



SPECIES FEELING the HEAT:
CONNECTING DEFORESTATION & CLIMATE CHANGE

**WILDLIFE
CONSERVATION
SOCIETY**

If a tree falls in a forest, and no one is there. . .

When we burn or cut down trees (deforestation) in tropical forests, we destroy precious habitat for the world's wildlife, and we release greenhouse gases into the atmosphere.

The amount of emissions from deforestation are more than those caused by all the world's trucks, trains, cars, planes, and ships combined. The drainage of peat lands and the conversion of grasslands to agriculture further impact the Earth's climate and its habitats.

Why does deforestation in the Tropics matter to an antelope on the Tibetan Plateau, a lake trout in Ontario, or to any of us living in the United States? The Wildlife Conservation Society is at work connecting these global dots.

Consider the Bicknell's thrush. This species may live far from Brazil and Indonesia, but when the forests are destroyed in those countries, this songbird loses its North American breeding habitat as a result of climate change. Bicknell's thrush is not alone.

As Steve Sanderson, President and CEO of the Wildlife Conservation Society, wrote in "Where the Wild Things Were" published in Foreign Affairs, "In short, the time is ripe for a new vision, one that takes both biodiversity and climate change seriously and explores the crucial connections between them."

Such a vision would begin with commitments to real reductions in fossil-fuel use and to saving places that are currently not considered "at risk." The heart of the Congo Basin, for example, holds hundreds of billions of tons of CO₂ in its "low risk" forests. Global peat-sourced emissions are also essential to any climate change solution and are being ignored in current policy discussions.

Wrote Sanderson: "The problems of climate change and biodiversity loss are global, but the solutions to them must begin at the local level. Conservation is about saving wildlife and wild places in specific locales. Small programs can become large building blocks if the global community stands ready to encourage them."

By placing a monetary value on standing trees and carbon-storing peat lands, (a WCS-supported program called Carbon for Conservation), we can offer local communities an economic alternative to cutting their forests and converting their land to other uses. WCS projects in Madagascar, Cambodia, and other countries are saving wildlife and conserving carbon by Reducing Emissions from Deforestation and Degradation (REDD)—proving that this local action can lead to global change. The potential for implementing REDD worldwide is huge—many natural ecosystems could provide critical tools for mitigating climate change, but leadership and support to create appropriate incentives are needed.

Climate change is threatening our planet with unprecedented losses of wildlife and wild places. In fact, climate-related changes could drive a quarter of land animals and plants to extinction between now and 2050. By financing forest protection through REDD, safeguarding wildlife, and helping species to adapt to climate change, we can save the species living in forest homes, in places such as the Amazon or the Congo Basin, as well as other habitats across the globe.

So when a tree falls in a forest, and no one is there, the world needs to be listening.



WHITE-LIPPED PECCARY

Distributed widely in Central and South America, white-lipped peccaries are the subject of a WCS climate adaptation study in the Maya Forest of Guatemala and Mexico. Here, this keystone species depends on shallow ponds to survive during the region's dry season. If climate change diminishes these water sources, white-lipped peccaries, which serve as a critical food source for jaguars, will likely suffer population declines and range contraction.



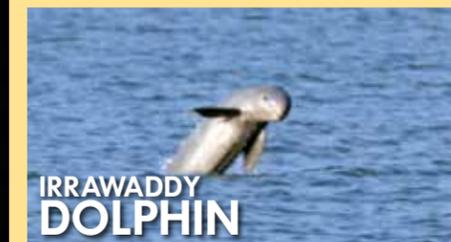
BICKNELL'S THRUSH

Scientists have found that a mean temperature increase of just 1 degree Celsius would reduce by more than half the critical mountaintop breeding habitat for the Bicknell's thrush, a songbird that breeds only in eastern North America. Given the limited availability of this habitat, WCS is developing management practices to inform the conservation of these high elevation areas.



CHIRU

Chiru, or Tibetan antelope, live on the high Tibetan Plateau. Starting in the mid-1980s, WCS's work on chiru conservation helped lead to the government creation of the world's second-largest nature reserve—the Chang Tang. If climate models predicting an increase of 4 to 5 degrees Celsius in Tibet are correct, the temperature change could dramatically affect chiru migration patterns, threatening their survival as well as the integrity of one of the last great wild places on Earth.



IRRAWADDY DOLPHIN

Changes in freshwater flow and salinity levels in estuaries brought about by climate change can affect the long-term survival of these freshwater-dependent cetaceans. Recently, a WCS census indicated large numbers of Irrawaddy dolphins in Bangladesh—a country expected to experience severe climate change impacts, including potential sea-level rise.



MAGELLANIC PENGUIN

Climate-induced changes, including shifts in ocean temperatures and prey availability, are making reproduction difficult for Magellanic penguins. WCS research indicates that in the last decade, the penguins have been laying their eggs later in the season and swimming farther away from their nests in search of food when they have eggs and chicks. The largest breeding colony of this species in Patagonia has declined more than 20 percent in the last 20 years.

Polar bears have been recognized by many as the poster child for climate change.

Unfortunately, they have plenty of company.

WCS conservationists are documenting how climate change affects species and their habitats, from the Amazon to the Arctic. The following examples illustrate myriad ways in which climate change is impacting, or will potentially impact, life on Earth.



VARIOUS PRIMATE SPECIES

In addition to the direct threats of hunting and deforestation, shifting rainfall patterns and other consequences of climate change may have far-reaching implications for diseases that primates and other species encounter and transmit. WCS and its partners monitor the health of wild animals throughout the world as part of a global wildlife health surveillance network.



CORAL

Coral reefs provide habitat for tens of thousands of plants and animals. Warming oceans can stress or kill many coral species, or cause bleaching events, which can wipe out entire reef ecosystems. WCS leads a global effort to identify which reefs are more likely to survive climate change and what conservation actions are necessary to help coral ecosystems. While protecting reefs in the Coral Triangle, Western Indian Ocean, and the Caribbean, WCS is effectively conserving nearly 90 percent of coral species in its priority seascapes.



MUSK OX

WCS scientists are investigating the decline of the musk ox, a full-time resident of the North American Arctic coastal plain and nearby foothills. A warming climate is rapidly altering the musk ox's habitat. This Pleistocene relic also faces a higher predation risk by grizzly bears, as more bears may be moving northward from the Brooks Range and boreal forests into the musk ox's tundra home.



LEMMING

Lemmings—a critical prey species for snowy owls, jaegers, Arctic fox, and other predators—choose areas of deeper snow as winter habitat. Snow cover provides insulation from the cold and a safe place to reproduce. To inform conservation planning in the face of a warming climate, WCS is developing snowfall modelling studies to assess potential impacts to lemming habitat and populations.



BUFF-BREASTED SANDPIPER and other migratory birds that breed in the Arctic

Shorebirds migrate from all over the world to breed on the coastal plain of Arctic Alaska, where WCS scientists have observed a variety of impacts from climate change. Buff-breasted sandpipers are nesting more than 10 days earlier than they did 25 years ago—a change that may reflect an earlier emergence of their insect prey. How this timing shift affects this species' migratory movements throughout their range is unknown.



FLAMINGO

Flamingos breed and feed in shallow wetlands, where water depth and quality impact their access to food and their ability to breed successfully. At WCS project sites in the Caribbean, South America, Asia, and Africa, climate change could threaten flamingos through changing weather patterns that influence water quality and availability—and potentially a wetland's suitability to support flamingos.



NUMEROUS AMPHIBIAN SPECIES

Climate change will affect amphibians in many ways. Changes in habitat range and the "summit trap" phenomenon (where species are "pushed off" of mountaintop habitats in response to increasing temperatures) are already implicated in the redistribution or disappearance of several amphibian species. WCS conservationists are working to document the shift in range of high Andean amphibians in Peru.



LAKE TROUT

Lake trout live in deep, cold, well-oxygenated lakes. A warming climate may decrease the suitability of these lakes for lake trout, while benefiting other species that compete with them for food. WCS is evaluating the potential for lake trout to adapt to these changing conditions. These data will inform land-use planning to help freshwater ecosystems remain resilient.



The Wildlife Conservation Society saves wildlife and wild places worldwide. We do so through science, global conservation, education and the management of the world's largest system of urban wildlife parks, led by the flagship Bronx Zoo. Together these activities change attitudes towards nature and help people imagine wildlife and humans living in harmony. WCS is committed to this mission because it is essential to the integrity of life on Earth. Visit www.wcs.org.

For additional information on this report, please contact Scott Smith at the Wildlife Conservation Society, 718-220-3698 or ssmith@wcs.org.

TAKE ACTION TO SAVE WILDLIFE AND OUR CLIMATE

Curbing emissions from deforestation and enabling natural resources and affected species to adapt to the effects of climate change is critical not only to their survival but to other species that depend on them—including people. Urge your Senators to support climate legislation with provisions that promote natural resource adaptation and protect tropical forests and the wildlife and people that rely on them around the world. Take Action at www.wcs.org/climate-change.

The species listed can benefit from your support. To help save wildlife and wild places, please visit www.wcs.org/donation.

PHOTOS BY: JULIE LARSEN MAHER/WCS; GEORGE SCHALLER; LARRY MASTER; STEVE ZACK; CALEB MCCLENNEN; MARK PACKILA; ALICE ROCCO; MEGAN JONES; RAFAEL REYNA-HURTADO; CATHI CAMPBELL; ERIC ENGBRETSON/USFWS; STEPHEN HALLOY; AND LARRY DUECK/FISHERIES AND OCEANS CANADA.



HAWKSBILL TURTLE

WCS is working to save hawksbill turtles in the Caribbean. Among the climate change-related threats to hawksbills and other sea turtles are habitat loss from sea-level rise and temperature increases at nesting beaches. Since sea turtles exhibit temperature-dependent sex determination (warmer weather produces more female hatchlings), rising temperatures could affect population sex ratios.



BOWHEAD WHALE

Bowhead whales are adapted to polar conditions and occur in areas with heavy ice cover during parts of the year. As the Arctic warms, changes in ice cover and ocean productivity in important habitats will likely affect bowheads. WCS is studying how previous whaling activity and long-term climate change influence the genetic diversity of bowhead populations. This research is essential to understanding how these marine mammals could respond to a warming climate.



WOLVERINE

Wolverines are well adapted to life in sub-freezing temperatures. In the spring, females depend on deep snow-pack for protection from predators while they give birth and raise kits. In response to the threat of climate change, WCS is at work protecting core habitats, linkage corridors, and natal den sites in North America for wolverines. A robust plan to conserve wolverines into the future is under development.