



Birds In a Changing Climate

The IMBD 2007 Theme

International Migratory Bird Day (IMBD), held annually on the second Saturday in May, is an invitation to celebrate and support migratory bird conservation.

IMBD Information
web - <http://birds.fws.gov/imbd>
phone - 703/358-2318

IMBD Materials
web - <http://www.BirdDay.org>
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The fact that the Earth is gradually warming is something most of us have heard about, although the cause for this trend is still being debated. Currently, the average temperature is predicted to rise by as much as six degrees by the year 2100. This will not only affect climate (all aspects of the weather over a period of time: temperatures, precipitation, storms) but may also affect sea level, coastal areas, and the timing of natural events. Climate change may also affect many forms of wildlife, including birds.

Changes may occur in the diversity of birds at given locations

- ***Ranges could shift north as species move to areas that match their temperature tolerances***

In some cases, this may already be occurring. Toucans in Costa Rica which normally breed only in low lying areas are now living in the mountains as well. Also, some Neotropical migrants such as the Cape May and Bay-breasted Warbler have extended their ranges significantly farther north in the last 20 years by an average distance of over 60 miles.

This effect may be dangerous for birds that live in the Arctic or mountainous regions, as they have distributions which can't shift any further north as the habitats around them change due to global warming.

- ***Nesting and feeding habitats may change***

Temperature changes will affect food availability for some birds. One example is the Gray Jay, which relies on stored frozen food. Populations of Gray Jays are declining in some areas because their stored food supply is thawing out and becoming unsuitable for the birds to eat.

- ***Migratory stopovers or breeding areas may be affected***

One example can be found in the Sahel region of Africa, used as a stopover by long-distance migrants crossing the Sahara. Reduced vegetation and the depletion of plant life in the Sahel (caused by less precipitation and warmer temperatures) may affect the survival of trans-Saharan migrants, who may not be able to survive the long trip across the Sahara without a suitable stopping point for food, water, and rest.



Brown Thrasher (Georgia)
American Goldfinch (Iowa)
Black-capped Chickadee
(Massachusetts)

Models of climate change project that the range of several State Birds could shrink or even shift entirely outside of the States that use them as a symbol:

Baltimore Oriole (Maryland)
Purple Finch (New Hampshire)
American Goldfinch (Washington)
California Quail (California)

Source: Birdwatcher's Guide to Global Warming



The Prairie Pothole Region in the Northern Great Plains produces 50-80% of the primary species of game ducks on the North American continent. This region, characterized by millions of shallow depressions that fill with water suitable for breeding and migrating ducks, is sure to be affected by climatic alterations. More droughts and evaporation will create fewer wetlands, saltier water, and plants with less nutritional value -- all of which make the region less suitable as habitat for ducks.

Changes may occur in the timing of events such as migration and egg laying

The effects of climate change are already being felt in every part of the journey of migratory birds, from the timing of migration to egg hatching. Birds in Britain (including Barn Swallow, Rose-breasted Grosbeak, and Black-throated Blue Warbler) are migrating two to three weeks earlier than thirty years ago. Tree Swallows are now laying eggs, on average, a week or more earlier than they did thirty years ago because of earlier springs with higher temperatures.

- **Temperature increases may affect breeding success -- if nesting occurs earlier, primary food sources for hatchlings may not yet be available.**

Commonly known as mistiming, the discrepancy between a bird's hatch date and the arrival of its food source can affect its survival. For example, Pied Flycatchers have declined by as much as 90% in areas where the food for nestlings (insects) peaks early, and is therefore mistimed for the baby birds' needs.

Changes may occur in the foraging and nesting success of seabirds

- **Foraging: rising sea level, reduction of sea ice, and increased sea surface temperature may affect food availability**

The numbers of Black Guillemots, who feed their young the arctic cod that can be found around pack ice, are declining because decreases in sea ice cover limit the availability of their main forage food. The population of Black-legged Kittiwakes in the Gulf of Alaska has also declined since 1980, probably due to abrupt changes in marine diet caused by fluctuations in water temperature.



Seabirds like the Common Murre have declined because of shifts in the marine ecosystem and changes in available prey. The murre has also advanced breeding by 24 days each decade over the last 50 years in response to warmer temperatures.

Between 1987 and 1994, Sooty Shearwaters (which live off the Pacific Coast of North America) declined by 90% - more than 4 million birds. Higher sea surface temperature reduced upwelling, which brings nutrients to the water's surface and nourishes zooplankton (a key food source for shearwaters and the fish they eat).

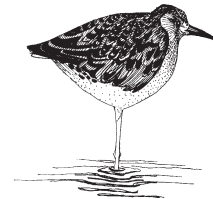
- **Nesting: location and behavior**
An excellent example of this is found in Horned Puffins, which were recently recorded nesting in arctic Alaska for the first time, possibly because of the increase in snow-free days.

Interestingly, the effects of climate change may make conditions more favorable for certain species of birds

as they become less favorable for others. As habitat and weather change in response to warming, the ranges of some birds may shift out of a given area while other species (previously unable to breed or live there) may now be able to move in.

For example, reduction of pack ice and changes in food availability affect species in different ways. Beginning in the 1970s, for example, numbers of Adelie Penguins in the Antarctic have been in decline, possibly based on their need of pack ice for habitat. The same changes during this time period have meant success, though, for Chinstrap Penguins who live there, which prefer open water for habitat.

Even if some species adapt or succeed in a world that is slowly warming, the fact remains that many will not. Those most at risk are those that are unable to generalize or adapt. Long-distance migrants and birds with limited geographical ranges may not be able to adjust to the changes caused by rising temperatures. Increased competition for habitat and the lack of suitable or available food in new locations also means that the shift northward will not be a permanent solution for bird populations adapting to climate change.



There is special concern for migratory species like this Red Knot, which breeds in the Arctic regions of Canada. These birds may face large population declines since their ranges cannot shift further north as the temperature rises.

For further reading:

101 Ways to Help Birds by Laura Erickson

Teaching about Climate Change edited by Tim Grant and Gail Littlejohn
"The Birdwatcher's Guide to Global Warming" (<http://www.abcbirds.org/climatechange/statepage.htm>)