



# 25 Ways

## to Connect and Protect

### Explore the Sanctuary

**1. Wildlife Watching**  
Get up close with whales, pinnipeds, dolphins, seabirds, and more on cruises to the sanctuary and park. Whale watch cruises depart regularly from Channel Islands, Ventura, and Santa Barbara harbors, with many boats providing interpretation by members of the Channel Islands Naturalist Corps. For watchable wildlife guidelines, visit <http://sanctuaries.noaa.gov/oceanetiquette/>

**2. Diving**  
Recreational divers find an underwater paradise in the sanctuary. Because it is a transition zone where the warmer southern current meets the cooler northern current, animals from both environments can be found swimming side by side. This is especially true at Santa Cruz Island. Some of the clearest water for diving can be found around Santa Barbara and Anacapa islands.

**3. Boating**  
The Channel Islands offer numerous protected and scenic anchorages for recreational boaters—among them, Landing Cove and Frenchy's Cove on Anacapa Island; Scorpion Anchorage, Smugglers Cove, and Prisoners Harbor on Santa Cruz Island; Water Canyon Beach and Bechers Bay on Santa Rosa Island; Cuyler Harbor on San Miguel Island; and Landing Cove on Santa Barbara Island.

**4. Kayaking**  
Sea kayaking in the sanctuary promises an unforgettable experience. Glide past kelp forests and playful pinnipeds, visit secluded coves and beaches, and explore sea caves—including Painted Cave at Santa Cruz Island, one of the world's largest sea caves. Santa Barbara and Anacapa islands are popular with kayakers; Santa Rosa and San Miguel islands have windier conditions appropriate for advanced paddlers.

**5. Underwater Photography**  
Photographers find no end of fascinating subject matter in the sanctuary. One of the most popular spots for underwater

photography is the marine reserve on the north shore of East Anacapa Island. A fully protected "no take" zone for more than two decades, this reserve contains a kelp forest replete with flora and fauna.

**6. Fishing**  
Fishing is a favorite activity for many sanctuary visitors. From kelp bass to halibut and more, anglers know that the waters surrounding the Channel Islands are a great resource. The recently established marine protected areas (MPAs) ban fishing in only about 10 percent of sanctuary waters—leaving nearly 1,100 square nautical miles with many popular fishing spots.

**7. Visiting the Islands**  
A visit to the islands puts visitors in touch with centuries gone by. These uninhabited, beautiful landscapes are the perfect place to slow down and get in touch with nature. Activities on the islands include camping, hiking, bird watching, and observing pinnipeds hauled out on remote beaches.

For more information about these recreational activities in the sanctuary and park, contact the Channel Islands National Marine Sanctuary (805-966-7107, <http://channelislands.noaa.gov>) or Channel Islands National Park (805-658-5730, [www.nps.gov/chis/](http://www.nps.gov/chis/))

### Become a Volunteer

**8. Channel Islands Marine Sanctuary Foundation**  
Individuals who share a commitment to protect the sanctuary are encouraged to volunteer with the Channel Islands Marine Sanctuary Foundation. Call Executive Director Anna Chouteau, (805) 963-3238 x13 or email [annachouteau@yahoo.com](mailto:annachouteau@yahoo.com).

**9. Channel Islands National Park**  
From abundant natural resources—including 145 unique species—to archaeological and cultural resources spanning 13,000 years, Channel Islands National Park presents a whole new world

to discover. Many volunteer opportunities are available. To apply, call (805) 658-5711 or visit [www.nps.gov/chis/](http://www.nps.gov/chis/)

**10. Channel Islands Naturalist Corps**  
This joint program of the sanctuary and park trains volunteer naturalists to serve as interpreters on whale watch vessels departing from Santa Barbara, Ventura, and Channel Islands harbors. Volunteers also assist with research projects and represent the sanctuary and park at public outreach events. For details, visit [http://channelislands.noaa.gov/edu/edu\\_natc.html](http://channelislands.noaa.gov/edu/edu_natc.html)

**11. Great Annual Fish Count**  
Every July volunteer divers take part in the Great Annual Fish Count, an international fish counting effort that started right here off the Channel Islands. The sanctuary sponsors fish identification seminars prior to the event. For more information, visit [www.fishcount.org](http://www.fishcount.org)

**12. Outdoors Santa Barbara Visitor Center**  
Insiders know that the best views of Santa Barbara are found at the Outdoors Santa Barbara Visitor Center, located on the fourth floor of the Waterfront Center Building at Santa Barbara Harbor. Volunteers greet the public and help them appreciate the natural setting. Call (805) 884-1475 or apply online at <http://outdoorsb.noaa.gov>

**13. Santa Barbara Channelkeeper**  
Programs open to volunteers include a water quality monitoring program at the Ventura River and Goleta Slough, kelp forest monitoring and restoration on the Carpinteria Reef, an eelgrass

restoration project at Anacapa Island, and monthly beach cleanups. Call (805) 563-3377 or visit [www.sbck.org](http://www.sbck.org)

**14. Santa Barbara Maritime Museum**  
Volunteers are part of the family at the Santa Barbara Maritime Museum, helping the museum carry out its mission to educate the public about the Central Coast's unique maritime history. To share your time, experience, expertise, and love of the sea, call (805) 962-8404 ext. 109 or visit [www.smmm.org](http://www.smmm.org)

**15. Santa Barbara Museum of Natural History Ty Warner Sea Center**  
Join the Sea Crew on Stearns Wharf in Santa Barbara! The Ty Warner Sea Center needs volunteer interpreters, demonstrators, and more to interact with the public at this beautiful new facility. Contact the Volunteer Coordinator at (805) 682-4711 ext. 104

**16. Creek Watchers**  
Volunteers for the Creek Watchers program conduct simple monthly tests at local creeks and report their findings. The Community Environmental Council provides the training and the testing kits. Call (805) 682-6113 or visit [www.communityenvironmentalcouncil.org](http://www.communityenvironmentalcouncil.org)

**17. Santa Barbara Wildlife Care Network**  
Santa Barbara County residents who have one or two hours per week to share with wildlife will find many volunteer opportunities at the Santa Barbara Wildlife Care Network. Volunteers assist at the Care Center, seabird pond facility, and more. Call (805) 966-9005 or visit [www.sbwcn.org](http://www.sbwcn.org)

### Adopt Ocean-Friendly Habits

**18. Automotive Tips**  
Recycle used motor oil at an authorized auto parts store, gas station, or hazardous waste collection center; wash cars at a commercial car wash where water is collected and treated; inspect and maintain your car regularly to prevent leaking oil, antifreeze, and other toxic fluids; use alternative transportation whenever possible, such as carpooling, walking, bicycling, and public transportation.

**19. Household and Home Maintenance Tips**  
Landscape as much of your property as possible; use porous paving to help reduce runoff; dispose of household chemicals at a hazardous waste collection center; avoid oil-based paints, and dispose of unused paint, varnishes, and solvents at a hazardous waste collection center.

**20. Lawn and Garden Tips**  
Use nontoxic alternatives to pesticides; adopt organic gardening techniques; take unused garden chemicals to a hazardous waste collection center; sweep driveways, patios, and sidewalks instead of hosing them down; dispose of animal waste in toilets or trashcans; place grass clipping and leaves in a compost pile or greenwaste recycling can; maintain lawns and gardens to prevent loss of topsoil when it rains.

### Get Educated

**21. Sanctuary Adult Education Class**  
It's fun, and it's free! The sanctuary teaches an adult education class called "Discovering the Channel Islands National Marine Sanctuary" for Santa Barbara City College and Ventura College Community Education. The three-session course offers an optional whale-watching trip or island trip. For upcoming class schedules, visit <http://channelislands.noaa.gov/focus/adult.html>

**22. Sanctuary Internship Program**  
Every year approximately 20 student interns have the opportunity to learn first-hand about the sanctuary, help protect its resources, and gain valuable career experience. Most of these positions are filled by college students. Visit <http://channelislands.noaa.gov/focus/intern.html>

**23. Channel Islands Argonaut Program**  
Teachers in Ventura and Santa Barbara counties nominate outstanding students in grades 5-8 for the Channel Islands Argonaut Program. Each year 20 students explore the sanctuary and park, conduct scientific research, and act as community ambassadors. Visit <http://channelislands.noaa.gov/edu/shoretosea.html>

### Make Your Voice Heard

**24. Sanctuary Advisory Council**  
The sanctuary belongs to everyone. The public is invited to attend meetings of the Sanctuary Advisory Council held throughout the year. The Council is comprised of representatives from many community interests, and public comments are encouraged. Even better, become an SAC member or join a working group! Visit <http://channelislands.noaa.gov/sac/main.html>

**25. Environmental Legislation**  
Together, we can preserve our ocean environment by supporting appropriate federal and state legislation. Take action by emailing and phoning your representatives about your concerns. You can make a difference!

Photo Captions (clockwise from lower left): Dolphin sighting on whale watch trip, © David O. Brown; Hiking on Anacapa Island, CINMS Library; Garibaldi in the kelp forest off Anacapa Island, © Kathy deWet-Oleson; Student kayakers, Laura Francis; Exploring tidepools during a Channel Islands field trip, © Ben Brandis; Diver with electric tomopoda ray, © Carl Gwinn; Young angler with a "greenie," or Pacific mackerel, © Merrit McCrea; Boats at Channel Islands Harbor, Oxnard, California, © Jeff Greenberg; California sea lion, © Ralph Clevenger; Volunteer diver for the Great Annual Fish Count, Laura Francis; Santa Barbara Channelkeeper's Eelgrass Restoration Project, © SB Channelkeeper; Water quality advisory at Leadbetter Beach, Santa Barbara, © Project Clean Water; Channel Islands Argonauts, Robert Schwemmer; Blue whale encounter, © Fred Benko; Participants in the sanctuary's adult education class, Julie Bursek; Contemplating the sanctuary, CINMS Library.



## 25 Years of Biological Monitoring

*The past quarter century of biological monitoring at the Channel Islands National Marine Sanctuary and Channel Islands National Park reveals compelling tales of species declining and thriving, and the human efforts undertaken to research the reasons behind these fluctuations and help threatened species recover. Here are a few of these stories.*

### Whale Research Yields New Insights

By John Calambokidis, Cascadia Research

Both humpback whales (*Megaptera novaeangliae*) and blue whales (*Balaenoptera musculus*) were present in the sanctuary at its inception, but our knowledge of both species has expanded dramatically since then. In the late 1980s and early 1990s, thanks to Peter Howorth, Fred Benko, and Charles Woodhouse, we became more aware of these whales in the Santa Barbara Channel. In 1991, Cascadia Research began tracking humpback and blue whales along the entire West Coast, including the Santa Barbara Channel, with the support of the National Marine Sanctuary Program.

Using photographic identification, this research has revealed a larger than expected humpback whale population: from about 500 whales in the early 1990s to nearly 1,400 in 2003. Blue whales have been found to number around 2,000 along the California coast, a figure confirmed by line-transect surveys conducted by NOAA Fisheries' Southwest Fisheries Science Center. We have anecdotal reports of increased numbers of blue whales from the 1970s to early 1990s; however, we have not documented a continued increase during the 1990s.

Many organizations are employing new research techniques, such as satellite tagging of blue whales to document their migrations and suction-cup tags that help track underwater behavior, feeding, and vocalizations. Autonomous recording seafloor packages also aid in monitoring vocalizations.

Future research promises to provide even better insights. For example, the Structure of Populations, Levels of Abundance and Status of Humpbacks (SPLASH) study, a collaboration among many researchers, will ultimately provide an estimate of humpback whale abundance in the entire North Pacific, including California waters.



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### California Brown Pelicans: Back from the Brink

By Franklin Gress, Research Ecologist, California Institute of Environmental Studies and Department of Wildlife, Fish, and Conservation Biology, UC Davis

During the late 1960s and early 1970s, California Brown Pelicans (*Pelecanus occidentalis californicus*) had almost no breeding success at colonies in the Southern California Bight (SCB), including Anacapa Island. Most eggs laid during this period had extremely thin shells that broke or were crushed during incubation. Eggshell thinning was caused by high levels of DDT in the marine environment.

The subspecies was placed on the Federal endangered species list in 1970 and on the State of California list in 1971. In 1970, only one pelican chick fledged from about 550 nests on Anacapa Island; also in that year, regulatory measures curtailed input of DDT into the marine environment. The first signs of recovery were observed in 1974-75, but reproduction did not show significant improvement until the mid-1980s.

The Anacapa Island breeding effort increased from 200-400 nests per year in the mid-1970s to 5,000-7,000 in the mid-1980s. The average annual number of nests since 1980 is about 4,000; it is the largest, most consistent Brown Pelican colony in the SCB. An estimated 70-75 percent of the total SCB breeding population nests on Anacapa Island.

The size of the breeding effort varies in response to food availability. Since 1993, we have not had a breeding effort less than 2,500 nest attempts; the low years coincide with severe El Niños. We still see occasional effects of DDT, but environmental levels in the SCB appear to have stabilized. Average eggshell thinning since 1984 is about 3-5 percent, a level that is not likely to cause population changes.

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## 25 Years of Biological Monitoring

### Good News for Xantus's Murrelets

By Darrell Whitworth, Wildlife Biologist, California Institute of Environmental Studies

The sanctuary and Channel Islands National Park provide homes for around half of the world's population of Xantus's

Murrelets (*Syntliboramphus hypoleucus*)—some 10,000 to 15,000 birds. The State of California listed this species as threatened in 2004.

Few people ever see these small black and white seabirds, which live at sea and return to land only to nest. They breed in sea caves, cliffs, and steep slopes, concealing their nests in rock crevices or under bushes. Unfortunately, their eggs are vulnerable to predators, with introduced rats posing a particular threat.

The largest murrelet colony in California is on Santa Barbara Island, which is free of introduced rats. Between 2000-2002, 42 percent of Anacapa Island's murrelet nests were destroyed by rats; following a successful rat eradication program, hatching success now exceeds 80 percent.

To determine the status of Xantus's murrelets, the sanctuary and the California Institute of Environmental Studies launched nine research cruises in 2004 that surveyed the entire coastlines of Santa Cruz, Anacapa, Santa Barbara, and Santa Catalina islands, plus large portions of San Miguel and Santa Rosa islands. Baseline information from these surveys will help researchers understand the threats that confront this species.

In 2005, surveys found record numbers of nests at Anacapa Island, with the birds occupying habitats unused for nearly a century—truly good news for Xantus's Murrelets.

### Christmas Tree Coral

By Milton Love and Donna Schroeder, Research Biologists, Love Lab, UC Santa Barbara Marine Science Institute

When you are a marine biologist, sometimes the most interesting things hide in plain sight. For the past 10 years, we have used the research submarine Delta to survey fishes in the sanctuary. From just about the first day, we saw large, tree-like structures up to 10 feet tall in lovely shades of white, red, pink, or orange-brown. And while we were pretty sure they were some sort of black coral, our colleague Mary Nishimoto started calling them Christmas Trees. Soon we all called them that.

Out of curiosity, we plucked branches from two colonies and sent them to Dr. Dennis Opreko, the black coral expert at the Oak Ridge National Laboratory. "It's a new species of black coral in the genus *Antipathes*," he informed us. "What do you want to call it?" Christmas Tree Coral was our answer.

So what do we know about *Antipathes dendrochristos*? Well, they don't live just anywhere. They prefer clear waters between 300 and 1,200 feet deep, and they like sticking onto boulders. The good news is that they indicate a healthy environment because they can be knocked off rocks by destructive fishing activities or die from large amounts of pollution. So far, we have seen Christmas Tree Corals at only a handful of sites in southern California, and some of the largest colonies are inside the sanctuary.



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### Where Have Most of the Cowcod Gone?

By Milton Love and Donna Schroeder, Research Biologists, Love Lab, UC Santa Barbara Marine Science Institute

The folks in our lab count fishes with SCUBA and research submersibles around natural reefs and oil platforms throughout southern California. And, while it's mostly fun because we love to count fishes, sometimes it's a bit sobering.

Take the fishes that live on the Footprint, for instance. The Footprint is an underwater mountain located in the sanctuary just outside the Anacapa Island-Santa Cruz Island Passage. Lying in water between 360 and 900 feet, much of this underwater feature is composed of massive boulders and deep caves strewn over steep-sided walls.

Forty years ago, the Footprint was an excellent place for many species of large fishes. It is likely that hundreds of thousands of big rockfishes—such as cowcod, bocaccio, and chilipeper—as well as other economically important species such as lingcod were caught here by recreational and commercial fishers.

But today, what do we see on the Footprint? Thousands of fishes, but almost all are small species. Most of the big species, the ones caught by the tens of thousands a few decades ago, are gone. No one knows how long it might be before the big fishes are back—although for species like cowcod, the answer is likely to be many decades.

## 25 Years of Biological Monitoring



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### Bison in the Sea: The Race to Save White Abalone

By Gary E. Davis, Visiting Chief Scientist, Ocean Programs, National Park Service

Thirty-five years ago, California divers gathered nearly 4,000 tons of abalone every year, creating fisheries worth millions. As supplies of popular pink and red abalones began to wane in the early 1970s, divers explored deeper reefs around the Channel Islands for even more valuable white abalone (*Haliotis sorenseni*). In 1972, commercial divers alone landed more than 60 tons of white abalone. Yet after just seven years, white abalone catches dropped to near zero.

No one worried because people believed there must be undiscovered reefs where divers didn't go, so some white abalone would escape. A large female can produce six million eggs a year. Unfortunately, the surviving white abalone were so few and scattered they could not find mates. The species received endangered species protection in 2001 and faces extinction.

For now, a rescue mission holds extinction at bay. By spawning wild brood stock in laboratories and raising the next generation for release into marine reserves, scientists, divers, and fishery managers hope to rebuild the collapsed fishery.

### Where Eagles Soar

By Kate Faulkner, Chief, Resources Management Division, Channel Islands National Park; and Jessica Dooley, Field Manager, Institute for Wildlife Studies

American bald eagles (*Haliaeetus leucocephalus*) disappeared from the Channel Islands in the 1960s primarily because of DDT in the food chain. Today visitors once again see bald



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eagles soar due to a restoration effort by the National Park Service and the Institute for Wildlife Studies.

After DDT was banned in 1972, bald eagles recovered in much of the U.S. However, southern California waters had unusually high concentrations of DDT, and bald eagles never recovered

on their own. Since 2002, 34 bald eagle chicks have been taken to Santa Cruz Island to be reared by an unseen hand in a hack tower.

When the chicks are about two months old, they take flight—equipped with GPS transmitters to track their movements. Most of the birds have remained on the Channel Islands, traveling throughout the northern island chain. Some birds took off for the mainland and didn't survive; others ranged throughout the western United States.

Currently there are approximately 25 bald eagles living on the northern Channel Islands. We expect the first nesting to occur in 2006. Until the birds lay eggs, we will not know whether the environment has recovered enough from DDT contamination to allow them to successfully reproduce.

### Giant Sea Bass Live!

By Kathy deWet-Oleson, KdO Diving, Research, and Photography

Giant sea bass (*Stereolepis gigas*), also known as black sea bass, were once abundant in southern California. One of the earliest accounts of giant sea bass behavior comes from Charles F. Holder in his 1910 book *The Channel Islands*. However, little scientific work has been conducted with this species.

When the sanctuary was designated in 1980, the giant sea bass population was already severely depleted. The California Department of Fish and Game was in the process of protecting the species from commercial and sport fishing. By 1982, laws of protection went into effect that remain today. Yet for almost two decades, encounters with giant sea bass remained rare.

In 1997, during a routine dive on the north side of Anacapa Island, I experienced an unprecedented sighting of 12 sub-adult and giant sea bass. Using the roving diver technique combined with video recording, the Island Giant Sea Bass Monitoring Project now monitors seasonal aggregation sites and behavior.

Since 1999 we have logged 800 dives searching for giant sea bass around Anacapa Island and recorded over 200 sightings. Notable species behaviors include utilizing specific habitats, posturing for and receiving cleaning, changing color patterns, and pre-spawning behavior such as territorial displays, circling in pairs or small groups.

Two areas that produce seasonal sightings at Anacapa Island are located within state marine protected areas, providing an ideal opportunity for continued monitoring. To learn more about the Island Giant Sea Bass Monitoring Project, visit <http://home.earthlink.net/~kdocean>



©Kathy deWet-Oleson

## 25 Years of Biological Monitoring

### Kelp Forest and Invertebrate Trends

By Jack Engle, Associate Research Biologist, Marine Science Institute, UC Santa Barbara

When Channel Islands National Park and Marine Sanctuary were established, a number of agencies, universities, foundations, and volunteers initiated marine monitoring programs. These periodic surveys have documented patterns of change over the past 25 years.

The Channel Islands experienced a warm-water regime between 1976-1998, highlighted by El Niño extremes in 1983-84, 1986-87, 1992-93, and 1997-98. Giant kelp was decimated. Sea urchins emerged from crevices to overgraze algae. Lush kelp forests changed to low-diversity "barrens" dominated by red, purple, and white urchins. The white urchin boom ended by the 1990s, but purple and smaller red urchins continued to prevail.

Kelp forests partially rebounded during the early 1990s but declined after the severe 1997-98 El Niño. Since then, cooler sea temperatures have resulted in gradual recovery at cold-water islands (San Miguel, Santa Rosa, San Nicolas, western Santa Cruz) and warm-water islands (San Clemente and Santa Catalina).

Transitional islands (Santa Barbara, Anacapa, eastern Santa Cruz) remain largely urchin-dominated except for Anacapa's "no-take reserve." These islands have also experienced population explosions of brittlestars, while cold-water islands periodically exhibit carpets of tiny sea cucumbers.

Diseases have greatly affected marine invertebrates between 1980-2005. Wasting disease caused

die-offs of seastars, sea cucumbers, and urchins during warm-water episodes. Withering syndrome and harvesting devastated five species of abalone.

Continued monitoring inside and outside marine protected areas will help us understand the complex interactions of climate, disease, and harvesting that affect kelp and invertebrates.

### Pinniped Populations Update

By Sharon Melin, California Current Ecosystem Program, NOAA Fisheries, National Marine Mammal Laboratory

Since 1969, NOAA Fisheries has conducted studies on the six species that comprise the Channel Islands pinniped community. Four species that breed on the islands—California sea



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lions, Northern fur seals, Northern elephant seals, and harbor seals—have increased steadily. The Steller sea lion disappeared from the islands in 1984, and the Guadalupe fur seal is an occasional visitor.

California sea lions breed on four of the Channel Islands during the summer and occur on the islands year round. The populations on San Miguel and San Nicolas islands are the largest, followed by colonies at San Clemente and Santa Barbara islands. The population has increased about five percent annually except during El Niño events in 1983 and 1997, when the population decreased sharply. Recently, population growth has slowed to one percent due to high pup mortality from disease. The current population estimate is 230,000.

Northern fur seals are summer residents of San Miguel Island. Immigrants from a large breeding population in the Bering Sea established a small colony at San Miguel Island in the 1960s, which is the southern extent of their range. The population has grown exponentially from a few animals in the early 1970s to over 9,000 in 2004. Decreases in population growth resulted from El Niño events in 1983 and 1997, and more recently from high pup mortality due to disease.

Northern elephant seals breed from Baja California to the Farallon Islands. Elephant seals were believed to be extinct by the late 1880s; however, small populations persisted in Mexico and colonies reappeared in the Channel Islands by the 1950s. The population has increased steadily and is estimated at 100,000, with the largest colonies at San Nicolas and San Miguel islands. Elephant seals occur on the Channel Islands year round but breed in winter, which allows them to utilize habitat occupied by northern fur seals and California sea lions in summer.

Harbor seals are found year round on all the Channel Islands and breed in the spring. Their numbers increased steadily during the 1980s but slowed during the 1990s, possibly due to competition for breeding space with molting elephant seals. The current population is estimated at about 5,000 animals.



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