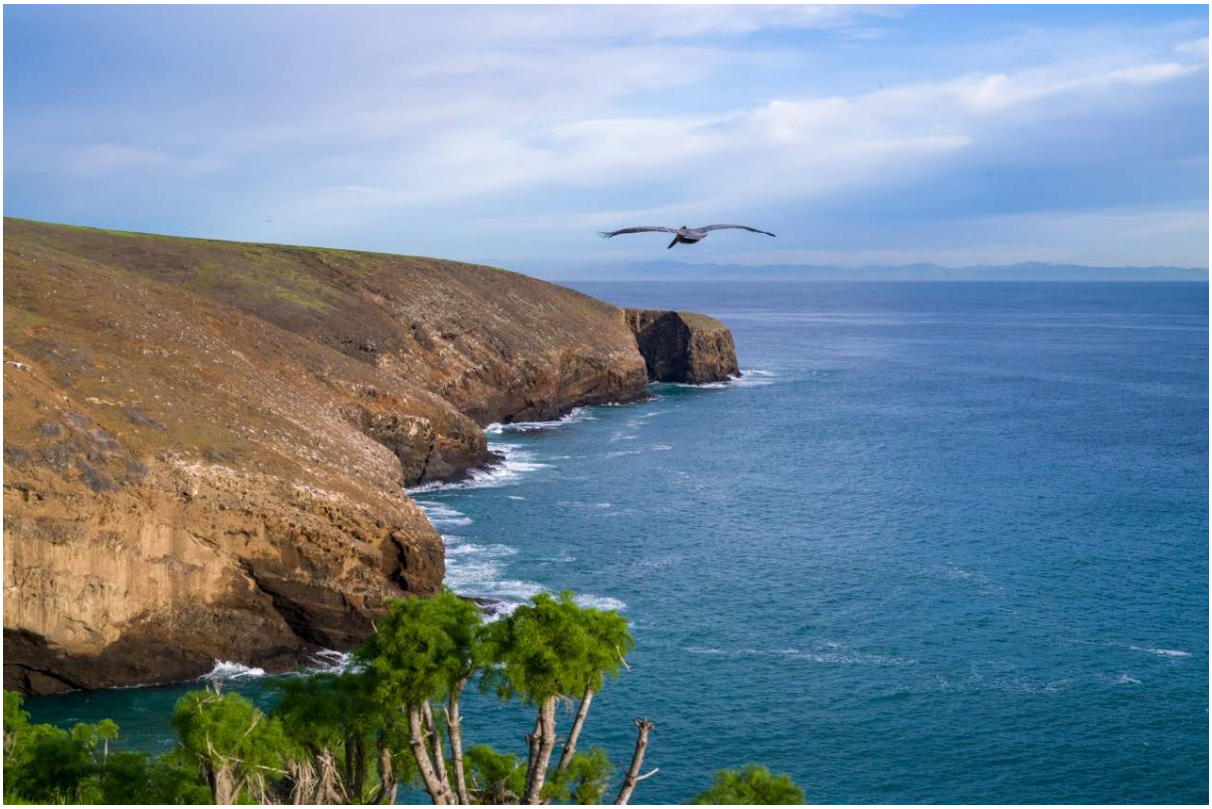
THE COALITION TO PROTECT AMERICA'S NATIONAL PARKS
VOICES OF EXPERIENCE

CHANNEL ISLANDS NATIONAL PARK

Science Drives Recovery Above & Below the Surface



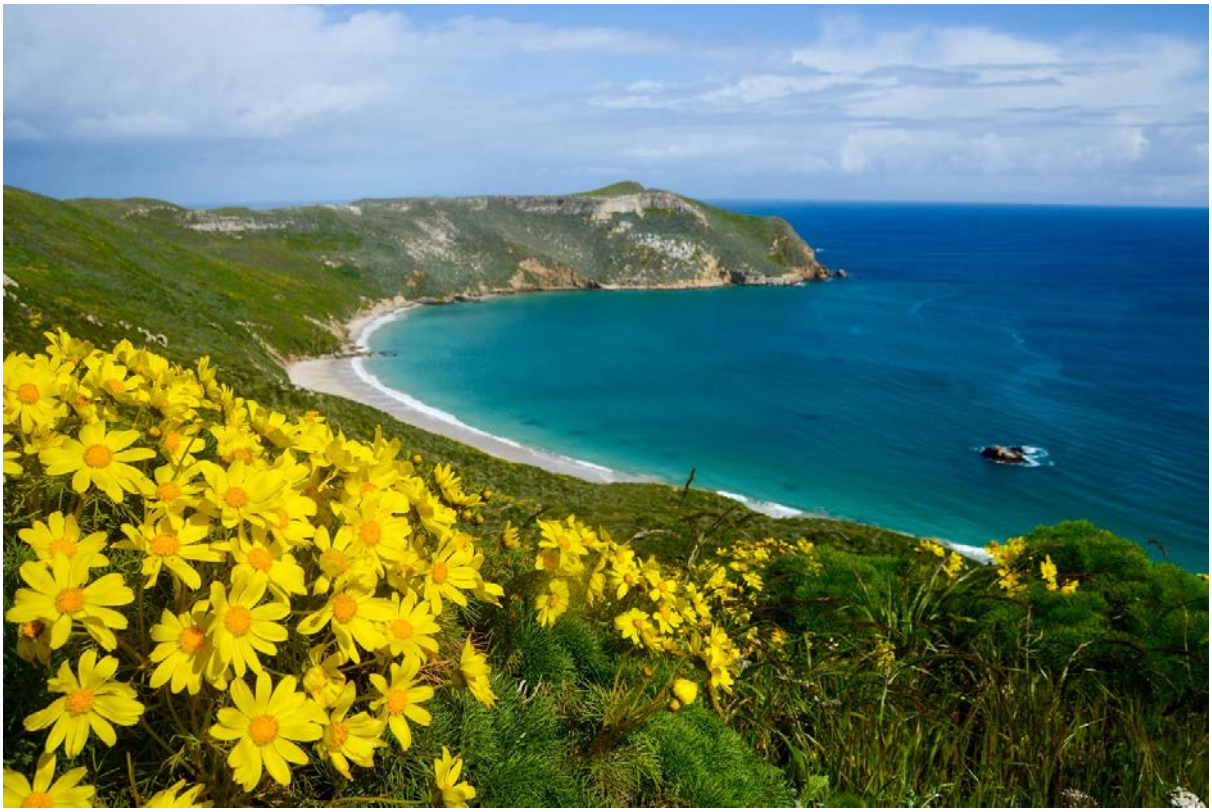
A Pelican flying off Santa Barbara Island with Arch Point in the background. NPS Photo by Sean Pickton.

Hidden off the coast of California, five islands rise out of the Pacific, often shrouded in mist but always teeming with life. On the surface and below, Channel Islands National Park is one of the most biologically rich marine environments in the world. The park consists of the islands of San Miguel, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara and is one of the most stunning and unique national parks in the United States.

For those visiting Channel Island National Park, the journey begins before they even step foot on the islands.

“The crossing is part of the magic,” recalled Jasmine Reinhardt, former Chief of Interpretation, Education, and Volunteers for the National Park Service (NPS). “You feel the spray of the ocean, see the dolphins riding alongside the boat and you realize you’re heading somewhere truly different.”

Beneath the surface, towering kelp forests filter sunlight into something like stained glass. On land, one of the smallest foxes in the world watches curiously from the brush. But the incredible flora and fauna that visitors to the island see today is not an accident; their survival is a result of decades of science stewardship and persistence.



The remote and biodiverse landscapes of Channel Islands National Park are important habitat for this Seussian plant, along with many other native and endemic species. NPS Photo by Reuven Bank.

The Pulse of the Park: A Blueprint for Success in Science Based Management

Channel Islands is home to the longest running scientific monitoring programs in the NPS. Since the 1980s, scientists have been tracking the "vital signs" of the park. This includes species populations, ocean conditions, and ecosystem changes. This work has carried on year after year, and decade after decade.

That consistency is what makes the park a powerful example of the success of science-based management. It is places like this that provide an ecological baseline to measure change.

"Long-term data is how we understand what's really happening," says former NPS Biologist David Kushner. "Even if a biologist works somewhere for 30 years, that's only a snapshot. Some of these species live a century. Without continuity, you're guessing."

Monitoring at Channel Islands is highly specialized, labor-intensive work that requires NPS staff with knowledge, skills, and training in the field. Divers spend hours underwater collecting data in precise locations and following protocols refined over generations.

"You can have the best protocols in the world," Kushner noted, "but without experienced staff, you lose the ability to do it right."

For Russell Galipeau, former Superintendent of Channel Islands National Park, the role of science is straightforward. "If you stop doing science, you lose your vital signs. It's like not going to the doctor. You don't know what's wrong until it's too late."

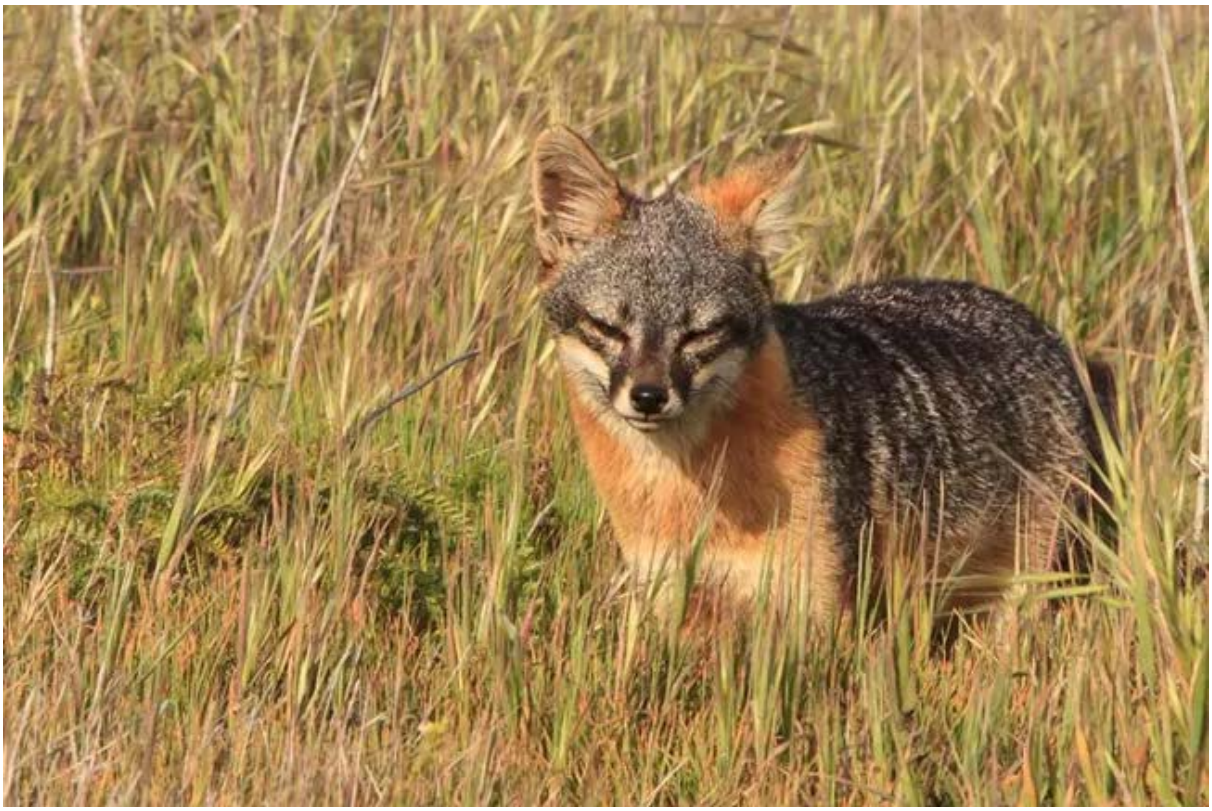
Monitoring those "vital signs" has made all the difference between loss and recovery. The right people, methods, and data over time help trigger the right signals of when and how to act.

Giant kelp grows on top of a live pink abalone, its hold fasted to the abalone's shell. NPS Photo by Reuven Bank.

From the Brink of Extinction: The Island Fox

In the 1990s, park biologists realized something was wrong with island foxes, which are endemic to Channel Islands. Through long-term monitoring, scientists noticed their population had decreased by over 90 percent in just a few years.

At their lowest point, the numbers were distressing. On San Miguel Island the population was once 450 foxes. "We went down to 15 foxes," recalled Tim Coonan, a wildlife biologist who spent more than two decades studying island foxes at Channel Islands National Park. "Only a few of them were breeding. The numbers were not in our favor."



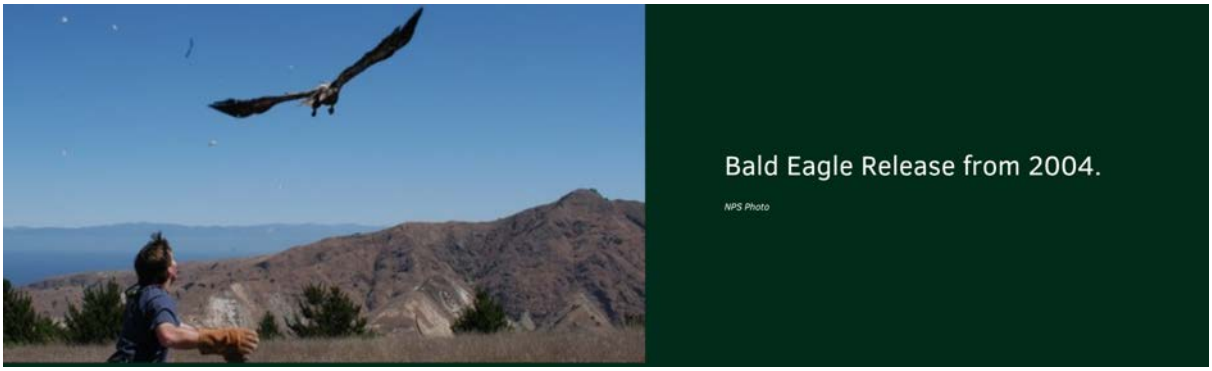
The berries of the Manzanita are a favored plant of the endemic island fox. NPS Photo.

The loss deeply impacted the biologists and park staff tracking the island foxes. "We knew them as individuals," Coonan said. "We followed them year after year, we watched them raise pups. And then they were gone."

Scientists and park managers had to step back and look at the ecosystem as a whole to understand what was out of balance. This resulted in one of the most ambitious ecosystem restoration efforts in National Park Service history.

Previous years of ecosystem monitoring on the island was analyzed to uncover the mystery of the island foxes decline. It was the result of an ecological chain reaction:

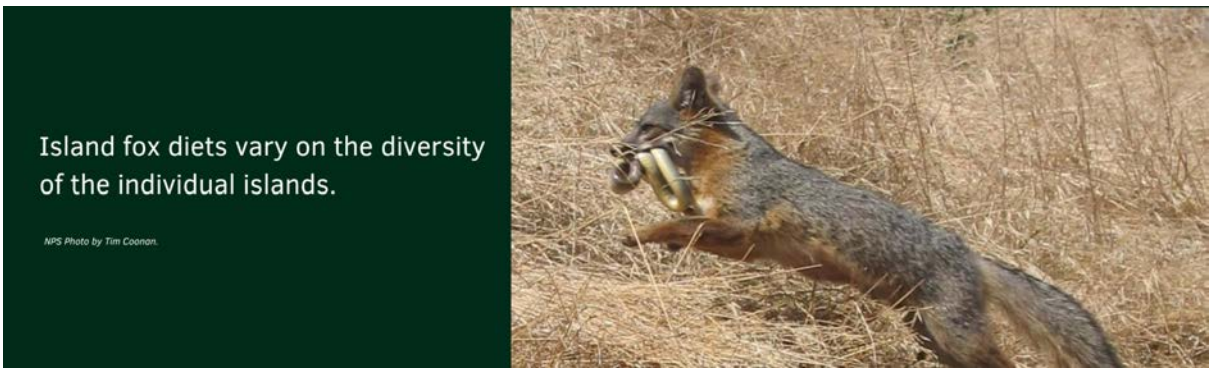
- Island foxes served as prey for golden eagles, but they were not abundant on the island.
- Then non-native pigs were introduced to the island, a food source that attracted more golden eagles.
- Bald eagles were missing from the ecosystem due to DDT. Bald eagles preyed on fish and not island foxes, began to be outcompeted by the golden eagles, who became the apex predator.
- The golden eagle population grew, and island foxes began to disappear.



Former Superintendent Galipeau learned from long-time research biologist Gary Davis that "Ecosystem management is like a puzzle. When you put the wrong pieces in, such as non-native species like pigs or rats, you destroy the whole picture, or in this case, the ecosystem. The work is about removing those extra pieces and allowing natural processes to prevail."

This triggered a coordinated effort within the park to balance the ecosystem and help save the foxes.

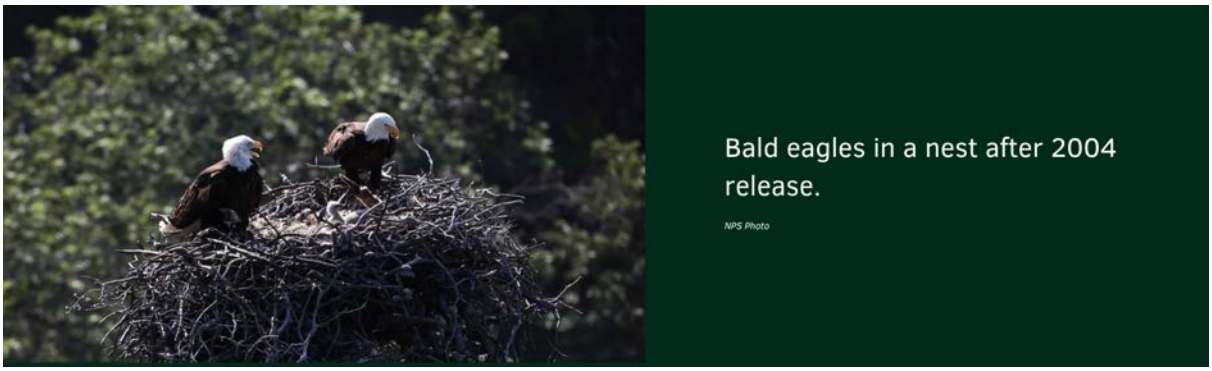
"We didn't know if we could capture golden eagles," Coonan said. "We didn't know if bald eagle recovery would work. It was a very uncertain path."



In the end, the project was a success. The NPS removed the pigs, relocated golden eagles, reintroduced bald eagles, and increased the island fox population through captive breeding. Within a few years, island foxes bred successfully in captivity and once reintroduced, quickly established themselves in the wild.

"They knew what to do," Coonan said. They found each other. They bred. They helped rebuild the population."

> **"None of this work happens in isolation. At Channel Islands, everyone plays a role. Scientists, park rangers, resource managers, and park partners. We are all working together in remote conditions to understand and protect the park."**
>
> — Yvonne Menard, former Chief of Interpretation, Education, and Volunteers.



Bald eagles in a nest after 2004 release.

NPS Photo

The collaboration extended beyond the on-the-ground work. In an early public outreach effort, the NPS and partners broadcasted a live bald eagle nest. Cameras were powered by solar panels hauled into place by hand. More than a million people tuned in.

"People got hooked," Menard recalled. "They connected to the story and that connection matters."

Ultimately, "monitoring saved our butts," biologist Tim Coonan said. "Without the monitoring and data, the population collapse might have gone unnoticed until it was too late.

While the island foxes remain one of the fastest-recovering mammals under the Endangered Species Act, they are not out of danger in the long run. The island fox is one

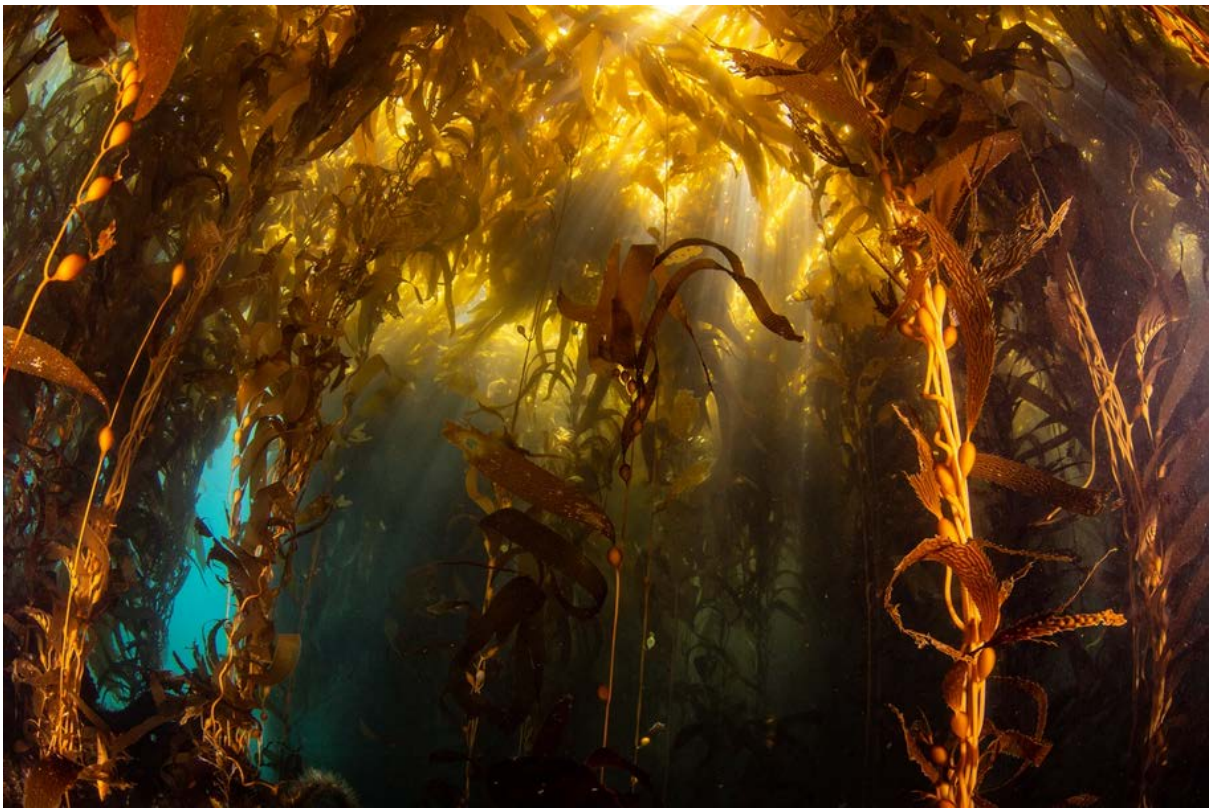
of the most geographically restricted canines in the world, with relatively small populations and limited resilience to sudden change.

"Drought reduces food, lowers reproduction, and increases mortality especially in the youngest and oldest foxes," Coonan explained. "Climate change is likely to make those extremes more common."

That vulnerability is exactly why monitoring must continue. "If we stop monitoring, we're in the dark. No one wants to be party to a species becoming extinct" says Galipeau.

At Channel Island National Park, the recovery of the island fox is proof of what is possible when science helps detect a problem early on, and when those entrusted to manage national parks have the resources to act in time.

Life Beneath the Surface: Science that Shapes Policy



Sunlight breaks through the canopies of the underwater kelp forests in Channel Islands National Park. NPS Photo.

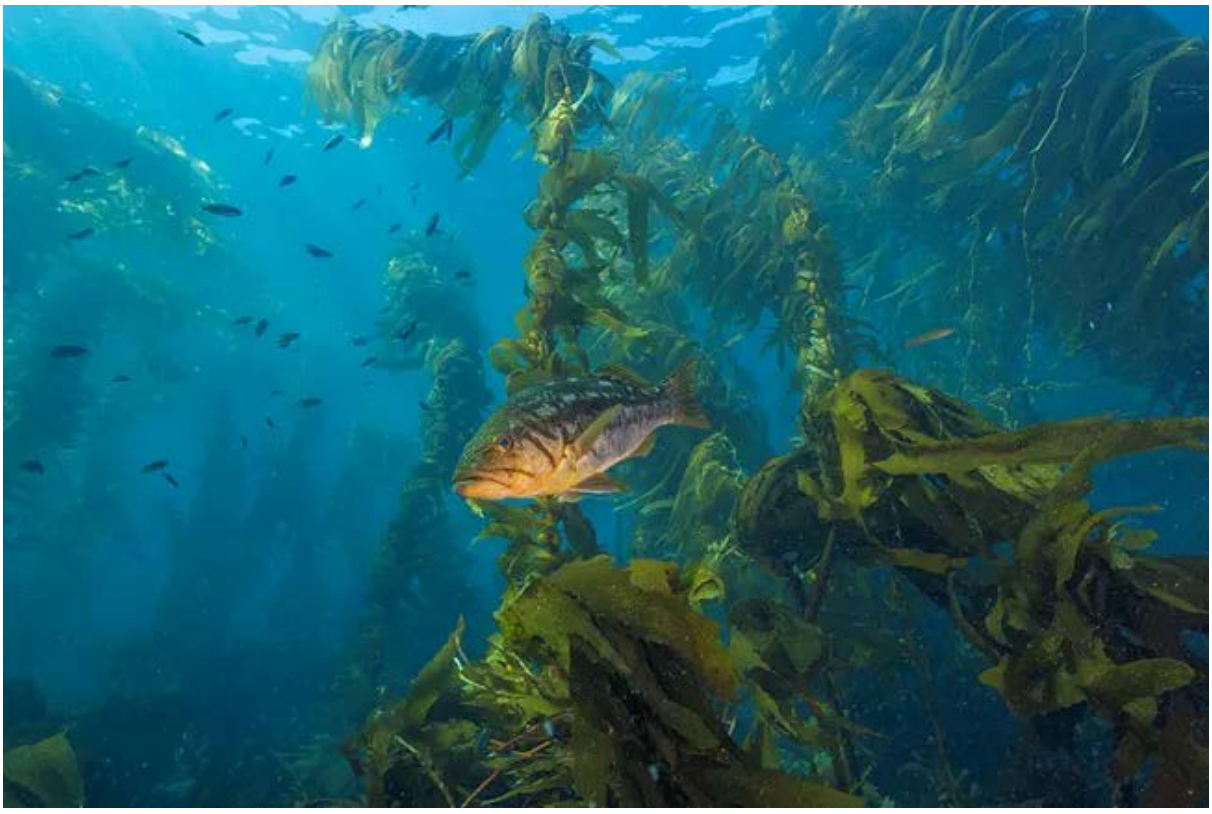
Beneath the surface of Channel Islands National Park lies a dynamic and remarkable ecosystem. Towering kelp forests support nearly a thousand species of plants and

animals, thriving in a zone where the cold northern currents meet warmer, southern currents. This confluence fuels an explosion of life that is constantly in motion and transformation, often invisible to the human eye.

For those who experience it, the underwater world is unforgettable.

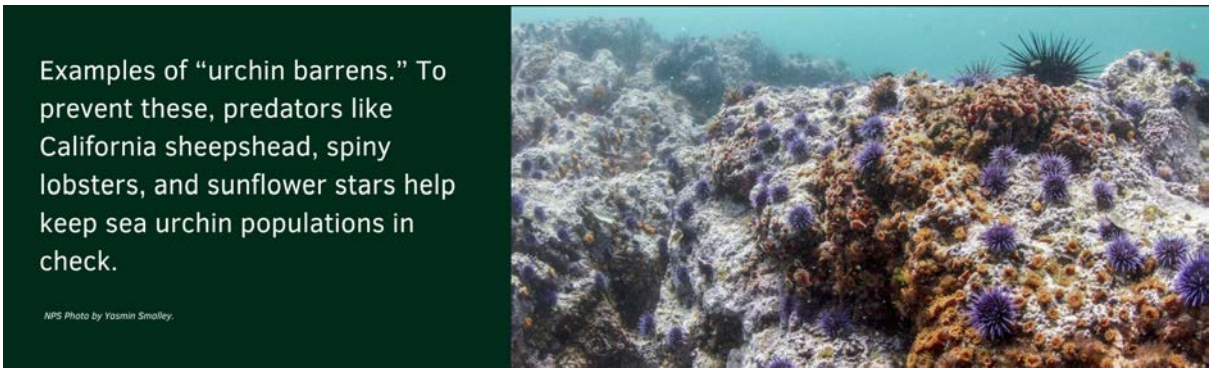
"Having the sun shining through a kelp forest, it's like swimming through stained glass windows. The multicolored fish add to this kaleidoscope of nature, which can be mesmerizing until you are brought back to reality by a curious sea lion next to you," says Jasmine Reinhardt, a former Chief of Interpretation, Education, and Volunteers at Channel Islands National Park. "It's something most people don't even realize exists."

Since the 1980s, National Park Service scientists at Channel Islands have tracked the health of kelp forests, intertidal zones, and marine species, resulting in one of the most comprehensive long-term marine datasets in the National Park System.



Fish in Kelp. NPS Photo Brett Seymor.

"We were establishing baseline conditions, understanding what species were there, how many, and how they changed over time," says former NPS marine biologist David Kushner, who spent more than three decades studying the park's ecosystems. "Without that, you don't know what 'normal' looks like."



That baseline is essential to understanding the delicate underwater ecosystem in the Channel Islands. Menard agrees saying "You need decades of data to understand what's normal. Ocean conditions are incredibly complex. One year might look extreme, but without long-term monitoring, you don't know if it's part of a cycle or something that is fundamentally changing."

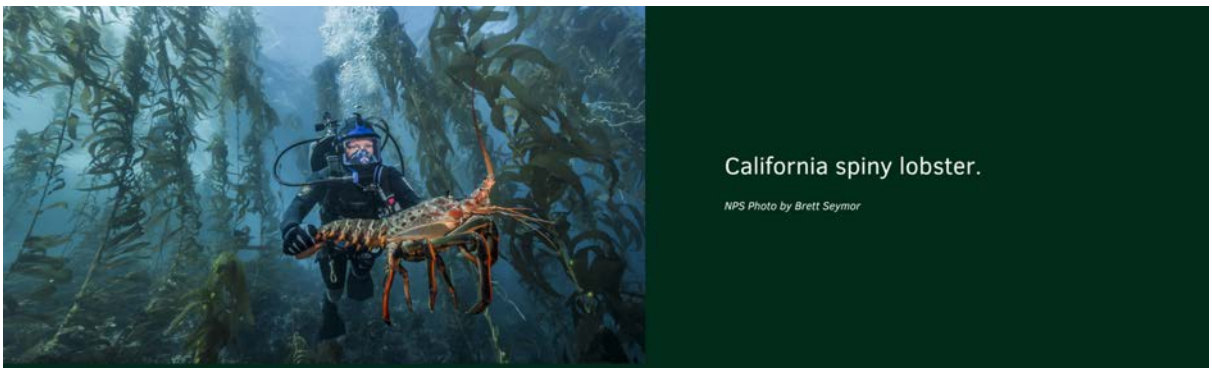
Discovering that the kelp forest ecosystem can disappear in a matter of weeks when overrun by sea urchins committed park staff to monitoring the downfall. Park scientists knew that when the natural predators are reduced by overfishing, vast "urchin barrens" occur and little else can survive.

It turned out that the protected waters around Channel Islands National Park tell a different story. They are sheltered from overfishing. Inside these protected waters, ecosystems remain far more intact.

> **"Within marine protected areas, the system is still functioning. You still have predators. You still have the structure of the ecosystem. Beyond the protected waters, the contrast is stark. It can look like a bomb went off. Overfishing has removed too many of the key species that keep the system in balance."**
>
> — **David Kushner, NPS Marine Biologist**

The monitoring work conducted by NPS staff played a critical role in establishing marine protected areas, and contributed to the designation of the surrounding Channel Islands National Marine Sanctuary, which protects an additional 1,470 square miles of ocean.

Protections limit the "take" of marine resources while ensuring the area remains open for visitors to experience and enjoy. And the results are measurable. The populations of spiny lobster and sheepshead - species that take decades to mature - have rebounded. This has helped to restore ecosystems that were once overwhelmed by sea urchins.



However, resilience is not guaranteed. Marine ecosystems operate on long timelines. Many species reproduce slowly, rely on rare successful recruitment events, and can take decades to reach maturity. Disruptions like overfishing, climate change, or disease can take years to reverse.

"You can't understand that without long-term monitoring," Menard said. "And you can't manage it without the knowledge."

By monitoring the dynamic and often invisible ecosystems beneath Channel Islands National Park, we track essential changes that directly inform how we protect the ocean itself.

A Model of Success Built on People, Science, and the Long View

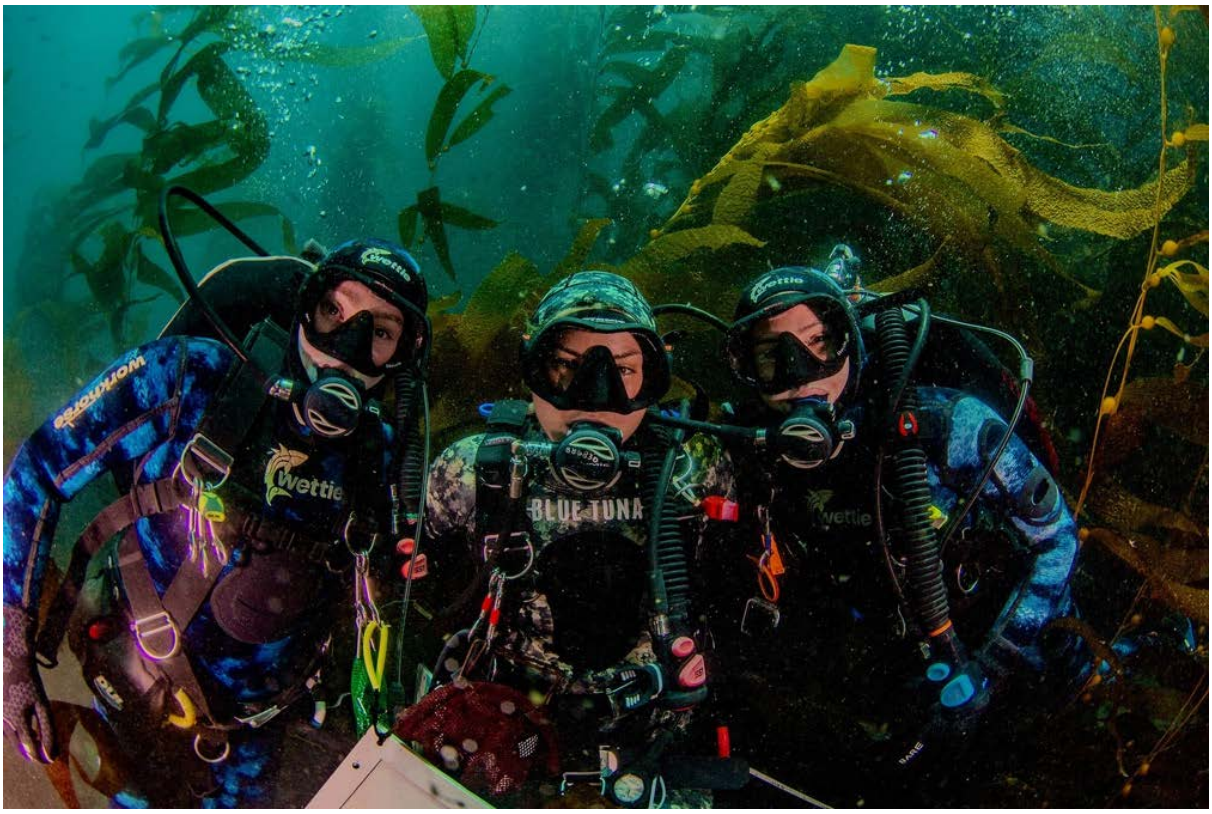
Behind every dataset at Channel Islands is a team of people who dedicate themselves to leaving things better than they found it.

"None of this work happens in isolation," adds Menard. "Everyone plays a role."

From scientists and divers to educators and managers, the successes at Channel Islands are built on expertise, collaboration and communication.

The health of the underwater ecosystem and the rebound of island foxes at Channel Islands demonstrates what is possible when science, stewardship, people, and time are allowed to work together. Ecosystems can recover. Species on the brink of extinction can come back.

But continuity and staff capacity are essential. "There's a depth of knowledge that comes from staff returning year after year," says Menard. "If we stop monitoring," warns biologist Tim Coonan, "we're in the dark."



Scientists from the Kelp Forest Monitoring team at Channel Islands National Park, a program that's been tracking marine biodiversity for over 40 years. NPS Photo by Scott Gabara.

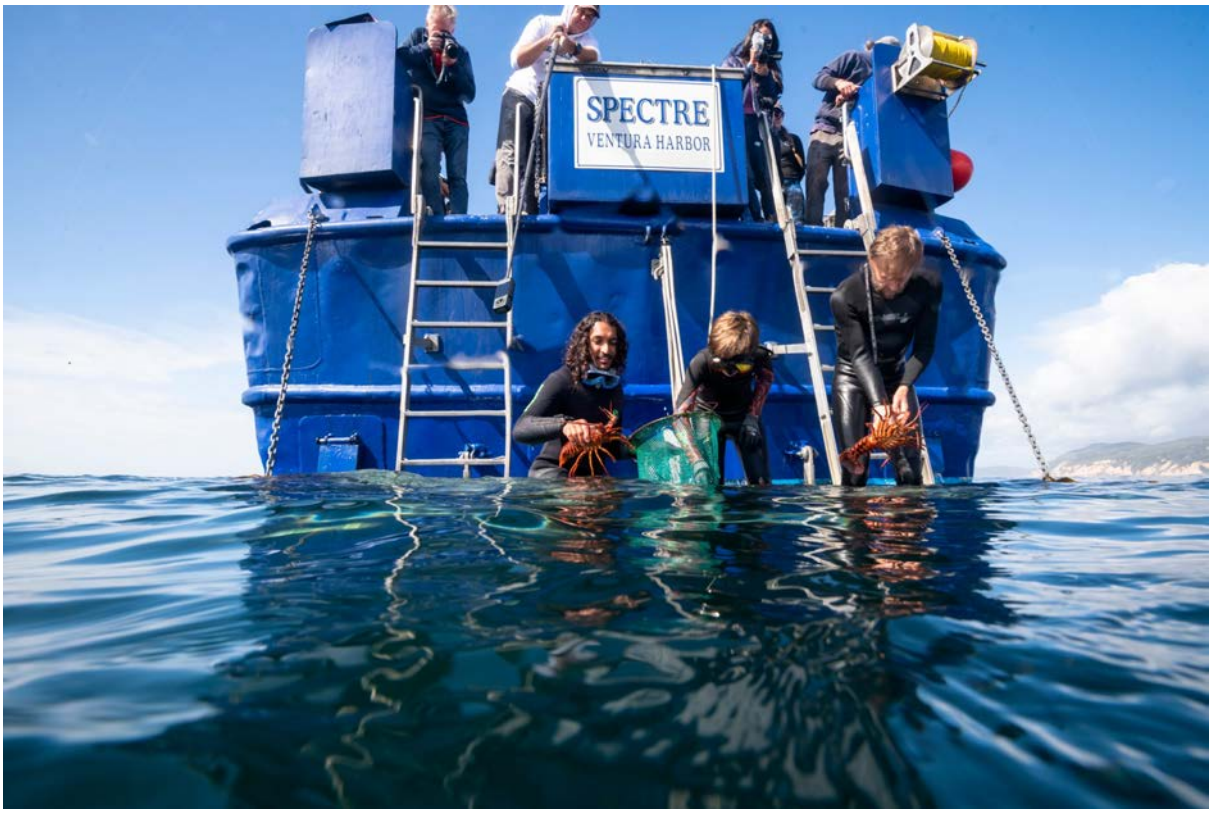
Marine biologist Gary Davis, who worked with the NPS for decades, believes that "the biggest thing we can give people is hope. And hope is grounded in real places, real recovery, and the belief that if we keep trying, we can get it right."

Parks Are Proof

To carry that hope forward, continued investment in science, long-term monitoring, and NPS employees who do the work is critical to the sustained health and future of the irreplaceable resources at Channel Islands National Park.

"The National Park Service is in the forever business," says former Superintendent Galipeau.

"And we have seen the past successes at this national park that have protected incredible resources for visitors to enjoy today. The work at Channel Islands provides proof that ongoing science in our parks matters. We just must make sure we don't jeopardize the future of Channel Islands and parks across the country by losing sight of the importance of a fully staffed and funded National Park Service, who can utilize science to help protect these parks today for the enjoyment of future generations."



Channel Islands National Park participated in a multi-day effort in conjunction with researchers from UC Santa Barbara and the Spectre Dive Boat to retrieve ghost lobster traps from the waters off Anacapa and Santa Cruz Islands. NPS Photo.