

## Great Cormorants enjoy warmer Arctic seas

Posted on Monday 20th December 2010

Populations of Great Cormorants in Arctic waters have grown as sea ice has retreated and the sea surface has become warmer, University of Birmingham scientists have found.

A study of sea surface temperatures and cormorant populations over half a century showed that on average the birds' numbers increased in warmer winters and decreased in relatively colder years.

The findings suggest that cormorant populations in the region are likely to increase as the climate continues to warm.

An international team of researchers, led by Professor Graham Martin from the University's Centre for Ornithology, looked at data on breeding populations of the Great Cormorant, *Phalacrocorax carbo*, at Greenland's Disko Bay, to understand exactly how strong the link is between sea temperatures and bird numbers.

They compared annual variations in sea temperatures with population data for 67 cormorant colonies in Disko Bay and adjacent areas for the period 1946 to 2005. The scientists found a positive relationship between winter sea temperatures and the rate of population change in the cormorant colonies. The highest rates of population change corresponded with periods of relatively high sea temperatures in recent years and during the 1960s.

For every degree Celsius increase in ocean temperature the cormorant population increased by 6.4 per cent. So in an average year – one with no variation in SST – the cormorant population will decrease by 1.5 per cent, but in a year that's 1°C warmer than average, the population will increase by 4.9 per cent.

'We were surprised that the effect is so strong,' says Dr Craig White, who led the report, published in *Ibis*. 'The population will increase by 11.3 per cent in a year that is only 2°C warmer than average, and will decrease by 14.3 per cent in a year that's just 2°C colder than average.'

So relatively small changes in temperature have dramatic effects for the cormorants.

Changes to the Arctic environment have caused the territories of some animal species to shrink and their numbers to decline, but for the cormorants it means their breeding range has expanded into areas that were previously too cold for them to exploit.

The warmer seas may also be having an indirect effect on the cormorants, by changing the distribution of their prey, the main ones being the fish species sculpin, Capelin and cod. Warmer seas may also favour the fish, though exactly how will also depend on changes to the ranges of their other predators.

But even if their favourite food declines, cormorants are flexible in their eating habits, so changes in the availability of particular prey species will not have a huge influence on the range of the birds themselves.

The research was part of a larger NERC-funded project led by researchers at the University of Birmingham, looking at what factors determine cormorants' success as foragers. Cormorants don't have particularly good vision underwater (about the same as humans without goggles), and their partially wettable plumage means they use a lot of energy when foraging in cold water.

'This led us to wonder how the northernmost breeding populations of cormorants in Greenland would respond to climate change,' explains White.

You might predict that any species that has a range that is limited by cold would benefit from global warming. However, foraging success for the cormorants depends on how well they can see, and this will probably limit the extent to which their winter range can expand as a result of global warming. Their foraging could become inefficient during the perpetual darkness of the polar night.

'Now we know the population is likely to increase, but we don't yet know the extent to which their range will expand,' he continues. So we're addressing that question by trying to predict how cormorants will respond to a northward extension in their range – into the polar night during winter – under a range of climate change scenarios.'

Craig R White, David Boertmann, David Grémillet, Patrick J Butler, Jonathan A Green and Graham R Martin, The relationship between sea surface temperature and population change of Great Cormorants *Phalacrocorax carbo* breeding near Disko Bay, Greenland. *Ibis*, 153(1), pp170-74. Published online October 2010 doi: 10.1111/j.1474-919X.2010.01068.x

For further information

Kate Chapple, Press Officer, University of Birmingham, tel 0121 414 2772 or 07789 921164

[Privacy](#) | [Legal](#) | [Cookies and cookie policy](#) | [Accessibility](#) | [Site map](#) | [Website feedback](#) | [Charitable information](#)

© University of Birmingham 2015

