

Armed for change

Having considered the impacts of climate change on birds, in the final article of his series for *BTO News*, James Pearce-Higgins examines how conservationists can respond to climate change.

Conservation aims to maintain and improve the status of rare and vulnerable species and habitats. This involves the protection of sites (nature reserves and designated sites) and populations alongside targeted conservation measures, such as agri-environment schemes or nature reserve management. Unfortunately, climate change makes the existing conservation problems that birds face doubly difficult to deal with. Potential changes in species distributions may mean that protected sites no longer support the species for which they were established. Climate change may also exacerbate existing population declines of already threatened species. Effective conservation in a changing climate will involve a combination of approaches to respond to these threats (Box 1).

ROOM TO MANŒUVRE

In a changing climate, the most important protected sites will be those which currently support large populations of rare and vulnerable species, and which will continue to support those populations, or populations of other rare and vulnerable species, in the future. Bioclimate models may be used to identify these sites (*BTO News* 297) or they

may be selected using simple guidelines. For example, protected sites should be large, and include as wide a range of altitudes and habitats as possible, as these will be most likely to accommodate future changes in species distributions. Sites which protect particularly rare and threatened habitats will always be important, even if the species that they support change through time.

If climate change does cause species distributions to move, some species, such as those restricted to the tops of mountains, islands or the edges of continents, may have nowhere to go. Does this mean they are not worth conserving? No! Given the difficulties with predicting the future, what is called an adaptive management approach should be adopted (Box 2). Monitoring should be put in place to identify when population declines are occurring, and research undertaken to understand why. Armed with this knowledge, conservationists may then be able to design conservation actions to counter or compensate for these effects (Box 3), the success of which can then be monitored. This cycle can repeat itself unless and until the magnitude of climate change exceeds the capacity to respond. ➤

1. Conservation actions

Sensible conservation actions in a changing climate.

- Increase the size of nature reserves. Larger reserves are more likely to continue to support a species in a changed climate.
- Target the protection of sites which contain a wide range of habitats, such as mountainous areas. These will contain lots of species now, and are more likely to support the same species in a changing climate because of the wide range of environments they contain.
- Monitor populations to identify climate-change impacts.
- Conduct research to identify the causes of population declines.
- Implement conservation actions to reverse negative effects of climate change and increase habitat quality.
- Reduce the negative effects of other pressures. This will increase the ability of vulnerable populations to cope with negative climate-change impacts.
- Increase the amount of semi-natural habitat in the landscape. This will improve links between nature reserves and enable species to track climate change.





STEVEN ROUND www.stevenround-birdphotography.com/ JOHN HARDING/TIAGO DUARTE



Wetlands are rare and threatened habitats which will always support specialised birds of conservation concern. Sites in the UK which are important for Bittern and Marsh Harrier may become important for Night Heron and Purple Heron if they colonise in response to climate change.

'Climate change adds to the already large challenge to survive which many of our bird populations face.'

◀ STEPPING STONES & CORRIDORS

Some species may struggle to shift their distribution in response to climate change. We understand relatively little of the factors which influence the dispersal and settlement of birds, but habitat fragmentation and a lack of habitat connectivity may be a problem, particularly for habitat specialists. Action in the wider countryside to provide stepping stones (small patches of habitat), corridors (linear strips of habitat) and a general increase in the amount of 'natural' habitat in the landscape may all be useful measures to increase connectivity, although these are largely untested. If they prove ineffective, some scientists consider it may be necessary to artificially introduce particularly vulnerable species to currently unoccupied sites as they become climatically suitable.

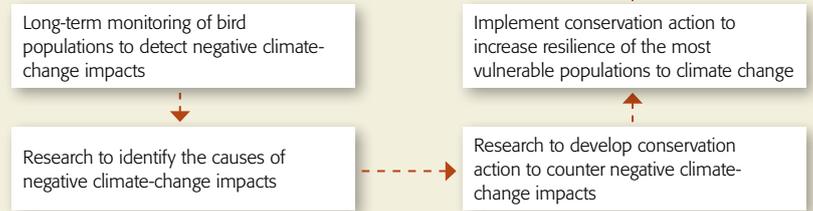
A CALL TO ARMS

Climate change adds to the already large challenge to survive which many of our bird populations face, both in the UK and particularly globally. Building on existing conservation science practice, research and monitoring will play an important part in determining the response. The vital work that many of us do as ringers, nest recorders and bird surveyors will be increasingly important. A range of sensible conservation actions can be implemented now to increase the likely resilience of species, populations and habitats to climate change. These include the targeted selection and expansion of protected sites, appropriate management of those sites, reducing the severity of other threats to birds, and more sympathetic management of the wider countryside. Other, more radical options may require consideration in the future, depending on the severity of climate change. Implementing these actions in the face of the many other competing pressures and demands on our countryside will be a significant challenge. Addressing this challenge will require close cooperation between scientists, conservationists and policymakers. Supported by our dedicated volunteers, the BTO is committed to providing the evidence and knowledge required to underpin these difficult decisions.

James Pearce-Higgins is currently co-authoring a book on birds and climate change with Rhys Green, to be published by Cambridge University Press

2. Adaptive conservation

An adaptive management framework for conservation management in a changing climate.

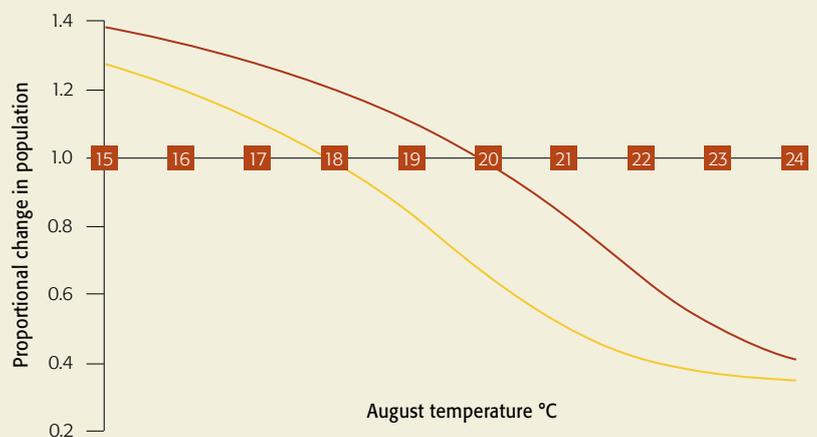


3. Conservation in action

Conservation management in a changing climate for Golden Plovers.



Climate change is likely to cause declines in breeding Golden Plover populations in the UK as a result of the impacts of drought on their crane-fly prey. Because many of our peatlands have been drained in the past, there is the potential to block these drains to increase the ability of Golden Plover populations to cope with climate change. Blocking drains can increase crane-fly populations within 10m, or more, of the drains by up to 4.5 times. Assuming that this effect occurs across an entire area of peatland occupied by Golden Plovers, this may enable the Golden Plover population to cope with a 2°C rise in summer temperature.



The average effect of maximum August temperature on the subsequent change in the Golden Plover population without drain blocking (yellow line) and with drain blocking (red line). Proportional changes of greater than 1 mean the population is likely to increase, whilst values below 1 indicate a decline.