

PRBO Conservation Science
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Are penguins more fearful than hungry?

In the quest to understand what influences the survival of penguins in Antarctica in the face of environmental change, a new discovery has been uncovered; Penguins make choices about where and when to feed based on the risk of being eaten, rather than where the best (or most) food is. Researchers David Ainley (HT Harvey and Associates) and Grant Ballard (PRBO Conservation Science) recently published the findings in the journal *Polar Biology*. The results are important because how behavioral factors like these influence the survival of species has not yet been considered as important in understanding and conserving Southern Ocean food webs.

The review and new analysis evaluates Adélie and Emperor penguin feeding behavior in the context of risk aversion (or “fear of being eaten”), as opposed to simply “going where the food goes.” Although the penguins can find food successfully in dark conditions, such as those found deep under the Antarctic sea ice, penguins do not enter or leave the water in the dark of night. Entering and leaving the water is a time when penguins are susceptible to being eaten by leopard seals or killer whales, and doing so in the dark, when the penguins can’t assess whether or not predators are present, appears to hold more risk than penguins choose to assume.

“This could explain why we have observed both Emperor and Adélie penguins making seemingly unnecessarily long trips during migration, passing by areas with large food concentrations and selecting places that have at least a couple of hours of daylight every day, even in winter” says David Ainley, H.T. Harvey and Associates.

The authors point to the recent, mysterious disappearance of an Emperor penguin colony as potential corroborating evidence that predators can have severe impacts on penguin populations. “Global climate change is forcing penguins to adjust their behavior to avoid new predation risks while still locating enough of their own food” says Grant Ballard, PRBO Conservation Science. “We are learning more and more that a piecemeal approach to marine conservation will not work – there are a lot of ‘gotchas’ lurking out there.”

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The study was supported by the National Science Foundation. Changing a behavior to avoid risk is a pattern seen not just in penguins, it is similar to songbirds choosing longer more concealed routes to visit their nests or shorebirds choosing migration stop-over locations where Peregrine Falcons are less likely to be present, in order to avoid being seen and eaten by predators. A whole new ‘subfield’ of ecology, called ‘fear ecology’, recently has emerged as ecologists view ecosystems that only in the last decades have re-acquired predators such as falcons and wolves. Animals showing behaviors not linked to food alone is an aspect of species interactions not yet considered as important in understanding and conserving Southern Ocean and other marine food webs.

About PRBO Conservation Science:

PRBO’s (www.prbo.org) 130 staff and seasonal scientists work to conserve birds and ecosystems through innovative research and outreach. Our highest priority is to reduce the negative impacts of changes in land-use, the ocean and climate on birds and ecosystems while promoting adaptation to future conditions. .

Note to reporters: Our organizational name is PRBO Conservation Science, as written with the acronym (not Point Reyes Bird Observatory Conservation Science).

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