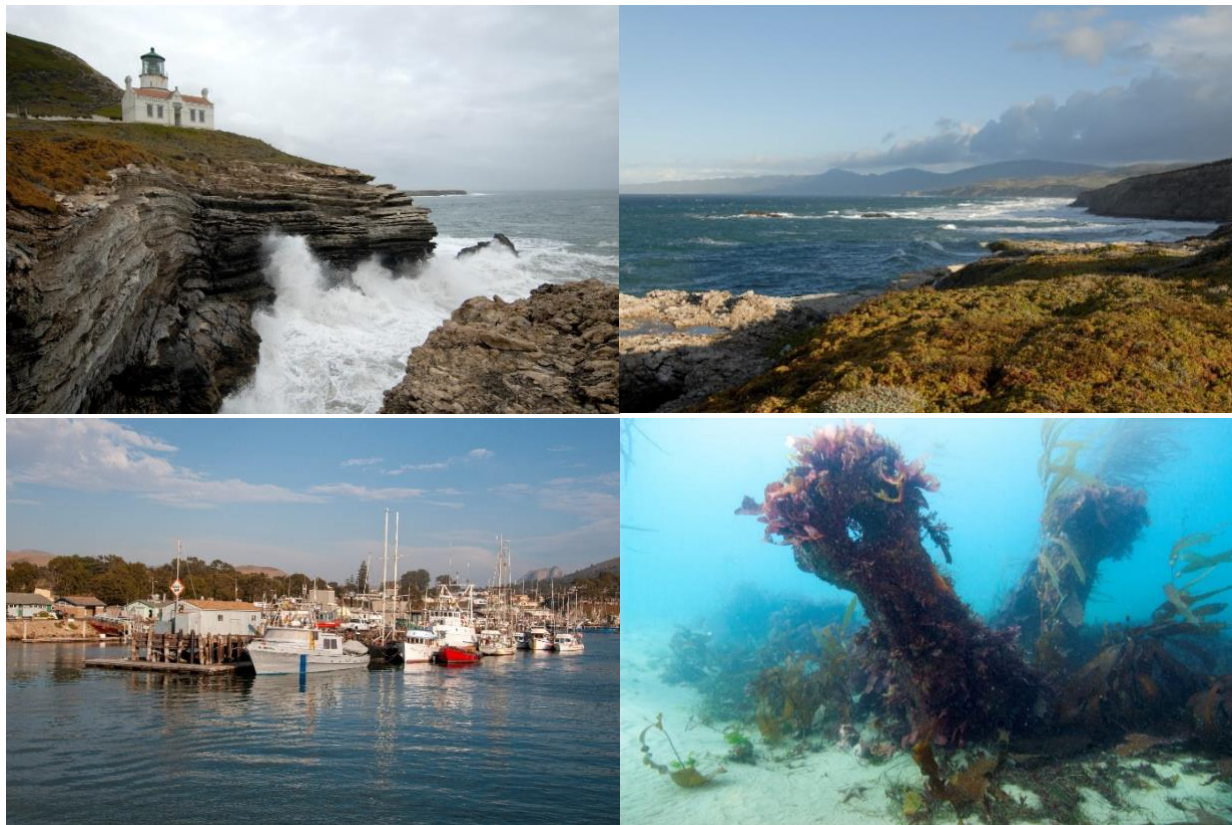




Proposed Chumash Heritage National Marine Sanctuary Community Profile, 2010–2021



April 2023 | sanctuaries.noaa.gov

National Marine Sanctuaries Conservation Science Series ONMS-23-03

U.S. Department of Commerce
Gina Raimondo, Secretary

National Oceanic and Atmospheric Administration
Richard W. Spinrad, Ph.D., Under Secretary of Commerce for Oceans and Atmosphere and
NOAA Administrator

National Ocean Service
Nicole LeBoeuf, Assistant Administrator

Office of National Marine Sanctuaries
John Armor, Director

Report Authors:

Giselle Samonte¹, Daniel Douglas^{2,3}, Jack Eynon³, Danielle Schwarzmann¹, Sarah Stein¹

¹ NOAA Office of National Marine Sanctuaries

² University of Maryland, Baltimore County

³ National Marine Sanctuary Foundation



**NATIONAL
MARINE
SANCTUARIES**

Suggested citation: Samonte, G., Douglas, D., Eynon, J., Schwarzmann, D., & Stein, S. (2022). Proposed Chumash Heritage National Marine Sanctuary community profile, 2010–2021. National Marine Sanctuaries Conservation Series ONMS-23-03. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries.

Cover photos (clockwise from top left): The second Point Conception lighthouse, located 133 feet above the Pacific Ocean; Point Conception, traditionally known by the Chumash people as the “Western Gate,” where cold northern waters meet warm tropical southern currents; the coral-covered anchor of the shipwreck site SS *San Pedro*; Morro Bay Harbor, a home port for commercial fishing, sport fishing, whale watching, and recreational boating. Photos: Robert Schwemmer/NOAA

About the National Marine Sanctuaries Conservation Series

The Office of National Marine Sanctuaries, part of the National Oceanic and Atmospheric Administration, serves as the trustee for a system of underwater parks encompassing more than 620,000 square miles of ocean and Great Lakes waters. The 15 national marine sanctuaries and two marine national monuments within the National Marine Sanctuary System represent areas of America's ocean and Great Lakes environment that are of special national significance. Within their waters, giant humpback whales breed and calve their young, coral colonies flourish, and shipwrecks tell stories of our nation's maritime history. Habitats include beautiful coral reefs, lush kelp forests, whale migration corridors, spectacular deep-sea canyons, and underwater archaeological sites. These special places also provide homes to thousands of unique or endangered species and are important to America's cultural heritage. Sites range in size from less than one square mile to almost 583,000 square miles. They serve as natural classrooms and cherished recreational spots, and are home to valuable commercial industries.

Because of considerable differences in settings, resources, and threats, each national marine sanctuary has a tailored management plan. Conservation, education, research, monitoring, and enforcement programs vary accordingly. The integration of these programs is fundamental to marine protected area management. The National Marine Sanctuaries Conservation Series reflects and supports this integration by providing a forum for publication and discussion of the complex issues currently facing the National Marine Sanctuary System. Topics of published reports vary substantially and may include descriptions of educational programs, discussions on resource management issues, and results of scientific or historical research and monitoring projects. The series facilitates integration of natural sciences, socioeconomic and social sciences, education, and policy development to accomplish the diverse needs of NOAA's resource protection mandate. All publications are available on the [Office of National Marine Sanctuaries website](#).



Disclaimer

The scientific results and conclusions, as well as any views or opinions expressed herein, are those of the authors and do not necessarily reflect the views of NOAA or the Department of Commerce. The mention of trade names or commercial products does not constitute endorsement or recommendation for use.

Report Availability


Electronic copies of this report may be downloaded from the Office of National Marine Sanctuaries website at <http://sanctuaries.noaa.gov>.

Contact

Giselle Samonte, Ph.D.
Economist
NOAA Office of National Marine Sanctuaries
1305 East West Highway, SSMC4, 10th Floor
Silver Spring, MD 20910
Email: giselle.samonte@noaa.gov

Table of Contents

About the National Marine Sanctuaries Conservation Series	i
Disclaimer	ii
Report Availability	ii
Contact	ii
Table of Contents	iii
Abstract	v
Key Words	vi
Chapter 1: Introduction	1
Key Takeaways	1
Overview of the Proposed Sanctuary	1
Geographic Scope.....	2
Key Habitats	3
Key Species.....	3
Key Heritage Resources	4
Priority Pressures and Threats.....	4
Chapter 2: Community Support and Engagement	6
Key Takeaways	6
Sanctuary Personnel.....	6
Chapter 3: Sanctuary Uses and Livelihoods	9
Key Takeaways	9
Access to the Shoreline and Proposed Sanctuary	9
Culture and Heritage.....	11
Commercial Harvest.....	11
Recreational Activities.....	14
Tourism	23
Other Uses	25
Chapter 4: Population and Socioeconomic Drivers	26
Key Takeaways	26
Population, Growth, and Density.....	26
Per Capita Income.....	27
Poverty Rates.....	28
Unemployment Rates.....	28
Chapter 5: Demographic Characteristics	30
Key Takeaways	30
Gender	30
Racial and Ethnic Composition.....	31
Age Distribution	32
Language	35
Education Level.....	36
Chapter 6: Economic Profile	37
Key Takeaways	37
Labor Force and Employment	37
Personal Income.....	38



Employment and Annual Payroll by Industry Sector	39
Acknowledgements	43
Glossary of Acronyms.....	44
Literature Cited	45
Appendix A: Fishing	49
Commercial Fishing	49
Recreational Fishing	51

Abstract

This sanctuary community profile provides cultural, demographic, and socioeconomic information for the communities surrounding the proposed Chumash Heritage National Marine Sanctuary (CHNMS). Data for 2010–2021 were sourced from the U.S. Census Bureau, U.S. Bureau of Labor Statistics, the World Bank, and other federal and state agencies, such as the Central Intelligence Agency. Socioeconomic characterization of the sanctuary community is essential for systematic planning and sanctuary management.

If designated, CHNMS would protect an area of approximately 5,620 square miles along and offshore of the central California coastline, with Monterey Bay National Marine Sanctuary to the north and Channel Islands National Marine Sanctuary to the southeast (Office of National Marine Sanctuaries [ONMS], 2023a). The sanctuary community includes the two primary counties of San Luis Obispo County and Santa Barbara County. Local resource managers, Indigenous peoples, businesses, institutions, and other local partners would benefit from the proposed CHNMS. Ecosystem service benefits associated with the designation of CHNMS include fishing, commercial, cultural, and recreational activities.

Highlights of the sanctuary community profile include:

- The proposed CHNMS aims to recognize and preserve Indigenous community cultural resources and history, while protecting the important ecological transition zone where northern temperate waters meet subtropic waters (ONMS, 2021). The proposed sanctuary is notable for its extensive kelp forests, sandy beaches, coastal dunes, wetlands, and cultural importance to the Chumash and Salinan people, and also provides nursery grounds for numerous commercial fish species and habitats for important threatened and endangered species (ONMS, 2021).
- Both commercial and recreational fishing activities occur in the proposed CHNMS. There are 16 ocean-related facilities in San Luis Obispo County, and six ocean-related facilities in Santa Barbara County.
- The top five commercial species harvested by value are market squid, sablefish, Dungeness crab, shortspine thornyhead, and hagfish.
- In 2017, visits, visitor spending, and tourism employment in San Luis Obispo County increased by 6.8%, 9.2%, and 8.2%, respectively, compared to 2013 values. In 2017, visits and visitor spending in Santa Barbara County increased by 18% and 25.3%, respectively, compared to 2013 values.
- In 2019, population density was 78 people per square mile in San Luis Obispo County, 118 people per square mile in Santa Barbara County, and 99 people per square mile in the sanctuary community (study area). The densities of each county and the study area were each lower compared to the entirety of California.
- In 2020, most residents of the sanctuary community were between the ages of 25 and 34 (12.7%). In San Luis Obispo County, 11.6% of the population was between 25 and 34, while in Santa Barbara County, 13.4% was between 25 and 34. In 2020, the median age was 39.5 in San Luis Obispo County and 33.8 in Santa Barbara County.



Key Words

Proposed Chumash Heritage National Marine Sanctuary, culture, economics, ecosystem services, community engagement, San Luis Obispo County, Santa Barbara County, California, tourism, demographics, population, labor, employment

Chapter 1: Introduction

Sanctuary community profiles provide information on socioeconomic, cultural, and ecosystem services benefits to support the Office of National Marine Sanctuaries (ONMS) in developing condition reports, management plan reviews, environmental impact statements, and Regulatory Flexibility Act analyses.¹ Most sanctuary community profile data are sourced from the U.S. Census Bureau, U.S. Bureau of Labor Statistics, the World Bank, and other federal and state agencies. Descriptions of fishing, recreational, and community engagement activities taking place within sanctuaries and areas proposed for sanctuary designation provide managers with an improved understanding of the sanctuary community and surrounding counties.

The objectives of sanctuary community profiles are to:

1. Provide a socioeconomic profile of the region surrounding an existing or proposed national marine sanctuary.
2. Inform assessment of the relationship between the sanctuary and nearby counties.
3. Characterize the social and economic impacts of activities taking place within the sanctuary.
4. Determine the ecosystem service benefits derived from national marine sanctuaries (e.g., fishing and recreational activities within sanctuaries).
5. Provide sanctuary managers with an improved understanding of the community around the sanctuary.

Key Takeaways

1. The proposed Chumash Heritage National Marine Sanctuary (CHNMS) is under consideration for sanctuary designation to protect the region's important marine ecosystem, maritime heritage resources, and Indigenous community cultural values.
2. The proposed CHNMS contains Santa Lucia Bank, Rodriguez Seamount, and Arguello Canyon, which protect an important ecological transition zone where northern temperate waters meet subtropical waters.
3. The sanctuary community of the proposed CHNMS includes San Luis Obispo and Santa Barbara counties in California.

Overview of the Proposed Sanctuary

The proposed CHNMS is currently under review for designation as a new national marine sanctuary. The Northern Chumash Tribal Council submitted a sanctuary nomination in July 2015, and the National Oceanic and Atmospheric Administration (NOAA) is considering sanctuary designation to protect the region's important marine ecosystem, maritime heritage resources, and cultural values of Indigenous communities (ONMS, 2021). The proposed CHNMS is located adjacent to San Luis Obispo and Santa Barbara counties, California, between

¹ Section 610 of the Regulatory Flexibility Act requires that ONMS periodically review existing regulations that have a significant economic impact on a substantial number of small entities, such as small businesses, small organizations, and small governmental jurisdictions.

Monterey Bay National Marine Sanctuary (MBNMS) and Channel Islands National Marine Sanctuary (CINMS). The proposed sanctuary aims to recognize and preserve Indigenous community culture and history while protecting the important ecological transition zone where northern temperate waters meet subtropical waters (ONMS, 2021). The sanctuary is notable for its extensive kelp forests, sandy beaches, coastal dunes, and wetlands, and provides nursery grounds for numerous commercial fish species and habitats for important threatened and endangered species. The area is home to members of both the Chumash and Salinan communities, collectively referred to throughout this document as the Indigenous community. The proposed sanctuary is of cultural importance to the Indigenous community (ONMS, 2021).

Geographic Scope

The area considered for CHNMS designation encompasses an area of approximately 7,670 square miles, along 156 miles of coastline, with MBNMS to the north and CINMS to the southeast (ONMS, 2021). The area considered for sanctuary designation extends from Santa Rosa Creek near the town of Cambria, San Luis Obispo County, south to Gaviota Coast in Santa Barbara County, and extends offshore to include Santa Lucia Bank, Arguello Canyon, and Rodriguez Seamount (ONMS, 2020; Figure 1). For the purposes of this sanctuary community profile, the Proposed Action is the area initially put forward by NOAA in the 2021 *Notice of Intent to Conduct Scoping and to Prepare a Draft Environmental Impact Statement for the Proposed Chumash Heritage National Marine Sanctuary* (ONMS, 2021). In the proposed CHNMS draft environmental impact statement, this Proposed Action area is referred to as the Initial Boundary Alternative (ONMS, 2023a).

Santa Lucia Bank connects to Santa Lucia Escarpment, which dominates a large portion of the central and eastern sections of the proposed CHNMS (National Oceanic and Atmospheric Administration [NOAA], 2022). Arguello Canyon is a submarine canyon located off the coast of Point Arguello, California (Monterey Bay Aquarium Research Institute, 2013). Rodriguez Seamount is a guyot that rises to 5,500 feet off the ocean floor (a depth of 2,133 feet below the ocean surface) and is located 42 miles offshore (Georgian, 2019). Figure 1 shows the location of the proposed sanctuary and sanctuary community. The proposed CHNMS community includes San Luis Obispo and Santa Barbara counties, where most economic and social impacts related to the sanctuary would occur.

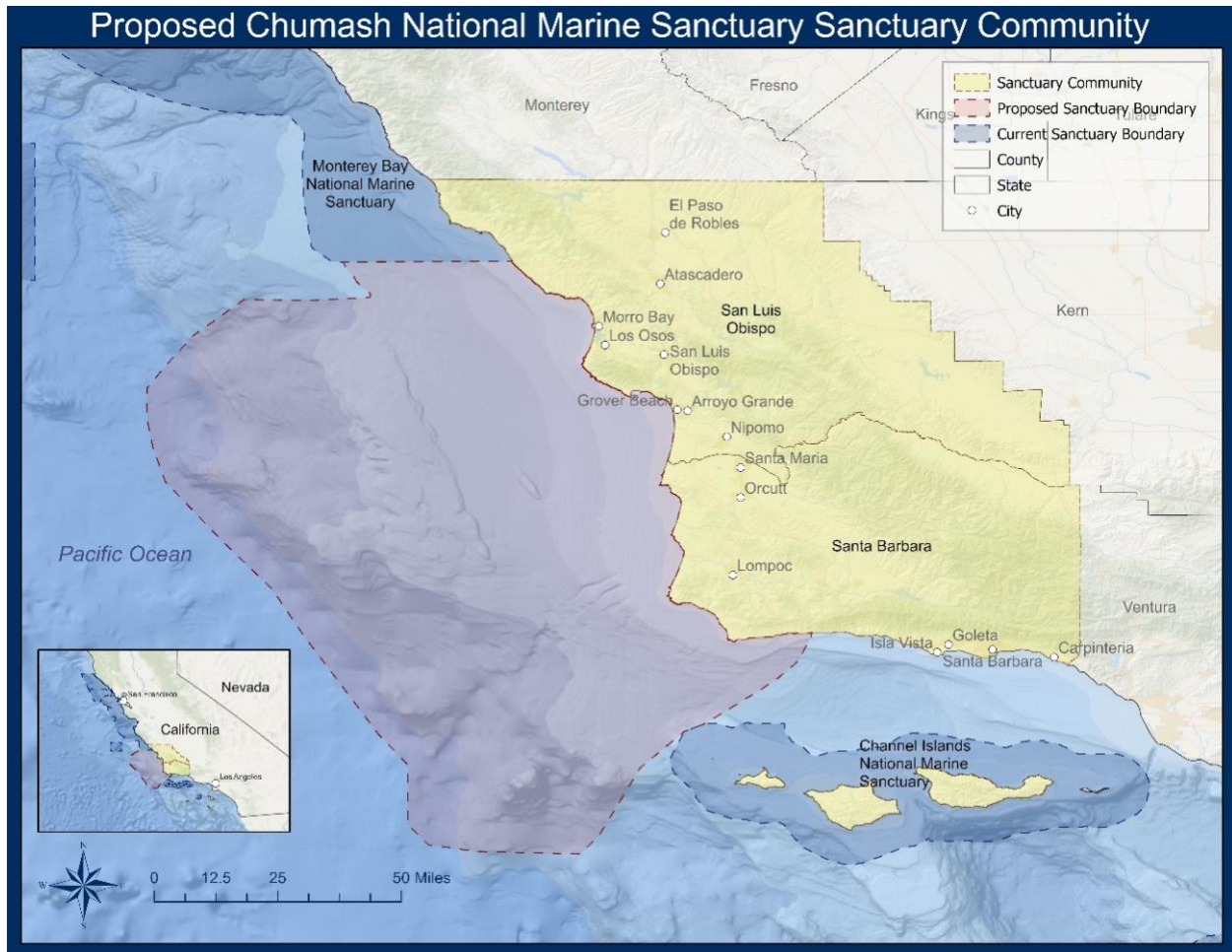


Figure 1. Area considered for the Proposed Chumash Heritage National Marine Sanctuary and study area. Image: NOAA

Key Habitats

Within the area of the proposed CHNMS, temperate Pacific Ocean currents flow southward to meet subtropical waters. This has created a special ecological transition zone that contains extensive kelp forests, rocky shores, shallow sandy seafloors, rocky reefs, deep seafloor, pelagic habitat, sandy beaches, estuarine habitat, seagrass beds, continental shelf and slope, coastal dunes, wetlands, nursery grounds for commercially important species, and habitat for endangered species (ONMS, 2020). Major offshore geologic features such as Santa Lucia Bank and Arguello Canyon create conditions that allow for consistent upwelling, with cold waters brought up to the surface to meet warmer tropical waters, resulting in a transition zone. This transition zone contains kelp forests, wetlands, and seagrass beds, which are all critical habitats and nursery grounds for many different species (ONMS, 2020).

Key Species

The proposed sanctuary is home to macroalgae and marine plants. There are 400 documented species of fish within the proposed boundaries, including groundfish, such as rockfishes, soles, and sablefish, and coastal pelagic and highly migratory fish species, such as mackerel,

anchovies, tuna, and marlin. The proposed sanctuary is also located along the Pacific Flyway, a major migratory route for birds, and breeding and nesting sites are located in the area. The proposed sanctuary is home to seabirds, waterbirds, and shorebirds. Four sea turtle species, each of them listed as endangered, have been observed within the proposed CHNMS. Further, the area is home to many marine mammals, including whales, pinnipeds, and sea otters. A full discussion of species documented in the area and their protected status may be found in Section 4.3, Biological Resources, in the CHNMS draft environmental impact statement (ONMS, 2023a).

Key Heritage Resources

The proposed CHNMS is an important coastal area that remains a vital part of the heritage of the Indigenous community. Different locations hold spiritual, cultural, and historical significance to Chumash and Salinan tribes, with ancient villages now submerged some three to six miles off the coastlines of San Luis Obispo and Santa Barbara counties. Archaeological evidence of mammoths, saber-tooth tigers, giant sloths, and grizzly bears have been identified off the coastline (ONMS, 2015). Evidence of early Indigenous human occupation has also been discovered in the area; these are considered some of the earliest records of human occupation in North America (ONMS, 2020).

ONMS has estimated that approximately 200 ships and aircraft have been lost within the proposed sanctuary area. Two major shipwrecks within the proposed boundaries include the U.S. quartermaster steam auxiliary bark *Edith*, lost at San Antonio River, and the U.S. Coast Guard cutter *McCulloch*, which lies offshore of Point Conception (ONMS, 2020). ONMS submitted a nomination to list the shipwreck *SS Montebello* in the National Register of Historic Places, which was approved on September 20, 2016, commemorating the 75th anniversary of the loss.

Priority Pressures and Threats

The proposed CHNMS was nominated to provide comprehensive and coordinated solutions to existing and future threats to the local environment. A range of threats to proposed CHNMS resources exist, including those related to climate change and energy production. A primary concern within the proposed boundaries are the variety of existing and proposed development projects (ONMS, 2020). Other major pressures result from climate change, which degrades important ecological zones and harms endangered animal populations.

Multiple types of energy development exist and have been explored near the proposed CHNMS boundaries. Existing oil and gas development on the outer continental shelf can result in accidental discharges that threaten the environment. The 2015 Refugio oil spill occurred close to the proposed sanctuary boundary (ONMS, 2020). A more detailed discussion of energy development, decommissioning, and exploration (including oil and gas, nuclear, and wind energy) within the proposed sanctuary may be found in the CHNMS draft environmental impact statement (ONMS, 2023a).

Off the coast of central and southern California, the Department of the Navy operates the Point Mugu Sea Range, which overlaps a large area of the proposed sanctuary. Military readiness

training and testing, warfare practice exercises, weapons testing (including ballistic missile tests), and other operations occur within the overlapping area (ONMS, 2020). National marine sanctuary designations have typically included exemptions for military testing and training, and, in turn, military agencies consult with sanctuary managers to reduce impacts from activities and operations that may harm marine resources or displace human ocean users (ONMS, 2020).

Climate change threats include sea level rise, warming ocean temperatures, and increased ocean acidification. California is expected to experience one to eight feet of sea level rise by 2100, which will greatly exacerbate coastal flooding, shoreline erosion, inundation of wetlands and estuaries, and saltwater intrusion into aquifers, and will also threaten cultural and historic resources and existing infrastructure (ONMS, 2020). Warming ocean temperatures threaten the ecological balance of major local kelp forests and the ecological transition zone (ONMS, 2020). Further, California oceans are acidifying at twice the rate of the global ocean average (ONMS, 2020). Ocean acidification has many harmful effects that are discussed in more detail in multiple NOAA publications (NOAA, 2020a, 2020b), including in the proposed CHNMS draft environmental impact statement (ONMS, 2023a).

Chapter 2: Community Support and Engagement

The primary counties of San Luis Obispo and Santa Barbara are host to numerous existing environmental, commercial, educational, and cultural programs and partnerships within and near the proposed sanctuary. This section will explore the existing and potential partnerships and programs that the proposed CHNMS may develop. Existing and potential partners may include local, tribal, state, and federal entities, such as educational initiatives, local businesses, Indigenous tribes and nations, and other organizations.

Key Takeaways

1. The proposed CHNMS would maintain existing and develop future partnerships with local, state, tribal, and federal organizations. These partnerships may be strengthened through shared use of the proposed sanctuary.
2. Partnerships facilitate community engagement, education and outreach, and business development, while enhancing the educational, cultural, commercial, and environmental services of the proposed CHNMS.

Sanctuary Personnel

Staff members from various California national marine sanctuary sites, the West Coast Regional Office, and ONMS headquarters currently support the designation process for the proposed CHNMS.

Partners and Collaborators

One of the goals of the proposed sanctuary designation is to enhance collaboration and partnerships with federal, state, local, and tribal entities in addition to working with non-governmental organizations and the private sector. This section highlights key existing and potential partners and collaborators for management of the proposed sanctuary. More details on how NOAA intends to engage with these partners will be available in the draft management plan for the proposed sanctuary (ONMS, 2023b).

Governmental Agencies

NOAA will partner with several governmental agencies and programs to promote effective resource conservation, to recognize and honor cultural heritage, and for overall management. These agencies and programs include: Bureau of Ocean Energy Management, California Department of Parks and Recreation, California State Historic Preservation Office, California State Lands Commission, NOAA Fisheries, NOAA Bay Watershed Education and Training Program, National Park Service Submerged Resources Center, NOAA Climate Program Office, NOAA Deep Sea Coral Research and Technology Program, NOAA Integrated Ecosystem Assessment Program, NOAA National Centers for Coastal and Ocean Science, NOAA Office of Coast Survey, NOAA Ocean Acidification Program, NOAA Pacific Marine Environmental Laboratory, Pacific Fishery Management Council, U.S. Fish and Wildlife Service, Santa Barbara County Office of Education, Morro Bay State Park and Museum of Natural History, Morro Bay

National Estuary Program, U.S. Geological Survey, U.S. Coast Guard, and Ventura County Office of Education.

Chumash and Salinan Tribes, Bands, Associations, and Organizations

Based upon initial expressions of interest from tribal communities and related groups, NOAA hopes to develop collaborative management partnerships with the following entities: Santa Ynez Band of Chumash Indians, Northern Chumash Tribal Council, yak titvu yak tilhini Northern Chumash Tribe, Northern Chumash Bear Clan, Coastal Band of the Chumash Nation, Barbareño Band of Chumash Indians, Barbareño Chumash Tribal Council, Barbareño/Ventureño Band of Mission Indians, Chumash Heritage Foundation, Chumash Maritime Association, Wishtoyo Foundation, Salinan Tribe of Monterey and San Luis Obispo Counties, and the Xolon Salinan Tribe.

Non-governmental and Academic Organizations

The proposed sanctuary would also maintain and develop partnerships with the following non-governmental organizations and academic institutions (among others): Cambria Historical Museum, Santa Barbara Maritime Museum, Morro Bay Maritime Museum, California State Natural History Museum Morro Bay, Lompoc Valley Historical Society, Piedras Blancas Lighthouse Association and The Nature Conservancy Dangermond Preserve, San Luis Obispo Marine Protected Area Collaborative, California State University Channel Islands, California State University Long Beach, California State University Northridge, California Polytechnic University San Luis Obispo, Marine Research and Exploration, Monterey Bay Aquarium Research Institute, Santa Barbara City College, University of California Santa Barbara, University of California Los Angeles, and Ventura County Community College District.

Sanctuary Infrastructure

Monitoring and Research

Research is conducted within the proposed CHNMS by a plethora of public and non-profit groups, including: academic institutions; non-profit and community-based organizations; Indigenous community groups; and regional, state, and federal agencies. Various studies include: water quality monitoring for pollutants; oceanographic research, including upwelling, sea surface temperature, wave, wind, and surface current monitoring; monitoring bird and mammal population distribution, status, and trends, as well as potential disturbance factors; fisheries assessments; and substrate and habitat mapping. A subset of the agencies and organizations conducting this research include: California State University Long Beach, California Polytechnic State University, NOAA's Deep Sea Coral and Research Technology Program, Morro Bay National Estuarine Reserve, Ocean Exploration Trust, California Cooperative Oceanic Fisheries Investigations, and Santa Barbara Channel Coastal Long Term Ecological Research and Partnership for Interdisciplinary Studies of Coastal Oceans. Additionally, the Central and Northern California Ocean Observing System five-year strategic plan includes monitoring climate change factors influencing coastlines and working with Indigenous communities to improve communication for shared interests and concerns in coastal

areas (Central and Northern California Ocean Observing System, 2020). Some additional ongoing areas of research in the proposed sanctuary include:

- Projects investigating climate change, oceanographic conditions, acoustic monitoring, ecosystem connectivity, sea level, deoxygenation, species distributions, and ocean acidification;
- Monitoring and research to understand impacts of wind farm implementation on biological resources, including soundscape monitoring;
- Tribal cultural landscape studies and research on traditional historic properties, shipwrecks, aircraft, and other maritime heritage sites;
- Seafloor mapping, remotely operated vehicle exploration, and autonomous underwater vehicle surveys;
- Water quality contaminant monitoring at beaches and tributaries; and
- Long-term monitoring of ocean conditions via the Beach Coastal Ocean Mammal and Bird Education and Research Surveys (BeachCOMBERS) program.

Education and Outreach

Educational programming in the coastal communities adjacent to the proposed sanctuary includes formal education programs, informal education programs, docent and volunteer programs, and programs organized by Indigenous communities, regional tourism organizations, and nonprofit organizations. For example, the California Polytechnic University of San Luis Obispo Ethnic Studies Department is developing educational opportunities to highlight Chumash archaeological sites and preserve the history, lifestyle, and culture of the Chumash. Additionally, the University of Santa Barbara's Bren School of Environmental Science and Management is identifying conservation and management needs of the region through their intertidal monitoring program, as well as through ecocultural preservation and curriculum development (ONMS, 2020). Some additional educational organizations in the area include: California State University San Luis Obispo and Channel Islands, University of California, Santa Barbara, Antioch University, Santa Ynez Band of Chumash Indians, Northern Chumash Tribal Council, yak titvu yak tilhini Northern Chumash Tribe, National Park Service, National Estuary Program, NOAA National Centers for Coastal and Ocean Science, and many more. Some of the other ongoing education and outreach programs in the sanctuary community include:

- Informal school programs, such as after-school programs and environmental education programs;
- Whale watching boat tours led by Subsea Tours and Morro Bay Whale Watching;
- Central Coast Parks Association coastal interpretation and naturalist programs; and
- Highway 1 Stewardship Program group beach clean-ups.

Chapter 3: Sanctuary Uses and Livelihoods

The proposed CHNMS protects natural and cultural resources and provides ecosystem services that are important to the lives and livelihoods of the sanctuary community. Ecosystem services are the goods and services from ecological systems that benefit communities. Services specific to the proposed CHNMS include cultural and provisioning ecosystem services (ONMS, 2020). Cultural ecosystem services primarily include non-material benefits, such as sense of place, heritage, education, science, and consumptive and non-consumptive recreation. Provisioning ecosystem services in the proposed CHNMS include commercial fisheries. The protection of these services will help to preserve and support small businesses as well as culture and heritage within the community. Small businesses that may have a higher dependence on proposed sanctuary resources include recreational for-hire tour operators, marine equipment rental and supply shops, commercial fishers, restaurants, and bed and breakfasts. This chapter presents the human uses and livelihoods that are associated with or dependent on the proposed CHNMS.

Key Takeaways

1. The proposed CHNMS and the surrounding area provide a variety of ecosystem services and benefits to the sanctuary community, which include economic, historical, cultural, recreational, tourism, and educational benefits.
2. Fishing activities in the proposed CHNMS are either commercial or recreational. Local fisheries are also tied to sense of place and sociocultural values.
3. There are 15 ocean-related facilities in San Luis Obispo County and six ocean-related facilities in Santa Barbara County.

Access to the Shoreline and Proposed Sanctuary

San Luis Obispo County

In California, the coastal zone boundary generally extends 1,000 yards inland; in San Luis Obispo County, the coastal zone extends further inland in several areas because of important habitat, recreational, and agricultural resources. Those areas include the lands surrounding Nipomo Dunes, Hearst Ranch and other north coast areas, and the Morro Bay watershed. Along the shoreline of San Luis Obispo County, there are 10 state parks and numerous smaller, local parks that provide access to the coast. Within the county, the state owns more than 14,500 acres of coastal parklands, which are designated as parks, beaches, historical monuments, vehicular recreation areas, reserves, or preserves. The 10 state park units range from Montana de Oro State Park's 7,828 acres, with over 21 miles of bay and ocean frontage, to the relatively small 15 acres of Cayucos State Beach. In addition to these state parks, there are several smaller parks and natural areas maintained by San Luis Obispo County. These include such sites as Oceano Memorial Park, Elfin Forest Natural Area, and Lampton Cliffs Park. Six of the 10 state parks and one county park in coastal San Luis Obispo County provide overnight camping opportunities. In San Luis Obispo County, public parks account for 30 miles of available public lateral access, close to one-third of the 96-mile shoreline. An additional 275 acres of land known as the Estero Bluffs have been acquired for public use. In Cambria, the shorefront 407-acre East-West Ranch

also has been acquired for public use. In addition to the parks, there are other, smaller coastal accessways, principally access easements. There are 16 ocean-related facilities in San Luis Obispo County, 14 of which are publicly accessible. The two private boating facilities are in Avila Beach and Morro Bay (Table 1).

Table 1. Ocean-related facilities in San Luis Obispo County. Source: California State Parks Division of Boating and Waterways, 2022a

Facility Name	City	Type
San Simeon S.P. Leffingwell Landing	Cambria	Launch
Bay Front Marina	Morro Bay	Marina
DeGarimore's Central Coast Fuel and Ice Dock	Morro Bay	Fuel dock
Morro Bay - City Harbor	Morro Bay	Department/district
Morro Bay Boatyard	Morro Bay	Marine services/repair
Morro Bay Kayak Ramp - Kayak Shack	Morro Bay	Boating access
Morro Bay Marina	Morro Bay	Marina/mooring fields
Morro Bay Public Launch Facility	Morro Bay	Launch
Morro Bay State Park Marina	Morro Bay	Marina
Olde Port Beach	Avila Beach	Launch
Port San Luis Boat Launch Facility	Avila Beach	Launch
Port San Luis Boatyard	Avila Beach	Marine services/repair
Port San Luis Harbor Dry Storage	Avila Beach	Dry storage
Port San Luis Harbor Mooring Field	Avila Beach	Launch/mooring fields
Port Side Marine	Avila Beach	Marina/launch

Santa Barbara County

Santa Barbara County spans 110 miles of shoreline, only 20.4 miles (18.5%) of which are publicly owned beaches. The coastline supports a range of recreational uses, including surfing, kayaking, sunbathing, swimming, and nature study. In addition to receiving extensive use by local residents, these beaches are popular destination points for visitors. Existing beach parks are being used to capacity, especially during summer weekends. The California Department of Parks and Recreation is a major supplier of coastal recreational opportunities in Santa Barbara County. Most state park developments along the coast provide numerous amenities, including facilities for campers and trailers. Generally, overnight use of these facilities is by out-of-county users, particularly those living in the Los Angeles metropolitan area. In the county's coastal zone, activity is concentrated in public recreational areas (rather than commercial visitor-serving facilities). From Ellwood west to Point Conception and north to the San Luis Obispo County line, the coastal area is rural and remote; extensive state park development, county parks, large cattle ranches, and rugged open areas characterize this area. In Santa Barbara County, there are six boat access locations (Table 2).

Table 2. Ocean-related facilities in Santa Barbara County within or near the study area. Source: California State Parks Division of Boating and Waterways, 2022b

Facility Name	City	Type
Gaviota State Park	Goleta	Launch
Goleta Beach County Park	Goleta	Launch
Goleta Beach Restoration	Goleta	Beach/erosion project
Harbor Marine Works	Santa Barbara	Marine services/repair
Santa Barbara Harbor	Santa Barbara	Marina/launch
Santa Barbara Palm Park (Chase Palm Park)	Santa Barbara	Boating access

Culture and Heritage

The waters and coast of the proposed CHNMS have significant cultural importance for past, present, and future Indigenous communities. The draft management plan (ONMS, 2023b) and draft environmental impact statement (ONMS, 2023a) provide detailed descriptions of the cultural importance of the proposed CHNMS. This section does not seek to qualify or quantify the cultural importance of the proposed sanctuary to the Chumash and Salinan people, but to acknowledge the existence of this extremely important connection to the place and its resources. Public comments indicate that Indigenous communities use the proposed area for multiple cultural and heritage purposes, including, but not limited to, tomol paddling, tule boat paddling, coastal gatherings and ceremonies, spiritual practice, cultural identity, science and stewardship, field trips for Indigenous youth, traditional fishing activities, beach clean-ups, habitat restoration and coastal conservation measures, coastal hikes, resource gathering, and more. Indigenous communities are the owners of their knowledge and the information described here (and in the draft management plan and draft environmental impact statement) are not inclusive of their traditional ecological knowledge.

Commercial Harvest

ONMS analyzed the existing level of commercial fishing activity in the proposed CHNMS and resulting contributions to regional and state economies. Tables 3 and 4 show estimates of the contribution of commercial harvest within the Proposed Action and Sub-alternative 5b, Gaviota Coast Extension areas as described in the proposed CHNMS draft environmental impact statement (ONMS, 2023a)² to the Morro Bay and Santa Barbara regional economy and state economy, respectively. The estimates were calculated using commercial logbook data from the California Department of Fish and Wildlife and 2020 commodity multipliers from the Input-Output Model for Pacific Coast Fisheries (IO-PAC). Commercial catch was grouped by commodity sector (defined by species and gear type) and port complex in order to apply the appropriate IO-PAC multipliers.³ The IO-PAC multipliers were developed using data from IMPLAN (Minnesota IMPLAN Group, 2010), Pacific Fisheries Information Network fish tickets,

² Harvest revenue data were available for California Department of Fish and Wildlife's statistical fishing blocks. Catch and harvest revenue were estimated by grouping the California Department of Fish and Wildlife blocks that best corresponded to the boundaries of the Proposed Action and Sub-alternative 5b, Gaviota Coast Extension, as described in the proposed CHNMS draft environmental impact statement (ONMS, 2023a).

³ On average from 2015–2019, over 99.9% of harvest revenue had a corresponding IO-PAC multiplier. The remaining <0.01% of harvest revenue was not included in the analysis.

and cost-earnings surveys administered by NOAA’s Northwest Fisheries Science Center (Allen Chen/NOAA, personal communication, September 26, 2022). The model was calibrated using 2020 data, where possible⁴, and all monetary values are in 2020 dollars. Estimates of the economic contribution of commercial harvest to the regional economy are based only on landings in the Morro Bay and Santa Barbara port complexes, whereas the California estimates include landings in all California ports⁵.

On average from 2015–2019, landings from the proposed CHNMS boundary area to Morro Bay and Santa Barbara ports contributed around \$16.2 million in output, \$8.4 million in income, and 254 jobs to the regional economy. For the state of California, the five-year average (2015–2019) economic contribution of landings from the proposed boundary area was \$22.6 million in output, \$12.1 million in income, and 262 jobs.

Table 3. Contribution of commercial catch from the CHNMS Proposed Action area to the Morro Bay and Santa Barbara regional economy. Source: California Department of Fish and Wildlife (CDFW), 2020; Northwest Fisheries Science Center (NWFSC), 2020a

Year	Harvest Revenue	Total Output	Total Income	Total Employment
2010	\$4,500,538	\$10,349,629	\$5,709,195	152
2011	\$7,835,293	\$17,901,686	\$10,010,226	254
2012	\$7,246,790	\$16,401,560	\$9,058,967	271
2013	\$7,796,246	\$19,247,634	\$10,683,364	288
2014	\$9,218,783	\$21,166,723	\$11,948,448	312
2015	\$6,088,146	\$13,326,588	\$7,137,685	253
2016	\$6,824,316	\$17,737,880	\$9,420,179	268
2017	\$6,811,373	\$20,608,284	\$10,858,487	282
2018	\$5,011,214	\$16,024,167	\$8,263,680	212
2019	\$4,717,060	\$13,168,185	\$6,517,981	255
2020	\$3,491,502	\$11,552,362	\$5,743,933	162
5-year average (2015–2019)	\$5,890,422	\$16,173,021	\$8,439,602	254

⁴ In some cases, 2020 data were not available to update the model. For example, the multipliers are based on IMPLAN data from 2018 (Allen Chen/NOAA, personal communication, September 21, 2022).

⁵ The Morro Bay port complex includes Avila/Port San Luis, Morro Bay, Cayucos, Oceano, San Simeon, and San Luis Obispo. The Santa Barbara port complex includes Ventura, Santa Barbara Harbor, Port Hueneme, Oxnard, Gaviota Beach, Goleta Beach, Santa Cruz Island, Santa Barbara area, Surf Beach, and Guadalupe Beach.

Table 4. Contribution of commercial catch from the CHNMS Proposed Action area to the California state economy. Source: CDFW, 2020; NWFSC, 2020a

Year	Harvest Revenue	Total Output	Total Income	Total Employment
2010	\$4,593,925	\$17,160,989	\$9,264,223	188
2011	\$8,424,415	\$30,776,324	\$16,894,698	318
2012	\$7,568,193	\$27,805,206	\$15,169,976	301
2013	\$8,158,328	\$28,983,314	\$16,080,414	312
2014	\$9,224,315	\$32,596,575	\$18,057,150	332
2015	\$6,129,982	\$22,826,762	\$12,109,402	276
2016	\$7,082,134	\$26,601,489	\$14,375,224	294
2017	\$6,926,911	\$25,369,638	\$13,849,656	281
2018	\$5,148,908	\$19,494,491	\$10,485,764	218
2019	\$4,875,372	\$18,775,857	\$9,742,641	242
2020	\$3,639,738	\$14,562,381	\$7,575,981	169
5-year average (2015–2019)	\$6,032,661	\$22,613,647	\$12,112,537	262

Similarly, Table 5 presents the estimated contribution of commercial harvest from the Sub-alternative 5b, Gaviota Coast Extension area to the regional economy, comprising landings from the Morro Bay and Santa Barbara port complexes. On average from 2015–2019, landings from the Gaviota Coast Extension area to Morro Bay and Santa Barbara ports contributed around \$8.1 million per year in output, \$4.1 million in income, and 111 jobs to the regional economy. For the Gaviota Coast Extension sub-alternative, estimates of the economic contribution to the state are omitted due to an artifact of the IO-PAC model that resulted in state-level estimates being smaller than regional estimates.⁶

⁶ IO-PAC multipliers for the state of California represent a weighted average of port-level multipliers. Within the relatively small area of the Gaviota Coast Extension sub-alternative, nearly all catch was landed in Santa Barbara County, where 100% of catch goes through processors. Conversely, only around 50% of landings go through processors in the state of California. Given the relatively high processor demand (and associated economic contributions from processor expenditures) in Santa Barbara County, model estimates of the regional economic contribution were greater than the state-level estimates.

Table 1. Contribution of commercial catch from the Sub-alternative 5b, Gaviota Coast Extension area to the Morro Bay and Santa Barbara regional economy. Source: CDFW, 2020; NWFSC, 2020a

Year	Harvest Revenue	Total Output	Total Income	Total Employment
2010	\$1,750,165	\$6,437,469	\$3,471,131	72
2011	\$3,724,707	\$13,299,545	\$7,300,970	137
2012	\$2,104,712	\$7,640,730	\$4,097,466	86
2013	\$2,868,320	\$10,421,475	\$5,662,150	115
2014	\$2,974,231	\$11,638,693	\$6,088,254	149
2015	\$1,870,236	\$7,768,076	\$3,936,535	107
2016	\$2,047,549	\$8,038,811	\$4,217,211	101
2017	\$2,063,874	\$8,255,584	\$4,260,199	114
2018	\$2,021,238	\$8,632,873	\$4,350,263	120
2019	\$1,862,560	\$7,728,068	\$3,881,202	112
2020	\$2,123,784	\$9,560,071	\$4,727,864	123
5-year average (2015–2019)	\$1,973,091	\$8,084,682	\$4,129,082	111

Recreational Activities

Recreational Fishing

ONMS worked with NOAA Fisheries to analyze how existing levels of recreational fishing activity in the proposed CHNMS support the regional and state economies. The Northwest Fisheries Science Center has pre-established regions for analyzing the economic contribution of recreational fishing. The region most applicable to this analysis is the Southern California Current (SCC) region, comprising Monterey, Santa Cruz, and San Luis Obispo counties.⁷ Although this adds two additional counties to the area of economic analysis (relative to the study area for the rest of the analysis), NOAA is using methodologies adopted by the Northwest Fisheries Science Center for consistency in results across the agency.

⁷ The counties adjacent to the proposed sanctuary fall within two IO-PAC economic multiplier regions: the SCC region, comprising Monterey, Santa Cruz, and San Luis Obispo counties, and the South Coast region, comprising Santa Barbara, Ventura, Los Angeles, Riverside, Orange, and San Diego counties. The SCC regional multipliers were selected for this analysis because a large majority of CPFV trips (96.5%) and private/rental vessel trips (96%) to the CHNMS Proposed Action area depart from San Luis Obispo county, part of the SCC region.

Commercial Passenger Fishing Vessels

Table 6 and Table 7 show estimates of the annual number of commercial passenger fishing vessel (CPFV) trips, in angler-days,⁸ within the CHNMS Proposed Action area.⁹ The tables also provide estimates of the economic contribution of those CPFV trips—in employment, income, and output—to the SCC region and state, respectively. These estimates were obtained using CPFV logbook data from the California Department of Fish and Wildlife, along with per-trip multipliers for for-hire recreational vessels from IO-PAC.

On average, from 2015 to 2019, there were about 22,225 CPFV trips that reported catch within the CHNMS Proposed Action area, which contributed roughly 84 jobs, \$4.47 million in income, and \$9.55 million in output to the regional economy. The same 22,225 trips contributed around 95 jobs, \$5.86 million in income, \$12.18 million in output to the state economy.

Table 6. Economic contribution of CPFV activity in the CHNMS Proposed Action area to the SCC region. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Trips	Employment	Income	Output
2010	13,984	53.0	\$2,809,785	\$6,011,555
2011	17,970	68.1	\$3,610,686	\$7,725,089
2012	16,313	61.8	\$3,277,748	\$7,012,765
2013	19,971	75.7	\$4,012,744	\$8,585,296
2014	22,139	83.9	\$4,448,357	\$9,517,293
2015	19,655	74.5	\$3,949,251	\$8,449,451
2016	19,675	74.6	\$3,953,269	\$8,458,049
2017	23,274	88.2	\$4,676,411	\$10,005,216
2018	23,853	90.4	\$4,792,749	\$10,254,121
2019	24,666	93.5	\$4,956,104	\$10,603,620
2020	20,601	78.1	\$4,139,329	\$8,856,125
Five-year average (2015–2019)	22,225	84.2	\$4,465,557	\$9,554,091

⁸ An angler-day is defined as one person angling for any part of one day.

⁹ CPFV effort and catch data were available at the level of California Department of Fish and Wildlife's statistical fishing blocks. The annual number of trips was estimated by grouping the California Department of Fish and Wildlife blocks that best correspond to the boundaries of the Proposed Action and Sub-alternative 5b, Gaviota Coast Extension as described in the proposed CHNMS draft environmental impact statement (ONMS, 2023a).

Table 7. Economic contribution of CPFV activity in the CHNMS Proposed Action area to the state of California. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Trips	Employment	Income	Output
2010	13,984	59.6	\$3,690,081	\$7,663,634
2011	17,970	76.6	\$4,741,902	\$9,848,076
2012	16,313	69.5	\$4,304,655	\$8,939,993
2013	19,971	85.1	\$5,269,924	\$10,944,682
2014	22,139	94.3	\$5,842,013	\$12,132,808
2015	19,655	83.7	\$5,186,538	\$10,771,505
2016	19,675	83.8	\$5,191,815	\$10,782,465
2017	23,274	99.1	\$6,141,515	\$12,754,820
2018	23,853	101.6	\$6,294,301	\$13,072,129
2019	24,666	105.1	\$6,508,835	\$13,517,676
2020	20,601	87.8	\$5,436,167	\$11,289,940
Five-year average (2015–2019)	22,225	94.7	\$5,864,601	\$12,179,719

Table 8 and Table 9 present the estimated number of trips and economic contribution of CPFV activity within the boundary of Sub-alternative 5b, Gaviota Coast Extension to the regional and state economies, respectively. From 2015 to 2019, there was an average of 2,254 angler-days within the Gaviota Coast Extension area, corresponding to a contribution of about 8.5 jobs, \$453,000 in income, and \$969,000 in output to the regional economy. CPFV activity within the Gaviota Coast Extension area contributed about nine jobs, \$554,00 in income, and \$1.15 million in output to the state economy.

Table 8. Economic contribution of CPFV activity in the Gaviota Coast Extension area to the SCC region. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Trips	Employment	Income	Output
2010	379	1.4	\$76,152	\$162,928
2011	966	3.7	\$194,097	\$415,272
2012	963	3.7	\$193,494	\$413,982
2013	1,225	4.6	\$246,137	\$526,613
2014	1,285	4.9	\$258,193	\$552,406
2015	1,490	5.6	\$299,384	\$640,533

Year	Trips	Employment	Income	Output
2016	2,294	8.7	\$460,930	\$986,163
2017	2,942	11.2	\$591,132	\$1,264,731
2018	2,761	10.5	\$554,764	\$1,186,921
2019	1,783	6.8	\$358,256	\$766,491
2020	2,099	8.0	\$421,749	\$902,335
Five-year average (2015–2019)	2,254	8.5	\$452,893	\$968,968

Table 9. Economic contribution of CPFV activity in the Gaviota Coast Extension area to the state of California. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Trips	Employment	Income	Output
2010	379	1.6	\$100,010	\$207,703
2011	966	4.1	\$254,907	\$529,396
2012	963	4.1	\$254,115	\$527,752
2013	1,225	5.2	\$323,252	\$671,335
2014	1,285	5.5	\$339,084	\$704,217
2015	1,490	6.3	\$393,179	\$816,563
2016	2,294	9.8	\$605,338	\$1,257,178
2017	2,942	12.5	\$776,331	\$1,612,301
2018	2,761	11.8	\$728,569	\$1,513,107
2019	1,783	7.6	\$470,496	\$977,135
2020	2,099	8.9	\$553,882	\$1,150,312
Five-year average (2015–2019)	2,254	10	\$594,783	\$1,235,257

Private/Rental Vessels

Table 10 and Table 11 show the number of private or rental vessel fishing trips within the CHNMS Proposed Action area and the associated contributions to the regional and state economies, respectively. The numbers of annual private/rental boat fishing trips (in angler-days) were estimated using sample data from the California Recreational Fisheries Survey (CRFS) and estimates of fishing effort by CRFS sampling district from the Recreational Fisheries

Information Network.¹⁰ Per-trip, private/rental vessel multipliers from IO-PAC were applied to the annual trip counts to estimate economic contributions in terms of employment, income, and output.

From 2015 to 2019, there was an average of about 15,400 private/rental vessel fishing trips to the CHNMS Proposed Action area. On average (from 2015–2019), those trips contributed roughly 22 jobs, \$1.4 million in income, and \$3.1 million in output to the SCC regional economy per year. Likewise, private/rental vessel fishing in the CHNMS Proposed Action area contributed an annual average of about 23 jobs, \$1.9 million in income, and \$3.9 million in output to the state economy from 2015 to 2019.

Table 10. Economic contribution of recreational angling from private and rental vessels in the CHNMS Proposed Action boundaries to the SCC region. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Trips	Employment	Income	Output
2014	17,822	24.9	\$1,641,873	\$3,570,957
2015	20,734	29.0	\$1,910,198	\$4,154,545
2016	16,708	23.3	\$1,539,288	\$3,347,842
2017	11,705	16.3	\$1,078,363	\$2,345,363
2018	15,768	22.0	\$1,452,651	\$3,159,413
2019	12,117	16.9	\$1,116,286	\$2,427,842
2020	–	–	–	–
2021	16,132	22.5	\$1,486,198	\$3,232,373
Five-year average (2015–2019)	15,406	21.5	\$1,419,357	\$3,087,001

¹⁰ As part of CRFS sampling, anglers are asked to indicate the number of days they spent fishing annually. Those angler-day counts, which were not available in the data before 2014, were aggregated by fishing location (i.e., either within the proposed sanctuary or within the two CRFS sampling districts containing the proposed sanctuary) to estimate the proportion of sample fishing effort in the sampling districts that occurred within the CHNMS Proposed Action or Sub-alternative 5b, Gaviota Coast Extension area. It was assumed that anglers spent all of their annual fishing days in the location reported on the CRFS sampling form. Finally, the annual trip estimates provided in the tables were calculated as the product of the proportion of sample fishing effort in the proposed CHNMS areas and the estimated total annual fishing effort by district.

Table 11. Economic contribution of recreational angling from private and rental vessels in the CHNMS Proposed Action boundaries to the state of California. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Trips	Employment	Income	Output
2014	17,822	26.7	\$2,154,428	\$4,489,207
2015	20,734	31.1	\$2,506,517	\$5,222,861
2016	16,708	25.0	\$2,019,818	\$4,208,719
2017	11,705	17.5	\$1,415,003	\$2,948,459
2018	15,768	23.6	\$1,906,135	\$3,971,837
2019	12,117	18.1	\$1,464,764	\$3,052,147
2020	–	–	–	–
2021	16,132	24.2	\$1,950,153	\$4,063,559
Five-year average (2015–2019)	15,406	23.1	\$1,862,447	\$3,880,805

Table 12 and Table 13 show the estimated number of private/rental vessel fishing trips in the Sub-alternative 5b, Gaviota Coast Extension area and associated contributions to the regional and state economies, respectively. On average from 2015 to 2019, there were roughly 1,300 trips in the Gaviota Coast Extension area, contributing nearly two jobs, \$122,000 in income, and \$265,000 in output to the regional economy (Monterey, Santa Cruz, and San Luis Obispo counties). Over the same period, the average contribution to the state economy was estimated to be two jobs, \$160,000 in income, and \$333,000 in output.

Table 12. Economic contribution of recreational angling from private and rental vessels in the Gaviota Coast Extension area to the Southern California Current region. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Trips	Employment	Income	Output
2014	1,460	2.0	\$134,518	\$292,566
2015	967	1.4	\$89,121	\$193,831
2016	1,625	2.3	\$149,665	\$325,511
2017	1,827	2.6	\$168,276	\$365,988
2018	1,047	1.5	\$96,434	\$209,738
2019	1,150	1.6	\$105,970	\$230,477
2020 ¹¹	–	–	–	–
2021	1,006	1.4	\$92,711	\$201,639
Five-year average (2015–2019)	1,323	1.8	\$121,893	\$265,109

Table 13. Economic contribution of recreational angling from private and rental vessels in the Gaviota Coast Extension area to the state of California. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Trips	Employment	Income	Output
2014	1,460	2.2	\$176,511	\$367,798
2015	967	1.4	\$116,942	\$243,674
2016	1,625	2.4	\$196,387	\$409,215
2017	1,827	2.7	\$220,808	\$460,099
2018	1,047	1.6	\$126,539	\$263,671
2019	1,150	1.7	\$139,051	\$289,743
2020 ¹¹	–	–	–	–
2021	1,006	1.5	\$121,653	\$253,489
Five-year average (2015–2019)	1,323	2.0	\$159,945	\$333,280

Shoreline Fishing

Table 14 and Table 15 provide the estimated number of shoreline angling trips in the CHNMS Proposed Action boundaries, along with the estimated economic contributions to the SCC region and the state of California. Two types of shoreline angling—fishing from beaches and banks, and

¹¹ CRFS sampling was disrupted in 2020 due to safety concerns related to the COVID-19 pandemic.

fishing from manmade structures, like piers and jetties—are sampled separately through interviews at set intercept sites.¹² Although shoreline fishing does occur within the Sub-alternative 5b, Gaviota Coast Extension boundaries, estimates for that area are not provided here due to discontinuities in sampling of the two shoreline fishing modes.¹³

IO-PAC economic multipliers were not available for recreational shoreline fishing, so a custom IMPLAN model was developed to estimate the economic contribution of shoreline fishing based on methods described in Lovell et al. (2020). First, annual shoreline fishing effort in the CHNMS Proposed Action boundaries, in number of trips, was estimated using CRFS sampling data¹⁴ (see Footnote 10). Then, annual trip estimates were multiplied by average shoreline fishing trip expenditures for California from the 2017 Marine Recreational Fishing Expenditures Survey (see Table CA_2 in Lovell et al., 2020) to estimate annual shore fishing expenditures. These angler expenditure estimates were assigned to IMPLAN sectors based on Table 3 in Lovell et al. (2020). To be consistent with the analyses for private/rental vessel and for-hire fishing, the IMPLAN model analyzed Monterey, Santa Cruz, and San Luis Obispo counties as a single region.

On average from 2015 to 2017, there were an estimated 160,400 shore-based recreational fishing trips in the CHNMS Proposed Action boundaries. These trips contributed an estimated 132 jobs, \$5.2 million in income, and \$17.1 million in output to the regional economy. Likewise, shore-based fishing in the CHNMS Proposed Action boundaries contributed an estimated 145 jobs, \$7.0 million in income, and \$24.3 million in output on average from 2015 to 2017.

Table 14. Economic contribution of shoreline angling in the CHNMS Proposed Action boundaries to the SCC region.

Year	Trips	Employment	Income	Output
2010	153,866	138.7	\$5,448,752	\$16,731,322
2011	128,777	112.5	\$4,419,290	\$13,201,549
2012	120,336	102.7	\$4,027,739	\$12,060,356
2013	178,364	149.0	\$5,853,880	\$17,616,624
2014	186,987	152.6	\$5,997,396	\$18,187,466
2015	215,896	177.7	\$6,968,577	\$22,525,065

¹² The following beach and bank sampling sites were included in the analysis of the CHNMS Proposed Action area: Guadalupe Dunes Beach, Jalama Beach, Cambria, Cayucos, Morro Bay Harbor Interior, Morro Strand State Beach, Montana de Oro State Beach, Avila Boat Sling/Port of San Luis Obispo, Avila Public Pier Beach, Shell Beach, Pismo Beach Public Pier Beach, and Oso Flaco State Beach. The following manmade structure sampling sites were also included in the analysis: Cayucos Pier, Morro Bay Jetties, Morro Bay Harbor Piers, Harford Pier, Avila Pier, and Pismo Beach Public Pier.

¹³ CRFS sampling of fishing from man-made structures in the Gaviota Coast Extension area only occurred through 2014. Sampling of beach and bank fishing was intermittent from 2004 to 2013, and sampling did not occur for either mode from 2018 to 2020.

¹⁴ Shore trip estimates are not available for 2018–2020 due to a pause in beach and bank mode sampling in 2018 and 2019 and sampling disruptions due to the COVID-19 pandemic in 2020.

Year	Trips	Employment	Income	Output
2016	165,024	135.5	\$5,321,229	\$17,927,945
2017	100,213	81.5	\$3,192,626	\$10,713,395
2018-2020	ND	--	--	--
Three-year average (2015–2017)	160,378	131.6	\$5,160,811	\$17,055,468

Table 15. Economic contribution of shoreline angling in the CHNMS Proposed Action boundaries to the state of California.

Year	Trips	Employment	Income	Output
2010	153,866	142.4	\$6,986,304	\$20,984,970
2011	128,777	115.6	\$5,637,709	\$16,632,223
2012	120,336	105.4	\$5,138,954	\$15,193,811
2013	178,364	161.1	\$7,472,503	\$25,731,508
2014	186,987	156.4	\$7,701,572	\$22,912,811
2015	215,896	197.1	\$8,943,473	\$33,805,071
2016	165,024	137.7	\$6,792,064	\$22,008,269
2017	100,213	100.1	\$5,383,265	\$16,962,043
2018-2020	ND	--	--	--
Three-year average (2015–2017)	160,378	145.0	\$7,039,601	\$24,258,461

Wildlife Viewing

There are several harbors within the study area that support wildlife viewing. Across Santa Barbara, Channel Islands, and Ventura harbors, eight operations were identified that are likely to use the proposed sanctuary waters for whale watching and other wildlife viewing (L. Ingulsrud/NOAA, personal communication, August 25, 2022). There are two main whale watching seasons: gray whales (December–April) and big whales (May–November). The gray whale season provides the opportunity to see migrating gray whales, in addition to seals, sea lions, several species of dolphins, and potentially orca whales. During the big whale season, in addition to the marine mammals previously listed, large whales such as fin, humpback, and blue whales are attracted to the region due to optimal feeding conditions that occur in summer months (Shea et al., 2021).

Other Recreational Activities

In 2017, more than half of visitors engaged in beach activities during trips to Santa Barbara County. Santa Barbara County residents partake in outdoor recreation such as biking, hiking, surfing, sea kayaking, stand-up paddle boarding, and beach combing. Other common activities were whale watching, kayaking, sailing, surfing/paddle boarding and excursions to the Channel Islands.

Table 16. Other recreation activities in Santa Barbara County, 2017. Source: Destination Analysts, 2017

Marine/Coastal Recreation Activity	Hotel Guest (n=894)	Visit Family/Relatives (n=228)	Day Trip (n=548)
Beaches	58.9%	68.4%	51.8%
Whale watching	4.8%	4.8%	2.6%
Kayaking	1.9%	7.0%	2.4%
Sailing	2.0%	3.9%	2.7%
Surfing/stand-up paddle boarding	1.8%	7.5%	2.0%
Channel Islands excursion	1.3%	1.3%	1.5%

San Luis Obispo County's coastline provides access and opportunity for a variety of beach activities (e.g., sand volleyball, hiking down the beach or at the tidepools) at all times of the year. Other year-round activities along the coast include stand-up paddleboard, surfing, and kayaking.

Tourism

Tourism is a major contributor to San Luis Obispo County's economy. In 2017, 7.2 million visitors spent nearly \$1.69 billion (Tourism Economics, 2018; Figure 2). Employment sustained by tourism was 23,386 jobs or 13.3% of all jobs in the county. Compared to 2014, visits, visitor spending and tourism employment increased 6.8%, 9.2%, and 8.2%, respectively. Lodging represented the largest spending sector at approximately \$490 million, followed by spending on food and beverages (\$354 million). On average, each visitor spent \$234. Overnight visitors outpaced day visitors in 2017, increasing 5.2% to 4.6 million visits since 2014. Day visitors increased 0.7% to 2.6 million visits.

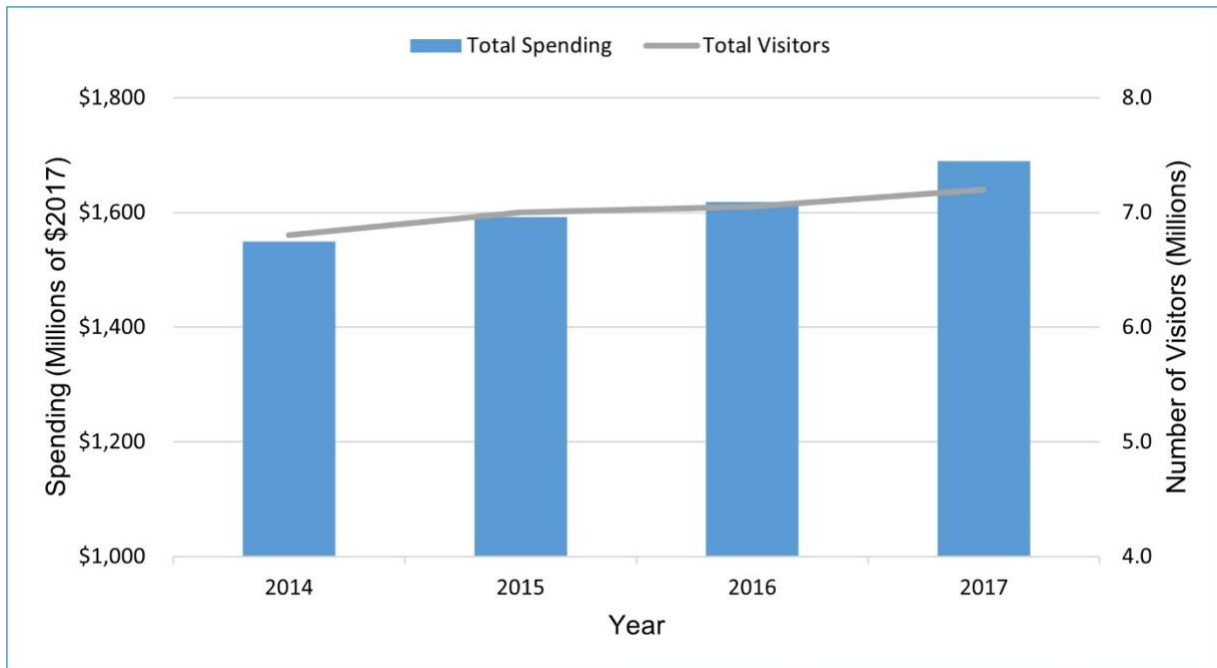


Figure 2. Total visitation and spending in San Luis Obispo County, 2014–2017. Source: Tourism Economics, 2018

In Santa Barbara County, a survey between September 2016 and August 2017 showed that total direct visitor-related spending contributed \$1.9 billion to the local economy, which represented a 25.3% increase since 2013 (when visitor spending was \$1.5 billion; Destination Analysts, 2017). The same survey reflected a total of 7.2 million visitors, an 18% from 6.1 million visitors in 2013. The majority of visitors surveyed resided within the United States (82%), while the remaining 18% were international residents (up from 15.6% in 2013). Canada, the United Kingdom, and China were the top international markets.

Visitor spending in the Santa Barbara South Coast area supported more than 13,000 jobs (Destination Analysts, 2017). Visitors reported spending an average of \$430 per day. Going to the beach was one of the most common activities visitors participated in during their trip to the Santa Barbara (55.0%). Survey results showed three in 10 visitors (23.6%) stayed overnight, and day-trippers represented the majority of Santa Barbara visitors at 69.3%.

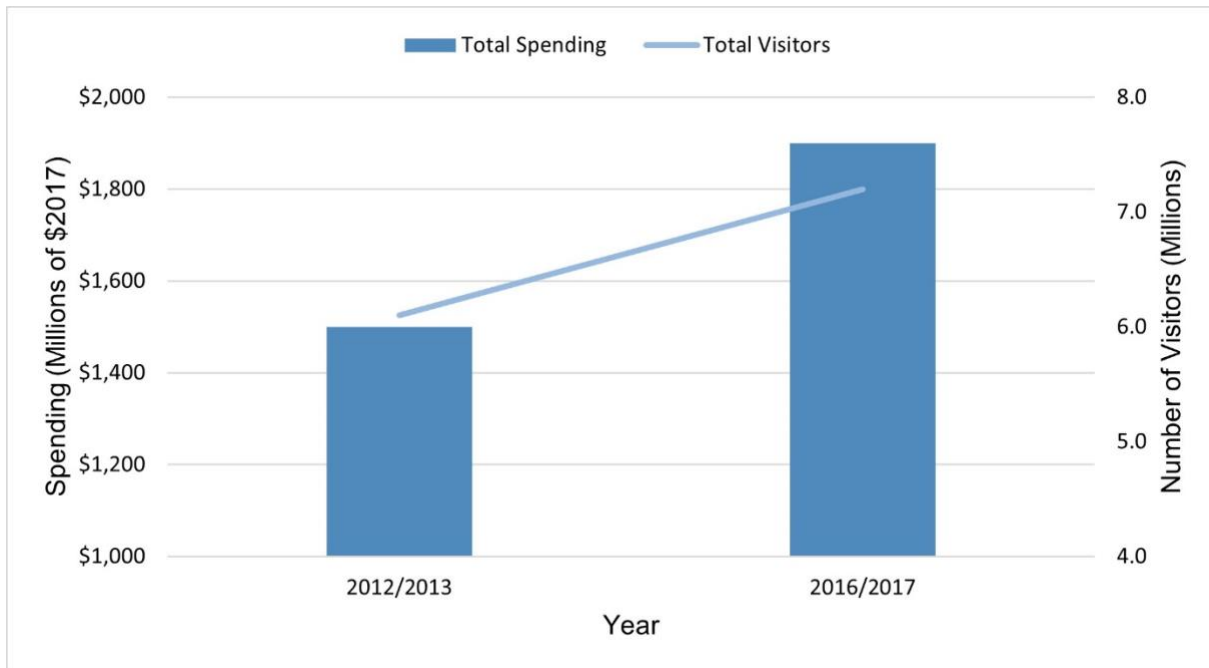


Figure 3. Total visitation and spending in Santa Barbara County, 2012–2017. Source: Destination Analysts, 2017

Other Uses

There are other uses within the proposed sanctuary waters. A short discussion is provided here, but more detailed information is available in the draft environmental impact statement (ONMS, 2023a).

Shipping and Ocean Transport

The proposed sanctuary is north of the ports of Los Angeles and Long Beach, which utilize the Santa Barbara Channel. In 2019, there were approximately 9,000 commercial vessel (over 300 gross tons) transits (inbound and outbound) from the Santa Barbara Channel. Approximately 72% of the traffic is from cargo ships (container, bulk, reefer, car carrier, bulk), 25% of the traffic is from tankers, and 3% of the traffic is from passenger vessels (cruise ships, ferries, and large private vessels). A more detailed discussion of vessel traffic, including maps and images of vessel density may be found in Chapter 4 of the draft environmental impact statement (ONMS, 2023a).

Energy Production and Development

Existing offshore oil and gas facilities include platforms, pipelines, and wells. Some of these facilities are already shut down, and some are preparing plans for decommissioning and removal. Additionally, there is one nuclear power plant on shore, Diablo Canyon Power Plant. There are no existing wind energy facilities within the proposed sanctuary, but wind energy development is dynamic and rapid. More information on energy production and development is available in the draft environmental impact statement (ONMS, 2023a).

Chapter 4: Population and Socioeconomic Drivers

Population exerts pressure onto marine resources (Kronen et al., 2010). Findings from previous studies reveal that as human population density increases, the size of protected areas decreases, and household density has been an indicator of the threat to biodiversity (Luck, 2007). Information on population, population growth, and population density in and around the sanctuary community may help to prioritize sanctuary management strategies.

In addition, socioeconomic factors influence people's perceptions of the environment and can help in the development of conservation strategies (Cinner & Pollnac, 2004; Sesabo et al., 2006). Income, unemployment, poverty, and access to utilities and telecommunication services are examples of components of the human dimensions used as variables and as a starting point to guide managers and researchers (Barreto et al., 2020).

Key Takeaways

1. Population and socioeconomic factors influence ecological pressures, community perceptions, and use of marine resources in the proposed CHNMS.
2. The sanctuary community has varying levels of access to services such as electricity, water, sanitation, internet, and telephone service. Access to services affects community well-being and development of infrastructure and tourism industries.

Population, Growth, and Density

Table 8 presents the population, growth, and density for the counties of San Luis Obispo and Santa Barbara, the state of California, and the United States.

In 2019, the total population of San Luis Obispo County was 283,111, and the total population California was 39,512,223. The population of San Luis Obispo County was smaller than that of Santa Barbara County, which was 446,499 in 2019. The sanctuary community contains 1.8% of California's population. In 2010, Santa Barbara County contained 1.1% of the total population of California, while San Luis Obispo County contained 0.7%; the population of the United States was 328,239,523 (U.S. Census Bureau, 2019)

From 2010 to 2019, the population of San Luis Obispo County increased by 4.9% (U.S. Census Bureau, 2020a). During the same period, the total population of Santa Barbara County increased by 5.2%, the state of California's population increased by 5.9%, and the population of the United States increased by 6.1%.

The population density of San Luis Obispo County increased from 74 people per square mile in 2010 to 78 people per square mile in 2019 (U.S. Census Bureau, 2020a). Similarly, the population density of Santa Barbara County increased from 112 people per square mile in 2010 to 118 people per square mile in 2019. The population density of the sanctuary community increased from 94 people per square mile in 2010 to 99 people per square mile in. The population densities of the individual counties and the study area, respectively, are lower compared to that of California.

Table 17. Population indicators for San Luis Obispo County, Santa Barbara County, the sanctuary community, the state of California, and the U.S., 2010–2020. Source: U.S. Census Bureau, 2021

Location	2010 Population	2020 Population	Population Growth, 2010–2020	2010 Population Density (people/sq. mi)	2020 Population Density (people/sq. mi)
San Luis Obispo County	269,802	282,517	4.5%	75	78
Santa Barbara County	424,231	444,895	4.6%	112	117
Sanctuary community	694,033	727,412	4.6%	94	98
California	37,319,502	39,346,023	5.2%	228	240
United States	309,327,143	326,569,308	5.3%	83	88

Per Capita Income

Per capita income is the average annual income earned per person in a given area, regardless of age or work status. It serves as an indicator of the health and economic status of a community.

In San Luis Obispo County, per capita income was \$47,172 in 2010 and \$61,004 in 2019 (2019 adjusted for inflation; U.S. Census Bureau, 2020a). In Santa Barbara County, per capita income was \$53,487 in 2010 and \$66,076 in 2019. In 2019, compared to the United States' per capita income of \$56,490, the per capita income of California was \$70,662, ranking it sixth compared to the rest of the United States.

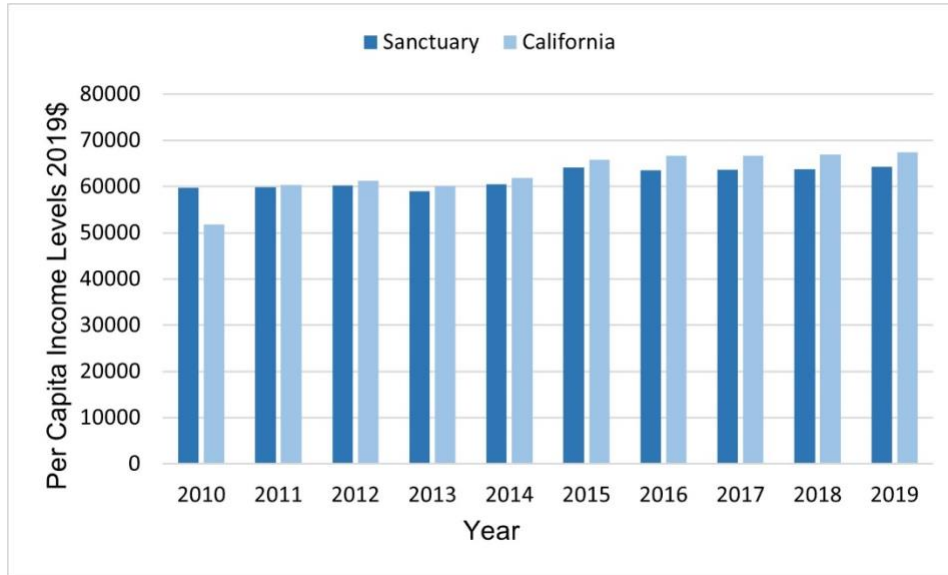


Figure 4. Per capita income level of California and the sanctuary community, 2010–2019. Source: U.S. Census Bureau, 2019

Poverty Rates

According to the U.S. Census Bureau, in 2019, the poverty rate was 11.8% in San Luis Obispo County and 12.3% in Santa Barbara County (Figure 5). The poverty rate in the sanctuary community (12.1%) was higher than the state-wide poverty rate (11.6%).

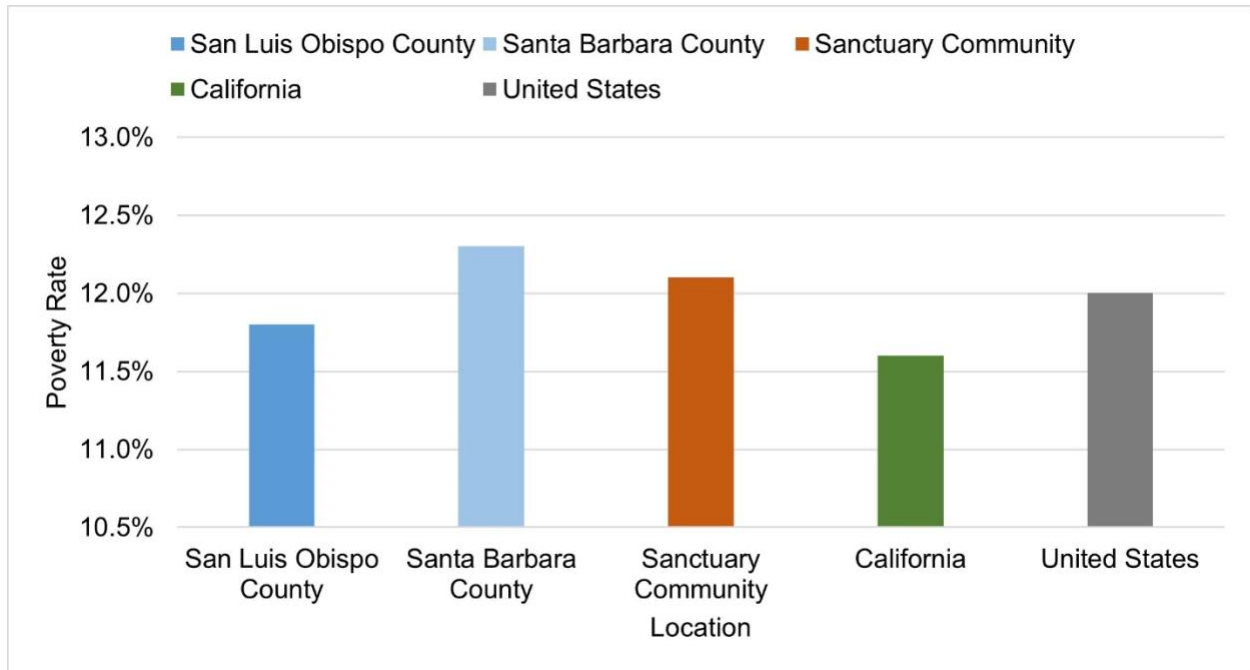


Figure 5. Poverty status in the sanctuary community, counties of interest, California, and the U.S., 2019. Source: U.S. Census Bureau, 2019

Unemployment Rates

In 2020, the unemployment rate in the sanctuary community was 7.9%. Of the two counties in the sanctuary community, Santa Barbara County's unemployment rate was higher at 8.0% compared to San Luis Obispo County's unemployment rate of 7.7%. Each of these values are lower compared to 2010, when unemployment rates were 10.1%, 10.2%, and 9.9% for the sanctuary community, San Luis Obispo County, and Santa Barbara County, respectively. The 2020 unemployment rate in the sanctuary community was lower than the overall unemployment rate of the state of California.

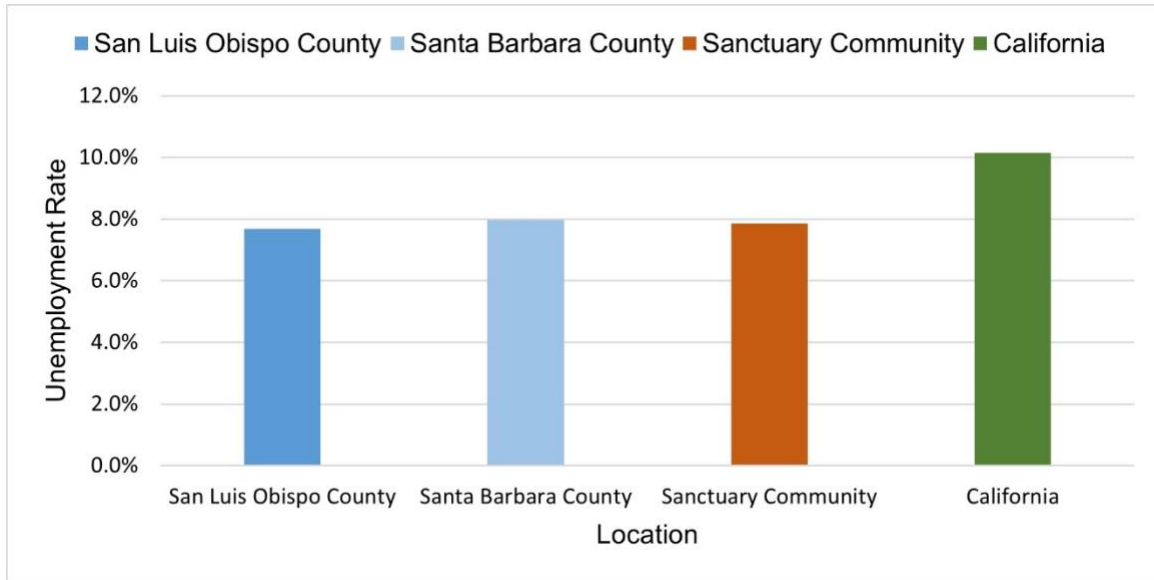


Figure 6. Unemployment status for the sanctuary community, counties of interest, and California, 2020. Source: U.S. Bureau of Labor Statistics, 2021

Chapter 5: Demographic Characteristics

The relevant demographic characteristics of the community include gender, racial and ethnic composition, national origin, age distribution, language, and education level. Demographic information may be integrated to design sanctuary planning and management strategies. For example, sanctuary managers may consider environmental awareness programs that are targeted to specific community demographics to increase access to sanctuary resources and participation rates in outdoor recreational activities.

Key Takeaways

1. Demographic characteristics such as gender, racial and ethnic composition, national origin, age distribution, language, and education level affect perceptions toward and use of marine resources in the proposed CHNMS and sanctuary managers may adapt outreach and management strategies for the community.

Gender

Gender analyses are needed to enhance coastal management and marine spatial planning (de la Torre-Castro et al., 2017). Gender is an important variable in the perceived effect of conservation on fishing (Kleiber et al., 2018; Ram-Bidesi, 2015; Rohe et al., 2018) and participation in outdoor recreation, including fishing (Milon, 2000), diving, and wildlife viewing (Burkett, 2019).

In 2019, the estimated population was 283,111 (50.6% male and 49.4% female) in San Luis Obispo County and 446,499 in Santa Barbara County (50.0% male and 50.0% female; U.S. Census Bureau, 2020b). For the same year, the population of the United States was 49.2% male and 50.8% female (Figure 7; U.S. Census Bureau, 2020b).

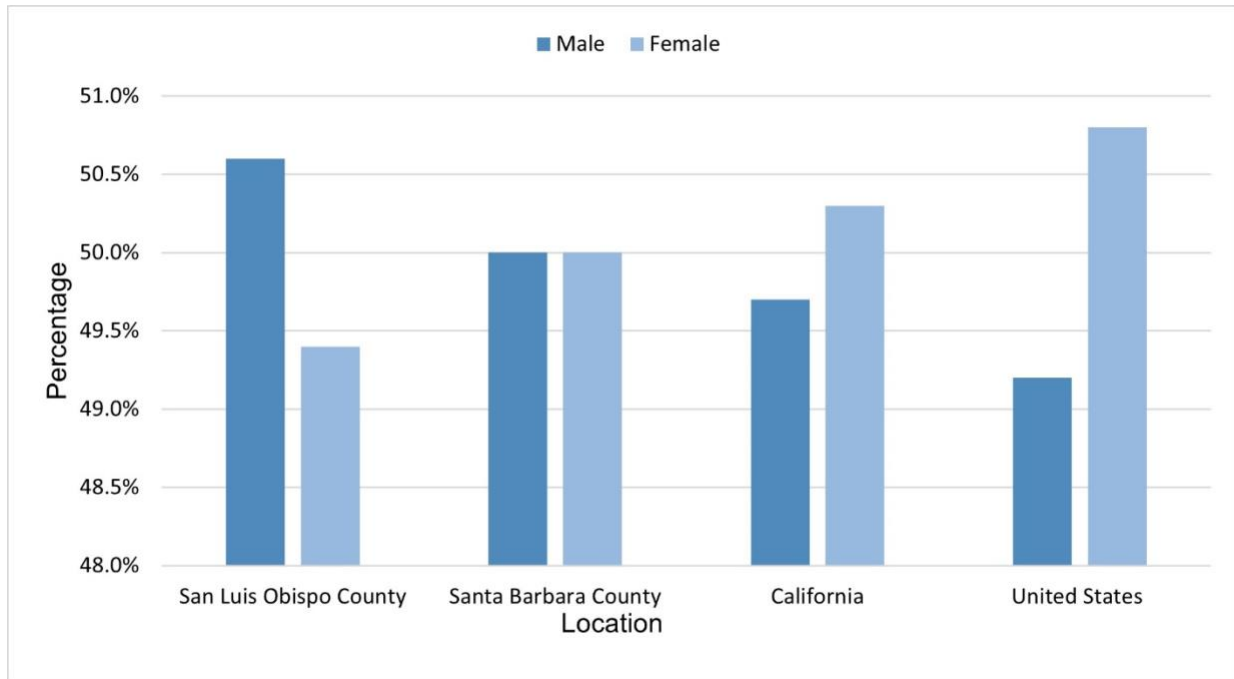


Figure 7. Gender distribution for San Luis Obispo County, Santa Barbara County, California, and the United States, 2019. Source: U.S. Census Bureau, 2020b

Racial and Ethnic Composition

Race and ethnicity are correlated with participation rates and attitudes or perceptions toward the definition of crowding (U.S. Fish and Wildlife Service & U.S. Census Bureau, 2016). Scott et al. (2004) reported that minority populations, including Black and Hispanic communities, were more likely to cite barriers to outdoor recreation than White populations. Reported barriers include “information and access constraints, intrapersonal constraints, and economic constraints” (Scott et al., 2004). Hispanic populations were more likely than other minority populations to cite “information and access constraints” as barriers to outdoor activity participation. According to the same study, racial and ethnic composition did not have notable effects on time availability and interest in participation.

The term “Hispanic” refers to ethnicity and is recorded separately from race in the United States census. Any race may identify as Hispanic. For this reason, ethnicity is discussed separately from race. The “Race” section presents information for non-Hispanic respondents. The “Ethnicity” section includes information for respondents of any race who reported Hispanic ethnicity.

Race

In 2020, the largest racial group in both San Luis Obispo County and Santa Barbara County was White (68.5% and 43.8%, respectively), followed by Asian (4.0% and 6.0%, respectively). Racial information for the sanctuary community (both counties combined) is presented in Table 18.

The census does not estimate the populations of Chumash and Salinan people within the U.S. Chumash and Salinan people maintain strong heritage and cultural identities associated with the coastal areas of the proposed sanctuary.

Table 18. Distribution of races in the sanctuary community, 2020. Source: U.S. Census Bureau, 2020b

Race	Number of People	Percent
White	552,844	76%
Asian	35,237	4.9%
Two or more races	62,006	8.5%
Black or African American	13,339	1.8%
Other	63,896	8.8%
Total population	727,412	100%

Ethnicity

In the 2020 U.S. census, Hispanic or Latino is defined as a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race. As of 2019, Hispanic or Latino people accounted for 22.9% of the San Luis Obispo County population and 44.6% of the Santa Barbara County population (U.S. Census Bureau, 2020b).

Table 19. Distribution of Hispanic or Latino people in the sanctuary community, 2020. Source: U.S. Census Bureau, 2020b

Ethnicity	Number of People	Percent
Mexican	239,328	32.9%
Puerto Rican	3,167	0.4%
Cuban	960	0.1%
Other Hispanic or Latino	24,027	3.3%
Total Hispanic population	267,482	36.8%
Total population	727,412	100.0%

Age Distribution

It is helpful for resource managers to know age distributions to understand impacts on resource use, as age is correlated with resource use, perceptions of ocean resources and recreation, and rates of participation in various activities, such as fishing and diving.

In 2020, most residents of the sanctuary community were between the ages of 25 and 34 (12.7%). This was consistent with the age distribution for California (15.3% between 25 and 34). In San Luis Obispo County, 11.6% of the population was between 25 to 34, while in Santa Barbara County, 13.4% was between 25 to 34 (U.S. Census Bureau, 2020c).

In 2020, the median age was 39.5 years in San Luis Obispo County, 33.8 years in Santa Barbara County, and 36.7 years in California. In San Luis Obispo County, the median age for men was 38.7 years and the median age for women was 41.6 years (U.S. Census Bureau, 2020c). In Santa Barbara County, the median age for men was 33 years and the median age for women was 34.9 years (U.S. Census Bureau, 2020c).

Table 20. Age distribution in California, each county, and the sanctuary community, 2020. Source: U.S. Census Bureau, 2020c

	Number of People (California)	Percent (California)	Number of People (San Luis Obispo County)	Percent (San Luis Obispo County)	Number of People (Santa Barbara County)	Percent (Santa Barbara County)	Number of People (Sanctuary Community)	Percent (Sanctuary Community)
Under 5 years	2,409,082	6.1%	12,906	4.6%	27,710	6.2%	40,616	5.6%
5 to 9 years	2,431,647	6.2%	13,874	4.9%	27,384	6.2%	41,258	5.7%
10 to 14 years	2,597,443	6.6%	14,616	5.2%	27,915	6.3%	42,531	5.8%
15 to 19 years	2,548,072	6.5%	22,270	7.9%	37,812	8.5%	60,082	8.3%
20 to 24 years	2,694,636	6.8%	28,909	10.2%	47,969	10.8%	76,878	10.6%
25 to 34 years	6,007,913	15.3%	32,709	11.6%	59,742	13.4%	92,451	12.7%
35 to 44 years	5,233,903	13.3%	31,028	11.0%	50,530	11.4%	81,558	11.2%
45 to 54 years	5,039,155	12.8%	30,797	10.9%	47,721	10.7%	78,518	10.8%
55 to 59 years	2,485,487	6.3%	18,639	6.6%	25,513	5.7%	44,152	6.1%
60 to 64 years	2,254,188	5.7%	20,069	7.1%	24,579	5.5%	44,648	6.1%
65 to 74 years	3,270,380	8.3%	33,744	11.9%	37,416	8.4%	71,160	9.8%
75 to 84 years	1,609,373	4.1%	16,135	5.7%	20,110	4.5%	36,245	5.0%
85 years and over	764,744	1.9%	6,821	2.4%	10,494	2.4%	17,315	2.4%
Total population	39,346,023	100%	282,517	100%	444,895	100%	727,052	100%

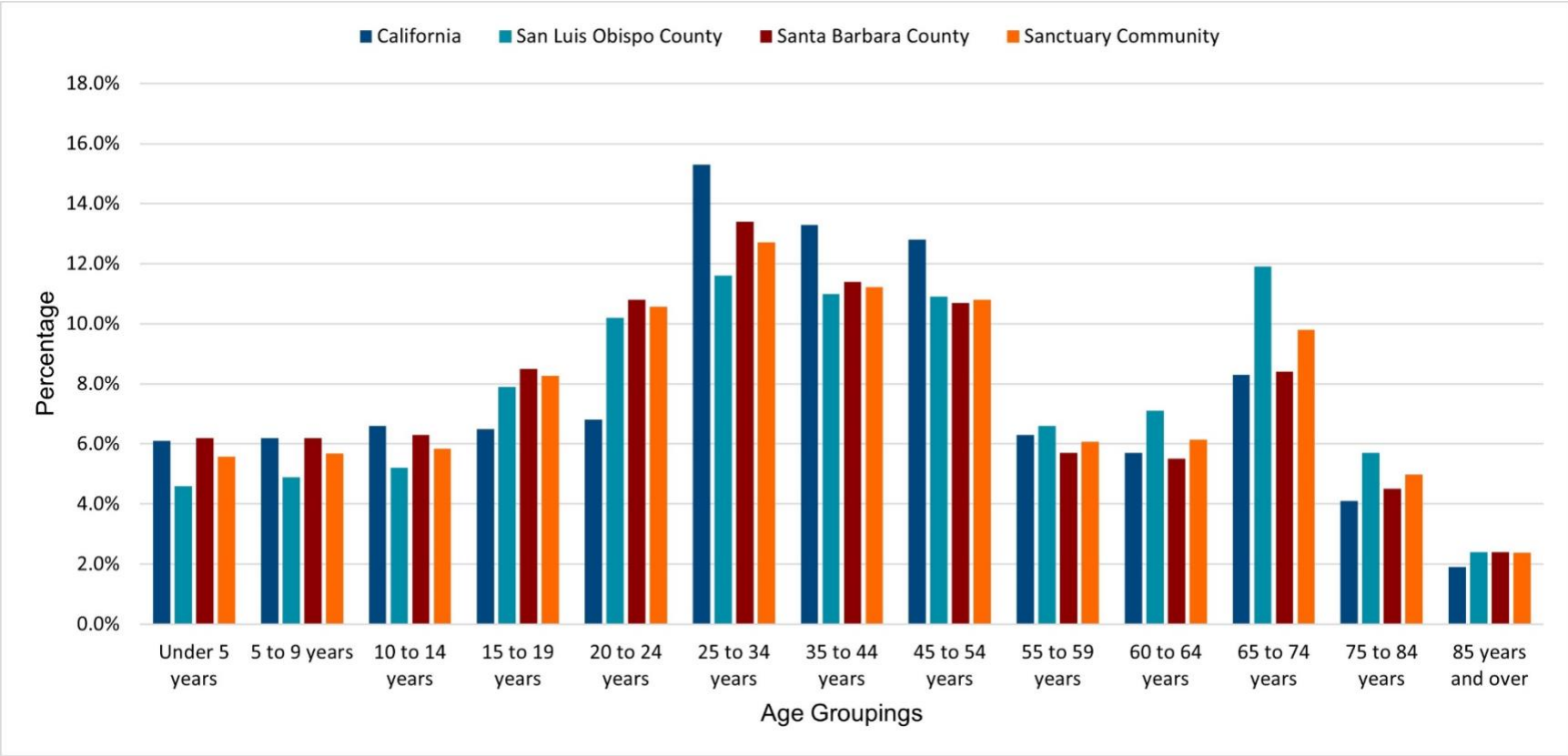


Figure 8. Age distribution in California, San Luis Obispo and Santa Barbara counties, and the sanctuary community, 2020. Source, U.S. Census Bureau, 2020c

Language

In 2020, most of the sanctuary community spoke English (68.9%) as their only language, while 31.1% spoke a language other than English. The most common language spoken other than English was Spanish (25.2%); other languages spoken were from the Indo-European (2.2%) or Asian and Pacific Island (3.1%) language families. It is important for resource managers to know which languages are commonly spoken in the sanctuary community to ensure educational materials, outreach, and other resources are accessible to all people living in the community (U.S. Census Bureau, 2020d). Additionally, native dialects of Chumash and Salinan languages are increasingly being recovered and learned by Indigenous peoples, and, through appropriate collaborations with NOAA, could become part of interpretive materials produced in partnership with the proposed sanctuary.

Table 21. Distribution of languages spoken at home in California, San Luis Obispo and Santa Barbara counties, and the sanctuary community, 2020. Source: U.S. Census Bureau, 2020d

Language Spoken	Number of People (California)	Percent (California)	Number of People (San Luis Obispo County)	Percent (San Luis Obispo County)	Number of People (Santa Barbara County)	Percent (Santa Barbara County)	Number of People (Sanctuary Community)	Percent (Sanctuary Community)
Speak only English	20,725,855	56.1%	223,482	82.9%	249,948	59.9%	473,430	68.9%
Speak a language other than English (total)	16,211,086	43.9%	46,129	17.1%	167,237	40.1%	213,366	31.1%
Speak a language other than English (Spanish)	10,462,968	28.3%	34,232	12.7%	139,023	33.3%	173,255	25.2%
Speak a language other than English (other Indo-European languages)	1,679,265	4.5%	5,011	1.9%	9,925	2.4%	14,936	2.2%
Speak a language other than English (Asian and Pacific Island languages)	3,677,164	10.0%	5,529	2.1%	15,636	3.7%	21,165	3.1%
Speak a language other than English (other languages)	391,689	1.1%	1,357	0.5%	2,653	0.6%	4,010	0.6%

Education Level

In San Luis Obispo and Santa Barbara counties, 35.8% and 29.9% have some college or associate degrees, respectively. The number of people over 25 years with a bachelor's degree was 22.3% and 20.8% in San Luis Obispo and Santa Barbara respectively (U.S. Census Bureau, 2020e).

Table 22. Education levels in the sanctuary community among people over 25 years old. Source: U.S. Census Bureau, 2020e

Location	Number of People Over 25	Less than 9th Grade	9th–12th Grade, No Diploma	High School Graduate, GED, or Equivalent	Some College or Associate's Degree	Bachelor's Degree	Graduate or Professional Degree
San Luis Obispo County	189,942	3.50%	4.70%	19.90%	35.80%	22.30%	13.80%
Santa Barbara County	276,105	11.70%	6.40%	16.90%	29.90%	20.80%	14.10%
Sanctuary community	466,047	8.4%	5.7%	18.1%	32.3%	21.4%	14.0%

Chapter 6: Economic Profile

In Chapter 4, several key indicators of economic health were addressed, including per capita income, unemployment rates, and poverty rates. In this section, other indicators are presented, including labor force, employment, and personal income. Labor force, employment, and personal income provide information on the relative health of the sanctuary community's economy. They indicate whether the economy is healthy or stagnant and suggest opportunities for employment and economic growth in the community. These are important elements in assessing whether people can adapt to changes in resource management and policy decisions that may displace them from resource use.

This section also presents employment and annual payroll by industry sector, which are important for analyses of the economic impact and contribution of resource management and policy decisions. By linking the spending in the local economy (as related to resource use in the sanctuary) to economic sectors, it is possible to leverage input-output models such as IMPLAN (Minnesota IMPLAN Group, 2010). The IMPLAN model can estimate multiplier impacts on the local economy and assess the proportion of the local economy affected by resource use in the sanctuary.

Key Takeaways

1. Economic indicators including labor force, employment, and personal income show whether the sanctuary community's economy is healthy and provide insight into whether sanctuary users can adapt to changes in resource management and policy in the proposed CHNMS.
2. Manufacturing, retail trade, and health care and social assistance sectors employed the most people and comprised the highest percentage of annual payroll in 2020.

Labor Force and Employment

Labor force is one indicator of the potential for economic expansion within the sanctuary community and local economy. Table 23 presents the labor force for the sanctuary community, individual counties of interest, and California in 2010 and 2020. Overall, there was an increase in the labor force in the sanctuary community during this time period, despite a decrease in the labor force in San Luis Obispo County. In 2010, 322,670 (92.1%) people in the sanctuary community were employed (Table 24).

Table 23. Labor force in San Luis Obispo County, Santa Barbara County, the sanctuary community, and California, 2010 and 2020. Source: Bureau of Economic Analysis, 2022

Location	Labor Force, 2010	Labor Force, 2020
San Luis Obispo County	133,590	132,690
Santa Barbara County	212,274	217,510
Sanctuary community	345,864	350,200
California	18,370,544	18,821,176

Table 24. Employment for San Luis Obispo County, Santa Barbara County, the sanctuary community, and California. Source: Bureau of Economic Analysis, 2022

Location	Employment	Employment Rate
San Luis Obispo County	122,495	92.3%
Santa Barbara County	200,175	92.0%
Sanctuary community	322,670	92.1%
California	16,913,083	89.9%

Personal Income

In 2017, 58.3% of households in the sanctuary community had a personal income of at least \$60,000 (Table 17). For both counties, income was concentrated between \$40,000 and \$149,999 (U.S. Census Bureau, 2017).

Table 25. Annual household income in San Luis Obispo County, Santa Barbara County, and the sanctuary community, 2017. Household income includes personal income from any source, including, but not limited to, unemployment insurance, social security, wages, and annual salary. Source: U.S. Census Bureau, 2017

Income Bracket	Number of Households (San Luis Obispo County)	Percent (San Luis Obispo County)	Number of Households (Santa Barbara County)	Percent (Santa Barbara County)	Number of Households (Sanctuary Community)	Percent (Sanctuary Community)
Less than \$20,000	13,348	5.3%	17,304	6.9%	30,652	12.2%
\$20,000 to \$39,999	14,990	5.9%	21,309	8.5%	36,299	14.4%
\$40,000 to \$59,999	15,107	6.0%	23,237	9.2%	38,344	15.2%
\$60,000 to \$99,999	24,556	9.7%	32,354	12.8%	56,910	22.6%
\$100,000 to \$149,999	19,505	7.7%	24,234	9.6%	43,739	17.4%
\$150,000 to \$199,999	8,312	3.3%	13,392	5.3%	21,704	8.6%
\$200,000 or more	8,726	3.5%	15,636	6.2%	24,362	9.7%
Total	104,544	41.5%	147,466	58.5%	252,010	100%

Employment and Annual Payroll by Industry Sector

Employment by Industry Sector

In 2020, San Luis Obispo and Santa Barbara counties had a higher proportion of employment generated in the “management, business, science, and arts,” “service,” “sales and office,” “natural resources, construction, and maintenance,” and “production, transportation, and material moving” sectors. The management, business, science, and arts industry represented the largest percentage at 38.3% of total employment in both counties in 2020.

Table 26. Employment by industry sector in San Luis Obispo and Santa Barbara counties, 2020. Data for farming, fishing, and forest occupations were not available. Source: U.S. Census Bureau, 2020

Location	Total Employed ¹⁵ Civilian Population	Management, Business, Science, and Arts Occupations (Percent of Total Employment)	Service Occupations (Percent of Total Employment)	Sales and Office Occupations (Percent of Total Employment)	Natural Resources, Construction, and Maintenance (Percent of Total Employment)	Production, Transportation, and Material Moving (Percent of Total Employment)
San Luis Obispo County	131,426	39.6%	20%	21.5%	9.9%	9.1%
Santa Barbara County	212,400	37.1%	21.2%	19.3%	13.4%	9%
Sanctuary community	343,826	38.3%	20.6%	20.4%	11.6%	9.1%

¹⁵ Per the U.S. Census Bureau, “employed” includes all civilians 16 years old and over who were either (1) “at work”—those who did any work at all during the reference week as paid employees, worked in their own business or profession, worked on their own farm, or worked 15 hours or more as unpaid workers on a family farm or in a family business; or (2) were “with a job but not at work”—those who did not work during the reference week but had jobs or businesses from which they were temporarily absent due to illness, bad weather, industrial dispute, vacation, or other personal reasons. Excluded from the employed are people whose only activity consisted of work around the house or unpaid volunteer work for religious, charitable, and similar organizations; also excluded are people on active duty in the United States Armed Forces (U.S. Census Bureau, 2022).

Annual Payroll by Industry Sector

In 2021, the industries with the highest percentage of total annual payroll in the sanctuary community were service-providing, goods-producing, professional and business services, and education and health services. These sectors are classified using the North American Industry Classification System.

Table 27. Payroll in the sanctuary community by private industry sector, 2015 and 2021. Source: U.S. Bureau of Labor Statistics, 2022a

Sector (2015)	Annual Payroll (Thousands of Dollars, 2015)	Sector (2021)	Annual Payroll (Thousands of Dollars, 2021)
Service-providing	8,667,904	Service-providing	11,721,328
Goods-producing	2,934,727	Goods-producing	4,128,104
Trade, transportation, and utilities	2,131,453	Professional and business services	3,386,099
Professional and business services	2,074,457	Education and health services	2,639,815
Education and health services	1,912,077	Trade, transportation, and utilities	2,527,002
Manufacturing	1,217,678	Manufacturing	1,523,609
Leisure and hospitality	952,903	Natural resources and mining	1,343,550
Natural resources and mining	949,404	Construction	1,260,945
Construction	767,645	Leisure and hospitality	1,247,816
Financial activities	694,339	Financial activities	955,202
Information	547,178	Information	591,135
Other services	305,178	Other services	374,152
Unclassified	49,780	Unclassified	107

The real hourly minimum wage for San Luis Obispo County was \$22.13 in 2015 and rose to \$28.58 in 2021 (U.S. Bureau of Labor Statistics, 2016a, 2022b). This represents a 29% increase in the hourly minimum wage over the six-year period. The hourly minimum wage for Santa Barbara was \$24.71 in 2015 and rose to \$29.82 in 2021 (U.S. Bureau of Labor Statistics, 2016b, 2022c). This represents a 21% increase to the hourly minimum wage over the six-year period.

Hourly minimum wage statistics were derived from the U.S. Bureau of Labor Statistics. Please note that hourly minimum wage values are representative of the San Luis Obispo-Paso Robles-Arroyo Grande Metropolitan Area and the Santa Maria-Santa Barbara Metropolitan Area, respectively. These metropolitan areas may not accurately represent the value of hourly minimum wage statistics across the entire counties of San Luis Obispo and Santa Barbara.

Table 28. Hourly minimum wage in San Luis Obispo- Paso Robles-Arroyo Grande Metropolitan Area (SLO) and Santa Maria-Santa Barbara Metropolitan Area (SB), 2015 and 2021. Source: U.S. Bureau of Labor Statistics, 2022a

Major Occupational Group	SLO 2015	SLO 2021	SLO Percent Increase	SB 2015	SB 2021	SB Percent Increase
Total, all occupations	22.13	28.58	29%	24.71	29.82	21%
Management	46.61	54.86	18%	58.26	59.88	3%
Business and financial operations	33.28	37.55	13%	37.53	40.28	7%
Computer and mathematical	39.02	46.55	19%	43.21	51.58	19%
Architecture and engineering	41.32	47.56	15%	44.86	50.24	12%
Life, physical, and social science	35.41	39.63	12%	36.07	38.63	7%
Community and social services	24.28	30.45	25%	23.18	29.53	27%
Legal	44.97	52.91	18%	48.19	57.72	20%
Education, training, and library	26.60	32.70	23%	31.08	38.31	23%
Arts, design, entertainment, sports, and media	22.06	30.82	40%	29.72	32.85	11%
Healthcare practitioner and technical	41.06	53.02	29%	49.54	52.26	5%
Healthcare support	15.34	17.40	13%	16.77	17.54	5%
Protective service	29.15	37.68	29%	28.26	35.48	26%
Food preparation and serving related	12.52	16.59	33%	12.34	17.18	39%
Building and grounds cleaning and maintenance	13.20	17.81	35%	14.35	18.34	28%
Personal care and services	13.50	17.65	31%	13.88	19.12	38%
Sales and related	16.91	20.65	22%	18.24	22.41	23%
Office and administrative support	16.84	22.23	32%	19.59	23.28	19%
Farming, fishing, and forestry	11.72	15.94	36%	10.77	15.96	48%
Construction and extraction	26.28	30.14	15%	26.19	29.29	12%
Installation, maintenance, and repair	22.43	29.72	33%	23.25	26.92	16%
Production	18.44	23.66	28%	18.80	20.70	10%
Transportation and material moving	15.64	20.86	33%	16.33	19.32	18%

Acknowledgements

We would like to acknowledge Allen Chen at NOAA's Northwest Fisheries Science Center for providing IO-PAC economic contribution multipliers and advising on methods. We would also like to thank Travis Grout with the NOAA Restoration Center for providing IMPLAN modeling support. Finally, we would like to thank Mike Murray, Laura Ingulsrud, and Paul Michel for reviewing an earlier draft of this report and Katie Lohr for editing the report.

Glossary of Acronyms

CHNMS	Chumash Heritage National Marine Sanctuary
CINMS	Channel Islands National Marine Sanctuary
CPFV	commercial passenger fishing vessel
CRFS	California Recreational Fisheries Survey
IO-PAC	Input-Output Model for Pacific Coast Fisheries
MBNMS	Monterey Bay National Marine Sanctuary
NOAA	National Oceanic and Atmospheric Administration
ONMS	Office of National Marine Sanctuaries
SCC	Southern California Current

Literature Cited

- Barreto, G. C., Domenico, M. D., & Medeiros, R. P. (2020). Human dimensions of marine protected areas and small-scale fisheries management: A review of the interpretations. *Marine Policy*, *119*, 104040. <https://doi.org/10.1016/j.marpol.2020.104040>
- Bureau of Economic Analysis. (2022). *Regional economic accounts*. U.S. Department of Commerce. <http://www.bea.gov/regional/downloadzip.cfm>
- Burkett, E. (2019). *Gendered recreational fisheries management and North American natural resource policy* (Doctoral dissertation). Michigan Technological University. <https://doi.org/10.37099/mtu.dc.etr/948>
- California Department of Fish and Wildlife. (2020). *California commercial landing receipt data, 1994–2020* [Unpublished data set].
- California State Parks Division of Boating and Waterways. (2022a). *Boating facilities in San Luis Obispo County* [Data set]. <http://www.dbw.ca.gov/BoatingFacilities/Search?county=San+Luis+Obispo>
- California State Parks Division of Boating and Waterways. (2022b). *Boating facilities in Santa Barbara County* [Data set]. <http://www.dbw.ca.gov/BoatingFacilities/Search?county=Santa+Barbara>
- Central and Northern California Ocean Observing System. (2020). *CeNCOOS strategic plan (2020–25): Advancing ocean observing*. <https://www.cencoos.org/images/docs/CeNCOOS-Strat-Plan-2020.pdf>
- Cinner, J. E., & Pollnac, R. B. (2004). Poverty, perceptions and planning: Why socioeconomics matter in the management of Mexican reefs. *Ocean & Coastal Management*, *47*(9–10), 479–493. <https://doi.org/10.1016/j.ocecoaman.2004.09.002>
- de la Torre-Castro, M., Fröcklin, S., Börjesson, S., Okupnik, J., & Jiddawi, N. S. (2017). Gender analysis for better coastal management—Increasing our understanding of social-ecological seascapes. *Marine Policy*, *83*, 62–74. <https://doi.org/10.1016/j.marpol.2017.05.015>
- Destination Analysts. (2017). *2016/2017 Santa Barbara South Coast visitor profile and tourism economic impact study*. <https://santabarbaraca.com/wp-content/uploads/2017/10/Santa-Barbara-Visitor-Profile-and-Economic-Impact-Study-2016-17-DECK.pdf>
- Georgian, S. (2019, May 1). *Rodriguez Seamount—A geologic rarity*. Marine Conservation Institute. <https://marine-conservation.org/on-the-tide/rodriguez-seamount/#:~:text=Rodriguez%20Seamount%20is%20a%2010,2%2C000%20feet%20below%20the%20surface.>
- Kleiber, D., Harris, L., & Vincent, A. C. J. (2018). Gender and marine protected areas: A case study of Danajon Bank, Philippines. *Maritime Studies*, *17*, 163–175. <https://link.springer.com/article/10.1007/s40152-018-0107-7>
- Kronen, M., Vunisea, A., Magron, F., & McArdle, B. (2010). Socio-economic drivers and indicators for artisanal coastal fisheries in Pacific island countries and territories and their use for fisheries management strategies. *Marine Policy*, *34*(6), 1135–1143. <https://doi.org/10.1016/j.marpol.2010.03.013>
- Lovell, S. J., Hilger, J., Rollins, E., Olsen, N. A., & Steinback, S. (2020). *The economic contribution of marine angler expenditures on fishing trips in the United States, 2017*. NOAA Technical Memorandum NMFS-F/SPO-201. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. <https://spo.nmfs.noaa.gov/sites/default/files/TM201.pdf>

- Luck, G. W. (2007). A review of the relationships between human population density and biodiversity. *Biological Reviews*, 82(4), 607–645. <https://doi.org/10.1111/j.1469-185X.2007.00028.x>
- Milon, J. W. (2000). *Current and future participation in marine recreational fishing in the southeast U.S. region*. NOAA Technical Memorandum NMFS-F/SPO-44. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. <https://www.st.nmfs.noaa.gov/st5/RecEcon/Publications/fspo44.pdf>
- Minnesota IMPLAN Group. (2010). *The IMPLAN V3 modeling system*. Stillwater, MN.
- Monterey Bay Aquarium Research Institute. (2013, October 2). *Mapping program: Arguello and Concepcion canyon systems*. https://www3.mbari.org/data/mapping/Santa_Barbara_Basin/arguello.htm
- National Oceanic and Atmospheric Administration. (2022, December 12). *Station 46259 - Santa Lucia Escarpment, CA (222)*. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Data Buoy Center. https://www.ndbc.noaa.gov/station_page.php?station=46259
- National Oceanic and Atmospheric Administration. (2020a, April 1). *Ocean acidification*. U.S. Department of Commerce. <http://www.noaa.gov/education/resource-collections/ocean-coasts/ocean-acidification>
- National Oceanic and Atmospheric Administration. (2020b, December 23). *Understanding ocean acidification*. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. <https://www.fisheries.noaa.gov/insight/understanding-ocean-acidification>
- Northwest Fisheries Science Center. (2020a). *Commodity multipliers from the Input-Output Model for Pacific Coast Fisheries (IO-PAC), 2020*. [Unpublished data set].
- Northwest Fisheries Science Center. (2020b). *Recreational fishing per-trip multipliers from the Input-Output Model for Pacific Coast Fisheries (IO-PAC), 2020*. [Unpublished data set].
- Office of National Marine Sanctuaries. (2015). *Chumash Heritage National Marine Sanctuary nomination*. U.S. Department of Commerce, National Oceanic and Atmospheric Administration. https://nmsnominate.blob.core.windows.net/nominate-prod/media/documents/nomination_chumash_heritage.pdf
- Office of National Marine Sanctuaries. (2020). *Five-year review of the Chumash Heritage National Marine Sanctuary nomination*. U.S. Department of Commerce, National Oceanic and Atmospheric Administration. <https://nmsnominate.blob.core.windows.net/nominate-prod/media/documents/20200922-chnms-technical-report-5-year-review.pdf>
- Office of National Marine Sanctuaries. (2021). *Proposed designation of Chumash Heritage National Marine Sanctuary*. U.S. Department of Commerce, National Oceanic and Atmospheric Administration. <https://sanctuaries.noaa.gov/chumash-heritage/>
- Office of National Marine Sanctuaries. (2023a). *Proposed Chumash Heritage National Marine Sanctuary designation draft environmental impact statement* [Report in preparation]. U.S. Department of Commerce, National Oceanic and Atmospheric Administration.
- Office of National Marine Sanctuaries. (2023b). *Proposed Chumash Heritage National Marine Sanctuary designation draft management plan* [Report in preparation]. U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

- Ram-Bidesi, V. (2015). Recognizing the role of women in supporting marine stewardship in the Pacific Islands. *Marine Policy*, 59, 1–8. <https://doi.org/10.1016/j.marpol.2015.04.020>
- Rohe, J., Schlüter, A., & Ferse, S. C. A. (2018). A gender lens on women's harvesting activities and interactions with local marine governance in a South Pacific fishing community. *Maritime Studies*, 17, 155–162. <https://doi.org/10.1007/s40152-018-0106-8>
- Scott, D., Herrera, S. L., & Hunt, K. S. (2004). Constraints to outdoor recreation among ethnic and racial groups. In P. T. Tierney & D. J. Chavez (Eds.), *Proceedings of the Fourth Social Aspects and Recreation Research Symposium* (pp. 17–20). San Francisco, California: San Francisco State University.
- Sesabo, J. K., Lang, H., & Tol, R. S. J. (2006). *Perceived attitude and marine protected areas (MPAs) establishment: Why households' characteristics matter in coastal resources conservation initiatives in Tanzania*. Working paper FNU-99. Hamburg University, Sustainability and Global Change Research Unit.
- Shea, R., Schwarzmann, D., Leeworthy, V., Hastings, S., Knapp, L., & Tracy, S. (2021). *Whale watching in Channel Islands National Marine Sanctuary: Understanding passengers and their economic contributions*. National Marine Sanctuaries Conservation Series ONMS-21-08. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries.
- Tourism Economics. (2018). *Economic impact of tourism in San Luis Obispo County, California—2017*. https://assets.simpleviewinc.com/simpleview/image/upload/v1/clients/slocal/SLO_CAL_Economic_Impact_Report_22d17f05-ebae-488f-bc4b-9e830174d08d.pdf
- U.S. Bureau of Labor Statistics. (2016a). *Occupational employment and wages in San Luis Obispo-Paso Robles-Arroyo Grande—May 2015* [Data set]. U.S. Department of Labor. https://www.bls.gov/regions/west/news-release/2016/pdf/occupationalemploymentandwages_sanluisobispo_20160726.pdf
- U.S. Bureau of Labor Statistics. (2016b). *Occupational employment and wages in Santa Maria-Santa Barbara—May 2015* [Data set]. U.S. Department of Labor. https://www.bls.gov/regions/west/news-release/2016/occupationalemploymentandwages_santabarbara_20160726.htm
- U.S. Bureau of Labor Statistics. (2021). *Unemployment* [Data set]. U.S. Department of Labor. <https://www.bls.gov/data/#unemployment>
- U.S. Bureau of Labor Statistics. (2022a). *Quarterly census of employment and wages* [Data set]. U.S. Department of Labor. <https://www.bls.gov/cew/downloadable-data-files.htm>
- U.S. Bureau of Labor Statistics. (2022b). *Occupational employment and wages in San Luis Obispo-Paso Robles-Arroyo Grande—May 2021* [Data set]. U.S. Department of Labor. https://www.bls.gov/regions/west/news-release/2022/occupationalemploymentandwages_sanluisobispo_20220714.htm
- U.S. Bureau of Labor Statistics. (2022c). *Occupational employment and wages in Santa Maria-Santa Barbara—May 2021* [Data set]. U.S. Department of Labor. https://www.bls.gov/regions/west/news-release/occupationalemploymentandwages_santabarbara.htm
- U.S. Census Bureau. (2017). *Income in the past 12 months (in 2017 inflation-adjusted dollars), S1901* [Data set]. U.S. Department of Commerce. <https://data.census.gov/table?q=income&g=050XX00US06079,06083&y=2017&tid=ACSS1Y2017.S1901>

- U.S. Census Bureau. (2019). *2019 U.S. population estimates continue to show the nation's growth is slowing*. U.S. Department of Commerce. <https://www.census.gov/newsroom/press-releases/2019/popest-nation.html>
- U.S. Census Bureau. (2020a). *Total population by state, county in the United States* [Data set]. U.S. Department of Commerce. https://data.census.gov/table?q=population&g=0400000US06_0500000US06079,06083
- U.S. Census Bureau. (2020b). *American Community Survey demographic and housing estimates, S0503* [Data set]. U.S. Department of Commerce. https://data.census.gov/cedsci/table?q=foreign%20born&g=0400000US06_0500000US06079,06083&tid=ACSST5Y2020.S0503
- U.S. Census Bureau. (2020c). *American Community Survey demographic and housing estimates, age* [Data set]. U.S. Department of Commerce. https://data.census.gov/table?q=Age+&g=0400000US06_0500000US06079,06083&tid=ACSDP1Y2021.DP05
- U.S. Census Bureau. (2020d). *American Community Survey demographic and housing estimates, S1601, language spoken at home* [Data set]. U.S. Department of Commerce. https://data.census.gov/table?q=language&g=0400000US06_0500000US06079,06083&tid=ACSST1Y2021.S1601
- U.S. Census Bureau. (2020e). *American Community Survey S1501 educational attainment* [Data set]. U.S. Department of Commerce. <https://data.census.gov/cedsci/table?q=ACS%20Demographic%20San%20Luis%20Obispo%20Santa%20Barbara%20Education&tid=ACSST5Y2020.S1501>
- U.S. Census Bureau. (2021). *American Community Survey demographic and housing estimates, DP05* [Data set]. U.S. Department of Commerce. https://data.census.gov/table?g=040XX00US06_050XX00US06079,06083&d=ACS+5-Year+Estimates+Data+Profiles&tid=ACSDP5Y2020.DP05
- U.S. Census Bureau. (2022). *Glossary*. U.S. Department of Commerce. <https://www.census.gov/glossary/>
- U.S. Fish and Wildlife Service, & U.S. Census Bureau. (2016). *2016 national survey of fishing, hunting, and wildlife-associated recreation*. U.S. Department of the Interior and U.S. Department of Commerce. <https://www.census.gov/content/dam/Census/library/publications/2018/demo/fhw16-nat.pdf>

Appendix A: Fishing

Commercial Fishing

ONMS analyzed the existing level of commercial fishing activity in the Agency-Preferred Alternative area and resulting contributions to regional and state economies. Tables App.1–App.3 show estimates of the contribution of commercial harvest within the Agency-Preferred Alternative area to the Morro Bay and Santa Barbara regional economy and state economy, respectively. The Agency-Preferred Alternative area comprises the areas of Alternative 2 and Sub-alternative 5b, Gaviota Coast Extension, as described in the proposed CHNMS draft environmental impact statement (ONMS, 2023a).¹⁶ The estimates were calculated using commercial logbook data from the California Department of Fish and Wildlife and 2020 commodity multipliers from IO-PAC. Commercial catch was grouped by commodity sector (defined by species and gear type) and port complex in order to apply the appropriate IO-PAC multipliers.¹⁷ The IO-PAC multipliers were developed using data from IMPLAN (Minnesota IMPLAN Group, 2010), Pacific Fisheries Information Network fish tickets, and cost-earnings surveys administered by NOAA’s Northwest Fisheries Science Center (Allen Chen/NOAA, personal communication, September 26, 2022). The model was calibrated using 2020 data, where possible,¹⁸ and all monetary values are in 2020 dollars. Estimates of the economic contribution of commercial harvest to the regional economy are based only on landings in the Morro Bay and Santa Barbara port complexes, whereas the California estimates include landings in all California ports.¹⁹

On average from 2015–2019, landings from the Agency-Preferred Alternative area to Morro Bay and Santa Barbara ports contributed around \$23.0 million in output, \$11.9 million in income, and 337 jobs to the regional economy.

¹⁶ Harvest revenue data were available for California Department of Fish and Wildlife’s statistical fishing blocks. Catch and harvest revenue were estimated by grouping the California Department of Fish and Wildlife blocks that best corresponded to the boundaries of the Agency-Preferred Alternative as described in the proposed CHNMS draft environmental impact statement (ONMS, 2023a).

¹⁷ On average from 2015–2019, over 99.9% of harvest revenue had a corresponding IO-PAC multiplier. The remaining <0.01% of harvest revenue was not included in the analysis.

¹⁸ In some cases, 2020 data were not available to update the model. For example, the multipliers are based on IMPLAN data from 2018 (Allen Chen/NOAA, personal communication, September 21, 2022).

¹⁹ The Morro Bay port complex includes Avila/Port San Luis, Morro Bay, Cayucos, Oceano, San Simeon, and San Luis Obispo. The Santa Barbara port complex includes Ventura, Santa Barbara Harbor, Port Hueneme, Oxnard, Gaviota Beach, Goleta Beach, Santa Cruz Island, Santa Barbara area, Surf Beach, and Guadalupe Beach.

Table App.1. Contribution of commercial catch from the CHNMS Agency-Preferred Alternative (Alternative 2 + Sub-alternative 5b, Gaviota Coast Extension) area to the Morro Bay and Santa Barbara regional economy by sub-area. Source: CDFW, 2020; NWFSC, 2020a

Year	Alternative 2 Revenue	Alternative 2 Output	Alternative 2 Income	Alternative 2 Employment	Gaviota Coast Revenue	Gaviota Coast Output	Gaviota Coast Income	Gaviota Coast Employment
2010	\$3,264,417	\$8,334,416	\$4,569,587	117	\$1,750,165	\$6,437,469	\$3,471,131	72
2011	\$6,133,066	\$15,051,975	\$8,388,297	205	\$3,724,707	\$13,299,545	\$7,300,970	137
2012	\$6,403,061	\$14,883,907	\$8,221,437	232	\$2,104,712	\$7,640,730	\$4,097,466	86
2013	\$6,246,602	\$16,688,600	\$9,154,396	229	\$2,868,320	\$10,421,475	\$5,662,150	115
2014	\$7,940,903	\$19,021,868	\$10,663,275	266	\$2,974,231	\$11,638,693	\$6,088,254	149
2015	\$5,417,466	\$12,210,493	\$6,535,909	222	\$1,870,236	\$7,768,076	\$3,936,535	107
2016	\$5,516,007	\$16,006,887	\$8,312,713	236	\$2,047,549	\$8,038,811	\$4,217,211	101
2017	\$6,205,453	\$19,488,485	\$10,189,275	257	\$2,063,874	\$8,255,584	\$4,260,199	114
2018	\$4,776,587	\$15,558,621	\$8,031,621	200	\$2,021,238	\$8,632,873	\$4,350,263	120
2019	\$4,075,296	\$11,613,191	\$5,744,063	216	\$1,862,560	\$7,728,068	\$3,881,202	112
2020	\$3,085,087	\$10,493,787	\$5,218,208	138	\$2,123,784	\$9,560,071	\$4,727,864	123
Five-year average (2015–2019)	\$5,198,162	\$14,975,535	\$7,762,716	226	\$1,973,091	\$8,084,682	\$4,129,082	111

Table App.2. Total contribution of commercial catch from the CHNMS Agency-Preferred Alternative area to the Morro Bay and Santa Barbara regional economy. Source: CDFW, 2020; NWFSC, 2020a

Year	Total Revenue	Total Output	Total Income	Total Employment
2010	\$5,014,582	\$14,771,885	\$8,040,718	189
2011	\$9,857,773	\$28,351,520	\$15,689,267	342
2012	\$8,507,773	\$22,524,637	\$12,318,903	318
2013	\$9,114,922	\$27,110,075	\$14,816,546	344
2014	\$10,915,134	\$30,660,561	\$16,751,529	415
2015	\$7,287,702	\$19,978,569	\$10,472,444	329
2016	\$7,563,556	\$24,045,698	\$12,529,924	337
2017	\$8,269,327	\$27,744,069	\$14,449,474	371
2018	\$6,797,825	\$24,191,494	\$12,381,884	320
2019	\$5,937,856	\$19,341,259	\$9,625,265	328
2020	\$5,208,871	\$20,053,858	\$9,946,072	261
Five-year average (2015–2019)	\$7,171,253	\$23,060,218	\$11,891,798	337

Estimates of the contribution of commercial catch in the Agency-Preferred Alternative area to the state economy are not presented due to an artifact of the IO-PAC model that resulted in state-level estimates of the contribution of catch being smaller than regional estimates for that area.²⁰

Recreational Fishing

Commercial Passenger Fishing Vessels

Tables App.4–App.7 show estimates of the annual number of CPFV trips, in angler-days,²¹ within the CHNMS Agency-Preferred Alternative.²² The tables also provide estimates of the economic contribution of those CPFV trips—in employment, income, and output—to the SCC region and state, respectively. These estimates were obtained using CPFV logbook data from the California Department of Fish and Wildlife, along with per-trip multipliers for for-hire recreational vessels from IO-PAC.

On average, from 2015 to 2019, there were about 16,104 CPFV trips that reported catch within the CHNMS Agency-Preferred Alternative area, which contributed roughly 61 jobs, \$3.2 million in income, and \$6.9 million in output to the regional economy. The same 16,104 trips contributed around 69 jobs, \$4.2 million in income, \$8.8 million in output to the state economy.

²⁰ IO-PAC multipliers for the state of California represent a weighted average of port-level multipliers. Within the relatively small area of the Agency-Preferred Alternative, over 60% of catch was landed in Santa Barbara County, where 100% of catch goes through processors. Conversely, only around 50% of landings go through processors in the state of California on average. Given the relatively high processor demand (and associated economic contributions from processor expenditures) in Santa Barbara County, model estimates of the regional economic contribution were greater than the state-level estimates.

²¹ An angler-day is defined as one person angling for any part of one day.

²² CPFV effort and catch data were available at the level of California Department of Fish and Wildlife's statistical fishing blocks. The annual number of trips was estimated by grouping the California Department of Fish and Wildlife blocks that best correspond to the boundaries of the Agency-Preferred Alternative as described in the proposed CHNMS draft environmental impact statement (ONMS, 2023a).

Table App.4. Economic contribution of CPFV activity in the CHNMS Agency-Preferred Alternative area to the SCC region by sub-area. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Alternative 2 Trips	Alternative 2 Employment	Alternative 2 Income	Alternative 2 Output	Gaviota Coast Trips	Gaviota Coast Employment	Gaviota Coast Income	Gaviota Coast Output
2010	8,995	34	\$1,807,352	\$3,866,844	379	1	\$76,152	\$162,928
2011	11,115	42	\$2,233,321	\$4,778,206	966	4	\$194,097	\$415,272
2012	10,153	38	\$2,040,028	\$4,364,654	963	4	\$193,494	\$413,982
2013	13,013	49	\$2,614,683	\$5,594,134	1,225	5	\$246,137	\$526,613
2014	14,814	56	\$2,976,556	\$6,368,363	1,285	5	\$258,193	\$552,406
2015	12,962	49	\$2,604,436	\$5,572,210	1,490	6	\$299,384	\$640,533
2016	13,647	52	\$2,742,072	\$5,866,683	2,294	9	\$460,930	\$986,163
2017	17,452	66	\$3,506,605	\$7,502,407	2,942	11	\$591,132	\$1,264,731
2018	12,733	48	\$2,558,423	\$5,473,765	2,761	11	\$554,764	\$1,186,921
2019	12,454	47	\$2,502,364	\$5,353,827	1,783	7	\$358,256	\$766,491
2020	8,810	33	\$1,770,181	\$3,787,314	2,099	8	\$421,749	\$902,335
Five-year average (2015–2019)	13,850	52	\$2,782,780	\$5,953,778	2,254	9	\$452,893	\$968,968

Table App.5. Total economic contribution of CPFV activity in the CHNMS Agency-Preferred Alternative area to the SCC region. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Trips	Employment	Income	Output
2010	9,374	35	\$1,883,504	\$4,029,772
2011	12,081	46	\$2,427,418	\$5,193,478
2012	11,116	42	\$2,233,522	\$4,778,636
2013	14,238	54	\$2,860,820	\$6,120,747
2014	16,099	61	\$3,234,749	\$6,920,769
2015	14,452	55	\$2,903,820	\$6,212,743
2016	15,941	60	\$3,203,002	\$6,852,846
2017	20,394	77	\$4,097,737	\$8,767,138
2018	15,494	59	\$3,113,187	\$6,660,686
2019	14,237	54	\$2,860,620	\$6,120,318
2020	10,909	41	\$2,191,930	\$4,689,649
Five-year average (2015–2019)	16,104	61	\$3,235,673	\$6,922,746

Table App.6. Economic contribution of CPFV activity in the CHNMS Agency-Preferred Alternative area to the state of California by sub-area. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Alternative 2 Trips	Alternative 2 Employment	Alternative 2 Income	Alternative 2 Output	Gaviota Coast Trips	Gaviota Coast Employment	Gaviota Coast Income	Gaviota Coast Output
2010	8,995	38	\$2,373,590	\$4,929,518	379	2	\$100,010	\$207,703
2011	11,115	47	\$2,933,013	\$6,091,339	966	4	\$254,907	\$529,396
2012	10,153	43	\$2,679,162	\$5,564,136	963	4	\$254,115	\$527,752

2013	13,013	55	\$3,433,855	\$7,131,498	1,225	5	\$323,252	\$671,335
2014	14,814	63	\$3,909,101	\$8,118,497	1,285	6	\$339,084	\$704,217
2015	12,962	55	\$3,420,397	\$7,103,548	1,490	6	\$393,179	\$816,563
2016	13,647	58	\$3,601,154	\$7,478,948	2,294	10	\$605,338	\$1,257,178
2017	17,452	74	\$4,605,213	\$9,564,197	2,942	13	\$776,331	\$1,612,301
2018	12,733	54	\$3,359,969	\$6,978,050	2,761	12	\$728,569	\$1,513,107
2019	12,454	53	\$3,286,347	\$6,825,150	1,783	8	\$470,496	\$977,135
2020	8,810	38	\$2,324,772	\$4,828,133	2,099	9	\$553,882	\$1,150,312
Five-year average (2015–2019)	13,850	59	\$3,654,616	\$7,589,979	2,254	10	\$594,783	\$1,235,257

Table App.7. Total economic contribution of CPFV activity in the CHNMS Agency-Preferred Alternative area to the state of California. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Trips	Employment	Income	Output
2010	9,374	40	\$2,473,600	\$5,137,221
2011	12,081	51	\$3,187,920	\$6,620,735
2012	11,116	47	\$2,933,277	\$6,091,888
2013	14,238	61	\$3,757,107	\$7,802,833
2014	16,099	69	\$4,248,185	\$8,822,714
2015	14,452	62	\$3,813,576	\$7,920,111
2016	15,941	68	\$4,206,492	\$8,736,126
2017	20,394	87	\$5,381,544	\$11,176,498
2018	15,494	66	\$4,088,538	\$8,491,157
2019	14,237	61	\$3,756,843	\$7,802,285
2020	10,909	46	\$2,878,654	\$5,978,445
Five-year average (2015–2019)	16,104	69	\$4,249,398	\$8,825,235

Private/Rental Vessels

Tables App.8–App.11 show the number of private or rental vessel fishing trips within the CHNMS Agency-Preferred Alternative area and associated contributions to the regional and state economies, respectively. The numbers of annual private/rental boat fishing trips (in angler-days) were estimated using sample data from CRFS and estimates of fishing effort by CRFS sampling district from the Recreational Fisheries Information Network.²³ Per-trip,

²³ As part of CRFS sampling, anglers are asked to indicate the number of days they spent fishing annually. Those angler-day counts, which were not available in the data before 2014, were aggregated by fishing location (i.e., either within the proposed sanctuary or within the two CRFS sampling districts containing the proposed sanctuary) to estimate the proportion of sample fishing effort in the sampling districts that occurred within the CHNMS Agency-Preferred Alternative. It was assumed that anglers spent all of their annual fishing days in the location reported on the CRFS sampling form. Finally, the annual trip estimates

private/rental vessel multipliers from IO-PAC were applied to the annual trip counts to estimate economic contributions in terms of employment, income, and output.

From 2015 to 2019, there was an average of about 11,350 private/rental vessel fishing trips to the CHNMS Agency-Preferred Alternative area. On average (from 2015–2019), those trips contributed roughly 15.8 jobs, \$1.0 million in income, and \$2.3 million in output to the SCC regional economy per year. Likewise, private/rental vessel fishing in the CHNMS Agency-Preferred Alternative area contributed an annual average of about 17 jobs, \$1.4 million in income, and \$2.9 million in output to the state economy from 2015 to 2019.

Table App.8. Economic contribution of recreational angling from private and rental vessels in the CHNMS Agency-Preferred Alternative area to the SCC region, by sub-region. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Alternative 2 Trips	Alternative 2 Employment	Alternative 2 Income	Alternative 2 Output	Gaviota Coast Trips	Gaviota Coast Employment	Gaviota Coast Income	Gaviota Coast Output
2014	12,609	17.6	\$1,161,671	\$2,526,551	1,460	2.0	\$134,518	\$292,566
2015	14,070	19.7	\$1,296,223	\$2,819,193	967	1.4	\$89,121	\$193,831
2016	11,481	16.0	\$1,057,704	\$2,300,431	1,625	2.3	\$149,665	\$325,511
2017	7,578	10.6	\$698,171	\$1,518,472	1,827	2.6	\$168,276	\$365,988
2018	9,959	13.9	\$917,468	\$1,995,428	1,047	1.5	\$96,434	\$209,738
2019	7,030	9.8	\$647,689	\$1,408,678	1,150	1.6	\$105,970	\$230,477
2020*	–	–	–	–	–	–	–	–
2021	9,542	13.3	\$879,072	\$1,911,919	1,006	1.4	\$92,711	\$201,639
Five-year average (2015–2019)	10,024	14.0	\$923,451	\$2,008,441	1,323	1.8	\$121,893	\$265,109

Table App.9. Total economic contribution of recreational angling from private and rental vessels in the CHNMS Agency-Preferred Alternative area to the SCC region. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Trips	Employment	Income	Output
2014	14,069	19.7	\$1,296,188	\$2,819,117
2015	15,037	21.0	\$1,385,344	\$3,013,024
2016	13,105	18.3	\$1,207,370	\$2,625,943
2017	9,405	13.1	\$866,447	\$1,884,460
2018	11,005	15.4	\$1,013,903	\$2,205,166
2019	8,181	11.4	\$753,659	\$1,639,155
2020 ²⁴	–	–	–	–
2021	10,548	14.7	\$971,782	\$2,113,558
Five-year average (2015–2019)	11,347	15.8	\$1,045,344	\$2,273,550

provided in the tables were calculated as the product of the proportion of sample fishing effort in the proposed CHNMS areas and the estimated total annual fishing effort by district.

²⁴ CRFS sampling was disrupted in 2020 due to safety concerns related to the COVID-19 pandemic.

Table App.10. Economic contribution of recreational angling from private and rental vessels in the CHNMS Agency-Preferred Alternative area to the state of California, by sub-region. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Alternative 2 Trips	Alternative 2 Employment	Alternative 2 Income	Alternative 2 Output	Gaviota Coast Trips	Gaviota Coast Employment	Gaviota Coast Income	Gaviota Coast Output
2014	12,609	18.9	\$1,524,317	\$3,176,238	1,460	2.2	\$176,511	\$367,798
2015	14,070	21.1	\$1,700,874	\$3,544,132	967	1.4	\$116,942	\$243,674
2016	11,481	17.2	\$1,387,895	\$2,891,973	1,625	2.4	\$196,387	\$409,215
2017	7,578	11.3	\$916,123	\$1,908,937	1,827	2.7	\$220,808	\$460,099
2018	9,959	14.9	\$1,203,881	\$2,508,541	1,047	1.6	\$126,539	\$263,671
2019	7,030	10.5	\$849,883	\$1,770,911	1,150	1.7	\$139,051	\$289,743
2020 ²⁵	–	–	–	–	–	–	–	–
2021	9,542	14.3	\$1,153,498	\$2,403,557	1,006	1.5	\$121,653	\$253,489
Five-year average (2015–2019)	10,024	15.0	\$1,211,731	\$2,524,899	1,323	2.0	\$159,945	\$333,280

Table App.11. Total economic contribution of recreational angling from private and rental vessels in the CHNMS Agency-Preferred Alternative area to the state of California. Source: Lovell et al., 2020; NWFSC, 2020b

Year	Trips	Employment	Income	Output
2014	14,069	21.1	\$1,700,828	\$3,544,036
2015	15,037	22.5	\$1,817,816	\$3,787,805
2016	13,105	19.6	\$1,584,282	\$3,301,188
2017	9,405	14.1	\$1,136,931	\$2,369,037
2018	11,005	16.5	\$1,330,419	\$2,772,211
2019	8,181	12.3	\$988,934	\$2,060,654
2020 ²⁶	7,016	10.5	\$848,120	\$1,767,239
2021	10,548	15.8	\$1,275,150	\$2,657,046
Five-year average (2015–2019)	11,347	17.0	\$1,371,676	\$2,858,179

Shoreline Fishing

Tables App.12 and App.13 provide the estimated number of shoreline angling trips in the CHNMS Agency-Preferred Alternative area, along with the estimated economic contributions to the SCC region and the state of California. Two types of shoreline angling—fishing from beaches and banks, and fishing from manmade structures, like piers and jetties—are sampled separately through interviews at set intercept sites.²⁷ Although shoreline fishing does occur within the

²⁵ CRFS sampling was disrupted in 2020 due to safety concerns related to the COVID-19 pandemic.

²⁶ CRFS sampling was disrupted in 2020 due to safety concerns related to the COVID-19 pandemic.

²⁷ The following beach and bank sampling sites were included in the analysis of the CHNMS Agency-Preferred Alternative area: Guadalupe Dunes Beach, Jalama Beach, Montana de Oro State Beach, Avila Boat Sling/Port San Luis Beach and Bank, Avila Public Pier Beach, Shell Beach, Pismo Beach Public Pier

boundaries of Sub-alternative 5b, Gaviota Coast Extension, estimates for that area are not provided here due to discontinuities in sampling of the two shoreline fishing modes.²⁸

IO-PAC economic multipliers were not available for recreational shoreline fishing, so a custom IMPLAN model was developed to estimate the economic contribution of shoreline fishing in the Proposed Action area based on methods described in Lovell et al. (2020), which are described in Chapter 3. Using outputs of the analysis for the Proposed Action area, ONMS derived per-trip multipliers for the level of economic activity (in employment, income, and output) supported by shoreline fishing in each year from 2010 to 2017. These multipliers were then applied to shoreline angling trip estimates for the Agency-Preferred Alternative area, excluding the Gaviota Coast extension, to obtain estimates of annual economic contributions to the region (i.e., Monterey, Santa Cruz, and San Luis Obispo counties) and the state of California.

On average from 2015 to 2017, there were an estimated 136,500 shore-based recreational fishing trips in the CHNMS Agency-Preferred Alternative boundaries. These trips contributed an estimated 112 jobs, \$4.4 million in income, and \$14.5 million in output to the regional economy. Likewise, shore-based fishing in the CHNMS Proposed Action boundaries contributed an estimated 123 jobs, \$6.0 million in income, and \$20.6 million in output to the state economy on average from 2015 to 2017.

Table App.12. Economic contribution of shoreline angling in the CHNMS Agency-Preferred Alternative area, excluding Sub-alternative 5b, to the SCC region.

Year	Trips	Employment	Income	Output
2010	107,415	96.8	\$3,803,797	\$11,680,207
2011	112,555	98.3	\$3,862,604	\$11,538,586
2012	106,813	91.2	\$3,575,124	\$10,705,080
2013	159,957	133.6	\$5,249,775	\$15,798,634
2014	175,034	142.8	\$5,614,024	\$17,024,868
2015	185,166	152.4	\$5,976,698	\$19,318,939
2016	142,281	116.8	\$4,587,874	\$15,457,173
2017	81,969	66.7	\$2,611,405	\$8,763,010
2018–2019	ND	–	–	–
Three-year average (2015–2017)	136,472	112.0	\$4,391,992	\$14,513,041

Beach, and Oso Flaco. The following manmade structure sampling sites were also included in the analysis: Harford Pier, Avila Pier, and Pismo Beach Public Pier.

²⁸ CRFS sampling of fishing from man-made structures in the Gaviota Coast Extension area only occurred through 2014. Sampling of beach and bank fishing was intermittent from 2004 to 2013, and sampling did not occur for either mode from 2018 to 2020.

Table App.13. Economic contribution of shoreline angling in the CHNMS Agency-Preferred Alternative area, excluding Sub-alternative 5b, to the state of California.

Year	Trips	Employment	Income	Output
2010	107,415	99.4	\$4,877,168	\$14,649,697
2011	112,555	101.0	\$4,927,542	\$14,537,108
2012	106,813	93.6	\$4,561,467	\$13,486,415
2013	159,957	144.5	\$6,701,360	\$23,076,083
2014	175,034	146.4	\$7,209,264	\$21,448,154
2015	185,166	169.0	\$7,670,496	\$28,993,395
2016	142,281	118.7	\$5,856,003	\$18,975,160
2017	81,969	81.9	\$4,403,236	\$13,874,085
2018-2020	ND	–	–	–
Three-year average (2015–2017)	136,472	123.2	\$5,976,578	\$20,614,213



NATIONAL MARINE
SANCTUARIES

AMERICA'S UNDERWATER TREASURES