

California's new no-fishing zones appear to be working, scientists say

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Six years after California put in place the nation's most expansive network of marine reserves -- a controversial experiment aimed at bringing back crashing populations of fish and other ocean species by creating dozens of "no-fishing zones" along the coast -- the effort appears to be working.

In the first major study of its kind, scientists have found that populations and sizes of several key species of fish, along with starfish, urchins, crabs and other sea life, have increased more in the protected areas established in 2007 between San Mateo and Santa Barbara counties than in unprotected ocean areas nearby.

Researchers cautioned that years of additional study are needed, noting that in some areas there was little or no difference. But overall, they said, the trends are encouraging -- a key finding because California's marine protected areas are being closely watched by other states and countries as a possible solution to improving the health of the world's oceans.

"So far, so good," said Mark Carr, a professor of marine biology at UC Santa Cruz. The 29 zones ban fishing over roughly 94 square miles and limit it in 110 additional square miles -- a combined area more than four times as large as San Francisco -- between Pigeon Point, south of Half Moon Bay, and Point Conception, near Lompoc. The areas make up about 18 percent of state waters out to three miles. Most fishermen opposed them, turning out in large numbers at public meetings to voice concerns. But scientists and policy makers who predicted they would act as nurseries for more and larger fish appear to be vindicated.

"It is fair for people to feel encouraged and optimistic," said Fred Keeley, a former Monterey Bay state assemblyman who co-authored the 1999 law that required the zones to be set up. "It is a more holistic, ecosystem-wide strategy to protect species. Species don't exist in vacuums. They exist in ecosystems."

The report, written by prominent California marine scientists, was released Wednesday to coincide with a three-day conference of marine biologists, fishermen and policy makers in Monterey called the "State of the Coast Symposium." Open to the public, the event is hosted by the state Department of Fish and Wildlife, California Ocean Science Trust and others.

The idea behind marine reserves, which are supported by organizations such as the Monterey Bay Aquarium, is to create national forests of the ocean. Rather than simply

having the government set catch limits and seasons for salmon, Dungeness crab, rockfish and other species, as has been the policy for decades, the concept is to draw boundaries where little or no fishing is allowed so fish, plants, crabs, starfish and other species can recover over decades, then seed larger areas of the ocean with their young.

After the state Fish and Game Commission held hearings and approved the rules for the Central Coast in 2007, it wrote similar rules for the rest of California's 1,100-mile coastline. The most recent ones, which took effect in December, extend from Mendocino to the Oregon border.

Fishing groups say they are still uncomfortable with the reserves.

"There have been economic losses to fishermen," said Zeke Grader, executive director of the Pacific Coast Federation of Fishermen's Associations in San Francisco. "A lot of these were unnecessary. They could have been done more carefully."

Grader said that while many

fishermen have moved to different waters, some -- particularly those who focus on smaller fisheries like spot prawns -- have gone out of business because of the fishing limits.

The new study showed a 70 percent decline in the number of commercial fishermen off California's central coast from 1992 to 2011.

Some of that drop is attributed to specific crashes in fish populations, including the sharp decline in salmon that led federal and state officials to prohibit all salmon fishing off California in 2008 and 2009. Despite that 70 percent decline, however, the total amount of fish commercially caught in the area has increased by roughly 50 percent since 1992, a trend driven by increases in the catch of squid and several other species. California's central coast is one of the world's most spectacular ocean areas. Famed for its kelp forests, rocky tide pools, sea otters, great white sharks and plunging marine canyons, the area is home to 26 species of marine mammals, 94 species of seabirds, four species of sea turtles and 340 types of fish.

Researchers who worked on this week's report spent years scuba diving, taking video from unmanned and manned submarines, walking miles of tide pool areas, and using high-tech imaging devices to make detailed images of the ocean bottom. They also worked with volunteer groups.

Scientists who participated came from UC Santa Cruz, Moss Landing Marine Labs, Cal Poly, the National Oceanic and Atmospheric Administration, CSU Monterey Bay, the state Department of Fish and Wildlife and the Monterey Bay Aquarium Research Institute.

Among their findings:

In kelp forests, a range of economically important fish species, including cabezon, lingcod and black rockfish, increased in abundance in marine protected areas compared with similar locations outside the areas from 2007 to 2012. Black rockfish, grass rockfish, cabezon and lingcod showed the largest increases.

Copper rockfish, rubberlip sea perch and yellowtail sea perch did worse in marine protected areas, however, than the unprotected areas.

Seven of 10 species of rockfish studied at Año Nuevo, Point Lobos, Piedras Blancas and Point Buchon were found to be larger in size inside the protected areas than outside. Larger fish tend to be older and have more larvae.

On rocky shores, numbers and sizes of black abalone and owl limpets increased inside protected areas, as did hermit crabs, purple urchins and starfish.

Point Lobos, south of Carmel, which has been protected for 40 years, has higher numbers and larger rockfish fish than newly protected marine areas in nearby Carmel Bay.

"You are no longer taking the biggest individuals out of the population," Carr said. "However, a lot of the species that are being fished grow slowly, so the changes take a while to detect."

