

THE AMAZING RACERS

THESE NEOTROPICAL MIGRANT SPECIES ACCOMPLISH THE INCREDIBLE

01 CANADA WARBLER

Canada Warblers depart the northern U.S. and Canada for the Andes, living in mountain forests from Colombia to Peru.



02 EASTERN WOOD-PEWEE

After singing their namesake song (*pee-a-wee!*) throughout the Eastern U.S. in summer, pewees migrate to the Amazon River Basin.



03 SCARLET Tanager

Scarlet Tanager males aren't scarlet when they migrate to South America. Instead they molt into muted greenish plumage as camouflage to blend into the Amazon rainforest canopy.



04 CHIMNEY SWIFT

Chimney Swifts disappear from the science radar screen when they reach South America; the core of their nonbreeding range is still unknown.



05 BANK SWALLOW

More than 7 million Bank Swallows—nearly their entire North American breeding population—pass through the narrow Darién Gap in Panama on migration.



06 EASTERN KINGBIRD

Kingbirds migrate in large flocks and fuel up by feasting on fruits in the canopy of the Amazon rainforest.



07 GRAY-CHEEKED THRUSH

Gray-cheeked Thrushes on spring migration have been recorded making remarkable nonstop flights of 46 hours from Colombia all the way to Indiana and Ontario.



08 BLACKBURNIAN WARBLER

These striking warblers spend their lives in two of the Western Hemisphere's most iconic landscapes, breeding in the boreal forest and migrating to the Andes Mountains.



09 VEERY

Veeries make two migrations during their nonbreeding season, flying first to southern Brazil, then moving northeast to the Venezuelan/Brazilian border before migrating back north in spring.



THE TEXAS GULF COAST

The Texas coast is critical stopover habitat for billions of migratory songbirds. The coastal groves of trees provide refueling stations—and safe harbors in the event of thunderstorms—for migrants attempting nonstop flights across the Gulf of Mexico. But these habitats are shrinking, as coastal ecosystems are threatened by development pressure and climate change impacts.



SCARLET Tanager on migration through South Padre Island, TX, by Steve Tucker/Macaulay Library

ISTHMUS OF PANAMA

Millions of long-distance migrants funnel through the narrow geography of Panama and Costa Rica every year. On peak migration days, rivers of raptors and swallows fill the sky, while clusters of warblers, thrushes, and tanagers wait among the trees to migrate at night. These migrants are dependent on the tropical forests on the slopes and foothills facing the Caribbean Sea.



TROPICAL FOREST, ISTHMUS OF PANAMA, BY KEN ROSENBERG

SANTA MARTA MOUNTAINS

Recent research has revealed that 20 species of long-distance migrant birds rely on the Santa Marta Mountains as a vital fueling-up stop before crossing the Caribbean Sea. Gray-cheeked Thrushes, for example, spend 15 days here and nearly double their body mass before flying off. Forests are being cleared for cattle and sun-coffee production in Santa Marta, though, and some of the Western Hemisphere's most important migratory bird habitat is at risk.



SANTA MARTA MOUNTAINS, COLOMBIA, BY KEN ROSENBERG

MAKE-OR-BREAK MIGRATION STOPOVERS

Just a few stopover sites can make or break the success of an entire migration. These mid-migration stopover sites are located at crucial points in a bird's intercontinental journey, when they need rest, shelter, and refueling.



Gulf of Mexico

Atlantic Ocean

Pacific Ocean

FIRE ESCAPES

When emergencies arise, an escape hatch can be the difference between life and death. Tiny warblers embark on multi-day flights over open ocean knowing that if they encounter stormy weather, there are reliable spots to take shelter along the Gulf Coast.

BOTTLENECKS

The entire global populations of many Neotropical migratory species pass through Central America every spring and autumn. That means millions of birds depend on the tropical forest habitat along the Isthmus of Panama.

REFUELING SITES

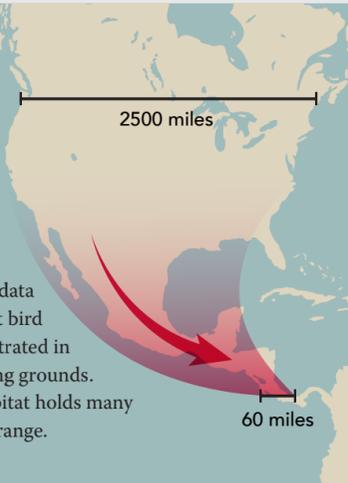
Long-distance migratory birds depend on a few key refueling sites where they stop for several days. These are food-rich forests where birds can stock up with the energy reserves necessary for crossing vast expanses of ocean such as the Caribbean Sea.

RESEARCH INSIGHTS

MID-MIGRATION STOPOVER HABITAT HAS OFTEN BEEN OVERLOOKED BY SCIENCE. But the Neotropical Flyways Project is working to change that. A collaboration of research partners including the Cornell Lab of Ornithology, the project is filling in the blanks by identifying stopover habitat—and discovering new insights about the phenomenon of, and threats to, long-distance bird migration between the Americas.

Birds in Nonbreeding Areas Are 3X More Concentrated

During migration, birds with breeding ranges across North America—more than 2,500 miles from the Atlantic to the Pacific Oceans—funnel into the narrow isthmus geography of Central America, squeezing through stretches of tropical forest that can be just 60 miles wide. Big-data models based on eBird show that migrant bird populations are three times more concentrated in Central America than they are on breeding grounds. That means each acre of nonbreeding habitat holds many more birds than an acre on the breeding range.



MIGRANT SCARLET TANAGER
IN PANAMA BY KEN ROSENBERG

90% of Migratory Stopover Habitat Is Not Protected

Less than 10 percent of the land used by migratory birds in Central America is protected as nature reserves or national parks. Most migratory bird habitat is forest within working landscapes, where people also live off the land and support their families by farming and timber harvesting. That's why agro-forestry programs—farming practices that encourage maintenance of a forest setting, such as shade-grown coffee and shade-grown cacao for chocolate—offer the best conservation solutions for both birds and people.

20% of Today's Nonbreeding Habitat Could Be Gone By 2050

Models show that at current deforestation rates, about 20 percent of today's migratory bird habitat in Central America could be cleared for croplands and cattle grazing within the next few decades. That loss would be devastating to the most imperiled Neotropical migratory bird species, such as Cerulean and Canada Warblers.

Source: La Sorte, F.A., D. Fink, P.J. Blancher, A.D. Rodewald, V. Ruiz-Gutierrez, K.V. Rosenberg, W.M. Hochachka, P.H. Verburg, S. Kelling. 2017. Global Change and the Distributional Dynamics of Migratory Bird Populations Wintering in Central America. *Global Change Biology*. 23:5284-5296.

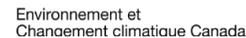
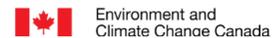
Designer: Jillian Dittner



NEOTROPICAL FLYWAYS PROJECT



The Cornell Lab of Ornithology



AN AMAZING RACE



SPRING MIGRATION IN THE AMERICAS

By Amanda D. Rodewald and Kenneth V. Rosenberg

Emerging scientific research shows Neotropical bird migration isn't a single marathon, but an epic intercontinental race consisting of a series of crucial stages. Failure at just one stage means the whole race could be lost.

The spring voyages of Neotropical migrant birds, from the New World tropics to breeding grounds in North America, are often described as marathons. But spring migration is more like an intercontinental Tour de France—a grueling, energy-draining endurance race that's run in a series of crucial stages. For the warblers, tanagers, and swallows that set off for the United States and Canada from Central and South America every spring, success at each stage means a

successful pit stop. Resting up and refueling for the next leg is the only way to survive an epic eight-week journey that can span 5,000 miles. But those pit stops, more properly called mid-migration stopover sites by ornithologists, have been a bit of a black hole for science. While much is known about birds on their breeding grounds, and to a lesser extent about the biological needs of birds in overwintering areas, knowledge is extremely limited in the migration zone

from South America to the southern United States. Scientists do know that the populations of more than half of Neotropical migratory bird species are declining, many precipitously. And they know that most mortality for these species occurs during migration. Understanding what these birds need to survive during the various stages of migration could be the key to helping them recover.

PHOTO BY BRANDON HOLDEN