

# NATIONAL MARINE SANCTUARIES *of the West Coast*



## INSIDE HIGHLIGHTS



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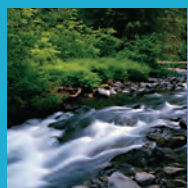
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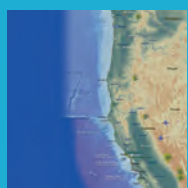
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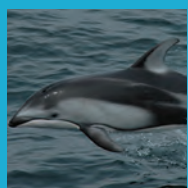
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# WELCOME

**O**ur five West Coast national marine sanctuaries encompass nearly 13,000 square miles of ocean which includes hundreds of miles of dramatic coastline. Teeming with life and filled with history, they offer countless opportunities for exploration, recreation and contemplation.

This guide introduces you to the natural and cultural wonders of your national marine sanctuaries. Whether you're traveling on foot or bicycle, by car or boat, above water or diving below, it can lead you to new discoveries and a greater appreciation of these ocean treasures.

*Explore and enjoy!*

Cover: From top left, clockwise:  
Stellar Sea Lions. Photo: Bob Wilson  
Seabirds. Photo: Gulf of the Farallones National Marine Sanctuary  
Giant Kelp. Photo: Laurie C Van De Werfhorst  
Planktonic Jelly. Photo: Shane Anderson  
Fish-eating Anemone. Photo: Steve Lonhart

# National Marine Sanctuaries: *America's Underwater Treasures*

The passage of the Marine Protection, Research and Sanctuaries Act of 1972 made it possible for special areas of our nation's ocean and Great Lakes waters to be designated as national marine sanctuaries. Following the legacy of our national parks, these areas—selected for their biodiversity, ecological integrity and cultural history—celebrate and safeguard our country's richest underwater treasures.

Today, the National Marine Sanctuary System, administered by the National Oceanic and Atmospheric Administration (NOAA), consists of 13 national marine sanctuaries and one marine national monument encompassing more than 150,000 square miles of ocean and Great Lakes waters.

Sanctuaries range in size from the one-quarter-square-mile tropical coral reef of Fagatele Bay National Marine

Sanctuary in American Samoa to the 6,094-square-mile Monterey Bay National

Marine Sanctuary—one of the largest marine protected areas in the

world. The 139,797-square-mile Papahānaumokuākea Marine National Monument in the Northwestern Hawaiian

Islands, which became a part of the sanctuary system in June 2006, is larger than all the lands managed by the National Park Service combined. Together, these

14 special places within the sanctuary system include

the breeding and feeding grounds of whales, sea lions, sharks and sea turtles; colorful coral reefs, lush kelp forests and deep sea

gardens of corals and sponges; ancient submerged volcanoes; and archeological treasures

such as the remains of the Civil War ironclad USS Monitor off the coast of North Carolina and hundreds of shipwrecks in Lake Huron



Our national marine sanctuaries are part of our collective riches as a nation, treasures that belong to all of us.

They protect some of our most precious marine resources and serve as natural classrooms. They provide for a wide range of recreational activities, from beachcombing and tide pooling to whale watching and sport fishing. They support valuable commercial industries such as fishing and kelp harvesting. And they help ensure, with proper management, these activities remain a part of our country's legacy far into the future.

*To learn more, visit*  
**[sanctuaries.noaa.gov](http://sanctuaries.noaa.gov)**

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# NATIONAL MARINE SANCTUARIES OF THE WEST COAST

Cordell Bank Reef. Photo: Robert Schmieder, Cordell Expeditions



Giant Kelp. Photo: Hal Beral

## CHANNEL ISLANDS



Healthy Reef at Harris Point. Photo: Jim Knowlton

Twenty-five miles off the coast of Santa Barbara, the waters around the Channel Islands host an incredible array of marine life and habitats. Here, warm and cold water currents collide to create a transition zone where cold water species blend with warmer water species to create unique and diverse marine communities.

Channel Islands National Marine Sanctuary and Channel Islands National Park were both designated in 1980 to protect these communities and to preserve cultural and archeological treasures. The sanctuary encompasses 1,470 square miles of ocean around Anacapa, Santa Cruz, Santa Rosa, San Miguel and Santa Barbara Islands. The sanctuary sits amid some of California's richest fishing grounds. To help protect and restore this fragile ecosystem, 11 marine reserves closed to all fishing and two state marine conservation areas open to limited fishing have been set aside. Between them, these protected areas cover 318 square miles. The national park also protects the five islands and their surrounding waters out to one nautical mile.

Visitors to the islands can walk along sandy beaches and rocky shores studded with tide pools. Seagrass meadows thrive in shallow, soft-bottomed areas. Giant kelp form dense underwater forests of amber and gold that attract sport divers from around the world.

More than 30 species of marine mammals, including rare blue and humpback whales, come to feast on the bounty, as do more than 60 species of sea birds. Elephant seals, harbor seals, California sea lions and northern fur seals use the islands as rookeries. The islands provide important nesting sites for Black Storm Petrels and Xantus's Murrelets and Anacapa Island is the only permanent rookery in California for threatened California Brown Pelicans.

The islands are also rich in history. Archaeologists have found remnants of sites occupied by the early Chumash peoples dating back thousands of years. And the prevailing currents and weather conditions made shipwrecks a common occurrence here; more than 150 ships lie on the seafloor around the Islands.

## MONTEREY BAY



Sea Lions. Photo: Brad Damitz

Monterey Bay National Marine Sanctuary embraces a 276-mile-long stretch of the central California coast from the Marin Headlands south to Cambria, and from the seashore to an average 35 miles offshore. Designated in 1992, it's our nation's largest marine sanctuary, protecting 6,094 square miles of one of the world's most productive marine environments.

Its northern shores are lined with pocket beaches and steep bluffs. The shoreline of Monterey Bay itself is a long crescent-shaped beach punctuated in the middle by Elkhorn Slough. Rugged rocky shores line its southern coast where steep mountains rise from the edge of the sea. Underwater, one of its major features is the huge Monterey Canyon. From its head near where Elkhorn Slough meets the bay, the canyon meanders 60 miles out to sea, cutting a trench one mile deep. In 2008, the sanctuary was expanded to include the Davidson Seamount, an extinct underwater volcano with 200-year-old coldwater corals.

The sanctuary contains a great diversity of habitats and marine life. More than 450 species of algae grow here. And 33 species of marine mammals, 94 species of seabirds, 345 species of fish, four species of sea turtles and thousands of invertebrates have been recorded in its waters. Some live here year round. Others visit seasonally or migrate through. When the California Current runs strongly, it carries cold-water animals down from the north. When it weakens in late summer, the warm water brings sea turtles, swarms of jellies and other plants and animals up from the south.

Some 2,000 sea otters live in kelp beds along the coast here. In winter and spring, gray whales can be spotted from high bluffs. Visitors who venture offshore in boats can find blue and humpback whales, along with seabirds, killer whales and other dolphins. Divers find kelp forests filled with fishes and invertebrates. The sanctuary's rich waters also support important commercial and sport fisheries for market squid, salmon, rockfish and other species.

# E WEST COAST

# Overview

## GULF OF THE FARALLONES



Tufted Puffin. Photo: Jeff Foott

<http://farallones.noaa.gov>

Designated in 1981, Gulf of the Farallones National Marine Sanctuary protects 1,279 square miles of ocean wilderness off the coast of northern California just west of the Golden Gate Bridge. Marine habitats found here include sandy beaches, estuaries, rocky shores, open ocean and deep sea. The sanctuary encompasses four estuaries—Esteros Americano, Esteros de San Antonio, Tomales Bay and Bolinas Lagoon—which are important nurseries for a host of marine fishes and invertebrates and critical habitat for nesting and migrating shore and water birds.

The sanctuary contains 26 federally listed endangered or threatened species, including seabirds such as Marbled Murrelets. Thirty-six species of marine mammals have been seen here. It's also home to one of the most significant populations of breeding white sharks in the Pacific Ocean and the largest concentration of breeding seabirds within the contiguous United States. The Gulf of the Farallones also provides crucial habitat for more than a quarter million breeding seabirds.

From fall through winter, sanctuary beaches serve as nurseries for tens of thousands of elephant seals and sea lions; 20 percent of California's harbor seals breed here during the spring. And northern fur seals have recently begun breeding on the islands again after an absence of more than 150 years.

For thousands of years, Coast Miwoks harvested the sanctuary's abundant halibut, rockfish, salmon, clams and mussels. Explorers, traders, whalers, sealers and gold miners made this area an international center of commerce. Many ancient and modern ships lie entombed within the sanctuary.

Visitors can begin their exploration of all the Gulf of the Farallones has to offer at the sanctuary's visitor center located in San Francisco's Presidio at West Crissy Field, in the Golden Gate National Recreation Area.

## CORDELL BANK



Rosy Rockfish. Photo: Jodi Pirtle/CBNMS

<http://cordellbank.noaa.gov>

The most remote of the five West Coast sanctuaries is Cordell Bank National Marine Sanctuary, just 52 miles northwest of the Golden Gate Bridge. Designated in 1989, the sanctuary protects 529 square miles of ocean around Cordell Bank—an underwater mountain that rises to within 115 feet of the surface. The bank sits 20 miles west of Point Reyes on the edge of the continental shelf, where the seafloor drops off precipitously into the depths.

Salmon, tuna and other large predatory fish use the sanctuary seasonally. Over 20 species of marine mammals migrate from around the globe to feed in these productive waters, as do many species of seabirds—including migratory albatrosses, shearwaters and petrels.

The bank's undersea ridges and pinnacles are covered with colorful gardens of sponges, anemones and hydrocorals. These provide homes to flourishing communities of fishes, such as lingcod and rockfish and invertebrates such as seastars, urchins, crabs and giant Pacific octopus.

Since the sanctuary is entirely offshore, it can only be visited by boat, and even then, only in good weather. September and October are the best months, when calm seas and light winds make the trip smoother and the marine life easier to see. If you're traveling along the coast, you can learn more about Cordell Bank at the Point Reyes National Seashore Visitor Center, Gulf of the Farallones National Marine Sanctuary Visitor Center at Crissy Field and Bodega Marine Laboratory in Bodega Bay.

*To learn more, visit*  
**[sanctuaries.noaa.gov](http://sanctuaries.noaa.gov)**

## OLYMPIC COAST



Octopus. Photo: Steve Fisher

<http://olympiccoast.noaa.gov>

Designated in 1994, Olympic Coast National Marine Sanctuary spans 135 miles of coastline to an average of 35 miles offshore, encompassing 3,310 square miles in all. Nearly two-and-a-half times the size of Olympic National Park, the sanctuary's sparsely populated shoreline includes more than 48 miles of wilderness beaches.

Visitors can explore miles of sand and cobble beaches and dramatic, rocky shoreline with tide pools, offshore islands and seastacks. Birders will find large colonies of seabirds such as murrelets and tufted puffins, as well as one of the largest populations of bald eagles in the lower 48 states. During annual migrations, more than a million seabirds, waterfowl and shorebirds travel along this coast.

Twenty-nine species of marine mammals are found here. These waters also teem with fishes. Seven species of salmon, along with halibut, rockfish, herring, sturgeon and others support important sport, tribal and commercial fisheries.

These waters are also rich in human history. Native peoples—the Hoh, Makah, Quileute and Quinault—have lived along this coast for thousands of years, as they continue to do today. And more than 180 ships lie wrecked on the seafloor along this rugged and stormy coast.

Visitors can learn more about sanctuary resources, science and conservation, and opportunities to explore this wilderness coast by visiting the Olympic Coast Discovery Center in Port Angeles, and the Makah Museum in Neah Bay.



Blue Ring Top Snail on Giant Kelp. Photo: Frank Virga

# RESEARCH



R/V Shearwater. Photo: Robert Schwemmer/NOAA

## Conservation Science in Our Sanctuaries

Our sanctuaries work in partnership with scientists from universities, public and private research centers, government agencies, international partners and other organizations to characterize, monitor and study the ocean, habitats and the plants and animals in and around them. Knowledge gained from this work plays an important role in the management of all our national marine sanctuaries on the West Coast.

## Understanding What We Have

Research conducted in these protected areas adds to our understanding of the dynamic ocean along our coast. One goal is to discover what is present within sanctuaries. Geologists use sonar, radar-like laser systems and other devices to map the seafloor. Oceanographers track the flow of winds and currents and use satellite imagery and other technology to measure water temperatures and the abundance and distribution of plankton. Archeologists survey the remains of shipwrecks. Deep-sea biologists probe the depths with manned and unmanned submersibles and remote sensors. Others study the movements and habits of marine mammals and seabirds.

**Monitoring Change** Long-term observations are key to successful long-term management of our sanctuaries. Fisheries biologists track the status of populations of rockfish and other commercially important fishes. Oceanographic imagery can alert us to changes in climate, the lack or abundance of plankton and patterns of productivity. Scientists and volunteers patrol beaches looking for dead or injured seabirds and marine mammals, which could give clues to offshore oil spills or other pollution.

## Gaining New Understanding

Research on processes that affect the marine environment and control connections between places is critical to understanding each sanctuary's role within the larger marine ecosystem and in protecting the habitats and living resources it contains.

**Managing for the Future** Information gathered through these and other studies provides us a baseline against which to measure future changes in climate and the abundance and distribution of plants and animals. By monitoring long-term trends, we're able to assess the effectiveness of our conservation efforts and make sound resource management decisions for the future.

*To learn more, visit*  
**[sanctuaries.noaa.gov/science](http://sanctuaries.noaa.gov/science)**

# CONNECTED BY THE



Anacapa Sunrise. Photo: Keith Berson

Giant kelp. Photo: Claire Johnson/NOAA



Humpback Whale. Photo: Sophie Webb



Elephant Seal Pup. Photo: Robert Schwemmer/NOAA



**Each** of our five West Coast national marine sanctuaries is a jewel unto itself with its own unique character. Each has a distinct set of physical conditions, including climate, daily weather patterns, the lay of the coast and the make-up of the seafloor. These and other factors help define the nature of each sanctuary and set each apart from the others.

But in the restless ocean, driven by wind and storms and powerful currents, no place is truly isolated from another. Each of our sanctuaries is intimately connected not only with the others, but also to the entire coast from Alaska to Baja, California, and to the far reaches of the world ocean.

Our national marine sanctuaries on the West Coast are linked by the California Current—a broad, shallow “river” of ocean water meandering southward along the Pacific Coast. This slow-moving surface current carries some 10 trillion gallons of water per hour—a flow 55 times greater than the Amazon. Below it, two counter currents, the Davidson Current and a deeper undercurrent, flow north.

Carrying cold, nutrient-rich water southward from the North Pacific, the California Current shapes the nature of the entire west coast, setting the stage for an abundance and diversity of ocean life equaled in only a few other places on Earth.

The current runs strongest in spring and summer, when northwest winds drive it southward and towards the coast. During these times, cold, nutrient-rich water wells to the sunlit surface. There, light and nutrients fuel an explosion of life with clouds of tiny, drifting plants known as phytoplankton that form the base of ocean food webs here. Closer to shore, these same forces spur the growth of towering kelp forests.

When it runs strong, the current carries drifting plants and animals southward from sub-arctic waters. When it slackens in the fall, the surface waters warm and southern species move northward. This ever-shifting mix of species adds to the great diversity of our marine communities in our West Coast national marine sanctuaries.

The current serves as a vast, open highway for whales, birds, fishes and plankton, which follow

# Currents



it on long migrations in search of food or suitable places to nest, spawn or give birth. For some—such as Pacific sardines, northern anchovies, gray whales, Western Gulls and Brandt's Cormorants—the boundaries of their lives are largely defined by the boundaries of the California Current.

Vast schools of sardines, anchovies and hake spawn in the warmer waters around the Channel Islands, then swim north through our other sanctuaries where they find rich pastures of plankton to feed on. The small fishes are joined by giant blue whales and other whales that come to feed on krill and various plankton.

Salmon spawned in streams along the Olympic Coast follow the current north to the Gulf of Alaska and south to Cordell Bank, Gulf of the Farallones, Monterey Bay and the Channel Islands sanctuaries in search of food.

Gray whales traverse the entire coast, passing through all five sanctuaries twice each year as they migrate from Alaska to Baja, California. Meanwhile, pods of transient orcas travel from the Olympic Coast to Monterey Bay and Channel Islands in spring to hunt gray whale calves as they swim north with their mothers.

Elephant seals, sea lions and fur seals roam widely along the coast and far out to sea then return to rookeries in the Channel Islands, Monterey Bay and the Gulf of the Farallones national marine sanctuaries where they give birth to their pups.

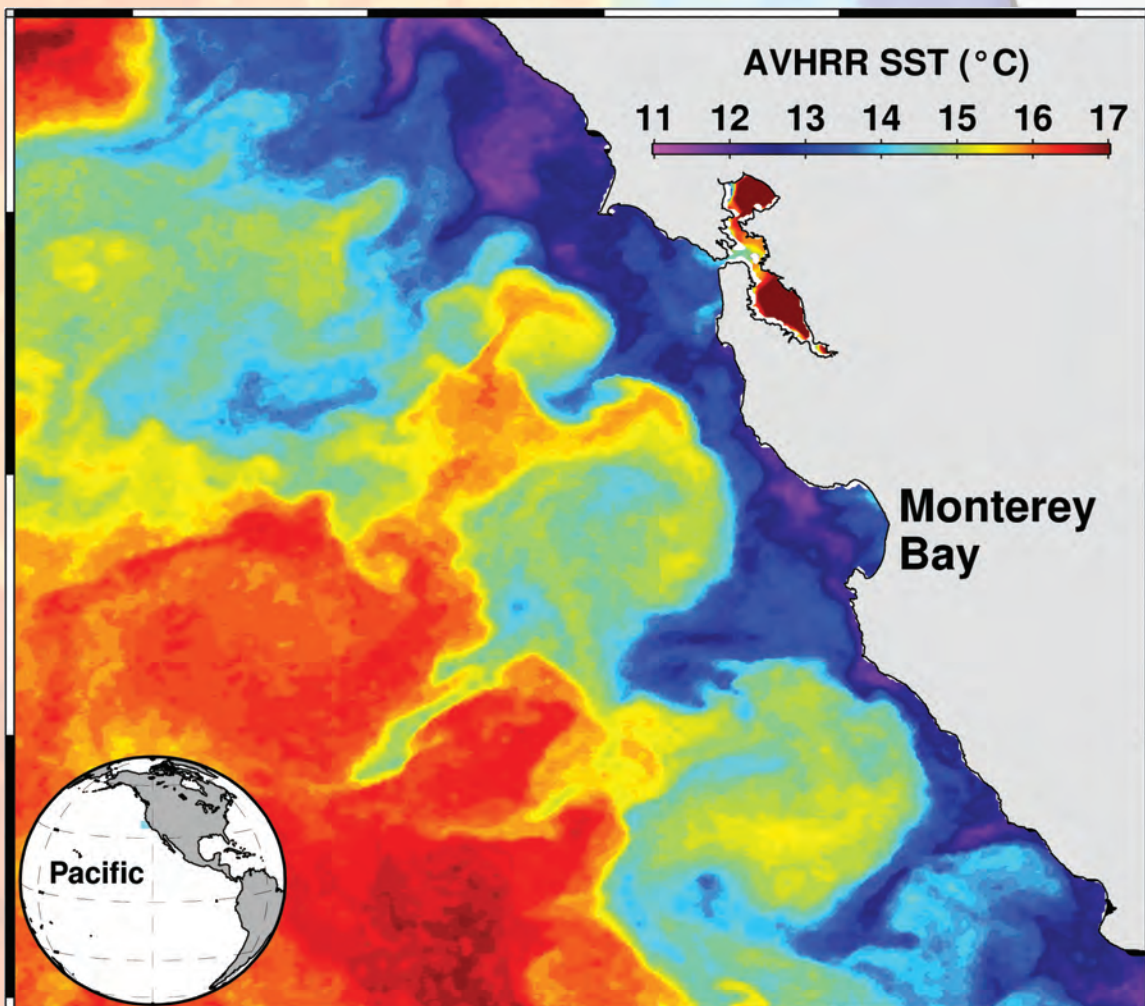
A Brown Pelican or Black Storm Petrel appearing along the Olympic Coast may have been hatched and fledged on the Channel Islands. And some 400,000 gulls, cormorants and murre nest in the Gulf of the Farallones then fly far and wide to our other sanctuaries and beyond. Our sanctuaries

protect vital habitat for shorebirds and countless species, along the important migration route known as the Pacific Flyway.

The connections extend further still as other species pass through these waters on their way to and from more distant places. Each year, albacore tuna follow currents across the Pacific Ocean and back again; Sooty Shearwaters travel here from as far away as New Zealand; and leatherback turtles migrate from Indonesia. Albatrosses breeding on the Northwestern Hawaiian Islands regularly fly back and forth to the Olympic Coast and Northern California national marine sanctuaries to find food for their chicks.

The great currents shaping ocean life recognize no man-made boundaries. No one sanctuary can shelter these wide-ranging ocean wanderers. The lines of our sanctuaries can only mark their passage. But taken together, the influence and protection of our sanctuaries extend far beyond their physical boundaries.

Each sanctuary is distinct from the other, but they're all part of a larger system connected by wind and water. And as part of this greater system, our national marine sanctuaries help protect not just individual places, but the entire fabric of ocean life along the West Coast.



This satellite image captures the sea surface temperature (SST) of the Pacific Ocean along the Monterey Bay coastline on October 17, 2005. The blue color represents colder water, which demonstrates the currents and upwelling of nutrients. This image is a rare example of a cloudless day when the satellite was overhead. Special thanks to John Ryan of the Monterey Bay Aquarium Research Institute for use of this image.

130° 0'0"W

125° 0'0"W

120° 0'0"W

# OUR NATIONAL MARINE SANCTUARIES

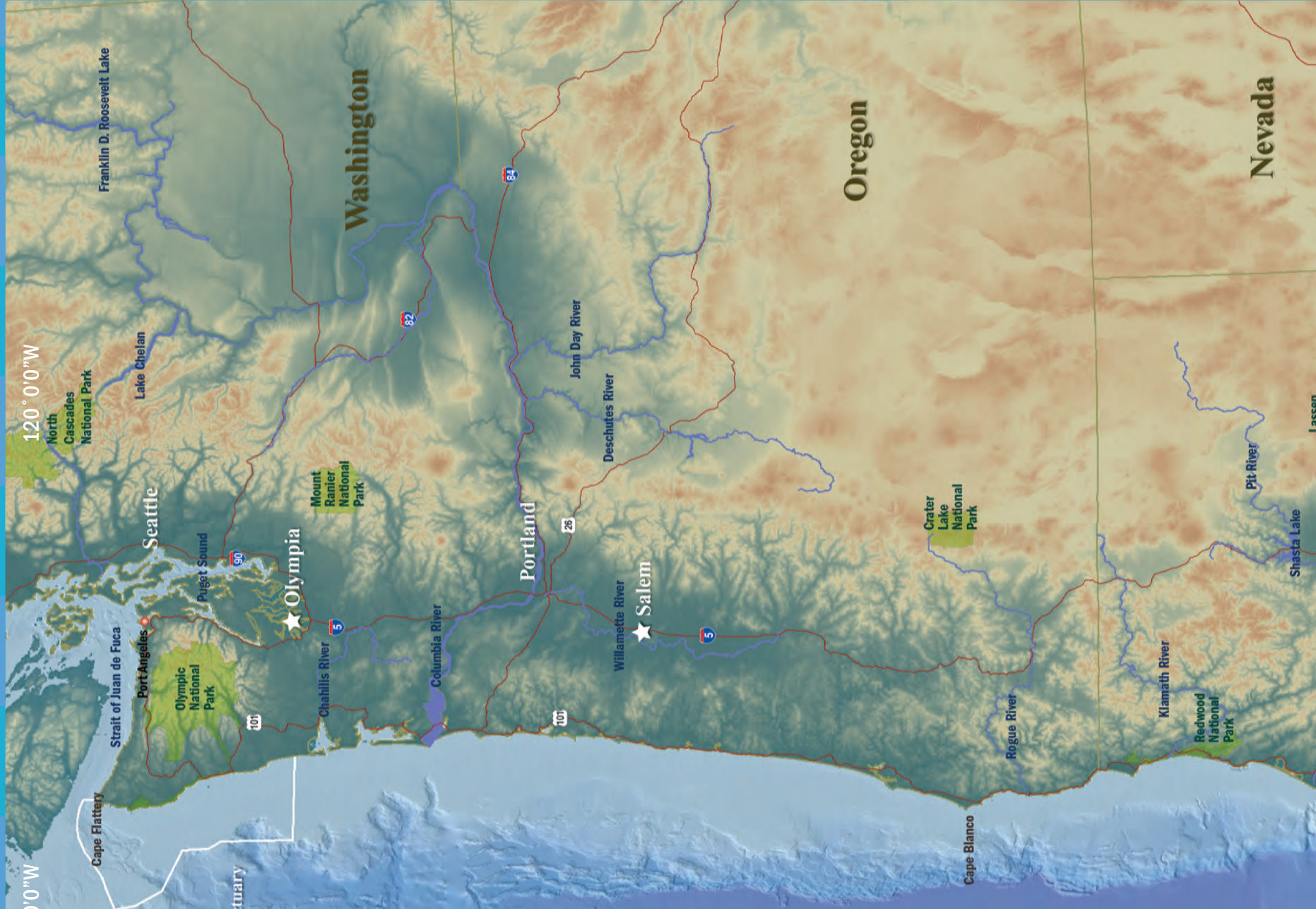
## of the West Coast

45° 0'0"N

The mission of the NOAA Office of National Marine Sanctuaries is to conserve, protect and enhance the biodiversity, ecological integrity and cultural legacy of our nation's system of marine protected areas.

To protect any one sanctuary, we must also look beyond its boundaries to the larger ecosystems of which it is an integral part. Our sanctuaries are connected to one another and to the ocean beyond by winds and currents, and the great migrations of birds, fish and marine mammals. Only by managing each national marine sanctuary with an understanding of the vital role it plays in the life of the others can we ensure the health of the ocean, and our planet, as a whole.

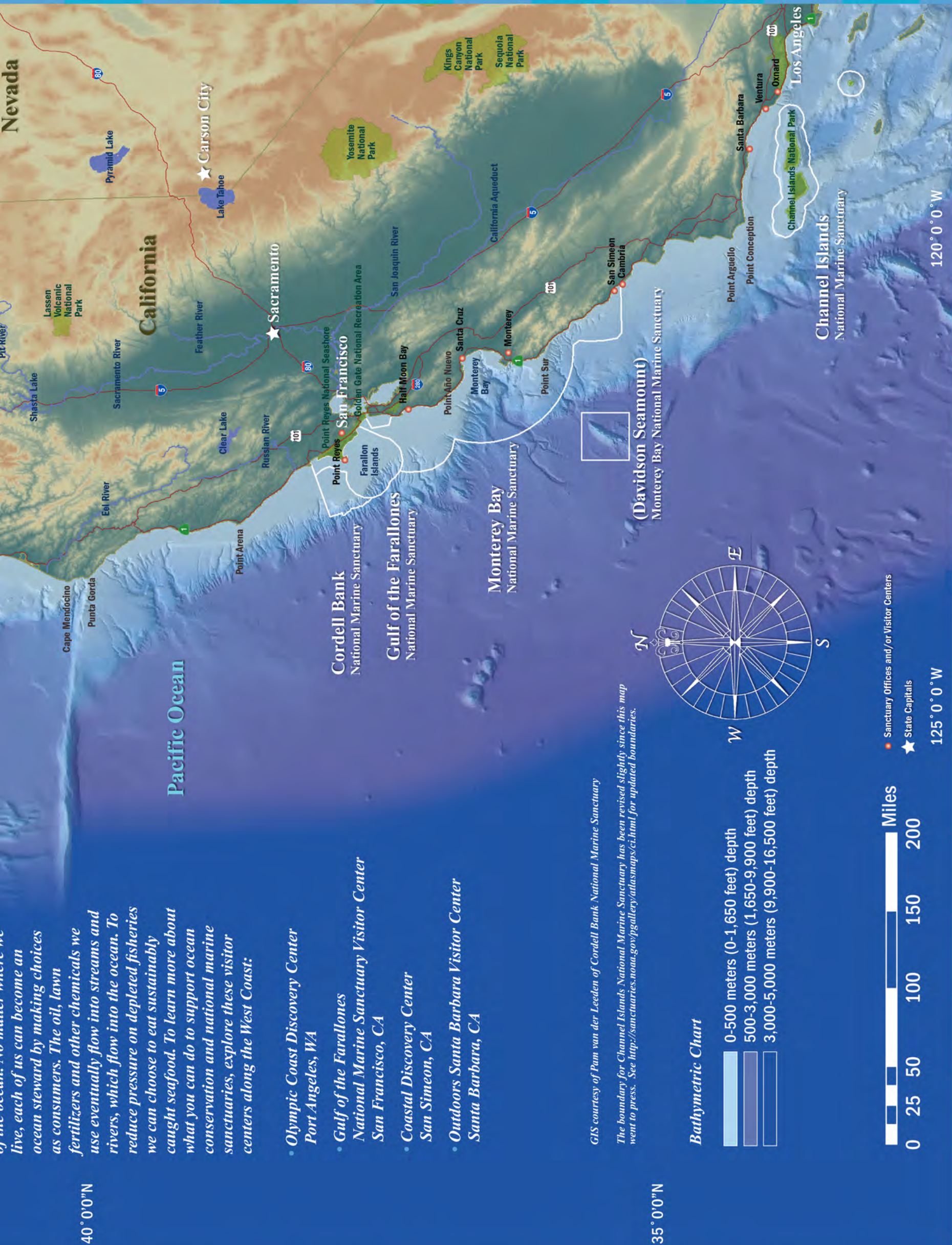
Even with the best management, sanctuaries alone can't ensure the long-term health of our ocean. Just as the ocean affects our daily lives, our daily actions affect the health of the ocean. No matter where we live, each of us can become an ocean steward by making choices



of the ocean. No matter where we live, each of us can become an ocean steward by making choices as consumers. The oil, lawn fertilizers and other chemicals we use eventually flow into the streams and rivers, which flow into the ocean. To reduce pressure on depleted fisheries we can choose to eat sustainably caught seafood. To learn more about what you can do to support ocean conservation and national marine sanctuaries, explore these visitor centers along the West Coast:

- *Olympic Coast Discovery Center*  
Port Angeles, WA
- *Gulf of the Farallones*  
National Marine Sanctuary Visitor Center  
San Francisco, CA
- *Coastal Discovery Center*  
San Simeon, CA
- *Outdoors Santa Barbara Visitor Center*  
Santa Barbara, CA

40° 0' 0" N

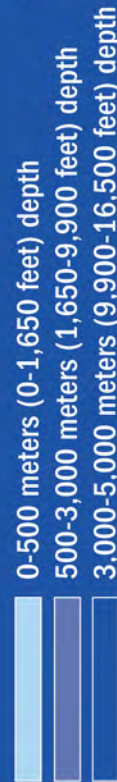


35° 0' 0" N

GIS courtesy of Pam van der Leeden of Cordell Bank National Marine Sanctuary

The boundary for Channel Islands National Marine Sanctuary has been revised slightly since this map went to press. See <http://sanctuaries.noaa.gov/gallery/atlasmaps/ci.html> for updated boundaries.

### Bathymetric Chart



- Sanctuary Offices and/or Visitor Centers
- ★ State Capitals

125° 0' 0" W

120° 0' 0" W

# NATIONAL MARINE SANCTUARIES OF THE WEST COAST

Seastars. Photo: Steve Lonhart for NOAA/MBNMS

*From seashore to seafloor, from muddy estuaries to clear, blue waters, our national marine sanctuaries encompass many habitats. Each habitat is home to its own distinctive community of plants, algae and animals ideally suited to meet the challenges and reap the rewards of living there. On the West Coast, many habitats connect our sanctuaries to each other.*

California Sheephead. Photo: Jim Knowlton

## Sandy Beaches



Marbled Godwits. Photo: Peggy Hansen

**M**any visitors know national marine sanctuaries first by their sandy beaches. Some stretch in long crescents, others lie in small pockets at the mouths of streams or between rocky outcrops.

At first glance, beaches appear barren: a world of sand and restless waves broken only by gulls wheeling overhead. But look more closely and you'll see shorebirds—sandpipers, willets, godwits, plovers and others—scurrying along at the water's edge. Their presence gives proof to buried treasures as they pick and probe through sand and beach wrack in search of worms, clams, crabs and tiny shrimp-like amphipods. In this rough-and-tumble world of crashing waves and scouring sand, animals survive by burrowing in or flying away. All of the West Coast sanctuaries, except Cordell Bank, which lies entirely offshore, protect large stretches of sandy beach habitat.

## Rocky Shores

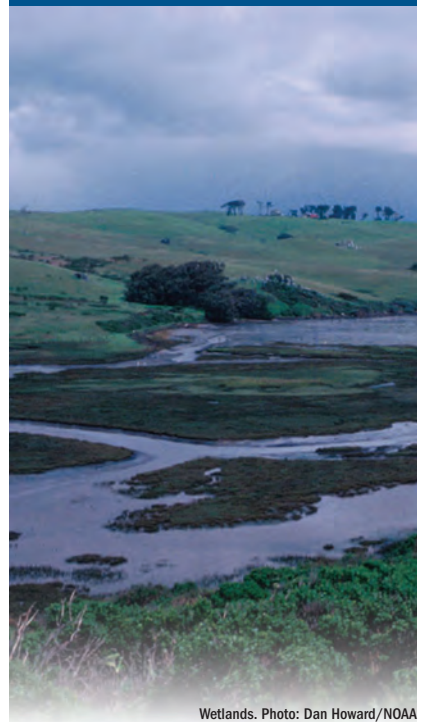


Rocky Intertidal. Photo: Coke Smith

**R**ocky coastlines are worlds of extremes and dramatic beauty. They're also places of amazing diversity and abundance, where plants and animals fight for space on the rocks. Life here moves to the rhythm of the tides. When the tide is out, sea creatures face hours of exposure to baking sun and drying wind. The returning tide brings with it both pounding waves and a host of hungry fishes and other predators moving up from deeper waters below.

Creatures able to meet these challenges reap great rewards. The rocks provide firm footing and hiding places where they can hold their own. And each returning tide brings a fresh feast of planktonic food from the sea. The tides also bring new generations to the shores. Many marine alga species and animals cast their spores and eggs into the water. They drift on the currents, sometimes far offshore, until the currents carry them back to settle on the rocks, starting the cycle anew.

## Estuaries and Sloughs



Wetlands. Photo: Dan Howard/NOAA

**T**hese wetlands play vital roles in the ecology of our coastal waters and in the lives of many marine animals. Their quiet waters, sheltered from the crash of ocean waves, serve as nurseries, sheltering the young of flounders, rays, sharks and other fishes. An abundance of plankton nourishes dense beds of oysters as well as sardines, anchovies and other coastal fishes. Clams and worms burrow into the thick mud. The abundance of food attracts hundreds of species of birds. Some nest here, others stop to rest and eat in the middle of long migrations; many find winter refuge in these rich, protected waters.

In spite of their importance, estuaries and sloughs are the most endangered habitats in our sanctuaries. Where many estuaries, sloughs and freshwater marshes once lined the coast, less than 10 percent remain today. Most have been drained and filled to make way for houses, agriculture and commerce. Three of our sanctuaries—Olympic Coast, Gulf of the Farallones and Monterey Bay—protect some of the largest and most significant of those remaining.

# Habitats

## Kelp Forests

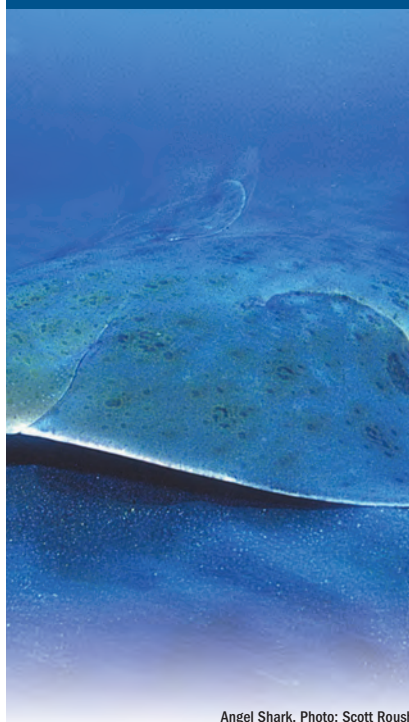


Harbor Seal in Kelp. Photo: Peggy Hansen

**O**ut from the tide pools, on the rocky seafloor in water depths typically 20 to over 100 feet, lies the cathedrals of the kelp forests. Giant kelp, covered with fronds from seafloor to surface, define the underwater forests of the Channel Islands and Monterey Bay sanctuaries. Bull kelp, with a bare stipe (stem) topped by a whiplike tangle of fronds, takes over in our northern sanctuaries. Both are among the most productive and fastest-growing plants in the world.

From the surface, the brown, tangled mats of fronds are all that can be seen. Below lies a rich, multi-layered world. The towering groves provide shelter, food and living space for thriving marine communities. A single kelp holdfast can be home to a thousand species, from tiny algae to giant kelpfish. And their influence extends far beyond their boundaries: from microscopic plankton to sharks and whales, countless millions more drift or swim through these swaying undersea forests.

## Sandy Seafloor



Angel Shark. Photo: Scott Roush

**M**uch of the seafloor in our sanctuaries is covered with sand or mud. Unlike in rocky areas, giant kelp can't take hold, so the sands lie open and bare. With no firm footing and no place to hide, life here lies low. Anemones, clams, worms, sand dollars and brittle stars burrow into the sand. Safely hidden, they expose only their feeding tentacles, arms and breathing siphons into the water above. Shrimps and crabs try to blend in as they scuttle across the sands searching for food. Flounders and skates lie perfectly camouflaged as they wait for a meal. More active fishes, like surfperch, spiny dogfish and salmon come and go above the shifting sediments.

## Open Ocean



Jelly. Photo: Steve Fisher

**F**ar out from land, the coastal waters gradually merge with the California Current and the open ocean. This fluid world changes moment to moment. One patch of water may appear clear and barren of life while nearby another teems with plankton, schools of fishes, pods of feeding whales and flocks of seabirds. Thus, the open ocean, the largest habitat on earth, is also very dynamic.

Generally spring and summer are times of abundance as cold, nutrient-rich water wells up to the sunlit surface, fueling dense blooms of microscopic plants—phytoplankton—that color the water a murky brownish-green. These blooms spur an explosive growth of swarms of tiny drifting animals called zooplankton. Great whales and schools of herring, sardines and anchovy feast in the pastures of plankton. The multitudes of small fish in turn draw larger predators. Pods of dolphins, sharks, seals, seabirds and people all come to hunt in these open waters.

## Deep Sea



Squid. Photo: Jamie Hall

**I**n places along our sanctuaries, submarine canyons cut into the continental shelf, bringing fingers of the deep sea closer to shore. The largest, Monterey Canyon, 60 miles long and one mile deep rivals the Grand Canyon in size.

Darkness and a scarcity of food, along with bitter cold and immense pressure, define the deep. Sunlight fades quickly underwater; around 300 feet below the surface, there's no longer enough light for plant plankton to grow. In this dark world, animals rely solely on what can be scavenged from the productive surface waters. Still, the deep shelters delicate creatures in a diversity—if not abundance—rivaling the crowded tide pools and kelp forests.

The open midwaters of the deep sea are home to anglerfishes crowned with glow-in-the-dark lures and viperfish, their gaping mouths filled with long fangs. Intricate glass sponges and deep sea corals grow attached to the seafloor and the rocky walls of undersea canyons. Solitary and stationary, they patiently filter tiny bits of food carried past them on the currents.

# NATIONAL MARINE SANCTUARIES OF THE V



White-sided Dolphin. Photo: Cornelia Oedekoven

**Our five West Coast national marine sanctuaries encompass some of the richest and most diverse marine communities anywhere in the world. A single walk along one of our beaches, a trip to a rocky tide pool, or a journey by boat out to offshore waters can reveal dozens or hundreds of different marine plants and animals. And it would take a lifetime of exploration to even begin to know them all.**

**Many excellent field guides are available to help you identify the wildlife you'll encounter in our sanctuaries. Visitor centers or local bookstores often have a good selection of guidebooks.**



Pigeon Guillemot.  
Photo: Gulf of the Farallones National Marine Sanctuary

## Invertebrates



Seastars. Photo: Joe Heath

**I**nvertebrates—animals without backbones—make up the overwhelming majority of animal life in our sanctuaries and throughout the ocean. “Invertebrate” is a broad term, encompassing a dizzying variety of different species, including everything from sea anemones and sponges, to crabs and shrimps, worms, snails, clams, octopuses, sea stars and many others. Many thousands of species live in our sanctuaries.

Tide pools are the best places to look for invertebrates, as nearly every square inch is covered with life. Limpets, periwinkles and other snails cling to life on rocks exposed at low tide. Ochre sea stars, in shades of yellowish-brown, purple and orange, are commonly seen intertidal predators. Little hermit crabs clamber among rocks and seaweed in the pools as they scavenge for bits of food. You may catch a glimpse of a purple shore crab peeking from beneath a rock, or a green sea anemone, with its flowery crown of tentacles, anchored among the sand and rocks in deeper pools.

Clumps of California mussels crowd wave-swept rocks, often growing so closely together that they keep other animals and plants from gaining a foothold. Where there's space, tiny barnacles—relatives of crabs and shrimp—live inside little volcano-shaped shells cemented to the rocks.

## Seaweeds



Kelp. Photo: Susan Lang

**W**alk along the rocky shores of any of our sanctuaries and you'll see lush gardens of seaweeds—mostly brown, red and green algae. They grow from the most exposed tide pools to the seafloor a hundred or more feet deep. These algae cling tightly to rocks or the seafloor with rootlike structures called holdfasts, without which they'd be swept away with the currents.

While these are the algae we can see, they're far from the only plantlike beings here. The open waters are home to groups of tiny photosynthetic organisms that survive by being small enough to stay afloat near the sunlit surface. While tiny, they occur in almost unimaginable numbers, especially in spring and summer when they turn the water murky with their abundance, and they play a central role in the overall richness of life here.

Brown rockweeds are among the most commonly seen seaweeds carpeting the intertidal rocks all along the Pacific Coast. Filmy, bright green clumps that resemble watery heads of leaf lettuce are the aptly named sea lettuce. Coralline algae grow in little, crusty, branching thickets or as red or pinkish crusts on the surface of rocks. Feather boa kelp—named for its long, narrow fronds—grows among tangles of seaweeds of wave-swept rocks. Away from the tide pools, forests of bull and giant kelp grow in deeper waters just offshore bathed by the currents.

## Marine Mammals



Pinnipeds. Photo: Roger Conrad

**T**he waters of our five national marine sanctuaries along the West Coast are home to more than 36 species of marine mammals, including whales, dolphins, seals, sea lions and sea otters. Some, like sea otters, seals and sea lions can be easily seen from shore. Others, like blue and humpback whales, stick to offshore waters, where upwelling along the edge of the Continental Shelf creates rich feeding grounds. While some live in the sanctuaries year-round, many appear here seasonally.

Harbor seals and California sea lions are among the most common and familiar marine mammals along the Pacific Coast. They can often be seen hauled out on rocks or swimming in the waters just offshore. Sea otters can be seen swimming among the tangled floating fronds of giant kelp.

Whales and dolphins swim further offshore, but can often be spotted by their spouts or seen from boats. Twice each year, in late fall and early spring, more than 20,000 gray whales pass through the waters of our sanctuaries as they migrate between their feeding grounds in Alaska to their calving areas off Baja, California. They're commonly seen from vantage points along the shores. Blue whales are rarer, but in summer and fall they feed on dense swarms of plankton in the open waters of our national marine sanctuaries along the California coast. Orcas (sometimes called “killer whales”) are large dolphins. They're most commonly seen off the Olympic Coast, but some travel down the coast to California as they prey on fishes, squid, seals and whales.

## Birds



Western Gull Chick. Photo: Chuck Graham

**B**irds can be seen in abundance in all our sanctuaries. At least a hundred or more species—including seabirds, shorebirds, wading birds, waterfowl and others—live in, or pass through sanctuary waters. The Pacific Coast lies along the Pacific Flyway, a major migration route for birds as they fly to and from summer feeding areas as far north as the Bering Sea and wintering grounds here or further south. And the waters of our sanctuaries, rich in food, nesting and resting areas, provides habitat critical to their continued survival.

Nine or more species of gulls live along the Pacific Coast, with Western Gulls one of the largest and most commonly seen species. California Brown Pelicans can be seen year-round in the Channel Islands, where they nest. In summer, they migrate in large numbers to central California, with some wandering as far north as the Olympic peninsula. Three species of cormorants—Pelagic, Double-Crested and Brandt’s—live along the coasts of our sanctuaries. They all lead similar lifestyles, nesting on islands, rocks or cliffs and diving underwater to hunt fish.

About 20 species of sandpipers can be seen on sandy beaches along the Pacific Coast. Birders sometimes refer to this group collectively as “peeps” for the plaintive peeping and piping calls they make as they scurry in small flocks at the edge of the waves. Seabirds frequent offshore waters. Some, such as Sooty Shearwaters, come ashore only to nest. In summer, you may see them in flocks of hundreds of thousands of birds flying low over the water in long, narrow lines stretching for a mile or more.

## Fishes



Garibaldi. Photo: Laurie C Van De Werfhorst

**F**rom two-inch-long gobies to 20-foot-long white sharks, more than 500 species of fish live in the waters of our national marine sanctuaries along the West Coast. Though most are hard to see without venturing underwater with scuba gear, they can be found here everywhere from wave-splashed tide pools to the bottom of deep-sea canyons. Some spend their entire lives in a single set of tide pools. Others, such as salmon and tuna, travel far and wide up and down the coast or even across the Pacific Ocean to Japan and back.

Tide pools are home to dozens of kinds of small fishes including sculpins, blennies, gunnels and clingfish, which are often collectively called “tide pool johnnies.” A good-sized tide pool may have dozens of these fishes, but you’ll have to look closely to see them; most are well camouflaged with mottled colors and patterns blending in perfectly with their surroundings.

Most fishes live in more open waters. Rockfish are the largest group of fishes along the West Coast. More than 60 species live along the Pacific Coast. Many are sought after by sport and commercial fishermen. Salmon are most common in the Olympic Coast National Marine Sanctuary where five species—chinook, sockeye, pink, chum and coho—feed in offshore waters and enter freshwater streams to spawn.

White sharks are generally quite rare and rarely seen, but in late summer and early fall they do gather off the seal and sea lion rookeries on the Farallon Islands.

## OCEAN ETIQUETTE

### Marine Wildlife Viewing Guidelines

*These guidelines are intended to help you enjoy watching marine wildlife without causing them harm or placing your personal safety at risk. Please note that these are general guidelines and it is best to follow location or species-specific guidelines if they are available. For more information visit, <http://sanctuaries.noaa.gov/protect/oceanetiquette.html>*



**Learn before you go.** Many marine wildlife species have specific habitat needs and sensitive lifecycle requirements. Use the Internet, guidebooks and knowledgeable people to learn more about wildlife that can be found in the place you are visiting.



**Keep your distance.** Getting too close to animals can be harmful to them and to you. Take precaution and use equipment such as binoculars that let you view animals from a distance where they won’t be disturbed.



**Hands off.** Touching wildlife, or attempting to do so, can injure the animal, put you at risk and is illegal for most protected species.



**Do not feed or attract marine wildlife.** Feeding or attempting to attract wildlife may harm animals by causing sickness, death and habituation to people. Animals that are accustomed to humans become vulnerable to injuries and can be dangerous to people.



**Never chase or harass wildlife.** Mind your proximity and approach patterns. Never surround, trap or separate animals, approach them head on, or approach them directly from behind.



**Stay away from wildlife that appears abandoned or sick.** Animals that appear sick may not be. They may just be resting or are young awaiting the return of a parent. If animals are approached, their behavior may become aggressive. If you think an animal is sick or injured, contact local authorities.



**Wildlife and pets don’t mix.** Wild animals can injure and spread diseases to pets, and pets can harm and disturb wildlife. If you are traveling with pets, keep them leashed and away from marine wildlife.



**Lend a hand with trash removal.** Human garbage and fishing debris are some of the greatest threats to marine wildlife. Carry a trash bag with you and pick up litter found along the shore.



**Help others to become responsible wildlife watchers and tour operators.** Lead by example. It’s up to you! Obtain and carry a few copies of the Marine Wildlife Viewing Guidelines on your travels and share them with others. Patronize businesses that follow these guidelines. Protecting and conserving wildlife is everyone’s responsibility.

*To learn more, visit*

## marinelife.noaa.gov

*to view hundreds of photos and videos of the diverse marine life found in our national marine sanctuaries.*

# NATIONAL MARINE SANCTUARIES OF THE WEST

Petroglyph at Wedding Rock. Photo: Olympic Coast National Marine Sanctuary

## First People



Guy Capoeiman, Quinault Nation. Photo: Olympic Coast National Marine Sanctuary

**All** along the Pacific Coast, native people have drawn from the ocean's bounty. They have made their living as hunters, gatherers and fishers, made jewelry and ornaments from shells, and traded up and down the coast.

They lived here for many thousands of years before the arrival of Europeans to the Pacific Coast. The newcomers exploited native tribes for labor and resources, introduced diseases that decimated entire tribes and sought to stamp out ages-old cultural traditions. But native peoples, though fewer in number, still survive up and down the Pacific Coast. Many still carry on native traditions, and some tribes still stand as sovereign nations in their ancestral lands.

Their ancestors lived along the Olympic Coast for at least 6,000 years. The sea was central to their cultures from the food they ate to the art they produced. These people were intimately attuned to the tides, currents and seasons. They hunted seals and whales, gathered crabs and mussels, fished for halibut, salmon and lingcod and gathered kelp to eat and to use for medicine.

Four tribes—the Makah, Hoh, Quileute and Quinalt—still live on the Olympic Coast as sovereign nations. Today, they hold to their traditional culture while serving as managers of the natural resources on their lands. The sanctuary supports them in their cultural revival and helps protect their cultural legacy. Olympic Coast sanctuary staff supported a canoe journey made by all tribes along the length of the coast, allowing a new generation of the ocean-going peoples to experience the traditions of their ancestors. Working with others under the supervision of the Makah, the sanctuary is involved in archeological studies of village and midden or refuse sites on their land.

The Coast Miwok, the first peoples near San Francisco, are part of the cultural heritage of the Gulf of the Farallones National Marine Sanctuary. Living in village communities, they built a strong culture based around fishing and gathering and hunting on land and sea. The ocean provided crabs, abalone, oysters and fish. They made flat beads from clam shells, which were strung together and used for trade throughout much of Northern California.

While much of their culture has been lost, they regained federal recognition as a tribe in 2002 and there are some 500 Coast Miwok tribal members today.

Like other native people along the Pacific Coast, the Ohlone of California's central coast drew their living from both land and water for 10,000 years or more. The Monterey Bay area provided acorns for food, and willows and other

plants for basket making. The sea supplied fish, birds, sea lions and other marine mammals and many kinds of shellfish.

Despite the devastation of their culture and the loss of their lands, there are still some 500 Ohlone today, most living in their ancestral area. Though few in number, they continue to thrive as a tribe and still carry on native traditions.

Native peoples have a long history on the Channel Islands. Daisy Cave on San Miguel Island is the site of the oldest known coastal shell midden in North America. This rock shelter was occupied by a series of native peoples over the course of more than 10,000 years. A sample of bone from the remains of "Arlington Springs Woman," recovered from Santa Rosa Island, dates back to 13,000 years ago, making her the earliest-known human in North America.

The Chumash, who lived on the four northern islands and on the mainland, were skilled in making their living from the sea. They built unique plank canoes, called tomols, to fish and collect abalone around the islands, and to trade with peoples on the mainland. And as integral members of an extensive system of trade among various tribes, they collected the shells of *Olivella* snails, which they used as currency.

Like other native peoples the Chumash suffered with the coming of Europeans and others to their lands. But there are still many people who can trace their ancestry back to these historic Chumash communities. They survived on the strength of their connection with their heritage to the islands, and today they're working to keep that heritage strong and vital. The sanctuary recently partnered with the Chumash community to build the tomol 'Elye'wun (Swordfish) under the leadership of the Chumash Maritime Association. The tomol and its paddlers made an historic journey from the mainland to Santa Cruz Island (Limuw)—the first such crossing in over 125 years.

Steven Villa, Barbareno Chumash/Diegeno Tomolero (paddler) of a Chumash Plank Canoe. Photo: Robert Schwemmer/NOAA

## Shipwrecks



Lumber Schooner *Comet* Shipwrecked at San Miguel Island in 1911. Photo: Santa Barbara Museum of Natural History

**Our** national marine sanctuaries on the West Coast share a long and diverse maritime history. And they hold remnants of that history in the hundreds of ships that lie wrecked in their waters. These historic maritime heritage resources preserve a seafaring legacy dating back to early explorers, traders, whalers, fishermen and immigrants who have traveled this coast since the mid-1500s.

Fierce storms and a rocky shoreline have combined to make the Olympic Coast a graveyard for ships. Historic records reveal that more than 200 shipwrecks have been documented in Olympic Coast National Marine Sanctuary. Many simply disappeared, their epitaph written by the lighthouse keeper at Tatoosh: “Last sighted, Cape Flattery.”

Cordell Bank was discovered by accident in 1853 when hydrographer George Davidson was returning to San Francisco from a mapping expedition in northern California. In 1869, Edward Cordell, of the U.S. Coast Survey, officially surveyed the area that now bears his name. No one knows for sure if any shipwrecks occupy the seafloor of the Cordell Bank National Marine Sanctuary. The sanctuary’s deep waters and distance from shore make it less likely for ships to run aground.

Powerful storms, thick fog and strong currents have claimed nearly 200 ships in the waters of Gulf of the Farallones National Marine Sanctuary. The earliest recorded shipwreck was the Spanish Manila galleon *San Agustin*, which sank in a gale while anchored in Drake’s Bay in 1595.

More recently, the C-3 freighter *Jacob Luckenbach* went down 17 miles off the Golden Gate in 1953 after colliding with the steamship *Hawaiian Pilot*. Over the next few decades it was the source of a number of “mystery” oil spills. The NOAA Maritime Heritage Program determined through historical research that the ship was a likely source of the oil discharges. Those suspicions were confirmed through the combined efforts of the local sport diving community, who investigated the site, and the sanctuary’s BeachWatch volunteer monitoring program. In 2002, the sanctuary, working with the U.S. Coast Guard and other agencies, took part in an effort to pump approximately 100,000 gallons of oil from the wreck’s deep bunker tanks, ending the mystery oil spills.

Monterey Bay and the surrounding coast were long a center of trade and a base for fishing and whaling. Being the largest sanctuary along the West Coast,

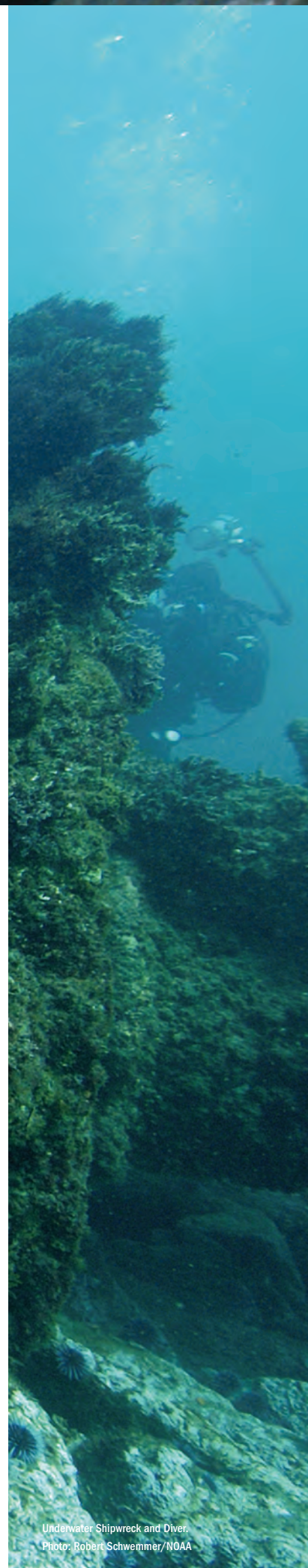
nearly 400 ships have been recorded lost in the region. One tragic event occurred in 1929 when an oil tanker *S.C.T. Dodd* rammed the passenger steamer *San Juan* off Pigeon Point, sending 73 passengers and crewmen to their deaths.

The submerged remains of the rigid airship USS *Macon* and four Curtiss F9C-2 Sparrowhawks aircraft lie off Point Sur, California. The site was first recorded in the 1990s by the U.S. Navy, working in partnership with the Monterey Bay Aquarium Research Institute. In 2006, the sanctuary led an expedition to conduct the first archaeological survey resulting in listing the site on the National Register of Historic Places.

More than 140 historic ships and military aircraft have been lost at the Channel Islands. Each has a story to tell about the history, technology and society of earlier times.

One of the oldest documented wrecks is the *Winfield Scott*, a side-wheel passenger steamship that operated during the California Gold Rush. With over 500 passengers heading to Panama from San Francisco, and a load of gold bullion and mail the ship grounded in dense fog on Anacapa Island in 1853. All passengers were rescued after being stranded on Anacapa Island for about a week before boarding the steamer *California* to continue their journey to Panama.

Today, NOAA, Channel Islands National Park and the Coastal Maritime Archaeology Resources group record the archaeological remains of the maritime heritage sites on and around the Channel Islands. Exhibits featuring some of the shipwrecks in the sanctuary are on display at the Santa Barbara Maritime Museum.



Underwater Shipwreck and Diver.  
Photo: Robert Schwemmer/NOAA

# NATIONAL MARINE SANCTUARIES OF THE WEST COAST

# Conservation

Underwater Diving. Photo: Scott Roush



Sea Lion Rookery on San Miguel Island. Photo: Roger Conrad

## Things You Can Do to Help Protect Our Ocean and Our Planet

**Practice Daily Conservation:** We can help protect our watersheds and ocean with these simple, everyday activities:

- *Reduce, Reuse, Recycle*
- *Use natural organic alternatives to fertilizers and pesticides on lawns and gardens*
- *Be mindful of your own environment. Keep litter, used motor oil, antifreeze, toxic chemicals, pesticides and debris out of drains, and conserve water*
- *Learn about sustainable seafood and choose wisely to support local, sustainable fisheries*
- *Properly dispose or pick-up trash that could entangle wildlife*

**Support Sanctuary Associations:** Some sanctuaries have nonprofit associations supporting conservation and education activities in these underwater treasures.

Visit these websites for more information:

- **National Marine Sanctuary Foundation:** [nmsfocean.org](http://nmsfocean.org)
- **Farallones Marine Sanctuary Association:** [farallones.org](http://farallones.org)
- **Monterey Bay Sanctuary Foundation:** [mbnmsf.org](http://mbnmsf.org)
- **Cordell Marine Sanctuary Foundation:** [cordellfoundation.org](http://cordellfoundation.org)

**Volunteer:** *Each sanctuary has opportunities for volunteers who do everything from helping out at visitor centers to monitoring wildlife washed up on beaches.*

### Channel Islands National Marine Sanctuary

The Channel Islands Naturalist Corps is a group of specially trained volunteer ocean stewards dedicated to educating passengers on board whale watching vessels.

Email [channelislands@noaa.gov](mailto:channelislands@noaa.gov) • Phone (805) 966-7107

### Cordell Bank National Marine Sanctuary

Learn more about volunteer opportunities.

Email [cordellbank@noaa.gov](mailto:cordellbank@noaa.gov) • Phone (415) 663-1397

### Gulf of the Farallones National Marine Sanctuary

Be a Sanctuary Ambassador or become a Beach Watch volunteer. Opportunities to be a sanctuary educator at the visitor center or in school outreach programs are also available.

Email [farallones@noaa.gov](mailto:farallones@noaa.gov) • Phone (415) 561-6622

### Monterey Bay National Marine Sanctuary

Volunteer as a Team OCEAN kayak naturalist. Join Beach COMBERS, become a member of the Sanctuary Citizen Watershed Monitoring Network or a Coastal Discovery Center docent.

Email [montereybay@noaa.gov](mailto:montereybay@noaa.gov) • Phone (831) 647-4201

### Olympic Coast National Marine Sanctuary

Volunteer at the Olympic Coast Discovery Center in Port Angeles or participate in the Coastal Observation and Seabird Survey Team.

Email [olympiccoast@noaa.gov](mailto:olympiccoast@noaa.gov) • Phone (360) 457-6622

All sanctuaries have advisory councils, which are comprised of volunteers from different constituencies who meet quarterly to advise management issues.

Email [sanctuary.education@noaa.gov](mailto:sanctuary.education@noaa.gov)



Debra Herring, member of the Channel Islands Naturalist Corps. Photo: Claire Johnson/NOAA

