



Global Warming and Birds

Global warming is the greatest threat to birds and other wildlife in human history. The rate of global warming is already impacting birds, their prey, and their habitat. Those impacts will become more severe over the coming decades, leading to the loss of one-quarter to one-third of all species on earth, including many bird species. Although some amount of change is inevitable, we can still take steps to prevent the most dangerous impacts of global warming and begin to stabilize the climate again. In the meantime, conservation, especially of larger areas with migratory corridors and buffer zones; better control of invasive species; and adaptive management are critical to stem the loss of bird and wildlife species. This loss will impact agriculture, forestry, public health, recreation, and hunting. The financial impact will be many billions of dollars annually.

Why Does Global Warming Matter for Birds? Global warming impacts birds and wildlife in many ways. Birds and other wildlife will face habitat loss due to sea level rise, more frequent and severe wildfires, flooding and droughts, invasive species, changes in vegetation and precipitation, and loss of snow and ice, among others. Birds, like most species, are highly adapted to particular vegetation and habitat types. To compensate for the warmer temperatures, the ranges of these habitats may move closer to the poles or higher elevations. Habitat types that cannot colonize new areas may rapidly decline or cease to exist. New pests, invasive species, and diseases will create additional risks. The timing of birds' migration, reproduction, breeding, nesting, and hatching are all highly adapted to match specific local conditions, such as the availability of suitable habitat and adequate food sources. Since climate change will affect different species differently, bird behavior may no longer be in sync with their food sources and other habitat needs. For example, robins in the Rocky Mountains arrive an average of two weeks earlier in spring than they did a few decades ago, but the worms and other food that they eat are not yet available for their newly hatched offspring.

Is Global Warming Already Affecting Birds?

Scientists are already seeing alarming impacts of global warming on birds. More than 80% of plant and animal species studied have shown changes in the timing of migration or reproduction, shifts in habitat or migratory routes, or other changes associated with climate change. Some of the observed impacts on birds include:

- Several North American warbler species have shifted northward more than 65 miles. The Golden-winged Warbler's range has moved nearly 100 miles north just in the past two decades.
- Between 1971 and 1995, many British bird species began laying their eggs an average of nine days earlier each year. A dozen species in Great Britain have shifted their ranges an average of 12 miles northward in the past 20 years.
- On Michigan's Upper Peninsula, 15 species—including the Rose-breasted Grosbeak and Black-throated Blue Warbler—are arriving up to 21 days earlier than in the 1960s.
- Adelie Penguins are taking longer routes to find food in the ocean as icebergs break off the Ross Ice Shelf.

Will Some Species or Habitat Types Be More Vulnerable than Others?

Birds that already live at high altitudes or latitudes may not be able to move with the changing climate. Endangered species with limited habitat or small gene pools may also not be able to adapt quickly enough to avoid extinction. Coastal and polar species will be vulnerable as coastlines advance inland and ice melts. Sea level rise and erosion will jeopardize the threatened Western Snowy Plover and other shorebirds. More frequent and severe droughts in the central U.S. are likely to cause prairie pothole wetlands to dry up, jeopardizing millions of waterfowl during breeding season. The projected loss of neotropical migrant songbirds is very high: 53% in the Great Lakes region, 45% loss in the Mid-Atlantic, 44% loss in the northern Great Plains, and 32% fewer in the Pacific Northwest.

Why Can't Birds Adapt to Global Warming?

In the past, species and ecosystems were able to respond to global temperature shifts in part because average global temperatures changed slowly. As they did, habitat patterns changed gradually and wildlife could either follow their preferred habitat to new locations or adapt to new conditions. Now, though, the change is simply too fast for many species to adapt. The rate of temperature increase over the next century will be ten times faster than the rate of increase since the last Ice Age.

In addition, species that could otherwise move or adapt are now limited by urban and industrial development, large-scale agriculture, and adjacent habitat fragmentation and destruction. For instance, the endangered Red-cockaded Woodpecker in the southeastern U.S. depends on mature pine forest, a habitat type that cannot spread to new areas quickly or at all.

Why is Loss of Bird Species Important for People?

Birds have great economic and personal value to people. One-third of all human food comes from plants that are pollinated by birds, butterflies, and other wild pollinators. Birds also disperse seeds and help to control rodents, insects, and other pests that would otherwise devastate crops, forests, and ecosystems. In the western U.S., Savannah Sparrows, Sage Thrashers, egrets, and other birds help control grasshopper populations that would otherwise destroy many crops. In the eastern U.S., nesting wood warblers consume 84% of the eastern spruce budworm that would otherwise decimate forests.

Birds are loved for their aesthetic value, playing an essential role in the U.S. economy and improving the quality of life for many Americans. More than 80 million Americans observe, fish, hunt, and otherwise enjoy birds and other wildlife. Together, they support more than 2.6 million jobs in the U.S. According to the U.S. Fish and Wildlife Service, America's 46 million birders spend \$32 billion annually, generating \$85 billion in overall economic output and \$13 billion in state and federal income taxes.

Birds are also important state symbols. Yet many states in the U.S. risk losing their state birds as the birds become extirpated or as their ranges shift because of climate change. These species include the Brown Thrasher in Georgia, the American Goldfinch in Iowa and Washington, the Baltimore Oriole in Maryland, the Blackcapped Chickadee in Massachusetts, the Purple Finch in New Hampshire, and the California Quail in California.

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