Red Knot, *Calidris canutus*

Status: ***State:*** Endangered ***Federal:*** Not Listed

Identification

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After journeying from the southern tip of South America, the red knots that appear on the shores of Delaware Bay in May arrive so thin that they look like sparrows. There they gorge themselves on the eggs of the horseshoe crab (Limulus polyphemus), putting on a layer of fat so thick that they leave for their Arctic breeding grounds looking like plump doves. At least five other shorebird species use the bay as a spring migratory stopover.

Among them, however, the red knot is the largest and stockiest. In its May-August breeding plumage, it also sports a distinctive breast of brilliant rusty red. Also described as pale salmon, this russet color extends up the neck and around the eyes, and bleeds somewhat into the patterned black, brown, gray and white colorations on the wings and back. The rump is whitish. The knot has a short, straight black bill and, during breeding season, dark brown/black legs.

A small number of the adults arrive in the middle of their molt showing various amounts of the non-breeding plumage that is typical between September and April: a washed-out gray look with scaly white feather edgings, whitish flanks with dark barring and greenish legs. Juveniles are primarily gray, with a scaly pattern on the wings and dull yellow-olive legs.

Passing through New Jersey again in August, adult red knots remain in breeding plumage and with many other species. During both the May and August migrations, whimbrels or Hudsonian curlews *(*Numenius phaeopus*)* look most similar to knots, but their breasts are duller, contrasting less with the rest of their bodies. Also, whimbrels are larger and their decurved bills are twice as long.

As with most shorebirds, the long-winged, strong-flying knots fly in groups, sometimes with other species.

Habitat

Red knots on Delaware Bay depend primarily on horseshoe crab eggs and therefore occur more frequently in areas of dense horseshoe crab spawning, usually sandy beaches with gentle slopes and minimal wave action (Botton and Loveland 1992).

Red knots sometimes roost on the high portions of sandy beaches along Delaware Bay, but usually fly to roosts on the Atlantic side of the Cape May peninsula. The largest numbers use the long sandy spits at ocean inlets, although many birds roost in small

numbers on the many marsh islands scattered between North Wildwood and Sea Isle City. Birds also roost on sandy beaches and spits on Egg Island and Fortescue.

In the Arctic, nesting red knots use a distinctive habitat type characterized by vast areas of sparsely vegetated, low elevation tundra (Richard Lathrop, pers. comm. 2001). These areas remain mostly covered in snow until mid-June, so birds must build nests in areas swept free of snow by prevailing northeasterly winds. Foraging habitat often consists of extensive isolated or lacustrine wetlands (interconnected by streams) that are dominated by sedges.

In southbound migrations, birds are often found in marsh flats and sandy washes. In the wintering areas, the birds occur primarily on large tidal flats. Red knots roost in expansive sand flats that are only infrequently flooded by tides. Most of the wintering population occurs in Bahia Lomas, Chile, where birds feed on a large sandy flat five miles wide and more than 40 miles long (Niles et al. 2001b). Depending on the stage of the moon, varying portions of the flat flood at high tide. Even though the tide varies by 10 m (about 32 ft.), the tides barely flood the flats of Bahia Lomas. Shorebirds feed along the advancing tide line and roost along the water's edge.

Status and Conservation

Conducted by a New Jersey Audubon team lead by Peter Dunne (Wander and Dunne 1981), the first comprehensive surveys of red knots on the Delaware Bay began in 1981. Since 1986, the surveys have been conducted annually by the ENSP's Kathleen Clark--making the survey one of the longest running surveys of shorebirds in North America. During the survey period red knot numbers have fallen dramatically, from high counts of more than 90,000 birds in 1989 to about 36,000 birds in 2001. The numbers fluctuate cyclically, possibly related to Arctic weather or cyclic changes in the populations of snowy owls *(Nyctea scandiaca),* Arctic foxes and jaegers.

The fall in numbers, however, parallels the decline in the Western Hemisphere flyway-wide population, estimated by the ratio of birds banded and eventually re-sighted throughout the flyway. Allan Baker has recently revised Brian Harrington's 1980s population estimate of 150,000 birds downward to just 70,000 birds. Moreover, counts of the winter population made by Niles et al. (2001b) suggest substantial declines of about 30%.

The red knot's status remains difficult to assess because the population remains relatively high, numbering in the tens of thousands. Most experts agree, however, that the decline of the knot, if it continues, will be abrupt and drastic. This is because the birds are relatively long-lived and have adapted to substantial reductions in productivity resulting from periodically harsh Arctic nesting conditions. This ability to withstand temporary losses in the population would, in effect, mask other impacts until significant declines were well underway.

The status of the numbers of red knots prior to the 1980s surveys is poorly understood. As populations of horseshoe crabs were once more widespread, it is likely that knots also concentrated during their spring migration in other estuarine systems from Cape Cod Bay to Chesapeake Bay. In 1897 Charles Shriner noted that knots were "formerly very plentiful in migrations in New Jersey," having fallen easy prey to shorebird gunners. Both he and Witmer Stone found red knots on the Delaware Bay in the early 20th Century, but made no remarks on unusual numbers. Red knots were

probably found in similar numbers in Cape Cod Bay and the Atlantic coastal islands of Virginia where large populations of crabs were once noted. As the horseshoe crab populations declined along the East Coast, birds probably concentrated around the Delaware Bay, currently their last remaining stronghold.

Due to the threat posed by the declining number of horseshoe crabs and the consequent effect on egg availability, the red knot was listed as threatened in New Jersey in 1999 and then endangered in 2012. Although the magnitude of the decline in horseshoe crab numbers remains uncertain, the long-term consequence of a decline in crabs, which do not first breed until they are eight or nine years old, will require intensive monitoring of crab and red knot populations to enable biologists sufficient time to act if populations fall drastically.