footage, the number of bedrooms, bathrooms, views, etc. The present analysis follows a similar approach, focusing on published valuation research on ecosystems in climates and social contexts similar to those in Santa Barbara County, including other important attributes such as their location relative to urban areas, riparian zones, etc.

Many of the selected studies report a range of values, rather than single-point estimates. This variance is preserved; no studies are removed from the dataset because their estimated values are deemed too high or too low. The study results are reported in a way that allows the reader to appreciate the range and distribution of values. While the final estimates may be imprecise, reporting such variance is preferable to assuming that ecosystem services have zero (or infinite) value. For decision makers, it is better to be approximately right than precisely wrong.

APPENDIX E

ANNOTATED BIBLIOGRAPHY FOR ECOSYSTEM SERVICES VALUATION

Beyers, W. B. (2002). Evaluation of Blanchard Mountain Social, Ecological and Financial Values. Washington State Department of Natural Resources.

The Washington Department of Natural Resources manages 4,827 acres of land on Blanchard Mountain that provide social, ecological, and financial values to residents of Washington and beyond. The study evaluated these values using the contingent valuation method, facilitated by a telephone survey of 200 nearby county residents. Results show that the community values environmental resources and attributes—including habitat and other regulating services— the highest ($4.3 million), followed by recreational opportunities ($2.8 million), land resources ($880 thousand), and finally educational opportunities ($520 thousand).

Brander, L., Brouwer, R., and Wagtendonk, A. (2013). Economic valuation of regulating services provided by wetlands in agricultural landscapes: A meta-analysis. Ecological Engineering, 56, 89-96.

This paper presents a meta-analysis of the economic valuation literature on ecosystem services provided by wetlands in agricultural landscapes. The study includes values from the United States and Europe with information on site attributes to improve transferability. A meta-regression is used to produce a value function for wetland regulating services that can be transferred based on site attributes. The authors focus on the value of flood control, water supply and nutrient cycling to create a database containing 66 value estimates standardized in USD per hectare per year.

Byrd, K. B., Flint, L. E., Alvarez, P., Casey, C. F., Sleeter, B. M., Soulard, C. E., ... and Sohl, T. L. (2015). Integrated climate and land use change scenarios for California rangeland ecosystem services: wildlife habitat, soil carbon, and water supply. Landscape Ecology, 30, 729-750.

This study focused on the central valley of California and surrounding foothills, examining the potential impacts of climate and land use change on California rangeland ecosystems. The authors developed six spatially explicit (250 m) climate and land use change scenarios consistent with IPCC emission narratives and used these to quantify baseline and projected changes in wildlife habitat, soil organic carbon (SOC), and water supply (recharge and runoff). Results indicate that habitat loss is expected to predominantly occur in grasslands, and opportunities for groundwater recharge will also reduce.

Cooley, H., Phurisamban, R., and Gleick, P. (2019). The cost of alternative urban water supply and efficiency options in California. Environmental Research Communications, 1(4), 042001.

Cooley et al. examine the costs and economic feasibility of various strategies for meeting growing water demands in urban areas. They include various stakeholder needs, including residents, farms, businesses, as well as natural ecosystems. The analysis found that water use efficiency options tend to be much less costly than traditional or alternative supply systems, and that water treatment and reuse systems, as well as urban stormwater capture projects, were less costly than the seawater desalination.

Chmura, G. L., Anisfeld, S. C., Cahoon, D. R., and Lynch, J. C. (2003). Global carbon sequestration in tidal, saline wetland soils. Global biogeochemical cycles, 17(4).

This study compiled data for 154 sites in mangroves and salt marshes from the western and eastern Atlantic and Pacific coast, as well as the Indian Ocean, Mediterranean Ocean, and Gulf of Mexico. The average soil carbon density of mangrove swamps (0.055 ± 0.004 g cm-3) is significantly higher than the salt marsh average (0.039 ± 0.003 g cm-3), yet sequestration rates were similar for both. Carbon density and sequestration both range with annual temperature and other climatic parameters. Globally, these combined wetlands store at least 44.6 Tg C yr-1, this number is probably more as detailed inventories are not available for salt marshes in China and South America. Peatlands, salt marshes and mangroves release negligible amounts of greenhouse gases and store more carbon per unit area.

DeLonge, M. S., Ryals, R., and Silver, W. L. (2013). A lifecycle model to evaluate carbon sequestration potential and greenhouse gas dynamics of managed grasslands. Ecosystems, 16, 962-979.

The authors designed a field-scale model that quantifies net greenhouse gas emissions (CO2, CH4, and N2O) from the production, application, and ecosystem response of soil amendments over a 3-year period, with case studies for grazed annual grasslands for Marin and Yuba counties in California. The authors are able to show that while manure emits larger amounts of greenhouse gases than fertilizers, the composting of manure and

vegetation can offset much of the GHG emissions across a broad range of environmental and management conditions. The results indicate a savings of 23 Mg CO2/ Ha over a three year period, compared to a 14 Mg CO2 emission over that same period without proper management of waste.

Ghermandi, A., Van Den Bergh, J. C., Brander, L. M., De Groot, H. L., and Nunes, P. A. (2010). Values of natural and human-made wetlands: A meta-analysis. Water Resources Research, 46(12).

This meta-analysis examines ecosystem service values provided by wetland ecosystems, with a focus on human-made wetlands. The semi-log model includes 416 value observations across 6 wetland types and 11 ecosystem service categories. The authors find that the highest-valued services are water quality improvement, non-consumptive recreation, and provision of natural habitat and biodiversity, but that the value of specific services varies with the type of wetland producing them.

Gopalakrishnan, V., Hirabayashi, S., Ziv, G., and Bakshi, B. R. (2018). Air quality and human health impacts of grasslands and shrublands in the United States. Atmospheric Environment, 182, 193-199.

This study models improvements in air quality for grasslands and shrublands at the state and county levels in the coterminous United States. The authors use the i-Tree Eco model to estimate the air pollution removal capacity of these land cover types for NO2, O3, PM2.5, and SO2. Monetary air quality benefits are derived from the US EPA's BenMAP program, which calculates avoided costs of adverse health effects such as emergency room visits, hospital admissions from respiratory illness, and more. Overall, pollution removal benefits were higher in urban areas, and the authors conclude that grasslands and shrublands are critical components in improving air quality and human health in urban regions of the United States. Supporting information for this article contains estimates of pollution removal by state.

Graham, R. C., Akers, S. C., Meixner, T., and Wechsler, S. P. (2004). Fire and Terrain Controls on Soil Carbon in Chaparral Watersheds. Kearney Foundation of Soil Science: Soil Carbon and California's Terrestrial Ecosystems.

This study examined the distribution of soil carbon in two chaparral watersheds in the San Gabriel Mountains of Southern California, one that experienced a prescribed fire and the other a wildfire. The methodology involved terrain analysis using a high-resolution (0.5 m) digital elevation model to define characteristics within each watershed, along with soil sampling and analysis for soil organic carbon (SOC) content. Results showed that the mean SOC in the prescribed fire watershed was significantly higher than in the wildfire watershed, indicating that fire severity is a major influence on post-fire SOC levels.

Hill, B. H., Kolka, R. K., McCormick, F. H., and Starry, M. A. (2014). A synoptic survey of ecosystem services from headwater catchments in the United States. Ecosystem Services, 7, 106-115.

Water supply, climate regulation, and water purification are estimated for over 500 headwater stream catchments, using data derived from the National Hydrography Dataset for the lower 48 states. Production functions were created for water supply, climate regulation, and water purification and their results reported for nine ecoregions. The combined ecosystem services—valued at up to $30 million per year overall—were presented in dollars per hectare per year.

Hoover, C. M., Bagdon, B., and Gagnon, A. (2021). Standard estimates of forest ecosystem carbon for forest types of the United States. US Department of Agriculture, Forest Service, Northern Research Station.

Presents annual stand-level forest carbon yields as a function of stand age, for 53 forest types within 11 regions of the United States. This updates earlier forest carbon stock estimates developed following USDA GHG estimation guidelines for agriculture and forestry.

Leschine, T. M., Wellman, K. F., and Green, T. H. (1997). The economic value of wetlands: wetlands' role in flood protection in Western Washington. Washington State Department of Ecology.

This study highlights the importance of flood-mitigating wetlands in Western Washington. Because flood risk reduction is a public good, this study sheds light on the private decisions developers take that negatively impact social welfare. Study sites include Scriber Creek in Lynwood, a 5.1-mile-long stream emptying into a wetland of about 6.8 square miles in a highly urbanized and developing community. Flooding along the lowlands rivers and streams of Western Washington has increased in frequency. The authors estimate that the benefits of wetlands—based on the costs to substitute engineered flood protection measures—ranges from $36,000 to $51,000 per acre.

Liu, H., Hou, L., Kang, N., Nan, Z., and Huang, J. (2022). The economic value of grassland ecosystem services: A global meta-analysis. Grassland Research, 1(1), 63-74.

This study provides a comprehensive assessment of the value of ecosystem services provided by grasslands. The authors construct a global database of grassland ecosystem service values containing 702 observations from 134 primary studies. A linear meta-regression of this database reveals the total value of ecosystem services provided by grasslands ranges from $3955 to $5466 per hectare and that regulating services have the highest value.

Liu, S., Liu, J., Young, C. J., Werner, J. M., Wu, Y., Li, Z., ... and Sleeter, B. M. (2012). Baseline carbon storage, carbon sequestration, and greenhouse-gas fluxes in terrestrial ecosystems of the Western United States. Baseline and projected future carbon storage and greenhouse-gas fluxes in ecosystems of the Western United States. Professional Paper, 45-63.

This chapter describes the modeling and analysis of baseline carbon storage and carbon flux across various biomes and land types throughout all of California, Oregon, Washington, Idaho, Nevada, Utah, Arizona and parts of Montana, Wyoming, Colorado, New Mexico, and Texas. Land-use and land-cover mapping and modeling results are used to assess carbon stock, carbon flux, and greenhouse gas (GHG) flux in live biomass, soil organic carbon, and dead biomass. Changing land use, land cover, and fire modeling were taken into account and reported as the total CO2 sequestered by land cover. The types of land modeled, in increasing order of carbon sequestered, are agricultural lands (7 percent), grasslands/shrublands (30 percent), and forests (62 percent). The average net carbon flux in terrestrial ecosystems in the Western US was estimated as -86.5 TgC/yr (a carbon sink). The western cordillera (Western US mountains), accounted for 59 percent of this storage.

Maher, A. T., Maczko, K. A., Taylor, D. T., and Tanaka, J. A. (2020). National and state economic values of cattle ranching and farming-based ecosystem services on federal and private lands in the US. Sustainable Rangelands Roundtable Publication. University of Wyoming, Laramie, Wyoming.

This report estimates ecosystem service values for forage production, wildlife recreation, and general services on pasture and rangeland used for beef cattle production in the United States. Forage production value is estimated from pasture rental rate data from the National Agricultural Statistics Service, general service values were estimated by assuming Conservation Reserve Program rental payments for maintaining ecosystem function on grasslands serve as a proxy for ecosystem service value provisioning, and recreation values were taken from the U.S. Fish and Wildlife Service survey on wildlife recreation. Values are presented by state.

Graham, R., Mansfield, C., Van Houtven, G., Hendershott, A., Chen, P., Porter, J., ... and Kilambi, V. (2012). Klamath River basin restoration nonuse value survey. US Bureau of Reclamation. RTI Project, (0212485.001), 010.

A comprehensive restoration program for the Klamath River Basin in southern Oregon and northern California involves removal of four large dams from the river. The decision to move forward with such a program should include a full accounting of the social benefits associated with “nonuse value,” which accrue to members of the public who value the river regardless of whether they will ever visit or use the resources it provides. The authors conducted a stated-preference valuation survey, finding that residents of the Klamath area would pay $67.56 per household per year for the restoration program.

McPherson, E. G., and Muchnick, J. (2005). Effects of street tree shade on asphalt concrete pavement performance. Arboriculture and Urban Forestry (AUF), 31(6), 303-310.

This study examined the relationship between street tree shade and the condition of asphalt pavement in Modesto, California. Results showed that higher pavement conditions scores were associated with more tree shade, indicating that tree shade is partially responsible for reducing pavement issues like cracking and other distresses. Overall, shade from large trees could reduce pavement maintenance by $7.13 per square meter over 30 years compared to an unshaded street.

McPherson, G., Simpson, J. R., Peper, P. J., Maco, S. E., and Xiao, Q. (2005). Municipal forest benefits and costs in five US cities. Journal of forestry, 103(8), 411-416.

The authors estimate the benefits from community forests from cities in Colorado, Wyoming, North Dakota, California, and Arizona. The modeling tool STRATUM is used to estimate benefits of trees including energy savings, atmospheric carbon reduction, air quality improvement, stormwater runoff reduction, and aesthetics. These cities spent $13-65 annually per tree, but benefits gained range from $31 to $89 per tree.

McPherson, E. G., Simpson, J. R., Peper, P. J., and Xiao, Q. (1999). Benefit-cost analysis of Modesto's municipal urban forest. Journal of Arboriculture, 25, 235-248.

The authors sought the answer the question of whether or not the city of Modesto's urban forest justifies its annual municipal budget. They valued co-benefits such as air pollution removal, aesthetic benefits, shade, carbon sequestration, and stormwater runoff interception using the i-tree model. Results show these co-benefits exceed management costs by a factor of almost 2. Total benefits were found to be $54.33 per tree.

McPherson, E. G., and Simpson, J. R. (2002). A comparison of municipal forest benefits and costs in Modesto and Santa Monica, California, USA. Urban Forestry and Urban Greening, 1(2), 61-74.

This study compares structure and benefits of street and park trees in two cities: Modesto, CA and Santa Monica, CA. The authors use the i-tree model to value as air pollution removal, aesthetic benefits, shade, carbon sequestration, and stormwater runoff interception. The ecosystem services provide $2.2 million in benefits in Modesto and $806,000 in benefits in Santa Monica. Benefit-cost ratios for these trees amounted to 1.85 to 1 in Modesto, and 1.52 to 1 in Santa Monica.

McPherson, E. G., Xiao, Q., van Doorn, N. S., de Goede, J., Bjorkman, J., Hollander, A., ... and Thorne, J. H. (2017). The structure, function and value of urban forests in California communities. Urban Forestry and Urban Greening, 28, 43-53.

This study investigated urban forests throughout the state of California, incorporating numerical models to calculate the value of ecosystem services produced by trees. Ecosystem services included were energy-savings cost due to shade, carbon sequestration, air pollution removal, and rainfall interception. The average benefits per tree were found to be $47.83, compared to an average management cost of $19 per tree.

Moore, W. B., and McCarl, B. A. (1987). Off-site costs of soil erosion: a case study in the Willamette Valley. Western Journal of Agricultural Economics, 42-49.

This study examined the marginal cost of sediment erosion in the Willamette Valley in Oregon. Erosion costs related to water treatment, infrastructure maintenance, and hydroelectric generation were estimated at approximately $5 million across the region. Infrastructure maintenance costs were highest, followed by water treatment costs.

Morandin, L. A., Long, R. F., and Kremen, C. (2016). Pest control and pollination cost–benefit analysis of hedgerow restoration in a simplified agricultural landscape. Journal of Economic Entomology, 109(3), 1020-1027.

Adequate field edge habitats on mono-cropped farms add ecosystem benefits that may not be economically beneficial in the short term, such as water quality protection and habitat for native bees and insects. The study area was focused in California's Sacramento Valley, an area with large-scale monoculture orchards. All plants used were restored California native perennials, replacing field edges primarily composed of nonnative grasses and plants. The purpose of this study was to develop a model showcasing the cost-benefit analysis of installing field edge habitats (hedgerows). Additionally, this model gives farmers, who are often driven by economic incentives, more robust information for making choices with their land. Given a fixed cost to plant rounded up to $4,000 on a 300m hedgerow, the model predicts it would take 16 years to break even based solely on savings in insecticide, and 7 years including benefits from native bee pollination.

Norton, J. B., Jungst, L. J., Norton, U., Olsen, H. R., Tate, K. W., and Horwath, W. R. (2011). Soil carbon and nitrogen storage in upper montane riparian meadows. Ecosystems, 14, 1217-1231.

The authors quantify soil carbon and nitrogen stress in montane riparian wetland meadows in the central Sierra Nevada Range in California. Soil cores were collected and analyzed in the lab from 17 sites. Overall, the meadows contained about 156 metric tons of carbon per hectare, on average, in their current condition.

Nowak, D. J., Hirabayashi, S., Bodine, A., and Greenfield, E. (2014). Tree and forest effects on air quality and human health in the United States. Environmental Pollution, 193, 119-129.

This study models improvements in air quality for forests at the state and county levels in the coterminous United States. Air pollution removal capacity of forests is estimated for NO2, O3, PM2.5, and SO2. Monetary air quality benefits are derived from the US EPA's BenMAP program, which calculates avoided costs of adverse health effects such as emergency room visits, hospital admissions from respiratory illness, and more. Values for each pollutant removed are published in terms of 2010 USD per hectare per year, by state, for both urban and rural areas within the United States.

Nowak, D. J., Hirabayashi, S., Bodine, A., and Hoehn, R. (2013). Modeled PM2. 5 removal by trees in ten US cities and associated health effects. Environmental pollution, 178, 395-402.

To quantify the value of trees' ability to filter particulate matter on human health, the authors model tree effects on concentrations of particulate matter less than 2.5 microns for 10 cities in the United States. The human health

value of this pollution removal is estimated using data from the U.S. EPA's BenMAP program, which models how air quality concentrations affect incidence of adverse health effects. City-wide values range from $1.1 million in Syracuse to $60.1 million in New York City.

Nowak, D. J., Hoehn, E., Crane, D. E., Stevens, C., Walton, T. (2007). Assessing Urban Forest Effects and Values. United States Forest Service (USFS).

This analysis focused on the benefits of tree cover in San Francisco, California. Ecosystem services valued include carbon storage, carbon sequestration, and removal of air pollutants. The total value of these services is estimated at $1.7 billion for the city.

Nowak, D. J., Crane, D. E., and Stevens, J. C. (2006). Air pollution removal by urban trees and shrubs in the United States. Urban forestry and urban greening, 4(3-4), 115-123.

This study models air pollution removal from urban trees across the coterminous United States. Models use hourly meteorological and pollution concentration data to estimate pollution removal for ozone, particulate matter less than 1 microns, nitrogen dioxide, sulfur dioxide, and carbon monoxide. Pollution removal was monetized based on dollar-per-ton externality values used in energy-decision-making from various studies. Total air pollution removal by United States urban trees is estimated at 711,000 metric tons, a value of $3.8 billion.

Nowak, D.J., Crane, D.E., Dwyer, J.F. (2002). Compensatory Value of Urban Trees in the United States. Journal of Arboriculture, 28(4), 194-199.

Using field data from eight U.S. cities, the authors estimated the total compensatory value of tree populations to range from $101 million in Jersey City, NJ, to $5.2 billion in New York, NY. Compensatory value is defined as the compensation to owners for the loss of an individual tree, and can be seen as a valuation of trees as a property asset. The authors estimate the total compensatory value for urban forests in the contiguous United States at $2.4 trillion.

Pate, J., Loomis, J. (1997). The effect of distance on willingness to pay values: a case study of wetlands and salmon in California. Ecological Economics, 20, 199-207.

This study analyzes the factors of distance and their effects willingness to pay for public goods with large non-use values. The data used came from a contingent valuation study regarding the San Joaquin Valley, CA. Respondents were asked about their willingness to pay (WTP) for three proposed programs designed to reduce various environmental problems in the Valley. A logit model was used to examine the effects of geographic distance on respondents' willingness to pay for each of the three programs. Results indicate that distance affected WTP for two of the three programs (wetlands habitat and wildlife, and the wildlife contamination control programs). They calculate the underestimate in benefits if the geographic extent of the public good market is arbitrarily limited to one political jurisdiction.

Pimentel, D., Wilson, C., McCullum, C., Huang, R., Dwen, P., Flack, J., ... and Cliff, B. (1997). Economic and environmental benefits of biodiversity. BioScience, 47(11), 747-757.

This review estimates that the annual economic and environmental benefits of biodiversity in the United States are valued at approximately $300 billion. Ecosystem services considered include: biomass and organic waste recycling, soil formation, nitrogen fixation, bioremediation of chemical pollution, genetic resources and crop and livestock yields, biotechnology, biological pest control, perennial grains, pollination, habitat and ecotourism, pharmaceuticals, and carbon sequestration.

Podolak, K., D. Edelson, S. Kruse, B. Aylward, M. Zimring, and N. Wobbrock. (2015). Estimating the Water Supply Benefits from Forest Restoration in the Northern Sierra Nevada. An unpublished report of The Nature Conservancy prepared with Ecosystem Economics. San Francisco, CA.

This study explored whether increased investment in forest and meadow restoration in the Sierra Nevada mountains could increase and enhance California's water supply. The analysis synthesizes potential water yield impacts from forest thinning from over 150 studies, finding that a three-fold increase in forest restoration could yield up to 6 percent more in mean annual stream flows. Market rates are used to value these benefits. Depending on the watershed, benefits of increased water yield could be as much as $415 million.

Rein, F. A. (1999). An economic analysis of vegetative buffer strip implementation. Case study: Elkhorn Slough, Monterey Bay, California. Coastal Management, 27(4), 377-390.

This study investigates the economics of implementing vegetative buffer strips as a tool to protect water quality from nonpoint pollution in Elkorn Slough, California's first National Estuarine Research Reserve. It evaluates environmental costs and benefits of implementing vegetative buffer strips, both to the grower and to society as a whole, as a means of capturing nonmarket ecosystem values and informing decision making. Benefits evaluated include tourism, commercial fisheries, long-term road maintenance, and harbor protection, using

replacement cost and market pricing methods. Results indicate a net economic benefit for growers to install vegetative buffer strips within the first year, when the costs of erosion are considered. Buffer strips also protect water quality and preserve soil fertility. A number of policy tools to encourage the implementation of vegetative buffer strips are discussed, including tax incentives and legislative policies. Government intervention through incentive-based programs is advocated due to the economic and ecologic benefits to society.

Reynaud, A., and Lanzanova, D. (2017). A global meta-analysis of the value of ecosystem services provided by lakes. Ecological Economics, 137, 184-194.

This study conducts the first meta-analysis on the economic value of ecosystem services provided by lakes, using a global dataset of 699 values drawn from 133 studies. The authors estimate two models: one representing hedonic price studies, measuring value per property per year; and another estimating value from non-hedonic price studies, measuring value per person per year (which captures values for ecosystem services such as erosion, flood mitigation, recreation, habitat, and others). The authors find an average value of ecosystem services to be between $106 and $140 USD$2010 per person per year for non-hedonic studies, and between $169 and $403 per property per year for hedonic studies.

Rosenberger, Randall S.; White, Eric M.; Kline, Jeffrey D.; Cvitanovich, Claire. (2017). Recreation economic values for estimating outdoor recreation economic benefits from the National Forest System. Gen. Tech. Rep. PNW- GTR-957. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 33 p.

This study presents a meta-analysis of consumer surplus studies derived from the Recreation Use Values Database (RUVD). The model includes 2,709 data points, including values for 14 different recreational activities at units of consumer surplus per person per activity day.

Ryals, R., and Silver, W. L. (2013). Effects of organic matter amendments on net primary productivity and greenhouse gas emissions in annual grasslands. Ecological Applications, 23(1), 46-59.

The authors studied the ability of organic soil amendments to increase carbon storage and water holding capacity on valley grasslands of Browns Valley and coastal grasslands of Nicasio, both in California. Field measurements were taken on over three years. Addition of organic soil amendments increased carbon storage in soils by 25 to 70 percent; water-holding capacity also increased on each site. The authors concluded that a single application of organic waste likely provides such benefits much longer than the study period.

Srivastava, L., Hand, M., Kim, J., Sánchez, J. J., Lupi, F., Garnache, C., ... and Quinn, J. F. (2020). How will climate change affect the provision and value of water from public lands in Southern California through the 21st century?. Agricultural and Resource Economics Review, 49(1), 117-149.

Srivastava et al. estimate the value of water supply from the San Bernardino National Forest, located in southern California. The authors couple water flow models with economic demand models for residential water to demonstrate how consumer welfare changes with water supply from public lands. Results predict that the value of an additional unit of raw water provided by the Forest ranges from $0.018 to $8.37 per hundred cubic feet through the 21st century.

Standiford, R. B., Huntsinger, L. (2012). Valuing forestland environmental services: a case study for California's Oak Woodlands. ISFE (International Symposium of Forest Economics).

Oak woodlands cover ten percent of the state of California, ad provide important ecosystem services. The paper assesses several of these services, including aesthetic and non-use values, using hedonic and contingent valuation, respectively.

Trust for Public Land. (2010). The Economic Benefits and Fiscal Impact of Parks and Open Space in Nassau and Suffolk Counties, New York. Available at: http://cloud.tpl.org/pubs/ccpe--nassau-county-park-benefits.pdf

This study analyzed the economic benefits and fiscal impact of parks and open space in Nassau and Suffolk Counties on Long Island, including: reduced cost of government services; recreation and tourism; agriculture industry; and government cost savings. Additional non-market benefits were discussed qualitatively.

Trust for Public Land. (2011). The Economic Benefits of Seattle's Park and Recreation System. Trust for Public Land, Seattle, WA. Available at: http://cloud.tpl.org/pubs/ccpe-seattle-park-benefits-report.pdf

This study assesses seven major factors to determine the value of Seattle park system, which includes more than 5,400 acres within city boundaries. The study assessed effects on nearby home prices, tourism, direct use, health, community cohesion, clean water, and clean air. Property tax and tourists' sales tax provide direct income to the city's treasury. Recreation on Seattle's public lands yields direct consumer surplus, and health benefits from recreation and cleaner air.

Wallmo, K., and Lew, D. K. (2011). Valuing improvements to threatened and endangered marine species: an application of stated preference choice experiments. Journal of environmental management, 92(7), 1793-1801.

The authors design a choice experiment to estimate willingness-to-pay values for improving the endangered species listing status of three Endangered Species Act-listed species in the United States. Results suggest that survey respondents had distinct preferences for each species as well as the level of improvement to their status. The willingness to pay for Puget Sound Chinook salmon recovery was used, estimated at $46.95 per household per year.

Ward, M. A., Hill, T. M., Souza, C., Filipczyk, T., Ricart, A. M., Merolla, S., ... and Beheshti, K. M. (2021). Blue Carbon Stocks and Exchanges Along the Pacific West Coast. Biogeosciences Discussions, 2021, 1-36.

Salt marshes and seagrasses can sequester and store large amounts of carbon in their soils relative to other aquatic habitats. This study quantifies the soil carbon stocks of these habitats in six bays along the Pacific coast of California. Salt marshes had twice as much soil carbon as seagrass meadows, estimated at 23.51 kg per cubic meter compared to 11.01 per cubic meter.

TREE FROGS, CREDIT: ALISON PETRO

APPENDIX F

DETAILED CONTRIBUTION RESULTS

TABLE 19. ECONOMIC CONTRIBUTIONS PER VISITOR-DAY, BY MANAGER TYPE AND VISITOR TYPE

MANAGER AND VISITOR TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
City Agency	**0.00003**	**$2**	**$3**	**$5**	**$0**	**$1**
Local day	0.00003	$2	$3	$5	$0	$1
County Agency	**0.00019**	**$10**	**$16**	**$30**	**$1**	**$4**
Local day	0.00011	$6	$10	$19	$1	$2
Local night	0.00076	$42	$64	$107	$5	$18
Non-local day	0.00023	$12	$18	$36	$1	$4
Non-local night	0.00104	$57	$87	$147	$6	$25
Federal Agency	**0.00060**	**$32**	**$53**	**$100**	**$4**	**$12**
Local day	0.00021	$11	$20	$42	$1	$4
Local night	0.00160	$86	$141	$251	$10	$34
Non-local day	0.00033	$17	$30	$64	$2	$6
Non-local night	0.00281	$146	$237	$406	$14	$53
State Agency	**0.00036**	**$19**	**$30**	**$53**	**$2**	**$8**
Local day	0.00012	$6	$11	$21	$1	$2
Local night	0.00076	$42	$64	$107	$5	$18
Non-local day	0.00023	$12	$18	$36	$1	$4
Non-local night	0.00104	$57	$87	$147	$6	$25
Grand Total	**0.00014**	**$8**	**$12**	**$23**	**$1**	**$3**

TABLE 20. ECONOMIC CONTRIBUTIONS PER VISITOR-DAY, BY MANAGER TYPE AND VISITOR TYPE

MANAGER, VISITOR TYPE, IMPACT TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
City Agency	**595**	**$31,322,000**	**$53,234,000**	**$105,440,000**	**$4,535,000**	**$12,217,000**
Local day	595	$31,322,000	$53,234,000	$105,440,000	$4,535,000	$12,217,000
Direct	480	$21,707,000	$33,153,000	$72,087,000	$3,257,000	$8,345,000
Indirect	61	$5,967,000	$12,867,000	$22,217,000	$867,000	$2,456,000
Induced	54	$3,650,000	$7,215,000	$11,136,000	$412,000	$1,417,000
County Agency	**2,614**	**$138,791,000**	**$219,700,000**	**$408,388,000**	**$17,139,000**	**$55,030,000**
Local day	1,149	$60,685,000	$99,942,000	$193,848,000	$8,358,000	$23,243,000
Direct	935	$43,058,000	$63,164,000	$132,832,000	$6,020,000	$16,147,000
Indirect	110	$10,546,000	$22,778,000	$39,406,000	$1,540,000	$4,348,000

TABLE 20 CONTINUED

MANAGER, VISITOR TYPE, IMPACT TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Induced	104	$7,082,000	$14,001,000	$21,611,000	$799,000	$2,749,000
Local night	605	$33,645,000	$50,913,000	$85,064,000	$3,592,000	$14,591,000
Direct	503	$25,827,000	$35,548,000	$59,744,000	$2,547,000	$10,983,000
Indirect	44	$3,939,000	$7,694,000	$13,480,000	$481,000	$1,663,000
Induced	57	$3,881,000	$7,672,000	$11,840,000	$566,000	$1,946,000
Non-local day	620	$31,291,000	$48,841,000	$95,698,000	$3,798,000	$11,480,000
Direct	511	$22,220,000	$30,191,000	$64,853,000	$2,624,000	$7,860,000
Indirect	55	$5,431,000	$11,453,000	$19,737,000	$765,000	$2,207,000
Induced	54	$3,641,000	$7,198,000	$11,109,000	$411,000	$1,413,000
Non-local night	240	$13,171,000	$20,006,000	$33,780,000	$1,392,000	$5,718,000
Direct	200	$10,016,000	$13,855,000	$23,650,000	$977,000	$4,272,000
Indirect	18	$1,640,000	$3,153,000	$5,504,000	$194,000	$683,000
Induced	22	$1,517,000	$2,999,000	$4,627,000	$222,000	$763,000
Federal Agency	**1,379**	**$72,651,000**	**$122,283,000**	**$230,446,000**	**$8,306,000**	**$27,658,000**
Local day	223	$11,931,000	$21,417,000	$45,303,000	$1,617,000	$4,597,000
Direct	176	$7,943,000	$12,552,000	$30,464,000	$1,010,000	$2,913,000
Indirect	26	$2,609,000	$6,138,000	$10,630,000	$451,000	$1,147,000
Induced	20	$1,380,000	$2,728,000	$4,210,000	$157,000	$539,000
Local night	384	$20,594,000	$33,810,000	$60,203,000	$2,314,000	$8,216,000
Direct	315	$15,125,000	$22,808,000	$41,908,000	$1,615,000	$5,916,000
Indirect	33	$3,097,000	$6,312,000	$11,055,000	$397,000	$1,261,000
Induced	35	$2,373,000	$4,692,000	$7,241,000	$303,000	$1,040,000
Non-local day	264	$13,737,000	$24,095,000	$51,465,000	$1,763,000	$5,219,000
Direct	211	$9,131,000	$13,912,000	$34,453,000	$1,065,000	$3,278,000
Indirect	30	$3,017,000	$7,043,000	$12,164,000	$518,000	$1,322,000
Induced	23	$1,589,000	$3,142,000	$4,849,000	$181,000	$621,000
Non-local night	508	$26,390,000	$42,962,000	$73,476,000	$2,614,000	$9,627,000
Direct	422	$19,513,000	$29,786,000	$51,568,000	$1,869,000	$6,971,000
Indirect	41	$3,838,000	$7,168,000	$12,636,000	$391,000	$1,433,000
Induced	45	$3,039,000	$6,009,000	$9,273,000	$356,000	$1,224,000
State Agency	**905**	**$49,253,000**	**$75,969,000**	**$133,153,000**	**$5,585,000**	**$20,608,000**
Local day	166	$8,770,000	$14,431,000	$27,974,000	$1,207,000	$3,358,000
Direct	135	$6,227,000	$9,124,000	$19,170,000	$869,000	$2,334,000
Indirect	16	$1,521,000	$3,284,000	$5,681,000	$223,000	$627,000
Induced	15	$1,024,000	$2,024,000	$3,124,000	$116,000	$398,000

TABLE 20 CONTINUED

MANAGER, VISITOR TYPE, IMPACT TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Local night	463	$25,760,000	$38,980,000	$65,126,000	$2,751,000	$11,171,000
Direct	385	$19,773,000	$27,216,000	$45,741,000	$1,950,000	$8,409,000
Indirect	34	$3,016,000	$5,891,000	$10,321,000	$368,000	$1,274,000
Induced	44	$2,971,000	$5,874,000	$9,065,000	$433,000	$1,490,000
Non-local day	92	$4,640,000	$7,243,000	$14,191,000	$564,000	$1,703,000
Direct	76	$3,295,000	$4,477,000	$9,617,000	$389,000	$1,166,000
Indirect	8	$806,000	$1,699,000	$2,927,000	$114,000	$328,000
Induced	8	$540,000	$1,068,000	$1,648,000	$61,000	$210,000
Non-local night	184	$10,084,000	$15,317,000	$25,863,000	$1,066,000	$4,378,000
Direct	153	$7,668,000	$10,608,000	$18,107,000	$748,000	$3,271,000
Indirect	14	$1,256,000	$2,414,000	$4,214,000	$149,000	$523,000
Induced	17	$1,161,000	$2,296,000	$3,543,000	$170,000	$585,000
Grand Total	**5,492**	**$292,015,000**	**$471,184,000**	**$877,425,000**	**$35,564,000**	**$115,511,000**

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APPENDIX G

DETAILED IMPACT RESULTS

TABLE 21. VISITOR DAYS, EXPENDITURES, AND EXPENDITURES PER VISITOR BY SITE AND VISITOR TYPE

SITE AND VISITOR TYPE	ANNUAL VISITOR DAYS	DIRECT EXPENDITURES	EXPENDITURES PER VISITOR
Santa Maria Valley Regional Preserve	**105,000**	**$2,600,000**	**$24.76**
Local day	75,000	$1,200,000	$16.00
Local night	6,500	$550,000	$84.62
Non-local day	22,000	$620,000	$28.18
Non-local night	2,000	$220,000	$110.00
Gaviota Coastal Park	**365,000**	**$14,650,000**	**$40.14**
Local day	195,000	$3,110,000	$15.95
Local night	90,000	$7,050,000	$78.33
Non-local day	55,000	$1,580,000	$28.73
Non-local night	25,000	$2,900,000	$116.00
Harvest to Coast Pathway Concept	**525,000**	**$12,800,000**	**$24.38**
Local day	375,000	$6,000,000	$16.00
Local night	30,000	$2,800,000	$93.33
Non-local day	110,000	$3,000,000	$27.27
Non-local night	10,000	$1,000,000	$100.00

TABLE 22. ECONOMIC IMPACTS PER VISITOR-DAY, BY SITE AND IMPACT TYPE

SITE AND IMPACT TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Santa Maria Valley Regional Preserve	**0.00024**	**$12.95**	**$20.00**	**$40.00**	**$1.48**	**$4.76**
Direct	0.00014	$8.29	$11.43	$24.76	$1.00	$2.95
Indirect	0.00005	$2.48	$4.76	$8.57	$0.29	$0.95
Induced	0.00005	$2.19	$3.81	$6.67	$0.19	$0.76
Gaviota Coastal Park	**0.00040**	**$22.47**	**$34.79**	**$63.01**	**$2.26**	**$7.95**
Direct	0.00030	$15.07	$20.82	$40.27	$1.49	$5.21
Indirect	0.00004	$4.11	$7.12	$12.88	$0.38	$1.37
Induced	0.00005	$3.56	$6.85	$10.96	$0.37	$1.37
Harvest to Coast Pathway Concept	**0.00023**	**$127.62**	**$20.00**	**$38.86**	**$1.43**	**$4.57**
Direct	0.00017	$8.19	$11.43	$24.38	$0.95	$2.86
Indirect	0.00003	$2.48	$4.76	$8.38	$0.27	$0.95
Induced	0.00003	$2.10	$3.81	$6.10	$0.21	$0.76
Grand Total	**0.00029**	**$16.30**	**$25.40**	**$48.00**	**$1.70**	**$5.80**

TABLE 23. ECONOMIC IMPACTS BY SITE AND IMPACT TYPE

SITE AND IMPACT TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Santa Maria Valley Regional Preserve	**25**	**$1,364,000**	**$2,147,000**	**$4,150,000**	**$154,000**	**$493,000**
Direct	18	$871,000	$1,229,000	$2,601,000	$103,000	$311,000
Indirect	3	$268,000	$507,000	$895,000	$29,000	$100,000
Induced	3	$226,000	$412,000	$656,000	$23,000	$84,000
Gaviota Coastal Park	**147**	**$8,224,000**	**$12,698,000**	**$23,269,000**	**$825,000**	**$2,891,000**
Direct	109	$5,430,000	$7,578,000	$14,649,000	$546,000	$1,867,000
Indirect	17	$1,438,000	$2,644,000	$4,674,000	$143,000	$523,000
Induced	21	$1,358,000	$2,477,000	$3,947,000	$137,000	$503,000
Harvest to Coast Pathway Concept	**122**	**$6,706,000**	**$10,555,000**	**$20,408,000**	**$757,000**	**$2,424,000**
Direct	90	$4,282,000	$6,040,000	$12,787,000	$504,000	$1,526,000
Indirect	15	$1,315,000	$2,493,000	$4,398,000	$142,000	$489,000
Induced	17	$1,109,000	$2,023,000	$3,224,000	$112,000	$410,000
Grand Total	**293**	**$16,293,000**	**$25,399,000**	**$47,826,000**	**$1,735,000**	**$5,808,000**

TABLE 24. ECONOMIC IMPACTS BY SITE AND VISITOR TYPE

SITE AND VISITOR TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Santa Maria Valley Regional Preserve	**25**	**$1,364,000**	**$2,147,000**	**$4,150,000**	**$154,000**	**$493,000**
Local day	11	$591,000	$963,000	$1,936,000	$76,000	$222,000
Local night	6	$331,000	$501,000	$873,000	$31,000	$115,000
Non-local day	6	$313,000	$486,000	$995,000	$36,000	$113,000
Non-local night	2	$130,000	$198,000	$348,000	$12,000	$45,000
Gaviota Coastal Park	**147**	**$8,224,000**	**$12,698,000**	**$23,269,000**	**$825,000**	**$2,891,000**
Local day	28	$1,516,000	$2,471,000	$4,970,000	$194,000	$569,000
Local night	73	$4,185,000	$6,366,000	$11,145,000	$382,000	$1,441,000
Non-local day	15	$802,000	$1,248,000	$2,553,000	$92,000	$290,000
Non-local night	31	$1,722,000	$2,615,000	$4,602,000	$159,000	$593,000
Harvest to Coast Pathway Concept	**122**	**$6,706,000**	**$10,555,000**	**$20,408,000**	**$757,000**	**$2,424,000**
Local day	53	$2,904,000	$4,732,000	$9,519,000	$372,000	$1,089,000
Local night	29	$1,628,000	$2,464,000	$4,292,000	$152,000	$562,000
Non-local day	29	$1,536,000	$2,390,000	$4,891,000	$175,000	$555,000
Non-local night	11	$639,000	$971,000	$1,708,000	$59,000	$220,000
Grand Total	**293**	**$16,293,000**	**$25,399,000**	**$47,826,000**	**$1,735,000**	**$5,808,000**

TABLE 25. ECONOMIC IMPACTS BY SITE AND INDUSTRY

SITE AND INDUSTRY	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Santa Maria Valley Regional Preserve	**25**	**$1,364,000**	**$2,147,000**	**$4,150,000**	**$154,000**	**$493,000**
Gas	1	$93,000	$255,000	$1,010,000	$25,000	$48,000
Food and Beverage	9	$502,000	$807,000	$1,219,000	$71,000	$193,000
Souvenirs	2	$74,000	$100,000	$154,000	$10,000	$26,000
Entertainment	3	$146,000	$152,000	$226,000	$7,000	$43,000
Lodging	1	$55,000	$97,000	$148,000	$4,000	$19,000
Camping	2	$134,000	$172,000	$236,000	$5,000	$40,000
Restaurants	7	$363,000	$568,000	$974,000	$35,000	$128,000
Entry Fees (State)	-	$0	$0	$185,000	$0	$0
Gaviota Coastal Park	**147**	**$8,224,000**	**$12,698,000**	**$23,269,000**	**$825,000**	**$2,891,000**
Gas	5	$428,000	$1,184,000	$4,691,000	$113,000	$222,000
Food and Beverage	47	$2,712,000	$4,358,000	$6,586,000	$380,000	$1,039,000
Souvenirs	5	$253,000	$344,000	$531,000	$35,000	$90,000
Entertainment	15	$733,000	$760,000	$1,134,000	$35,000	$212,000

TABLE 25. CONTINUED

SITE AND VISITOR TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Lodging	13	$726,000	$1,275,000	$1,954,000	$52,000	$251,000
Camping	29	$1,770,000	$2,271,000	$3,128,000	$63,000	$518,000
Restaurants	33	$1,605,000	$2,510,000	$4,311,000	$151,000	$563,000
Entry Fees (State)	-	$0	$0	$938,000	$0	$0
Harvest to Coast Pathway Concept	**122**	**$6,706,000**	**$10,555,000**	**$20,408,000**	**$757,000**	**$2,424,000**
Gas	5	$453,000	$1,254,000	$4,967,000	$119,000	$235,000
Food and Beverage	43	$2,468,000	$3,966,000	$5,993,000	$345,000	$946,000
Souvenirs	8	$360,000	$490,000	$756,000	$50,000	$128,000
Entertainment	15	$718,000	$743,000	$1,110,000	$35,000	$208,000
Lodging	5	$270,000	$473,000	$725,000	$20,000	$93,000
Camping	11	$657,000	$843,000	$1,161,000	$24,000	$192,000
Restaurants	37	$1,783,000	$2,789,000	$4,790,000	$168,000	$626,000
Entry Fees (State)	-	$0	$0	$910,000	$0	$0
Grand Total	**293**	**$16,293,000**	**$25,399,000**	**$47,826,000**	**$1,735,000**	**$5,808,000**

TABLE 26. ECONOMIC IMPACTS BY SITE, VISITOR TYPE, AND IMPACT TYPE

MANAGER, VISITOR TYPE, IMPACT TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Santa Maria Valley Regional Preserve	**25**	**$1,364,000**	**$2,147,000**	**$4,150,000**	**$154,000**	**$493,000**
Local day	11	$591,000	$963,000	$1,936,000	$76,000	$222,000
Direct	8	$366,000	$536,000	$1,214,000	$51,000	$137,000
Indirect	1	$128,000	$249,000	$438,000	$15,000	$49,000
Induced	2	$98,000	$179,000	$285,000	$10,000	$37,000
Local night	6	$331,000	$501,000	$873,000	$31,000	$115,000
Direct	4	$225,000	$310,000	$551,000	$21,000	$76,000
Indirect	1	$52,000	$92,000	$164,000	$5,000	$19,000
Induced	1	$55,000	$100,000	$159,000	$6,000	$21,000
Non-local day	6	$313,000	$486,000	$995,000	$36,000	$113,000
Direct	4	$194,000	$263,000	$618,000	$23,000	$69,000
Indirect	1	$68,000	$129,000	$227,000	$8,000	$26,000
Induced	1	$52,000	$95,000	$151,000	$6,000	$20,000

TABLE 26 CONTINUED

SITE NAME, VISITOR TYPE, AND IMPACT TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Non-local night	2	$130,000	$198,000	$348,000	$12,000	$45,000
Direct	2	$88,000	$121,000	$219,000	$8,000	$30,000
Indirect	0	$22,000	$38,000	$67,000	$2,000	$8,000
Induced	0	$22,000	$40,000	$63,000	$3,000	$8,000
Gaviota Coastal Park	**147**	**$8,224,000**	**$12,698,000**	**$23,269,000**	**$825,000**	**$2,891,000**
Local day	28	$1,516,000	$2,471,000	$4,970,000	$194,000	$569,000
Direct	20	$939,000	$1,375,000	$3,117,000	$131,000	$352,000
Indirect	4	$327,000	$638,000	$1,124,000	$38,000	$124,000
Induced	4	$251,000	$458,000	$730,000	$26,000	$93,000
Local night	73	$4,185,000	$6,366,000	$11,145,000	$382,000	$1,441,000
Direct	55	$2,840,000	$3,931,000	$7,054,000	$252,000	$952,000
Indirect	8	$656,000	$1,177,000	$2,086,000	$61,000	$235,000
Induced	11	$690,000	$1,259,000	$2,006,000	$70,000	$256,000
Non-local day	15	$802,000	$1,248,000	$2,553,000	$92,000	$290,000
Direct	11	$497,000	$675,000	$1,585,000	$59,000	$176,000
Indirect	2	$173,000	$332,000	$583,000	$20,000	$65,000
Induced	2	$133,000	$242,000	$386,000	$14,000	$50,000
Non-local night	31	$1,722,000	$2,615,000	$4,602,000	$159,000	$593,000
Direct	23	$1,156,000	$1,599,000	$2,894,000	$106,000	$388,000
Indirect	3	$283,000	$499,000	$883,000	$25,000	$100,000
Induced	4	$285,000	$519,000	$826,000	$29,000	$106,000
Harvest to Coast Pathway Concept	**122**	**$6,706,000**	**$10,555,000**	**$20,408,000**	**$757,000**	**$2,424,000**
Local day	53	$2,904,000	$4,732,000	$9,519,000	$372,000	$1,089,000
Direct	38	$1,797,000	$2,634,000	$5,970,000	$251,000	$674,000
Indirect	7	$626,000	$1,222,000	$2,153,000	$73,000	$238,000
Induced	7	$481,000	$877,000	$1,398,000	$49,000	$178,000
Local night	29	$1,628,000	$2,464,000	$4,292,000	$152,000	$562,000
Direct	21	$1,106,000	$1,522,000	$2,709,000	$102,000	$372,000
Indirect	3	$254,000	$453,000	$803,000	$23,000	$90,000
Induced	4	$269,000	$490,000	$781,000	$27,000	$100,000

TABLE 26 CONTINUED

SITE NAME, VISITOR TYPE, AND IMPACT TYPE	JOBS	WAGES	VALUE ADDED TO GDP	OUTPUT	COUNTY TAXES	OTHER TAXES
Non-local day	29	$1,536,000	$2,390,000	$4,891,000	$175,000	$555,000
Direct	22	$951,000	$1,293,000	$3,036,000	$113,000	$337,000
Indirect	4	$331,000	$635,000	$1,116,000	$37,000	$125,000
Induced	4	$255,000	$464,000	$739,000	$26,000	$94,000
Non-local night	11	$639,000	$971,000	$1,708,000	$59,000	$220,000
Direct	9	$429,000	$593,000	$1,074,000	$39,000	$144,000
Indirect	1	$105,000	$185,000	$328,000	$10,000	$37,000
Induced	2	$106,000	$193,000	$307,000	$11,000	$39,000
Grand Total	**293**	**$16,293,000**	**$25,399,000**	**$47,826,000**	**$1,735,000**	**$5,808,000**

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