

Sea lion pups washing ashore because ocean can't support them

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Once a year in June, sea lion mothers on the Channel Islands give birth to a pup. For the next 11 months, the mothers swim off to forage for days to provide food for themselves and milk for their progeny.

But in early 2015, calorie-dense [sardines](#) and anchovies - the best food - were hard to find. The mothers were forced to dive deeper and swim farther, and by the time they returned to the islands, they didn't have much milk to offer.

The ocean, which in years past had been full with food, was different, emptier, than before. The pups, hungry, struck out prematurely that winter. They wound up stranded on mainland beaches in record numbers, emaciated and starving.

As El Nino bears down on California this year, worse is expected.

Marine mammal care centers are preparing for a rash of strandings. They do so even as some marine biologists and ocean advocates warn that such a compassion-laden response is little more than a futile attempt to wrap a Band-Aid on an oceanwide problem that could last decades and may have been worsened by overfishing.

"We treat them as sacred animals," said Geoff Shester, the California campaign director for Oceana, an environmental group. "In the end, it's shortsighted to believe you're going to save the sea lions simply by rescuing them, rehabilitating them and then sending them out when

there's not really enough food to go around.

"From a humane point of view, it makes sense, but it's really only addressing the symptom rather than the root cause."

No one knows how well the [sea lion](#) pups fare after rehabilitation, because "once you release them, the odds of seeing them again are really low, whether they make it or not," said Sharon Melin, a National Oceanic and Atmospheric Administration wildlife biologist who studies sea lions.

"If the environment is really bad and adult females can't find food, then a young pup that doesn't really have experience feeding itself is going to have trouble, too," Melin added.

In a normal year, the Pacific Marine Mammal Center in Laguna Beach, which relies on donations and government grants, will rehabilitate 100 to 120 sea lions. It may take in one that re-stranded after getting treated.

In 2015, the center rescued a record-setting 534 sea lions, including more than two dozen that had re-stranded. The center is braced for even more this year.

"That's a high number, but it shows there's something wrong out in the wild," said Keith Matassa, the executive director at the mammal center.

What exactly is wrong, and why, is much less clear.

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Every year for the past 35 years, NOAA research biologist Mark Lowry has chartered a plane and taken more than 6,000 aerial photos of sea lions at their Channel Island rookeries, where 99.8 percent of the U.S.

sea lion population breeds. Later, in his office, he assembles the photos into a mosaic. Over the course of several months, he counts the sea lions one at a time.

By performing a series of calculations on the pup count number, he can come up with an estimate for the entire sea lion population.

Between 1975 - three years after the passage of the federal Marine Mammal Protection Act, which outlawed the killing, capture or harassment of all marine mammals - and 2012, the pup population grew an average of 5.5 percent per year, to roughly 300,000 today. Such growth cannot continue indefinitely, and has, in fact, already flattened.

Historically, El Nino events such as the one California is experiencing now caused pup production to plummet. But three years ago, something changed. It wasn't an El Nino season, and births were very low. Something else was going on.

"The ecosystem changed," Lowry said. "Those poor animals are having a really hard time right now."

It's what El Nino does to sea lions' food supply - specifically the nutritious sardines and anchovies they prefer - that makes them suffer.

The health of those fish populations is driven by climate, said Dave Checkley, an oceanography professor at Scripps Institution of Oceanography in La Jolla. Specifically, it's the way climate affects wind and ocean currents.

Plankton, which are eaten by fish, need nitrogen and sunlight to survive. When the wind currents are right, nitrogen and other nutrients are drawn up from the deep ocean to the sun-filled surface through a process called upwelling. The intensity and type of the wind changes over the course of

decades because of varying climate cycles.

Whenever "the blob" - an unusually warm patch of water parked off the West Coast - or El Nino or something else prevents that upwelling, the plankton, fish and sea lions pay the price.

Last year, the blob prevented upwelling. That warm water has mostly dissipated, but now El Nino is having much the same effect.

In recent years, as ocean conditions have changed, the sardine and anchovy populations have collapsed. And fishing may be exacerbating the problem.

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Though they're often spoken of together, sardines and anchovies "march to the beat of different drummers," as Checkley said.

Sardines live farther from shore and anchovies live closer. Sardines prefer warm water and eat the smaller plankton that thrive there. Anchovies prefer colder water and the larger plankton that come with it. Sardines are most common off the West Coast of the United States, while anchovies are more plentiful off Peru.

After a sardine collapse in the 1950s, the fish essentially disappeared until the late 1980s and early 1990s, when population growth accelerated. At their peak in the early 2000s, they could be found as far north as Vancouver Island in Canada, a place they migrate to only when the population is high, above 700,000 tons.

Then came a slide. In 2013 and 2014, Canada saw no sardines - an early warning sign. A stock assessment in 2014 contained a now-recognized error that allowed fishing to continue that year.

In 2015, a new stock assessment revealed that the sardine population had dropped below a threshold of 150,000 tons. Federal regulators closed the fishery.

It was a collapse that two NOAA scientists - David Demer and Juan Zwolinski - had forecast as "imminent" several years before. The prediction was little heeded at the time, and fishing continued.

Though ending fishing wouldn't have staved off the collapse, "any removal of fish will accelerate that decline," Zwolinski said.

To predict the collapse, Demer and Zwolinski tied sardine population health to a 60-year oceanic climate cycle called the Pacific Decadal Oscillation. In the 1940s and 1950s, just before that well-documented sardine collapse, the ocean was going through a cold-water cycle.

The same thing was happening in the late 2000s, the researchers noted, and the sardine population started to crash.

Even though the ocean switched a couple of years ago to the warm cycle that sardines prefer, the fish haven't started to recover. Demer predicts they won't until 2020 or 2025.

Anchovies had a much closer shave last year.

During the last quarter of the 20th century, fishermen largely targeted sardines, leaving anchovies mostly alone. By 1995, federal regulators were so unconcerned with anchovy populations that they set a maximum haul for fishermen - 25,000 tons per year - and haven't done another assessment of the stock for 20 years.

With such a low take, and fishermen not actually taking even that much anchovy, regulators figured there was no way fishermen could deplete

the population.

The anchovy population, low in the 1950s, stayed mostly stable until the mid-2000s. Then, between 2009 and 2011, it plummeted to fewer than 20,000 tons, according to an analysis of historic larvae and egg levels led by NOAA fisheries biologist Alec MacCall and published in the journal *Fisheries Research* in November.

"The estimated spawning biomass decreased by over 99 percent from 2005 to 2009, and merits the term 'collapse,'" the researchers wrote.

In the past few years, anchovy catches have risen dramatically. And with the population so low, fishing may now be having an outsize impact.

Pretty much all the fished anchovies are coming from the Monterey Bay area, where a large school has congregated.

"As of 2011, the stock was so low that if they had caught 25,000 tons, they might have done some major ecological damage," said Steve Marx, the Pew Charitable Trusts' lead policy expert on West Coast forage fish.

This fall, federal regulators will do an official stock assessment and consider updating the 25,000-ton rule.

Now that warm water conditions are prevailing, however, it's going to be difficult for the anchovy to recover. And as the anchovy continues to struggle, so will California's sea lions.

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In five of the past seven years, California sea lions have suffered either very poor survival rates or very low birth numbers, or both. In the coming years, those low reproductive rates will inevitably cause the first

drop in total sea lion population since the 1970s.

Marine biologists agree that, overall, the sea lion population is far from crisis, and not even close to extinction, even as record numbers of pups are expected to strand this year amid dire oceanic conditions.

More than 3,300 animals were stranded along the California coast through the first five months of 2015 - seven times the average for those same months during the previous 10 years.

"And a lot of them don't make it. They're so far gone they can't be saved," said Jim Dines, the mammalogy collections coordinator at the Natural History Museum of Los Angeles County.

The strandings this year already have started, like they did this time a year ago. Normally, sea lion pups shouldn't leave the Channel Island rookeries until spring, and historically that's the only time strandings occurred. Now, strandings seem to happen year-round.

To prepare, the Pacific Marine Mammal Center is hiring additional staff and interviewing volunteers. Last year, it opened a triage facility in Huntington Beach. Last week, 30 animals were getting rehabilitated at the Laguna Beach center.

"In December, we should have had no animals here. We shouldn't have animals around now," said Matassa, the executive director, giving a tour of the facility.

Matassa explained that without care centers like his, "you'd have everyone taking sea lions home and doing this in their bathtubs. You don't want that."

At the same time, Matassa recognizes that "we're not going to be able to

save every sea lion. ... Some of them are going to be humanely euthanized if they don't have a chance."

Nearby, a dozen sea lion pups clambered out of a pool as rainclouds overhead poised to unleash a storm. The pups waddled, launched themselves and slid across the wet concrete, barking happily.

"When things are really bad, you come down here and watch them play and slide and be healthy. And you remember why you do all the administrative work you don't want to do," Matassa said. "They came in half-dead."

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SEA LIONS

-Weight: 700 pounds for males; 240 pounds for females

-Length: 7.5 feet for males; 6 feet for females

-Lifespan: 20 to 30 years

-Diet: Squid, anchovies, mackerel, rockfish and sardines

-Range: Pacific Coast, from central Mexico to British Columbia

-Protected: Marine Mammal Protection Act (1972)

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