

Study of ancient emperor penguin populations creates concern for future of species

By Felicity Ogilvie and Tyson Shine

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The first study of ancient populations of the world's largest penguin, the emperor penguin, has raised serious concerns about the future prospects of the species.

Scientists have studied how climatic changes affected the birds over the past 30,000 years.

They said at the time of the last ice age, the emperor penguin population was around seven times smaller than it is now.

Just three colonies of the bird survived that period as opposed to the almost 50 thriving colonies currently in Antarctica.

While the species has flourished more recently, researchers warned modern climate change had emerged as a new threat.

During the last ice age the temperature was about 15 degrees colder on average than it is today.

Barbara Wienecke from the Australian Antarctic Division said emperor penguins were well adapted to the cold but even they struggled to survive the last ice age.

"Antarctica at some point was nearly too cold for these highly cold adapted birds," she said.

A team of scientists from Australia, the UK, and the US teamed up to examine the genetic diversity of modern and ancient emperor penguin populations in Antarctica.

PhD candidate Jane Younger said the penguins were reliant on sea ice and were therefore vulnerable to climate change.

"During the ice age, there seems to have only been three populations of emperor penguins, compared to almost 50 populations today," she said.

"Due to there being about twice as much sea ice compared to current conditions the penguins were unable to breed in more than a few locations around Antarctica.

"The distances from the open ocean, where the penguins feed to the stable sea ice where they breed was probably too far.

"The three populations that did manage to survive may have done so by breeding near polynyas, areas of the ocean that are kept free of sea ice by wind and currents."

The study was published on Monday in the *Global Change Biology* journal.

It said the freezing conditions helped the scientists study what life was like for the penguins during the last ice age.

The bodies of the birds froze when they died and decomposed so slowly that scientists were able to take DNA samples from emperor penguins that died 600 years ago.

Ms Wienecke said the data suggested the current conditions on the ice continent could be as good as it gets for the species.

"What they have experienced over the past 5,000 to 6,000 years have been nearly ideal conditions for them and their population's expanded," she said.

"They do need a flattish ground to breed on, which is of course provided at the moment by the sea ice."

Ms Younger said there were 48 known colonies of the world's largest penguins in Antarctica but studying their past has some experts worried about their future.

"Emperor penguins are quite sensitive to climate change," she said.

"If the sea ice changes, that could be a big problem for them."

She believed today's warming climate indicated the emperor penguin could face more challenges in the future.

Topics: science-and-technology, research, endangered-and-protected-species, environment, climate-change, tas, antarctica

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Article Questions

1. How do current temperatures in Antarctica compare to those during the last ice age?
2. Compare the number of emperor penguin populations then and now.
3. How does sea ice coverage affect penguin breeding?
4. Define polynyas.
5. What challenges do emperor penguin populations face?