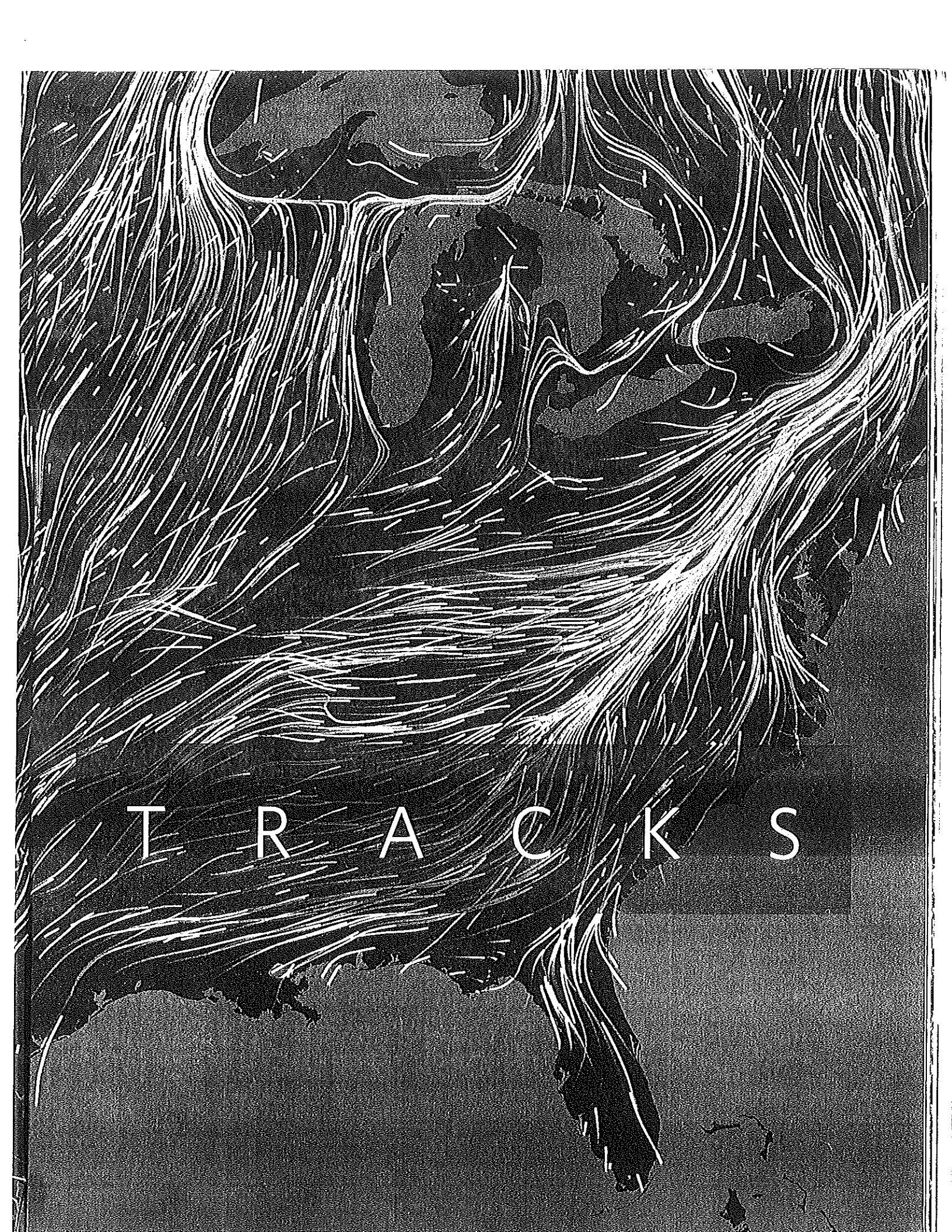


ANIMAL

BY
KIRSTEN WEIR

SCIENTISTS ARE TURNING TO NEW
TECHNOLOGIES TO BETTER UNDER-
STAND ANIMAL MIGRATIONS AND
PROTECT CRITICAL HABITATS.

● MAMMALS ● BIRDS ● AMPHIBIANS



T R A C K S

THE ARCTIC TERN CAN TRAVEL MORE THAN 49,000 MILES EVERY YEAR

as it makes its round-trip trek between the Arctic and Antarctica. In contrast, the Jemez Mountains salamander never moves more than 10 feet from its home. Scientists have long known that if you want to protect a species and its habitat, the first step is finding where it is and where it's going.

"Animals move in all sorts of ways and places and spatial scales," says David Mehlman, director of The Nature Conservancy's Migratory Bird Program. "To fully conserve them, we have to protect all the places they go."

Consider shorebirds such as red knots, which stop in coastal Delaware, New Jersey and Virginia to refuel by gorging on the eggs of spawning horseshoe crabs during their journeys between the Arctic and South America. Although the birds might spend only a few weeks along the shores of the Mid-Atlantic, if they miss the horseshoe crabs or the habitat is somehow disrupted, the result can be devastating.

"We tend to think about biodiversity as a static thing," says Jorge Brenner, a TNC marine scientist based in Texas. In fact, he says, animals move through space and time, urged on by the need to breed or to feed. And, as many scientists know all too well, they can be surprisingly hard to follow as they flit around a forest or dive beneath the waves.

But that is changing.

Today, technology makes it easier than ever to follow animals large and small. Satellite and GPS monitoring tags get smaller and lighter every year, thanks to battery improvements and solar-powered options, allowing scientists to trail

ever more petite species while minimizing animal disturbance. Newer tracking systems are able to forgo satellite monitoring and instead rely on cellular networks, which can handle more data and provide a critter's coordinates at more frequent intervals.

Understanding the needs of a species will be increasingly important as the world warms. Plants and animals may be forced to shift their ranges as climate change alters their habitats. Tracking data will help guide conservationists as they decide which landscapes to protect now and into the future.

"Tracking boils down to full life-cycle conservation," Mehlman says. "Without that full picture, we're not really accomplishing the mission of conserving species and the ecosystems they depend on."

Kirsten Weir is a Minnesota-based freelance science writer whose work has appeared in *Discover*, *Popular Science*, *Nautilus* and *Scientific American Mind*.



INTERACTIVE MIGRATION MAP

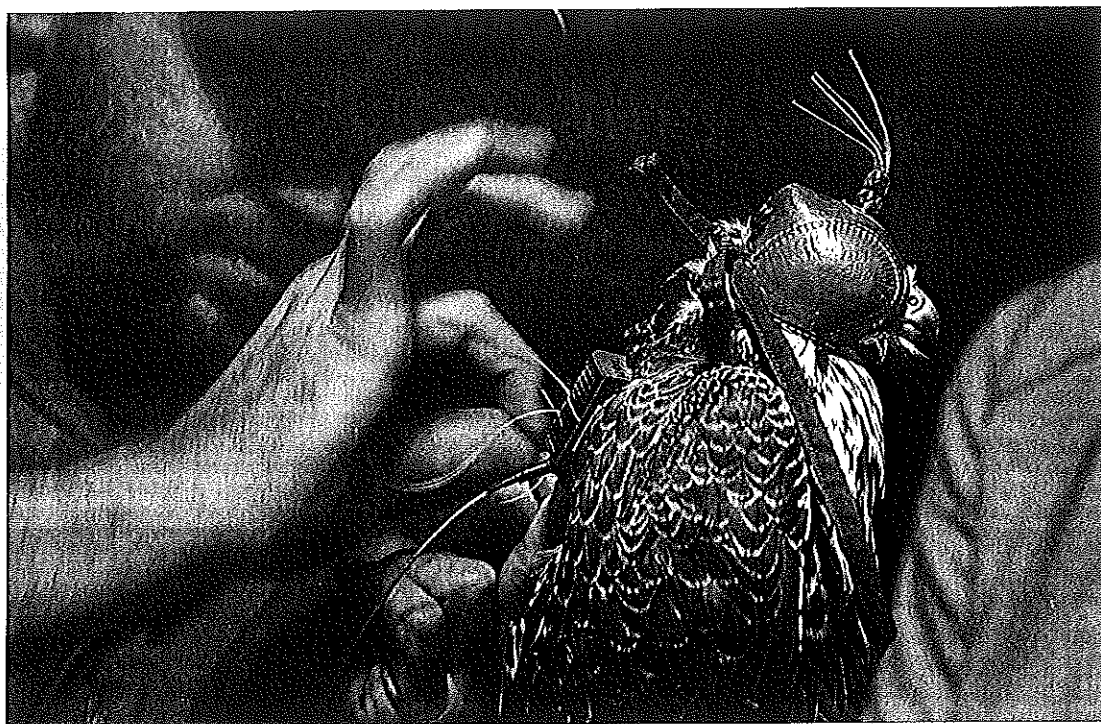
See the
interactive map
(previous page)
at [nature.org/
migrationmap](http://nature.org/migrationmap).

MODEL PLANNING

Tracking tells us where animals are now. Modeling can tell us where they're headed as climate change forces them out of their comfort zones. Conservancy scientists applied circuit theory—based on the flow of electrical current—to predict how multiple species move through complicated landscapes. "We can't go out and follow every animal on the landscape," says TNC landscape ecologist Brad McRae. Tools like the map on the previous page can provide a big-picture prediction of the looming climate flight.

FLY AWAY: Chris Perslco,
a raptor biologist for the
Biodiversity Research
Institute, releases a
peregrine falcon on
Baldwin's Island, Calif.
Photo by Michael
Graham





QUICK PRECISION: Biologists attach a lightweight solar-powered transmitter harness to a peregrine falcon. A hood keeps the bird calm during the process.

Eyes in the Sky

THIRTEEN MILES FROM THE COAST OF RHODE ISLAND, MIGRATING raptors find refuge on a dollop of land called Block Island. Since 2012, biologists from the Biodiversity Research Institute, facilitated by TNC, have been capturing merlins and peregrine falcons on their island stopovers in order to understand the birds' migration patterns. They collect blood and feather samples for analysis before harnessing some of the birds with small satellite transmitters—technology only recently light enough to use on certain species.

From his office computer, the research institute's raptor program director Chris DeSorbo tracks the raptors to their wintering grounds in Central and South America, the Bahamas, and Cuba. In the spring, he follows them on the way to their summer abodes in Greenland, Canada and other northern spots.

The work was initially funded by a federal grant related to offshore wind energy development. DeSorbo is sharing the findings with the scientific community and natural resource agencies to inform decisions related to wildlife conservation and management.

It's clear that many birds rely on Block Island as a migratory stopover, he says. "It's pretty striking when you see the maps of these squiggly lines all over the open ocean. That's basic info nobody really had much of a handle on."

PEREGRINE FALCONS

Falco peregrinus

TRACKING METHOD

GPS and satellite transmitters

MAP MIGRATIONS

The name "peregrine" is Latin for wanderer, but researchers are still learning basic facts about the species. If something threatens the birds in the future, knowing how the birds use habitats will enable conservationists to make decisions that can help the falcons survive.