

No-fishing zones help endangered penguins

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African penguins. Credit: Richard Sherley

Small no-fishing zones around colonies of African penguins can help this struggling species, new research shows.

Working with the South African government, researchers from the universities of Exeter and Cape Town tested bans on catching "forage

fish" such as sardines and anchovies - key prey for the endangered penguins - from 20km around their breeding [islands](#).

The body condition and survival of chicks improved when the no-fishing zones were in place.

More research is needed, but the scientists say the fishing closures should continue in South Africa and should be considered elsewhere.

"The amount of [forage fish](#) caught worldwide is increasing and - although the effects are disputed - the impact on marine ecosystems could be severe," said Dr Richard Sherley, of the Environment and Sustainability Institute on the University of Exeter's Penryn Campus in Cornwall.

"Forage fish are a key link in the food chain as they eat plankton and are preyed on by numerous species including tuna, dolphins, whales and penguins.

"We need to do more to understand the circumstances in which small no-fishing zones will improve the food available to predators, but our research shows this is a promising way to help African penguins."



African penguins. Credit: Richard Sherley

The test areas were on a small scale compared to some no-fishing zones worldwide, which can cover hundreds of thousands of square kilometres.

Researchers examined colonies at Dassen Island, Robben Island, St Croix Island and Bird Island, and compared fishing bans of about three years with similar periods when fishing was allowed.

The study says evidence for overall effects was "subtle and inconsistent", with clear benefits for penguin populations at only two of the four islands.

Dr Sherley said it was difficult to discover the full effects of the no-fishing zones because many other factors also affect the birds.

"Decades of research may be needed to be absolutely certain of the impact on the penguins' population size," he said.

However, the researchers used a statistical method called Bayesian inference to demonstrate beyond doubt that the zones improved the health and survival rates of penguin chicks.



African penguins. Credit: Richard Sherley

"There's never going to be a quick answer to problems in complex ecosystems," Dr Sherley said.

"However, without conservation action, there's a good chance African penguins will go extinct in at least some of their current colonies.

"We are calling for a precautionary and adaptive approach - no-fishing zones to protect this species, with an open mind to change as more evidence emerges."

Dr Stephen Votier, senior author of the study, added: "This is an excellent example of how a collaboration between government, fisheries and scientists can lead to positive outcomes for conservation.

"Statistics have played an important role here - only by using the approach we adopted was it possible to understand fully that these fisheries closures do indeed work."

More information: Bayesian inference reveals positive but subtle effects of experimental fishery closures on marine predator demographics, *Proceedings of the Royal Society B*, rspb.royalsocietypublishing.org/doi/10.1098/rspb.2017.2443

Provided by University of Exeter

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