



Raptor Research on Block Island



Photo © BRI-Chris Persico

Approximately 13 miles off the southern coast of Rhode Island in Narragansett Bay lies a teardrop-shaped natural wonder: Block Island. In the fall, countless numbers of migrating birds stop at Block Island to rest and refuel before continuing their journeys to distant southern latitudes. Often times, their destinations are thousands of miles away in Central and South America.

Migration can be a long and arduous endeavor for birds, and their survival during this journey can have a strong effect on overall populations. Conservation biologists at Biodiversity Research Institute (BRI) strive to better understand the factors limiting bird populations. To accomplish this, we seek field sites that enable us to efficiently capture and sample species of interest.

Researchers have known for years that Block Island is an ideal place to study songbirds during migration. Only recently however, did we confirm that Block Island is also highly valuable in studying raptors. Imagine our surprise when we tracked an adult Peregrine Falcon from Block Island to Greenland!

The purpose of this publication is to introduce island residents to the migrant raptors on Block Island, and to promote continued research and conservation on this island. Such research is important in efforts to help conserve birds and the habitats important to them around the globe.

Block Island:

Where Wildlife and Conservation Intersect

Spend some time on Block Island and you will notice something very unique: it contains an abundance of undeveloped coastal and forested habitat, much of it open to the public. This natural beauty reflects the considerable conservation efforts by The Nature Conservancy, the Block Island Conservancy, the Block Island Land Trust and other conservation partners. Due to these efforts, more than 44.8 percent of the island has been preserved for wildlife, plants, and people.



Raptor Research on Block Island

With assistance from The Nature Conservancy, BRI biologists established a raptor research station on Block Island during fall seasons of 2012 and 2013. This station enabled us to capture, band, and collect blood and feather samples from migrating raptors. We especially wished to learn about the migratory pathways of southbound Peregrine Falcons using satellite tracking technology.

Preliminary observations and data supported the notion that Block Island is likely an important stopover site for migratory raptors. Our efforts also confirmed our suspicions that Block Island is a unique and ideal place to study these birds.

During 2012-2013, we captured 263 individuals of 8 different raptor species on Block Island. The Falcons—primarily Merlins and Peregrine Falcons—were the most commonly observed and captured. We encountered Northern Harriers, Cooper’s Hawks and Sharp-shinned Hawks with moderate frequency, and rarely captured American Kestrels, Red-tailed Hawks, and Northern Goshawks.

The suite of species we encountered on Block Island was expected because their body design (wing shape, bird weight) influences their willingness and ability to embark upon large open water journeys to offshore islands.



At left: A display of the back, wings, tail and characteristic white rump of a juvenile Northern Harrier. Breeding Northern Harriers are considered rare in most Northeastern U.S. states. Harriers are listed as endangered at the state level in NH, RI, CT, NJ, and DE. They are of special concern status in ME, VT, MA, NY, and PA. Below: Raptor banders closing down the trapping station at sunset. Peregrine Falcons and Merlins are often captured late in the day. Photos © BRI-Chris Persico.



Raptors as Bioindicators

Scientists have been using raptors as barometers of ecosystem health for decades. Their distribution and abundance is closely tied to the food webs that support them. Raptors often sit at or near the top of food webs in which they feed, and they play an important role in ecosystems by regulating populations of their prey. Because raptors tend to accumulate contaminants from their prey, their tissues (blood, feather, or eggs) are regularly used to monitor contaminants in our environment.

Several raptors such as Bald Eagles, Peregrine Falcons, and others were nearly extirpated due to contaminant exposure and other factors. As a result, the natural histories of these species are closely intertwined with some of the most important landmark environmental policies in U.S. history such as the banning of DDT and the Endangered Species Act.

Evaluating Mercury Exposure in Migrant Raptors

BRI researchers have been measuring mercury exposure and impacts in birds for over two decades. Mercury is a naturally occurring element, but it is released into the environment through a wide variety of industrial processes such as coal-burning, gold mining, and others. Once present in ecosystems, mercury is persistent and it quickly accumulates in organisms and magnifies up foodwebs, placing top predators at risk. Species have different levels of sensitivity to mercury exposure, and potential effects on some populations remain poorly understood.

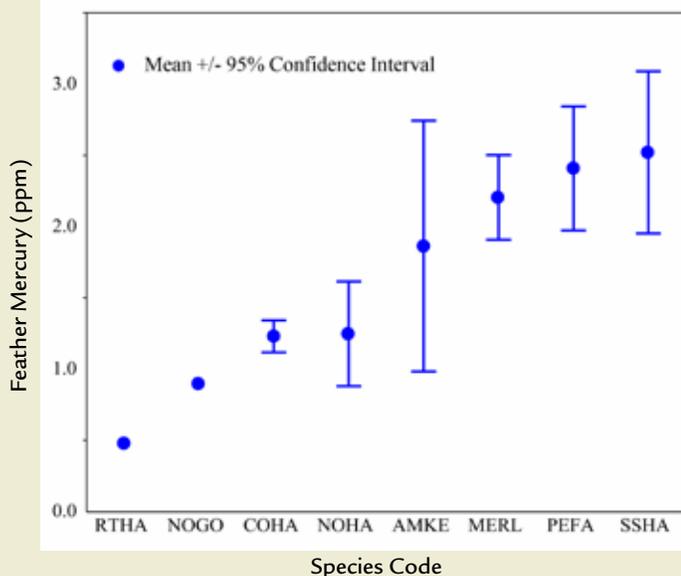
Traditionally, toxicologists focused on evaluating contaminant exposure in fish-eating birds such as Bald Eagles. Recent studies, however, show that birds feeding in terrestrial foodwebs, such as songbirds (and thus their predators), are at equal or greater risk to mercury effects. Due to increased concerns that global mercury emissions are increasing, there is a significant interest among researchers in measuring current mercury exposure across species and regions.



Top: A juvenile male Peregrine Falcon wears a 12 g solar satellite transmitter. Few efforts have been previously made to track young falcons during migration. One male peregrine tracked from Block Island travelled approximately 2,100 mi (3400 km) to Colombia in just over one month. Bottom: We collect standard measurements on all raptors captured. For some species, like this Cooper's Hawk, measurements confirm the gender of individuals. Photos © BRI-Rick Gray



BRI Findings from the Field



Mercury concentrations in migrant raptors sampled at Block Island showed differences in exposure by species. Sharp-shinned Hawks had the highest concentrations, while Red-tailed Hawks had the lowest. Researchers are still evaluating the extent to which mercury exposure could cause negative effects in each of these species. While these exposure levels are low compared to other well-studied raptors such as Bald Eagles, recent studies suggest that some species may be more sensitive to mercury than previously thought.

Figure 1. Mean breast feather mercury concentrations in eight migrant raptor species captured on Block Island, fall 2012-2013. Some raptors including Merlins, Peregrine Falcons, and Sharp-shinned Hawks exhibited feather mercury concentrations associated with negative impacts in other species. Columns (sample sizes) from left to right: Red-tailed Hawk (1), Northern Goshawk (1), Cooper's Hawk (15), Northern Harrier (26), American Kestrel (5), Merlin (133), Peregrine Falcon (60), and Sharp-shinned Hawk (21).

Future Research: Why Block Island?

With support from the Ocean View Foundation and The Bailey Wildlife Foundation, BRI will return to Block Island in the fall of 2014. This season, BRI will partner with The Nature Conservancy and the University of Rhode Island to continue operating our raptor research station on Block Island. These collaborations allow us to expand our raptor research and related educational outreach and conservation efforts. Block Island provides a unique opportunity to study and educate the general public about these majestic creatures and conservation.

The Block Island raptor research station is the northernmost and furthest offshore on the Atlantic coast. These characteristics coupled with the unique migration patterns of raptors there make this island valuable for its research and monitoring potential.

Future research projects include building our sample size of satellite-tracked Peregrine Falcons (particularly males), and initiating tracking studies of Merlins and Northern Harriers, both of which are poorly studied. Wildlife satellite tracking data can be used toward a wide variety of purposes such as linking wintering and breeding areas for bird populations, identifying priority habitats for conservation, and providing baseline data to inform wind power risk evaluations and facility siting decisions.

We will continue banding and collecting biological samples from raptors to evaluate their exposure to mercury as well as other contaminants. We aim to use our efforts and findings on Block Island to conduct educational outreach about raptors, conservation, and environmental issues. Continued operation of this research station will enable further development of other studies with additional partners to maximize overall conservation benefits of this work.



Above: Juvenile Merlins were the most commonly captured raptor on Block Island. Many aspects of the migration ecology of this species remain unknown. Below: Keith and Kay Lewis, conservation legends of Block Island, hold a juvenile Northern Harrier. Photos © BRI-Chris DeSorbo; Rick Gray.



Photo © Ken Archer

How You Can Help

If you would like to help support continuing research and educational outreach efforts on Block Island, please contact:

Chris DeSorbo at 207-839-7600 x115 • chris.desorbo@briloon.org

For more information about BRI's raptor research visit:

www.briloon.org/raptors

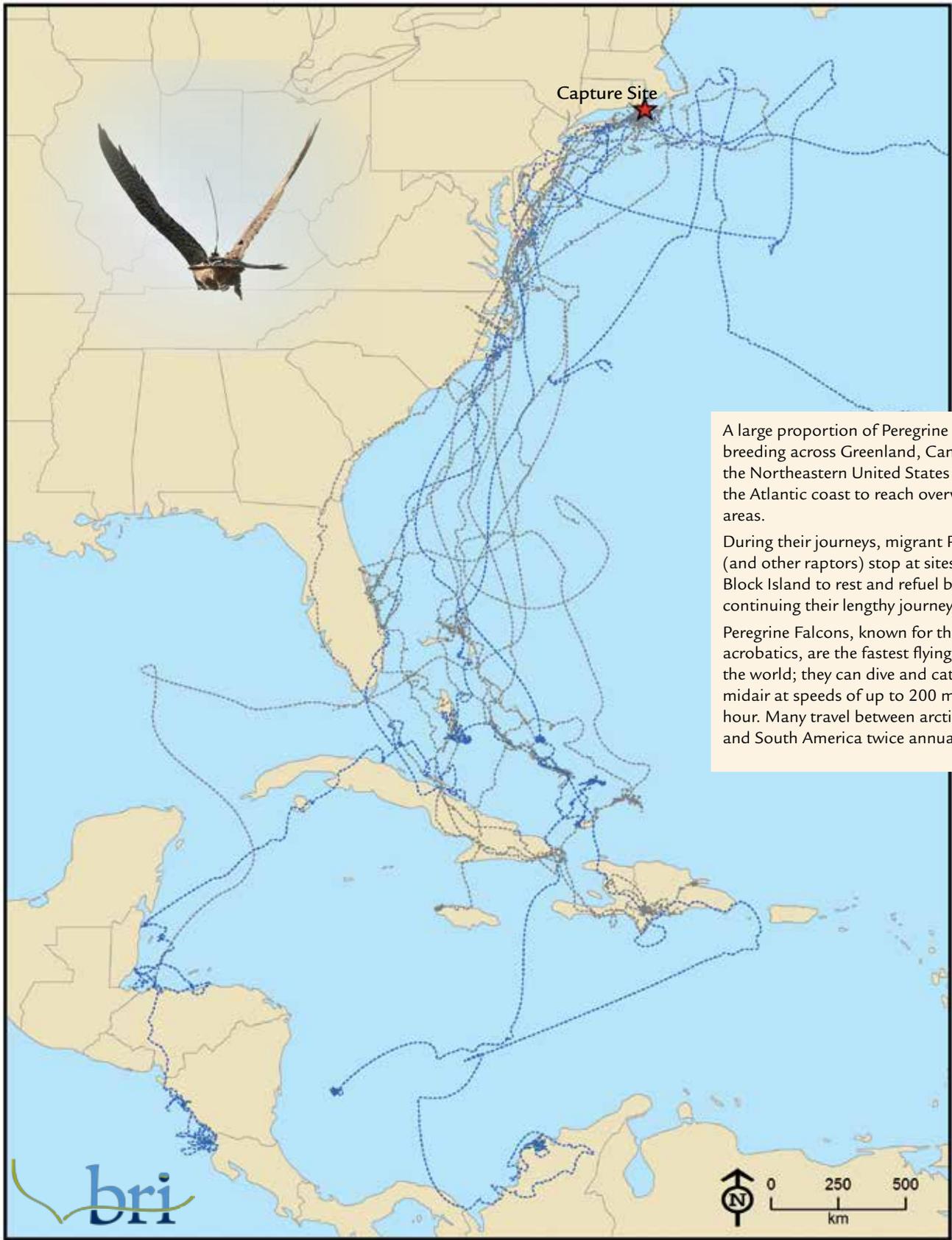
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Satellite tracking work on Block Island during 2012-2013 is a component of a broader Mid-Atlantic Baseline Study, made possible by a grant from the U.S. Department of Energy (Award Number: DE-EE0005362). For more information on the Mid-Atlantic Baseline Study, visit www.briloon.org/mabs.



THE BAILEY WILDLIFE FOUNDATION

Migratory Movements of Peregrines Falcons Captured on Block Island, RI



Fall migration paths used by migrant Peregrine Falcons fitted with satellite transmitters on Block Island. Males ($n = 4$) are represented in blue and females ($n = 8$) are shown in gray. Peregrines used both inshore and offshore habitats along the mid-Atlantic U.S. states. After reaching North Carolina, many flew over open water to reach wintering areas in the Caribbean and Central and South America. Male peregrines tended to migrate further south compared to females, but sample sizes are limited (particularly for males). Photo by Ken Wright, Map by Jeff Tash.

Learning about Raptor Movement Patterns Using Satellite Telemetry and Banding

Peregrine Falcons can fly hundreds of miles offshore during migration. Recent advances in satellite tracking technology have us to collect information on the migratory patterns of birds at a scale that was previously unthinkable.

By fitting birds with small backpack-mounted tracking units, we can study their daily and annual movements, flight altitude, and other information. This information is critical to inform important management and conservation decisions.

During the fall of 2012-2013, we fit satellite tracking units to four male and eight female Peregrine Falcons. We were interested in determining where they overwintered, where they came from, which migratory routes and habitats they used throughout their migration, and the extent to which they used proposed offshore wind energy areas in the Mid-Atlantic U.S. Since migrating peregrines can eat on the wing and likely follow their prey (songbirds, shorebirds) during migration, tracking raptors also provides some insights on the migration patterns in those species.

By banding birds and capturing birds banded elsewhere, we have linked raptors captured on Block Island to Massachusetts, Vermont, Assateague Island Maryland, and Cape May New Jersey. Peregrine Falcons fitted with transmitters on Block Island were successfully linked to wintering areas throughout the Caribbean and Central and South America. After their first winter, several



*A juvenile female Peregrine Falcon wearing a satellite transmitter.
Photo © Al Hinde.*

individuals were tracked to Saskatchewan, Manitoba and far northern Quebec. Others remained in the Bahamas. Transmitters fitted to these individuals continue to provide important information on bird movements, improving our understanding of their ecology, and aiding in their conservation.

Funding and Support

If you would like to help support future research and educational outreach efforts on Block Island, please contact:

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