

## Migration of Knots through Bahía de San Antonio, Río Negro, Argentina

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Because of concern about declining numbers of Red Knots (*Calidris canutus rufa*), the International Shorebird Banding Project (ISBP) is attempting to estimate population parameters and migration strategies. In early December 2000, an ISBP team caught and colour-banded 582 knots in Río Grande (RG), Tierra del Fuego, Argentina, of which 62 were marked individually, and 45 marked with standard combinations for juveniles and immatures. In the ensuing period to the end of April 2001, Western Atlantic Shorebird Association (WASA) observers along with ISBP and Canadian Wildlife Service researchers made counts and scans of colour-banded birds mostly in RG and Bahía de San Antonio (SAO), a key stopover site 1450 km north in Patagonia.

Northern migration of adults started in mid February when the first decline in numbers at RG was noted and 6000 birds arrived in SAO. From 20 February to 20 March, about 5000–7000 knots were counted at SAO. Re-sightings of birds individually colour-banded at RG showed that they were arriving in SAO during this period. A big drop in numbers at SAO occurred by March 21, when 700–1500 knots were present, but by March 31 numbers increased to 3000. Re-sightings of individually colour-banded birds during this second period showed that several birds present in SAO in mid-February were still in SAO in early April (5 of 44 adults resighted at SAO). The first sightings of immatures banded in RG were recorded during this second wave.

Scans of RG banded birds re-sighted in SAO gave an estimate of the total wintering population of knots south of SAO of 31,800 (26,850–37,850 95% CL) birds, while scans of SAO banded birds re-sighted both at SAO and RG gave an estimate of 37,600. These estimates are consistent with those obtained during an aerial census by Larry Niles (NJ Division of Fish and Wildlife's Endangered and Nongame Species Program), Guy Morrison (CWS), Ken Ross (CWS) in early February 2001 in the Tierra del Fuego expedition lead by NJDFW.

The wintering population size in RG was estimated as 5,500–6,500 birds (18 % of southern total) both from censuses and colour band scans. The migration through SAO was different from the pattern in 1998 and 1999 when bird turnover was more gradual. SAO population size declined from 20,000 (or more) in 1996, to 15,000 birds in 1997 and 1998, and then to 8,500 ( $\pm 500$ ) birds in 2001. This figure for 2001 represents 24% of the total southern population on its northward migration.

### Migration and other biological data of *Calidris canutus rufa* from Brazil

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Nearctic shorebirds have been monitored in Brazil since

1980 through CEMAVE/IBAMA. The main objective has been to furnish sound information for shorebird conservation. Recent population decreases detected in species such as the Red Knot (*Calidris canutus rufa*) have made the monitoring of population levels and migratory strategies fundamental to proper conservation policies.

CEMAVE has conducted aerial and terrestrial evaluation of potential areas while census and capture has been set up in key locations. For the Red Knot, Maranhão state coast (MA) and Lagoa do Peixe National Park (LP) have been monitored since 1987 (MA) and 1984 (LP).

From 1984 to 1999, 2,398 Red Knots have been banded in Brazil (LP = 2251 and MA = 47), 87% as adults and 13% as immatures. The recovery rate is 7%.

Southward migration shows a stopover in eastern US coast (Scituate, Massachusetts, August 10th) and Guianas (September 7th and 12th). MA is used from September although Central Brazil is overflowed. Quick stops take place in Pantanal (late September and early October 1989 at Rio Negro's salt lakes) where 8 of 10 still have breeding plumage. Birds arrive at LP as early as the second week of September, some still with breeding plumage. Numbers increase in October, decreasing afterwards when birds migrate to Argentina (where banded birds were observed on October 6th, 1997) and Chile.

During northward migration higher numbers occur on the coast of Rio Grande do Sul, with LP the major stopover. Main passage takes place from the second week of April to the first week May. Body moult occurs in April when breeding plumage is acquired. May average mass is 192g ( $n=309$ ,  $SD = 27$ ). A LP colour-banded knot was seen near Turiaçu, MA, two weeks after banding. May MA samples show masses between 115 g and 210 g ( $SD = 29.7$ ). The average mass (153.6 g) suggests fattening for migration may take place there. An alternative hypothesis is that birds below minimum migratory mass may remain on the continent's northern coast, skipping breeding. Immatures must stay, being found in June and July as far south as LP.

The next major stopover for birds from LP is Delaware Bay, in U.S. (94 recoveries), perhaps the same is true for MA banded knots. Apart from a recovery in Presqu'île, Ontario, there is no further information on Brazilian-banded knots in Canada.

Data indicate 7,000 knots using LP in recent years. This follows a decline from 1997 to 1999 and again in 2001 (as also found in Argentina (P. Gonzalez, pers. comm.)). MA has 10,000 knots or more.

Future studies aim to establish the age composition of the population, particularly on the north coast. It is also important to identify all sites used by knots, either for stopovers or for wintering. Demographic aspects of the population will be cornerstones of conservation strategies, whether in a local or hemispheric perspective.

### Red Knot monitoring in southwest Florida

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Red Knots (*Calidris canutus*) are present along the southwest Florida coast year round. In this paper, I describe population trends and site fidelity of Red Knots in the vicinity of Marco

