



U.S. Fish & Wildlife Service

Red knot

Calidris canutus rufa

Skilled aviator Rear Admiral Richard E. Byrd flew over both the North and South poles. But what this renowned man accomplished with the help of sled dogs, ships and airplanes, a little shorebird weighing less than a cup of coffee completes every year of its life. The red knot is truly a master of long-distance aviation.

On wingspans of 20 inches, red knots fly more than 9,300 miles from south to north every spring and repeat the trip in reverse every autumn, making this bird one of the longest-distance migrants in the animal kingdom. About 9 inches long, red knots are among the largest of the small sandpipers. Biologists have identified five races of red knot, three of them living in the Western Hemisphere: *C.c. islandica*, *C.c. rogersi*, and *C.c. rufa*. This last, the red knot known as rufa, winters at the tip of South America in Tierra del Fuego and breeds on the mainland and islands above the Arctic Circle.

Surveys of wintering knots along the coasts of southern Chile and Argentina and during spring migration in Delaware Bay on the U.S. coast indicate a serious population decline. Biologists from the U.S. Fish and Wildlife Service, state natural resource agencies, and non-profit organizations all share a concern for this race of red knot and are pooling efforts to identify what needs to be done to prevent further losses.

A red knot banded in May 1987 was seen on Delaware Bay in May 2000. During those 13 years, the bird had flown about 242,350 miles, a distance farther than from the earth to the moon.



Strength in numbers

Red knots migrate in larger flocks than do most other shorebirds. They break their spring and fall migrations into non-stop segments of 1,500 miles and more, ending at stopover sites called staging areas. Flocks of red knots converge on staging areas along the entire Atlantic coast. Red knots are faithful to these specific sites, stopping at the same location year after year.

While we can guess at some of the benefits of traveling in large flocks, we can also see the downside - susceptibility to habitat change and loss, susceptibility to toxins and diseases, and susceptibility to hunting. Red knots were heavily hunted in the early 20th century, and have never recovered in eastern Canada. They are still hunted in Barbados, the Guianas and other regions in South America. When wintering, the flocking of red knots may protect them from attack by birds of prey. Red knots under attack from falcons perform evasive maneuvers in dense flocks. These flock movements provide very successful protection for individual birds.

Eating like a bird

In order to endure their long journeys, red knots undergo extensive physiological changes. Flight muscle mass increases, while leg muscle mass decreases. Stomach and gizzard masses decrease, while fat mass increases by more than 50 percent. For much of the year red knots eat small mussels and other mollusks, shell and all. When red knots stop to eat during their migration, they eat fewer hard foods because of their shrunken gizzards, and in spring they seek the soft eggs of the horseshoe crab. In fact, the birds' spring migration is timed with the release of horseshoe crab eggs, the perfect food for a traveling red knot. The abundance of these nutritious eggs also makes them a quick and easily found food, saving the birds' energy. Red knots arrive at staging areas very thin, sometimes emaciated. They eat constantly to increase their fat mass to continue the trip, gaining up to 10 percent of their body weight each day and essentially doubling their body weight during their stopover stay.

Red knots often arrive in their arctic breeding areas before the snow cover has melted, and before insects are active and available to eat. The birds then eat plant seeds, grass shoots and other vegetable foods. Once insects hatch, chicks eat them almost exclusively, and adult red knots increase their consumption of insects along with plant materials.

Requirements for survival

Red knots' unique and impressive life history depends for its success, and the species' survival, on certain conditions. One of the most important is the continued availability of billions of horseshoe crab eggs at major North Atlantic staging areas, notably the Delaware Bay and Cape May peninsula. The increase in taking of horseshoe crabs for bait in commercial fisheries that occurred in the 1990s may be a major factor in the decline in red knots. Another necessary condition for red knots' survival is the continued existence of middle- and high-arctic habitat for breeding. Red knots could be particularly affected by global climate change, which may be greatest at the latitudes where this species breeds and winters.

Red knots fascinate biologists, bird watchers and people who appreciate the complex beauty of the natural world. Together with these partners, the U.S. Fish and Wildlife Service is dedicated to working to conserve this extraordinary bird.

**Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035
413/253 8200
<http://northeast.fws.gov>**

**Federal Relay Service
for the deaf and hard-of-hearing
1 800/877 8339**

**U.S. Fish and Wildlife Service
<http://www.fws.gov>
1 800/344 WILD**

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