

**PROPOSAL FOR THE INCLUSION OF SPECIES ON THE APPENDICES OF THE
CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD
ANIMALS**

A. PROPOSAL: Inclusion of the Red Knot (*Calidris canutus rufa*) on Appendix I of the Convention on the Conservation of Migratory Species of Wild Animals (CMS).

B. PROPONENT: Republic of Argentina

C. SUPPORTING STATEMENT:

1. Taxon

- 1.1. Class:** Aves
- 1.2. Order:** Charadriiformes
- 1.3. Family:** Scolopacidae
- 1.4. Genus and species:** *Calidris canutus* (Linnaeus 1758)
- 1.5. Subspecies:** *Calidris canutus rufa* (Wilson 1813)

2. Biological data:

2.1. Distribution (current and historical)

The Red Knot (subspecies *rufa*) is a nearctic migratory species that reproduces in the Canadian Arctic (Lat 66 N) – e.g. Southampton Island. After the reproduction season during boreal summer, it migrates South along the American Atlantic coast to its main non-breeding concentration areas in Tierra del Fuego and Argentine Patagonia (Lat 53 S) (Piersma & Davidson 1992). Although the Red Knot population in the North areas of South America (Maranhao and French Guiana) is considered to belong to the subspecies *rufa*, recent studies (Dec. 2003) on coloured-banded birds indicate that they are different non-breeding populations (González P., Baker A., Nascimento I. *et al.* unpublished data).

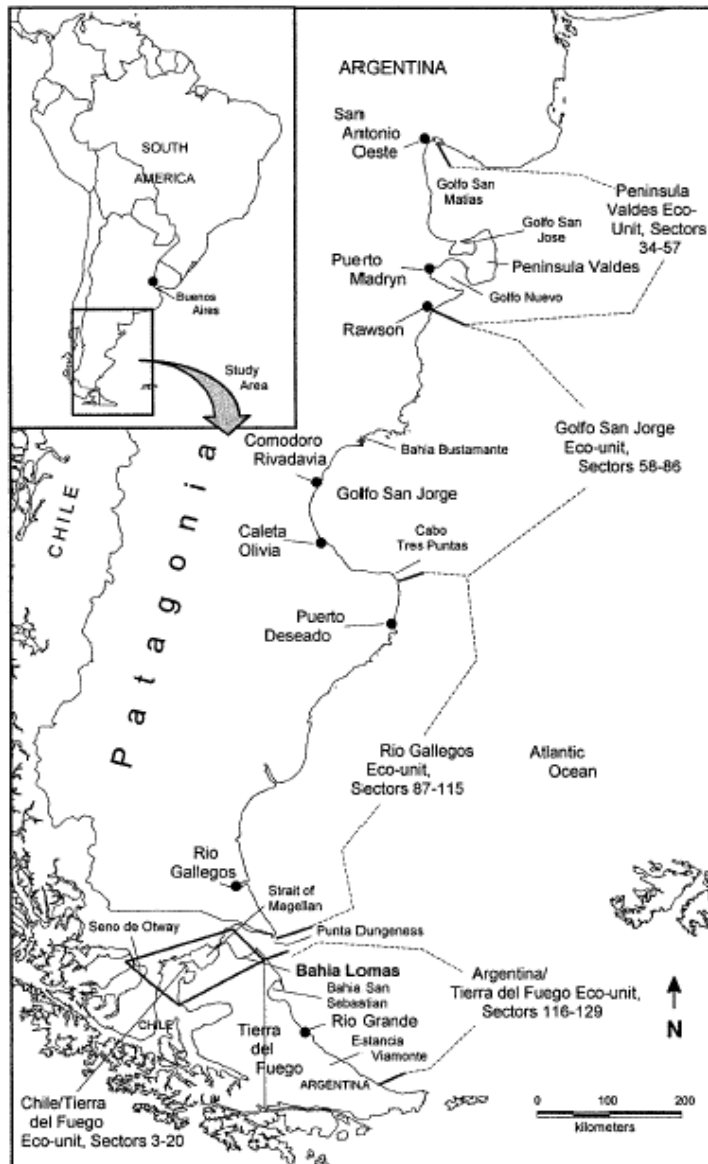
2.2. Population (estimates and trends)

Aerial surveys by the Canadian Wildlife Service on Patagonia and Tierra del Fuego coast lines reported a total of 67,496 individuals in 1982-85 (Morrison & Ross 1989) and the estimated population size on the South of San Antonio Oeste in Rio Negro province by capture-recapture methods in 1995 was 74,193 individuals with a confidence interval of 95% [51,398 – 111,573] (González *et al* published data).

From the year 2000 aerial surveys showed a drastic reduction in the population size at Tierra del Fuego, which is the main wintering site, from 51,255 individuals in 2000, down to 27,250 individuals in 2002, 29,915 individuals in 2003 (Morrison *et al* 2004) and approximately 30,000 individuals in a recent survey in January 2004 (Morrison G. pers. com.). This drop in population size matches the estimated size obtained by capture-recapture methods below.

Furthermore, although Brayton & Schneider (2000) report austral wintering populations in Peninsula Valdes in the 80ies, the studies by Bala *et al* (2001 – 2002) in Peninsula Valdes and Ferrary *et al.* (2002) in Rio Gallegos estuary show that Red Knot populations have been migrating in the 90s and 2000s.

Therefore, a drastic population decline and geographic reduction of Red Knots at its core sites in Tierra del Fuego has been registered, since it has disappeared from wintering areas in the continental Patagonia that were used until two decades ago.



The following figures and tables show some details of the results obtained by Morrison *et al.* 2004 and González *et al.* (in press) on the population size of Red Knots in wintering areas in Tierra del Fuego and Argentine Patagonia.

Wintering concentration areas:

Distribution map of the ecounits found during summer aerial surveys and a Table with details on the number of Red Knots recorded in past and recent studies (by Morrison *et al.* 2004).

FIGURE 1. Map of Patagonia and Tierra del Fuego, Argentina and Chile, showing coastlines covered during surveys for wintering Red Knots. Eco-unit boundaries and sectors they contain are indicated, along with major geographical features and sites mentioned in the text. The main wintering site for Red Knots, Bahía Lomas in the Chilean part of Tierra del Fuego, is marked in boldface. Core sites are in Tierra del Fuego (Argentina and Chile), and peripheral sites on the coast of Patagonia. Filled circles indicate major towns and cities.

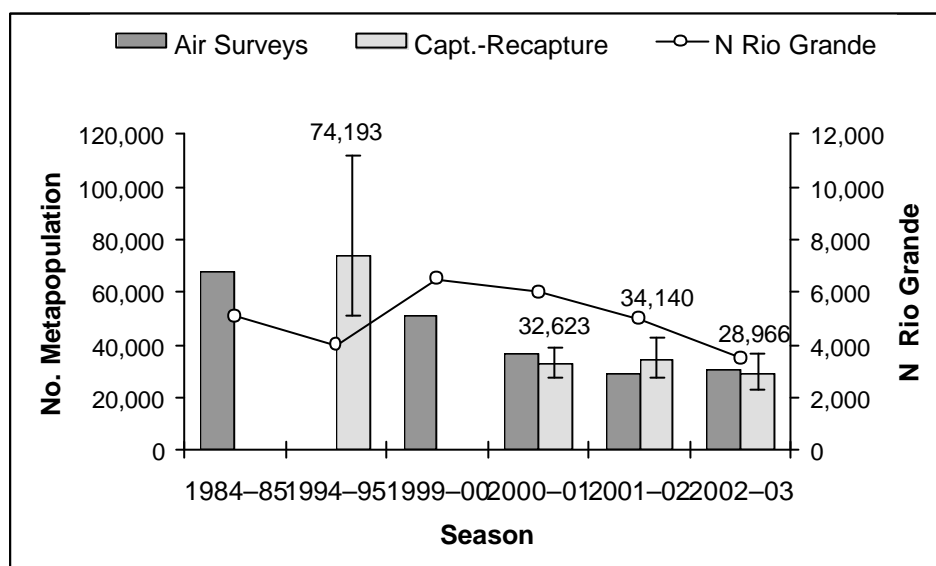
TABLE 2. (by Morrison *et al.* 2004) Summary of counts of Red Knots wintering on the coast of Argentina and Chile. Subtotals are shown for the core sites in Tierra del Fuego (Argentina and Chile) and for the principal wintering site for this subspecies of Red Knot at Bahía Lomas. Counts from 1982-1985 refer to atlas counts in Morrison and Ross (1989). Ecounits and locations are shown in Figure 1.

Country Ecounit	Survey years				
	1982 - 1985	2000	2001	2002	2003
Argentina					
Peninsula Valdes	5023			650 ^a	350
Golfo San Jorge	8691			679	210
Rio Gallegos	550			700	0
Tierra del Fuego	10470	5550		5070	4400
Chile	42762	45705	29745	22172	25515
Tierra del Fuego					

Total all sectors	67496	51255	29745	29271	30475
Subtotals for core areas					
Argentine and Chile					
Tierra del Fuego	53232	>51255		27242	29915
(% total)	(79%)			(93%)	(98%)
Chile					
Bahia Lomas	41910	45250	29745	21855	25500
(% total)	(62%)			(75%)	(84%)

^aNot all sectors surveyed.

Population size estimates (= metapopulation) (\pm confidence interval of 95%) of Red Knot on the South of Bahia de San Antonio by capture-recapture methods, as compared to the results from air surveys (Morrison & Ross 1989, Morison *et al.* 2004) and fluctuation of non-breeding population size throughout the austral wintering season under study. (by González *et al.* in press). Significant differences have been observed between the figures before and after the 1999-2000 season.



✓ Trend and Actual Population Size

The figures for the two last decades, which reveal a decreasing trend, have already been mentioned above.

In terms of long term trend, the actual population size of *C.canutus rufa* is of around 2000-4000 female individuals. There is, therefore, an urgent need to increase the number of breeding pairs in the population in order to avoid extinction (Allan Baker pers. com.).

2.3. Habitat (brief description and trends)

In the breeding areas in the Arctic, nests have been found in the tundra ecoregion. The main source of food for Red Knots in these areas is represented by arthropods obtained by pecking. In their migration and non-breeding areas they prefer wetlands offering vast intertidal areas, preferably with soft substrates, where they obtain bivalve molluscs and gasteropods (the main items in their diet) and crustacea. In Patagonia, they also feed at large intertidal rocky surfaces also known as “restingas”, where they feed from bivalve molluscs (González *et al.* 1996, Piersma *et al.* in press). Delaware Bay in USA is a special case, since they feed there from horseshoe crab eggs (*Limulus polyphemus*) that have been laid at the upper intertidal zone (Tsipoura and Burger 1999).

2.4. Migrations

The main concentration areas in their North migration are the following: Each year, between 20 to 50% of the Red Knot population whose non-breeding areas are in the South of the continent arrive in Bahía de San Antonio in Río Negro province (González *et al.* 2003); between March and April, Peninsula Valdés is another important site in the North migration (Bala *et al.* 2001, 2002) as well as Punta Rasa and Bahía Samborombón (Blanco *et al.* 1992, Vila *et al.* 1994) in Buenos Aires province, although the figures have significantly dropped in the last few years (D.Blanco pers. com.).

There are also other migration stopover areas with variable incidence, such as Río Gallegos estuary (Ferrari *et al.* 2002), Bahía San Julián (M.Hernández pers. com.) and Punta Medanosá. in Santa Cruz province, Bahía Bustamante (Escudero *et al.* 2003), Río Chubut estuary and Laguna Piedrabuena in Puerto Madryn (Raúl León, pers. com.), Chubut; Complejo Islote Lobos, (J.P.Chillón, pers. com. & P.González pers. obs.) and Caleta de los Loros (Chani *et al.* in litt.) Río Negro province ; Punta Alta, (P.Petracci, pers. com.), Monte Hermoso, (G.Francia, pers. com.) and Mar Chiquita (M.Martínez and L.Oliveira, pers. com.) in Buenos Aires province.

Therefore, the North migration moves along the Atlantic route following Río Grande do Sul coastline to then reappear in Maranhão (Brasil), French Guiana (Le Dreff A. & Hansen E. unpublished data), Surinam, Panama (Buehler 2002) - a small number of birds banded in Argentina have been seen in Caribe and Florida (Baker *et al.* unpublished data) - along USA East coast, with the last concentration area in Delaware Bay before arriving at their nesting areas in the Arctic with a brief passing through the South of James Bay and occasionally a short number of birds at Ontario Lake (Morrison & Harrison 1992).

The main concentration sites during South migration are James Bay, where ringed birds have been seen on the North coast of Saint Lawrence Gulf (Baker *et al.* unpublished data), Fundy Bay, Massachusetts, s.e. USA, Surinam, French Guiana ((Le Dreff A. & Hansen E. unpublished data), Maranhão (Rodrigues & Lopes 2000), and the South of Brazil (Morrison & Harrington 1992).

As regards the South migration, there are no known concentration sites in Argentina of the same importance of those identified for the North migration, and only Punta Rasa, Bahía de San Antonio and Río Gallegos estuary seem to be visited every year although by a much smaller number of birds.

✓ **Seasons** (nesting, migration and non-breeding concentrations).

Seasons	E	F	M	A	M	J	J	A	S	O	N	D
Nesting						X	X					
Migration	X	X	X	X	X		X	X	X	X		
Non-breeding	X	X	X							X	X	X

Red Knots do not necessarily migrate at the same time, hence the overlapping shown in the diagram. Generally young adults (2nd year) move to the North typically later than adults (Gonzalez *et al.* 2001) and the juveniles born in the Arctic migrate South and normally arrive at Bahía San Antonio later than the adults (Gonzalez P. unpublished data).

Not all the juvenile individuals arrive at Tierra del Fuego in their first year (Baker *et al.* 2004) and their distribution range spreads up to the North of Southamerica (and Caribbean?). During the adults North migration, the juvenile individuals move in the same direction although they do not nest in the North Hemisphere but stay in Southamerica (and Caribbean?) during the boreal summer breeding season (Gonzalez & Baker unpublished data).

3. Data on threats

	Migration area	Wintering area
1	Overfishing Horseshoe Crabs in Delaware Bay	Expansion of tourism, leisure activities and unplanned development.
2	Expansion of tourism, leisure activities and unplanned development.	Pollution? (oil, real or potential) seismic exploration?
3	Actual or potential pollution (for example, Solvay, soda manufacturing plant in Bahia San Antonio?)	Aquaculture activities (potential)
4	Aquaculture activities (potential)	
5	parasites and viruses in subtropical and tropical areas.	

3.1. Direct threats on the population

The only hunting on shorebirds that has been reported is in Guadalupe, where the population of Red Knots seem to be scarce and occasional.

3.2. Habitat destruction

The expansion of tourism and unplanned development in Red Knot concentration areas destroys resting and feeding areas (e.g. construction of pools at intertidal rocky zones in Bahia San Antonio, increasing the number of accesses to beaches, vehicle, people and dogs traffic in critical areas, alteration of coast natural structures such as cliffs, sea landfills and modification of coastlines for developments).

3.3. Indirect threats

Actual or potential pollution by carbohydrates in Patagonia (no assesment has been carried out). The activities by a soda manufacturing plant, Solvay, is soon to start up in San Antonio Oeste and should be monitored. The overfishing of the Horseshoe Crab in Delaware Bay (see below) is another factor to take into account.

The consequences of Global Climate Change have not been fully identified and could be extremely important.

3.4. Threat that are particularly related to migrations

Baker *et al.* (2004) proved that the decline in annual survival and recruiting is concurrent with those years when the reduction in number has been reported, and it is related to the overfishing of Horseshoe Crabs in Delaware Bay and a late arrival of the population from Tierra del Fuego.

González *et al.* 2003 proved that in Patagonia, in the 2002 and especially in the 2003 seasons, North migration from Tierra del Fuego delayed significantly. In 2002 the birds arrived at Bahia San Antonio after making stopovers at alternative intermediate wetlands and the population peak was registered during the first week in April, i.e. two weeks later than in regular years. In 2003, Knots, not only arrived with a delay at Bahia San Antonio with a population peak around 10th April, but also it remained unchanged until 23rd of the same month. Concurrently, the lowest aerial survey figures for the last years were registered during the 2003 season at Delaware Bay, with a maximum number of 16,000 individuals. (K.Clark *et al.* unpublished data). Between 50 to 60 per cent of these birds were from Tierra del Fuego and the rest had come from other places (North of Southamerica and Caribbean?). This estimate is based on the examination of stable isotopes in flight feathers (P. Atkinson *et al.* MS) and the numeric analysis of ringed-bird sightings (Gonzalez & Baker unpublished data). These low figures coincide with late Horseshoe Crabs egg laying and poor weather conditions, while captures showed a significant reduction in average body weight in comparison to previous years (Delaware Bay International Shorebird Project, unpublished data).

* In this context, we must take into account that the apparent stability of the population size in Tierra del Fuego throughout the last two seasons (2003 – 2004) could be the result of aborting the migration and the nesting season by a large part of the population. A differential survival rate study should be carried out for those birds arriving at Delaware Bay and those which did not arrive at this area.

3.5. National and international values

Red Knots together with other shorebirds are an economist asset for bird-watching tourism in Delaware Bay, and particularly in New Jersey. In Lagoa do Peixe, Brazil, shorebird festivals have been held for the last few years. There are innovating ecotourism projects in Argentina, in San Antonio Oeste, Rio Negro province and emerging proposals for Rio Grande in Tierra del Fuego. There is a project to develop an interpretation centre in Bahia Lomas, Tierra del Fuego, Chile.

4. Current situation and protection needs

4.1. Protection in the different countries

The Provincial Reserves in Argentina are the following: Tierra del Fuego Atlantic Coast (Hemispheric Site of the Western Hemisphere Shorebird Reserve Network – WHSRN) - and Ramsar Site). Provincial Reserve Rio Gallegos Estuary, in Santa Cruz province; Peninsula Valdes (World Heritage, UNESCO) in Chubut province.

In Rio Negro province, the Nature Protected Areas of Complejo Islote Lobos, Bahia de San Antonio (International WHSRN Site) and Caleta de Los Loros. In Buenos Aires province, Bahia de Samborombon (Ramsar Site).

4.2. International Protection

This species has been included in Appendix II of the CMS (Convention of Migratory Species) in the Scolopacidae family.

Chile has applied for the inclusion of Bahia Lomas as a Ramsar Site. There are two protected areas in Brazil: The National Park Lagoa do Peixe in Rio Grande do Sul (International WHSRN Site and Ramsar Site), and Reentrâncias Maranhenses/Salgado Paraense, in the states of Pará and Maranhão (Hemisphere WHSRN Site and Ramsar Site).

In the North Hemisphere it is protected by agreements and conventions such as the "Migratory Bird Treaty Act"(USA), "Convention for the Protection of Migratory Birds"(USA and Canadá), "Convention for the Protection of Migratory Birds and Game Mammals"(USA and México), "Convention for the Protection of Migratory Birds and Birds in Danger of extinction and Their Environment"(USA and Japón) and the "Convention for the Conservation of Migratory Birds and Their Environment" (USA and Rusia).

4.3. Environment protection needs

In Argentina it is a priority to implement the management plans of the above mentioned areas. All of them, except for Peninsula Valdes are protected on paper, but not in fact. We would like to make the following regional suggestions for this country:

- 1 - Implementation of management plans in critical areas.
- 2 - Encouraging communication and data exchange between teachers, researchers, civil servants and the community in general about sites sharing shorebirds. Exchange visits are very important to set up solid links.
- 3 - Setting up a stable and qualified body of environment guards.
- 4 - Recent urban development is frequently unplanned and is increasingly expanding to critical areas. It is necessary to develop innovative strategies to find solutions for this type of problem.

- 5 - Large firms should compensate for their negative environmental impact and provide funds to conservation projects (publications, leaflets, videos, interpretation centres, etc.).

✓ **Main information gaps in flyways:**

1	The size of the non-breeding population in the North of Brazil and Southamerica and their demographic parameters in relation to the population in Tierra del Fuego are still to be determined.
2	The rate of recruitment in the Arctic is not known.
3	What is the survival rate of the population in the North of Southamerica and why do these individuals do not migrate to Tierra del Fuego? (except for juveniles from Tierra del Fuego which spent their first season there).
4	Late migration: Is there a survival difference between the birds arriving at Delaware Bay and those who “aborted” the last stage of the migration? Can it be quantified?
5	Which are the connectivity factors determining late migration?
6	At some places, new or deeper trophic ecology studies are needed.

5. Current distribution areas

ARGENTINA, Brazil, Canada, CHILE, United States of America, FRANCE (French Guiana), PANAMA, Suriname, URUGUAY (and other Caribbean countries). Records of the *rufa* subspecies in other countries such as Venezuela, Mexico or ECUADOR are not conclusive. There are some isolated records in Paraguay.

6. Comments on the countries in the distribution areas

7. Other comments

The subspecies *rufa* is the one that travels the longest migration distance of all the 6 recognized subspecies of Red Knot. It travels from the Canadian Arctic to austral wintering areas in Argentine Patagonia and Tierra del Fuego (Piersma & Davidson 1992). For an overview of this subspecies refer to Piersma *et al.* in press.

Due to its low genetic variability (Baker 1992, Baker *et al.* 1994, Buehler & Baker in press) and life history, the *Calidris canutus* is extremely vulnerable to alterations in their migration stopover sites and austral wintering areas (Piersma & Baker 2000).

8. Referencias

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