FINAL REPORT
WATERBIRDS IN BRAZIL

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WATERBIRDS IN BRAZIL: A CONSERVATION ASSESSMENT

1. Species Occurring Within the Country

Brazil is the largest country in Latin America, stretching from about latitude 5º N in the Venezuela/Guyana border to about 34º S at Arroio Chuí, between Rio Grande do Sul and Uruguay .

The Brazilian territory includes the bulk of some of the largest river systems in South America, including the Amazon and the Paraná-Paraguay basins. The Amazon basin, the largest in the world, includes varied river types and extremely complex wetland systems. Black-water rivers such as the Rio Negro form flooded forests (igapós) while white-water rivers with heavy sediment loads such as the Madeira and Solimões form large lakes as their courses changes, including the famous Mamirauá system. Lakes are also a feature of parts of the Amazon, as can be seen near Monte Belo and Santarém, in its middle reaches. All over the basin sandbars and beaches form during the low-water season, and these are important nesting habitats for a suite of specialized birds and provide feeding grounds for migrating shorebirds.

The might discharge of freshwater, sediments and nutrients by the Amazon has impacts all over the northern coast of Brazil and even neighboring countries. The intricate system of channels, islands, flooded forests, mangroves, beaches and mudflats along the coasts of Amapá and Pará are a result of the all-pervasive influence of the great river.

Other important basins, such as the São Francisco, Parnaíba and Lagoa dos Patos are wholly in Brazilian territory. The Rio São Francisco hydrology has been heavily modified by several hydropower projects, the same fate of most of the Paraná basin, and also feeds several irrigation projects in the semi-arid area of northeastern Brazil. The Rio Paranaíba, although blocked by the Boa Esperança dam, has one of the largest deltas in the continent, an area still mostly covered by undeveloped mangrove forests and huge mudflats.

Among the inland wetlands, Brazil has a sizeable part of the Pantanal, shared with Bolívia and Paraguay, and of the Itenez/Guaporé/Mamoré floodplain. The latter can be viewed as forming part of a wetland corridor that links them to the Pantanal, the wetlands of the Rio Paraná (now remaining only along the Paraná / Mato Grosso do Sul border and including Ilha Grande National Park) and the ones in the lower Paraná in Argentina.

The Araguaia valley system (including the Pantanal do Rio das Mortes) covers a huge area in central Brazil, including parts of Mato Grosso, Goiás and Tocantins. It is still poorly known outside the country, but seems to have waterbird populations that rival the world-famous Pantanal de Mato Grosso. It floods during the rainy season (October-April), drying during the austral winter.

Other extremely important wetlands are found along eastern Rio Grande do Sul. While the Paraná basin receives most rain during the austral summer, the wetlands in Rio Grande do Sul flood during the winter rains, providing a crucial link to waterbirds moving along the Paraná basin. These southern wetlands (the “banhados”) are linked to several lagoons stretching along the coast of Rio Grande do Sul, and isolated from the sea by one of the longest sandbeaches in the world. This stretches for over 700 km from Tramandaí to Arroio Chuí and provides one of the most important stop-over and feeding areas shorebirds, terns and gulls, especially south of the Patos Lagoon mouth.

The Brazilian coast stretches along a latitudinal gradient of 7,300 km, with a coastline of over 8,500 km. This varied coast includes some of the largest mangroves in the world, stretching from Amapá to Maranhão. The discharge of the Amazon and tides of over 5 m result in a mangrove, mudflat and freshwater wetland belt of tens of kilometers in this region. Freshwater wetlands cover huge areas of Amapá behind the coastal mangroves, being fed by high rainfall and the damming of the rivers by the high tides. Those wetlands, including protected areas

such as Cabo Orange National Park and Lago Piratuba Biological Reserve, remain poorly known.

Most of the Brazilian coast is under a greater influence of the South Equatorial and Brazil currents, resulting in seas of comparatively low productivity along most of the coast. That means the discharge of rivers and lagoons in estuaries is extremely important in boosting productivity, what is quite obvious when one checks chlorophyll concentrations along the coast receiving the discharge of the Amazon in Amapá and Pará, and over the southern Brazilian shelf, where the winter discharge of the Patos Lagoon and Río de La Plata help to create an important feeding area for migrating albatrosses, petrels, gulls and terns.

Several estuaries dot the Brazilian coast and the mangroves and saltmarshes associated to them provide important habitats to waterbirds all over the region. Important areas include the mouth of the São Francisco and Sergipe rivers, the Recôncavo Baiano, Camamu Bay, Caravelas Bay, Guanabara Bay, Santos Bay, the Iguape-Cananéia-Paranaguá Estuary (or "Lagamar") and Guaratuba Bay.

Localized, and sometimes erratic, upwelling foster fish populations in sites in northeastern and southeastern Brazil (the best known area being off Cabo Frio, in Rio de Janeiro) and around oceanic islands and seamounds, including Trindade Island and Saint Peter and Saint Paul Rocks. All are important for seabirds, especially tropical species, and some probably support the large concentrations of migrant terns in northern Bahia.

The most recent list of Brazilian birds (see http://www.cbro.org) includes 1796 species, of which 253 are considered as waterbirds (Appendix).

Brazilian waterbirds include 2 screamers (both resident), 25 ducks and geese (20 resident), 5 grebes (four resident), 4 penguins (none breeding in Brazil), 10 albatrosses (all visitors), 27 petrels and shearwaters (3 nesting in Brazil), 6 storm-petrels (none breeding), 1 vagrant diving-petrel, 3 tropicbirds (2 breeding), 1 vagrant pelican, 5 boobies (3 breeders), 2 cormorants (one common breeder and one improbable vagrant), 1 nesting anhinga, 3 nesting frigates, 25 herons, egrets and bitterns (21 breeding in Brazil), 9 ibises (1 Old World vagrant), 3 nesting storks, 4 flamingoes (one breeder), 1 nesting limpkin, 32 rails (1 visitor), 1 resident finfoot, 1 resident sungreebe, 1 resident jacana, 1 resident painted snipe, 1 nesting oystercatcher, two nesting stilts, 1 nesting tick-knee, 1 vagrant pratincole, 11 plovers (6 non-breeding migrants), 29 sandpipers and snipes (only 2 nesting in Brazil), 1 vagrant seedsnipe, 1 vagrant sheathbill, 7 visiting skuas, 8 gulls (3 breeding), 17 terns (4 only as migrants) and 1 skimmer.

The Appendix shows the status (resident or migratory) of all Brazilian waterbirds. Several (sheathbill, pratincole, pelican, seedsnipe, one cormorant, some egrets and sandpipers) occur only as vagrants and Brazil is not likely to an important part of their range. This, nevertheless, may change if some manage to establish themselves as breeders (a possibility for some Old World visitors in Fernando de Noronha island), or if migratory patterns change together with global climate.

It can be seen that some groups (albatrosses, petrels and ducks) have a strong component of austral visitors/migrants, while plovers and sandpipers are mostly boreal migrants. Among groups such as ducks, ibises, gulls, terns, skimmers and cormorants, resident Brazilian populations receive an influx of migrants coming from Argentina, Uruguay and Paraguay.

2. Distribution and Habitat Needs Information
3. Population estimates, percent of global population, and in-country trends (status)

Until now most of the waterbird censuses done in Brazil were deficient. Great part of waterbird researches were done during the last twenty years but papers considering population estimates for the entire country do not exist. The results are "pinpointed" and we have little information of really specific places. Just Rio Grande do Sul have censuses

considering some gamebirds and involving the entire state. Even with the NWC (Neotropical Waterbird Census) between 1991 and 1995 (from 26 states that builds up the country, only 11 were sampled), the coverage of the national territory related to the waterbirds census had some problems like:

1) magnitude of the territory;
2) low demography observed in some regions;
3) difficult to access some sites;
4) large distances among homes of cooperators and counting sites;
5) small number of professional ornithologists relatively to the extension of Brazilian territory;
6) lack of birdwatching tradition.

Added to these obstacles we don't have continuity on the researches causing the interruption of the works. There are true "holes" between some censuses as well as different methods used to estimate a local population. It is very important a standardization of the methodologies to improve the quality and quantity of available information for the next years. Considering the scarcity of data and the lack of a protocol to census the birds the available population estimative is highly temporal and spatial fragmented. The Appendix 1 lists all the papers with information considering any counting on waterbirds from 1984 until 2006.

4. Species of Special Concern

This section presents information on waterbirds considered to be globally threatened or near-threatened for which Brazil has special importance, and taxa (some considered as subspecies) considered to be threatened in Brazil. For some, the current taxonomic treatment may eventually prove to be inadequate, so we provide comments on this issue.

Several albatrosses and petrels use Brazilian waters as feeding grounds, especially the region under influence of the Subtropical Convergence. Several species are threatened by incidental mortality in long-line fisheries which, in Brazil, are a serious issue for Tristan Albatross *Diomedea dabbenena*, Spectacled Petrel *Procellaria conspicillata* and Yellow-nosed Albatross *Thalassarche chlororhynchos*.

An action plan providing detailed information on those species and a conservation strategy has already been prepared by the ngo Instituto Albatroz with support from BirdLife – Brasil, FAO, and approved by the Brazilian government. It is expected to be published in early 2006, but is already available in the web (see http://www.projetoalbatroz.com.br).

American Comb-duck *Sarkidiornis sylvicola*

Considered globally Near-threatened (as *S. melanotus sylvicola*), this Neotropical endemic has a wide range in Brazil, from Rio Grande do Sul (where it nests but is considered Vulnerable) to the Amazon (Sick 1997). It is usually associated to open wetlands, ponds, lagoons and ricefields, including man-made reservoirs in semi-arid northeastern Brazil. Most records in the Pantanal are clustered in its northern area (Tubelis & Tomas 2003) but this is likely an artifact as most birdwatchers visit the area around Poconé and the Transpantaneira road.

It is usually found in small numbers, although concentrations of several tens have been recorded in the Sobradinho reservoir (Rio São Francisco) by Nascimento & Schulz-Neto (2000).

In Rio de Janeiro it is considered as Endangered due to habitat loss related to the filling of wetlands along the northern coast of the state and lower Rio Paraíba do Sul valley.

More information on numbers and localities are desirable for a proper evaluation of its status.

(This species is no longer globally near threatened)

Orinoco Goose *Neochen jubata*

Currently considered as globally Near-threatened, it was once widespread in Brazil but is now extremely rare and very local over most of the country. If the situation in Brazil is an indicative of its status elsewhere it should be considered Vulnerable.

Even in the Amazon this goose is mostly encountered along remote waterways with low human populations and little or no hunting pressure. It is a specialist of riverine beaches, grazing herbs growing on sandbars and beaches, being very dependent on the flood cycles of large rivers that maintain its habitat. Hydropower reservoirs along the Paraná basin are blamed for its local extinction in the southern part of its range, in São Paulo.

It is surprisingly uncommon in the Brazilian Pantanal, with records from Caiçara, Mato Grosso, and Porto Quebracho, by the Paraguai river in the Brazil-Paraguay border (Tubelis & Tomas 2003). In areas such as the middle Juruá river (Acre) flocks of up to 20 were not uncommon in 1991 (Whittaker & Oren 1999). Recent records report isolated breeding pairs in the Mamoré river, Rondônia, during July 2002 and June 2003 (Whittaker 2004) and the species to be rare on the middle Jiparaná river, a tributary of the Rio Madeira (Stotz *et al*. 1997).

Currently, Brazilian Orinoco Geese are common only along the Araguaia river, which runs between Goiás-Tocantins and Mato Grosso-Pará. The meandering middle stretches of the Araguaia form huge areas of sand beaches during the dry season and flocks of up to 32 were recorded by F. Olmos and J.F. Pacheco along the Araguaia and the lower Caiapó and Cocos rivers (two east bank tributaries) near Araguacema and Caseara in late November 2005. In fact, geese were among the commonest waterbirds censused in the period. Orinoco Geese are known to leave the area when water rises between December and May but their whereabouts are completely unknown.

The Araguaia is under increasing threat from hydropower projects such as the Santa Isabel reservoir, to be built near the town of Ananás. Also, the beaches in Goiás and Tocantins receive ever increasing number of tourists in June-July. For example, in July 2005 one site near Araguacema hosted 30,000 people who camped on one beach. Boat traffic, jetskis, vandalism, poaching and blasting loudspeakers playing bad music that make one wish to become extinct, all associated to the multitude of tourists during the exact period when birds are nesting on the beaches (not only geese but also terns, skimmers and plovers) are increasing problems.

The Araguaia also receives increasing quantities of sediment carried from the neighboring basin, which has been mostly occupied by pastures and agribusiness enterprises. These have already caused high erosion rates in Goiás, where colonization is older, and are know fast spreading into Tocantins in the Formoso do Araguaia and Lagoa da Confusão areas, where seasonally flooded savanna (“campos de murunduns”) and forest are favored for establishing rice and other grain plantations. Silting and associated changes in river dynamics are a potential problem for Orinoco Geese and other waterbirds.

There are (or were) two protected areas in the Araguaia where Orinoco Geese occur. The 90,018 ha Cantão State Park (Tocantins) is currently being implemented but understaffed and with land-tenure problems. Araguaia National Park, with 557,174 ha at the northern tip of Bananal island has ceased to exist since Karajá and Javaé Indians invaded the area expelling the park personnel and vandalized the facilities, annexing the area to the 1,38 million Araguaia Indian Land, a move approved by the Brazilian Justice Ministry. The indians apparently thought their area was too small and decided to annex the park. The Karajá and Javaé have a long tradition of renting their land for cattle-raising and every year burn the whole of Bananal island, what has caused serious environmental damage and destroyed the

forests that once covered the northern part of the island. This kind of land management makes the future of the area bleak.

Where geese migrate during the high water season remains a mystery and should be a topic of future research, as well obtaining accurate population figures along the Araguaia basin, including areas so far wholly unexplored of seemingly good habitat such as the Pantanal do Rio das Mortes in Mato Grosso (a potential site for Hooded Seedeater *Sporophila melanops*). Surveys along the Itenez/Guaporé/Mamoré in the Brazil-Bolivia border, including Corumbiara State Park in Rondônia (the Brazilian counterpart of the Llanos de Mojos) would be worth.

Trindade Petrel *Pterodroma arminjoniana*

Globally Vulnerable, has the same status in the Brazilian red list. This medium-sized petrel nests only in Trindade island and its stacks, about 1,140 km from the mainland (20º30'S, 29º19'W) and the Martin Vaz islets (20º15'S, 28º55'W), 48 km from Trindade. Nevertheless, Luigi (1995), says *P. arminjoniana* does not nest in Martin Vaz any longer. A population of *P. arminjoniana* apparently occurs in Round Island, near Mauritius, but it may actually be made of Herald Petrels *P. heraldica*, which nest alongside Kermadec petrels (Brooke *et al*. 2000). Dark-phase Kermadec Petrels *P. neglecta* (the only Atlantic population) also nest in Trindade (Imber 2004), where they are outnumbered by Trindade Petrels by 20:1.

Active nests and pairs in display flights are found year-round in Trindade. Nests are scraped on the surface and sited in fissures and caves in the island's cliffs, sometimes making small colonies inside a largish cave. Current nest sites may be an adaptation to the great changes the island environment has experienced.

A single nest is incubated for 52-54 days, both parents taking incubation stints of up to 19 days. The Young fledge with 95-100 days. The main cause of nest failure is the large land crab *Gecarcinus lagostoma* (Luigi 1995).

It feeds mostly on squid (*Ommastrophes bartrami*, *Histiotheuthis* sp. e *Japetella diaphana*), fish (it will take flying-fish in mid flight), jellyfish (*Porpita* sp.) and water striders (*Halobates* sp., Luigi 1995). Luigi (1995) says it is rarely atracted by boats.

There are no available records from the Brazilian mainland, suggesting it is a fully pelagic species using waters far from the shelf, with records south to the Subtropical Convergence. On the other hand, most records come from the northern Atlantic, where it is regularly recorded in the Caribbean (Puerto Rico; July) and in the Gulf Stream off North America (off North Carolina and New York in May-September; Brinkley & Patteson 1998, Imber 2004). Kermadec Petrels range further north and may reach the eastern North Atlantic (Imber 2004).

The Trindade population was estimated in c.5,000 birds in the 1990's, but this figure includes c. 5% Kermadec Petrels. There is no information on the situation in Martin Vaz. Trindade has seen the almost complete destruction of its native vegetation, once dominated by forests (85% of the island) made of *Colubrina glandulosa*, *Pisonia* sp., *Rapanea guianensis*, etc. The loss of those dense forests was caused by a combination of man-made fires to open the land to failed colonization schemes; and overgrazing by introduced goats and pigs (Olson 1992).

Forest destruction resulted in the collapse of tree-nesting seabirds, including Red-footed Booby *Sula sula* (now extinct) and the endemic frigates *Fregata minor nicolli* and *F. ariel trinitatis* (both Critically Endangered). The Navy and the Museu Nacional do Rio de Janeiro are now carrying a tree-planting project aiming to restore some of the forest in the island.

Introduced predators, including pigs, cats and mice, certainly had an impact on Trindade seabirds. Pigs have been eliminated by the Brazilian Navy detachment stationed in the island after attacks to people, and it seems the last goats were killed in late 2003-early 2004, after intensive efforts by the Navy (Ruy Valka Alves, Museu Nacional /RJ, in litt.). Cats seem to

have died out. There are plans to build an airstrip in the island to facilitate supplying the navy detachment.

Audubon Shearwater *Puffinus lherminieri*

The shearwaters of the *Puffinus assimilis* - *lherminieri* complex form a poorly known assemblage of small-sized birds widespread in tropical and temperate seas, with around 20 described taxa. Austin *et al*. (2004) presented the first phylogenetical analysis of the group based on molecular (mtDNA) data, suggesting 14 "lower-level" and five "higher level" taxa can be recognized. The five described Atlantic taxa actually make a group of four morphologically and genetically diagnosable species with allopatric nesting distributions.

Following those results, *Puffinus lherminieri* is restricted to shearwater populations nesting in the Caribbean and Brazil. Birds that once built nesting colonies in Santa Helena and Ascension (where occasional records are made from time to time) may also belong to the same taxon.

Audubon Shearwater is considered as Critically Endangered in Brazil because their small populations make them vulnerable. Two nesting areas are known, the Itatiaia islands, off the coast of southern Espírito Santo (20°21'30"S, 40º16'45"W), with five known nests, and Morro do Leão and Morro da Viúva islets, off the main island of Fernando de Noronha (about 3º54' S, 32º25' W), with 11 known nests. Beached young found in Espírito Santo suggest other populations may exist (Efe 2004).

The main island of Fernando de Noronha is overrun by Black Rats, Norway Rats, Mice, Cats, Dogs and Tegu Lizards, all preying on ground-nesting birds, so it is no wonder only tree and cliff-nesting seabirds remain there. The islets where the shearwater nests are close to the main island and rats and tegus could easily colonize them, wiping out the nesting seabirds. It is a wonder that has not happened yet (Neves *et al.* 2003).

Despite Fernando de Noronha being a National Park, management apart tourist control is non-existent, and the government agency in charge, IBAMA, is refractory to control introduced predators, apparently because of fear of public outcry against killing furry cats and dogs, and the use of poison against rats. The high costs are also a more down to earth factor.

Birds in Espírito Santo are known to follow fishing boats and to be aggressive in taking discards, what may cause them to get entangled in fishing lines. Islands in Espírito Santo are unprotected and subject to visits by fishermen who, in the past, have introduced rabbits and cavies, causing the vegetation to be degraded.

Trindade Lesser Frigatebird *Fregata ariel trinitatis*

Considered as Critically Endangered in Brazil, if not already extinct.

While Lesser Frigatebirds are widely distributed in the Indo-Pacific (where two subspecies have been described), there is only one remaining population of this frigate in the Atlantic, where *Fregata ariel trinitatis* is now endemic to Trindade island. The Trindade population is likely the last of a taxon formerly widespread in tropical South Atlantic islands such as Fernando de Noronha, Santa Helena and Ascension, all heavily hit by 500 years of human impact.

A colony with some 15 nests was recorded at Trindade (Ponta do Sul) in 1975, with a total population of some 50 birds (Olson 1981). Nesting was recorded in the same area between 1987 and 1992, but only five records of flying birds were made along several field-trips in 1994-2000 (Fonseca 2004).

Formerly covered by forest, Trindade has a long history of human occupation and was completely denuded by fires and introduced goats, with serious impacts on tree-nesting birds.

Pigs and cats were also introduced. All have died out or were killed by the Brazilian Navy, and there is an on-going reforestation project, but it may be too late for the endemic frigates. See more under Trindade Petrel.

The area around Trindade is one of the main fishing grounds for tuna, billfish and shark in Brazil. The populations of large pelagic predators are crashing worldwide and Brazil is no exception. The decrease of predators making prey such as flying-fish available to the frigates may have been the final blow to the Atlantic birds.

Nothing is known of the situation in Trindade and it is urgent surveys are made to see if any birds remain. The taxonomic status of Atlantic birds deserves to be investigated, especially from osteological studies and DNA analysis of specimens housed in collections such as Museu Nacional do Rio de Janeiro and the American Museum of Natural History. Olson (1981) suggests there are osteological differences between Atlantic and Indo-Pacific birds.

As has happened with Cape Verde Kite *Milvus fasciicauda*, this may be another case of a species becoming extinct without anything being done because its taxonomic status was not resolved.

Trindade Great Frigatebird *Fregata minor nicolli*

Considered as Critically Endangered in Brazil,

Great Frigatebirds are widely distributed in the Indo-Pacific, where four subspecies have been described. The Atlantic form was first recorded in 1874, when a large number of nesting pairs was found in Trindade Island. Later expeditions to the island recorded its presence, but without detailed information on population figures. Olson (1981) did not find it in 1975 but thought it could be nesting at Martin Vaz.

It may still nest in Trindade along the sheer cliffs of Ponta do Sul, where a small colony was found between 1987 and 1992. There are two recent (c. 2000) records of birds collecting nesting material. The status in Martin Vaz is unknown. In 1994 about 100 birds were seen following a fishing boat working off Trindade (Fonseca 2004).

Like Lesser Frigatebirds, it depends on surface prey like flying fish and squid made available by large predatory fish. Hatchling green turtles (Trindade is one of the main nesting grounds in the Atlantic) are preyed by frigates and there are old records of disgusted researchers and Navy personnel killing frigates because of that.

Fregatta minor nicolli is said to have a distinctive juvenile plumage (Mathews 1914, Olson 1981) and its isolation from Indo-Pacific *F. minor* raises the suspicion if it is not actually a full species. DNA and ostelogical studies should be carried to confirm this hypothesis. If so, this may be another case of a species becoming endangered, if not extinct, without anything being done because its taxonomic status was not resolved.

There is an urgent need of complete surveys being carried in Trindade and Martin Vaz to assess population sizes and colony sites, and define any possible conservation strategy that could possibly be implemented.

Red-billed Tropicbird *Phaethon aethereus aethereus*

Considered Vulnerable in Brazil. Red-billed Tropicbird *Phaethon aethereus* breeds in the Lesser Antilles and southern Caribbean, the Gulf of California (350 pairs at two colonies), Galapagos Islands (a few thousand pairs at 30 colonies), Cape Verde Islands (100-1,000 pairs), and islands off Senegal and the Madelain Archipelago of Senegambia (30 pairs; data from Lee and Walsh-McGehe 2000). The species is currently listed as Least Concern.

Lee and Walsh-McGehe (2000) noted that colonies have disappeared from a number of sites in the Lesser Antilles and declines have occurred at other (at least 4,000 breed in the West Indies and Caribbean basin). Declines have been caused by a number of factors, including development and predation by black rats. Severe declines have also occurred in the congeneric White-tailed Tropicbird *P. lepturus* in the region. The nominate form optimically numbers only a few hundreds of nesting pairs in Brazil, Ascension island Gulf of Guinea.

In Brazil it is known to breed in five islets of the Abrolhos group off southern Bahia (Santa Bárbara, Sueste, Redonda, Guarita and Siriba (Alves *et al.* 2004), totalling about 70 nests every year, and in cliffs of the main island of Fernando de Noronha (less than 10 birds) and at least one of its islets (Morro da Viuvinha – two nests in 1987; Antas 1991, Schulz-Neto 2004). Breeding in Fernando de Noronha may not occur every year. At-sea records have been made from Maranhão to Cabo Frio. Both Abrolhos and Fernando de Noronha are national parks receiving large numbers of visitors, and income.

Despite that, management of both areas is poor. All islets in Abrolhos have large populations of rats that will nib anyone sleeping onshore (Robson Silva e Silva, pers. com.). Santa Bárbara, belonging to the Brazilian Navy and with most pairs, has cats, rabbits and goats (Alves *et al.* 1997, 2004). As the islands have little vegetation cover but grasses and sedges, seabirds provide most of the food and rats are the likely cause of the comparatively small local populations of smaller species such as Sooty Terns. The large and aggressive adult tropicbirds are able to defend themselves but unattended eggs and young are vulnerable.

Fernando de Noronha, with its very small population, has two species of rats, plus cats, dogs and tegu lizards which are a threat to all seabirds. There is no attempt, or plans, to control introduced predators in both parks despite the issue being well-known to the Brazilian conservation agency, IBAMA.

White-tailed Tropicbird *Phaethon lepturus ascensionis*

Considered Vulnerable in the Brazilian red list because its small overall population, and because it nests successfully in a single locality.

Phaethon lepturus ascensionis is restricted to Ascension island and Brazil. Measurements and color clearly set these birds aside from populations in the Caribbean (*P. l. catesbyi*) and West Africa (apparently an innominate form). The systematic and phylogeography of tropicbirds deserves further attention as more than one species may be involved.

White-tailed Tropicbirds in Brazil nest only in Fernando de Noronha and Abrolhos. In Fernando de Noronha nests are located in inaccessible cliffs in the main island, and in both cliffs and cavities in flatter ground in several of the satellite islets, including Morro da Viuvinha, Rasa, Meio, Rata, Sela Ginete and Dois Irmãos (Schulz-Neto 2004). Nesting birds are found year-round in Noronha, but numbers vary depending on season. In Abrolhos two nests were found at in 1992 at Redonda islet, but although sporadical records have been made since, White-tailed Tropicbirds never bred successfully in Abrolhos (Alves *et al.* 2004).

The population in Fernando de Noronha numbered 300 birds in 1987 and is said to be stable but, in fact, there is no actual monitoring of seabirds population there and any figure is speculative.

As pointed above, both Abrolhos and Fernando de Noronha have problems with introduced predators, especially rats. Rat-gnawed tropicbird carcasses have been found in Noronha. The smaller White-tailed Tropicbird may be more vulnerable tan the larger *P. aethereus*, what may explain the failure of the species to breed in Abrolhos.

Fasciated Tiger-heron *Tigrisoma fasciatum*

The Fasciated Tiger-heron is considered Endangered in Brazil, where there are very few recent records, all from the dwindling Atlantic forest.

It is a specialist of fast-flowing, clear-water streams cutting through forested areas, catching small fish such as characins and catfish. It occurs in low-densities and is shy, making studies quite difficult.

Brazilian records come from Pará (Serra do Cachimbo), Mato Grosso (Chapada dos Guimarães, upper Rio Guaporé), Goiás (Chapada dos Veadeiros), Mato Grosso do Sul (Boca da Onça), Minas Gerais (Triângulo Mineiro and upper Rio Paranaíba), Rio de Janeiro (Campos), São Paulo (Intervales State Park, Carlos Botelho State Park, Estação Ecológica Juréia-Itatins), Paraná (Salto do Cobre, Porto Xavier da Silva, Ilha do Mutum, Rio São João, Rio Floriano, Serra da Prata, Rio Taquaral, Cedro, Rio São João and Castelhanos), Santa Catarina (Corupá, Lontras, Blumenau, Pirabeiraba and Garuva) and Rio Grande do Sul (Taquara).

There are no recent (< 20 years) records from Pará, Mato Grosso, Rio de Janeiro and Rio Grande do Sul. Actually, there are only six localities with records made in the last 15 years, three in Paraná (including Iguaçu National Park and environs, Rio Tibagi and along the Serra do Mar massif, including Saint Hilaire-Lange National Park), one in Goiás (Chapada dos Veadeiros National Park) and three in São Paulo (Intervales State Park, Carlos Botelho State Park and Estação Ecológica Juréia-Itatins).

This species seems to face the same problems as the Brazilian Merganser, being a low-density species vulnerable to changes in water quality caused by deforestation, pollution, and especially by dams. Hydropower plants have turned several river systems (including parts of the upper Guaporé, Paranaíba, Tocantins, Iguaçu and Pelotas, all known or likely localities) into lakes unsuitable to the Tiger-heron.

Roseate Tern *Sterna dougalli*

Roseate Terns nesting in northeastern USA are long-distance migrants. While Roseate Terns are considered of Least Concern at a global level, there are concerns about North American populations.

Wintering grounds were unknown until recently but Roseate Terns have now been found to winter mostly in Bahia, where several sandbars are used as night roosts while the terns forage offshore during daytime (Hays *et al*. 1997, 1999). The sandbars (Mangue Seco, Cacha Prego, Morro de São Paulo, Ituberá, Camamu e Corumbau) are located between the Bahia-Sergipe border and Camamu Bay, being used in an alternate way by this and other terns (mostly Common Terns *Sterna hirundo*).

The same sandbars used by the terns are prime real-state areas craved by tourists looking for more secluded spots and rich people who wish to build vacation homes.

Royal Tern *Thalasseus maximus*

Considered Vulnerable in Brazil. The country receives migrant birds from the southern USA and Caribbean that reach the coast of northern and, perhaps, northeastern Brazil in the austral summer, and from Patagonia, found in the southern part of the country during the austral winter.

Nevertheless, some birds nest in coastal islands off São Paulo, and the country status reflects the one of this autochthonous population. Breeding occurs in winter-spring, assuring reproductive isolation from other South American populations. Genetic studies have shown

low genetic diversity and the birds to be distinctive from other Neotropical population (Patricia de Jesus Faria pers. com.).

Nesting colonies have been found in seven islets, all off the coast of São Paulo. Not all are used during the same year, what makes the figure of over 800 birds given Campos *et al.* (2004) an overestimate of the total population, which may number half that.

Most islets are visited by fishermen who disturb the terns and allow heavy predation by Dominican Gulls. Only one islet (Laje de Santos State Park) is protected from such disturbance. Another two islets are close to Alcatrazes island, used for target practice by the Brazilian Navy. Although only ordinance without explosives is used, the noise from the firing of the guns certainly does not help the birds.

Gull-billed Tern *Gelochelidon nilotica*

Form *groenvoldi* from the eastern South American coast (French Guiana to Argentina) is considered as Data Deficient in the Brazilian red list. Generally uncommon over most of Brazil, its distribution seems to be disjunct and now centers in two areas. One is the coastal area from the Amazon estuary (including Mexiana and Marajó islands) south along the coasts of Maranhão, Ceará and Rio Grande do Norte. In this area it is associated to extensive mangroves, flooded grasslands (in Mexiana and Marajó), huge mudflats and, in Rio Grande do Norte, saltpans. What seems a second population center is located in the coastal lagoons, ricefields and marshes of southernmost Brazil, in Rio Grande do Sul, being continuous to populations in Uruguay and Argentina. Gull-billed terns may also occur in a regular way in abandoned saltpans and coastal lagoons in Rio de Janeiro (Cabo Frio area), but this needs confirmation (J.F. Pacheco pers. com., F. Olmos pers. obs.).

There are very few recent records of this species nesting in Brazil. Antas (1991) reports a small (50 nests) nesting colony in Lagoa do Peixe (Rio Grande do Sul) in October 1986 but it no longer nest there (Leonardo Mohr in litt.). Nesting has been reported in August (dry season) on newly exposed bare ground by the water in the general area of the Amazon estuary (Sick 1997). Azevedo *et al*. (2004) found it in mixed colonies with *Larus cirrocephalus* between April and June in saltpans at the northern coast of Rio Grande do Norte.

Overall, this species seems to be a local species that is now uncommon over most of Brazil except for the northern coast. There is no updated information on its breeding areas except for the Rio Grande do Norte saltpans. More information on its actual status is needed.

Wilson's Plover *Charadrius wilsonia*

This polytypical species badly needs a taxonomical revision. There are both migratory (nominate, *beldingi*) and resident (*cinnamominus, rufinucha*) populations that are morphologically distinct. It is likely resident birds are a distinctive species. Grantsau *et al*. (2002) have argued *Charadrius crassirostris* Spix, 1825, currently considered a synonym of nominate *wilsonia*, is the correct name for resident Brazilian birds.

Wilson's Plovers occur along the Brazilian coast from Pará to Bahia, with an extra-limital record from Ilha Comprida, São Paulo (Sick 1997). Nesting has been recorded along the Maranhão coast in May (Rodrigues *et al*. 1996), Rio Grande do Norte in March, April and June (Sick 1997, Azevedo *et al.* 2004) and in Bahia from April to October (Lima *et al.* 1996, Grantsau *et al.* 2002). Pairs nest singly on sand beaches and saltpans. Bahian birds are considered to be fully resident in Mangue Seco, at the northern coast (Grantsau *et al*. 2002).

Charadrius wilsonia seems generally uncommon in Brazil, only a few pairs being recorded per day in proper habitat. The confusion between migrant and resident birds may mask the true status of the latter. As other beach-nesting birds, it is highly sensitive to human disturbance, which is on the increase thanks to booming real-state and tourist enterprises along the coast

of northeastern Brazil, including its apparent stronghold in northern Bahia (P.C. Lima pers. com.).

Brazilian Merganser *Mergus octosetaceus*

This globally Critically Endangered species is among the most threatened waterfowl in the world. Its ecology and current status have been described in detail in an action plan soon to be published by IBAMA.

This a specialist of fast-flowing, clear-water watercourses rich in small fish running through areas where suitable nest cavities (both in trees and rock faces) are found. Its decline has been linked to deforestation causing the silting of rivers and hydropower plants turning the fast-flowing rivers used by mergansers into turbid lakes.

The total world population is estimated to number about 250 birds. Most mergansers are now found in and around Serra da Canastra National Park, at the headwaters of the rio São Francisco, where around 70 birds are known to live. A recent paper showed us at least 47 individuals - 28 adults and 19 young – at Serra da Canastra (Lamas, 2006). Birds are also present in tributaries of the rio Tocantins in northern Goiás (including Chapada dos Veadeiros National Park) and eastern Tocantins (rio Novo in the Jalapão area), and in northern Paraná (rio Tibagi). The status of populations once reported from left bank tributaries of the São Francisco in west Bahia remain unclear, as recent searches failed to find any birds.

Hydropower plants are planned to the same rivers where mergansers have been found in Paraná (rio Tibagi), Goiás (rio Paranã) and Tocantins (rio Novo) are the greatest threat to the species. Current government policy in Brazil, backed by minister Dilma Roussef, a former communist guerrilla, favors hydropower over other options and has backed projects no matter how illegal, damaging, anti-economic or stupid they are. There is a very real chance those merganser populations will be lost for “development”.

The proposed expansion of Chapada dos Veadeiros National Park and setting the limits of Serra da Canastra according to the decree that created the park would protect the main populations of mergansers and their habitat. Both measures are strongly opposed by local interests including, in Serra da Canastra, the mining company De Beers, and they are not likely to occur without strong external backing.

Activities long proposed to help the species, including assessing the effectivity of nest-boxes to boost productivity and increase carrying capacity, and establishing a captive population for future reintroductions (there are many areas of suitable habitat in southern and southeastern Brazil that could support mergansers) have not progressed. Considering the perspectives on habitat protection, setting a captive population may be the single most important step to be taken in the short term. IBAMA has been far too slow in promoting them and it is doubtful they will ever be carried.

5. Locations and Descriptions of Key Sites

5.1 - RAMSAR Sites

Brazil signed RAMSAR in 1993 but so far only seven areas have been listed as wetlands of global importance. Those cover 6,456,896 ha. Not all seem really important to waterbirds, while most face serious threats from human activities. Below we discuss each area, their ecological settings and conservation issues.

Reentrâncias Maranhenses / Baixada Maranhense Environmental Protection Area. Maranhão state; 2,680,911 ha; 01º41’S, 045º04’W-03°00’S, 044°57’W. Ramsar sites n^{o}. 640 and 1020.

Extensive low, seasonally flooded coastal lands characterized by fields, gallery forests, mangrove swamps, and lacustrine basins along the northeast coast of Brazil. The site qualifies under all of the representative/uniqueness criteria (new Criterion 1) and most of the biodiversity criteria, including those for waterfowl and fish. It is located between the mouth of the Gurupi River and the Bay of San Marcos, including Cajual Island. It is a very geomophologically diverse area, with bays and estuaries, mangroves, sandy beaches and coastal dunes. There are also many low-lying islands. Tides are up to 8 meters.

The Maranhense coast concentrates large fluvial and fluvial-marine plains and flat lowlands, crossed by channels of brackish water, relatively unaffected by human activity due to a population density of only 26 inhabitants per square km. At certain times, seawater is able to reach far up the rivers, and the area is different from other seasonally flooded parts of the Amazon or perennially flooded areas of the Pantanal because of this marine influence and saline intrusion. The four significant rivers rise annually and flood their banks to fill the many lakes with water for gradual release over time. In the estuaries, mangrove swamps occur by penetrating the narrow natural waterways among the fields up to the limit of tidal influence. During Dec.-June rainy seasons the fields are flooded, leaving small islands called "tesos".

Most of the 327,000 Nearctic shorebirds counted by Morrison & Ross (1989) in the north-central eco-unit of Brazil were found in this region, and some 50% of all birds censused in Brazil. The area has 54% of all Black-bellied Plovers counted in South America, 72.5% of all Ruddy Turnstones, 49.3% of all Willets, and 43.7 % of all Whimbrels. The summary, the surveys clearly demonstrated that the north-central coast of Brazil is of major international importance as a wintering area for shorebirds and is of critical importance for several individual species (Morrison & Ross 1989). The many diverse habitats in the area support a large variety of bird species, including large colonies of Scarlet Ibises, Yellow-crowned Night-heron, Little Blue Heron and Tricolored Heron, the latter an uncommon species in Brazil. One important nesting area is found in Cajual island, deep in São Marcos bay. Flocks are Grey-headed Gulls and Gull-billed Terns are common in São Marcos bay.

The rio Mearim empties in São Marcos bay and its lower reaches cut through freshwater wetlands known for large populations of Azure Gallinule, waterfowl (including Comb Duck), herons and egrets. Woodstorks are also known from the area.

Human uses include subsistence agriculture (mainly rice, corn, cassava and beans), fisheries, mineral exploitation of clay and sand, exploitation of plants (especially nuts from the babaçu palm), and limited, but growing, ecotourism. Potential threats include mangrove deforestation and growing urban and industrial development, especially around São Marcos Bay. An "ecological economic zoning project" is under study.

Reentrâncias Maranhenses is an Environmental Protection Area (Área de Proteção Ambiental - APA) created in June 1991. It is not a traditional conservation unit as a reserve or national park, as the legislation allows a sustainable use of natural resources, but forbids heavily polluting enterprises and human activities other than traditional resource usage. Theoretically, this is an important tool for conservation and management, but the effective implementation and the use of sustainable use techniques within Brazil of most, if not all, APAs in Brazil show this category is a very weak conservation tool and, in practice, amounts to nothing.

The area is fairly protected from agriculture by its high salinity and inaccessibility. Nevertheless, from the 26 Amazonian eco-regions, the Matranhão Mangroves rank second in vegetation loss, with 49.3% lost up to 2002 (Leandro Ferreira, Museu Paraense Emílio Goeldi, in litt.). There does exists some threat from possible overexploitation of mangroves and from the salt industries in the area. Shrimp farms are a threat, as they are being encouraged by the government. There are projects for new steel plant in São Luís and port facilities in Alcântara that will damage large areas of mangroves and tidal flats.

Ilha do Bananal. Tocantins state; 562,312 ha; 10º31'S 050º12'W. Ramsar site no. 624. The northern area of Bananal island is partially included in the national park, while the southern part was given to several Indian groups. As discussed under Orinoco Goose, the status of the park has been, for all purposes, revoked and the area is being used as the Indians seem fit. Flying over the former park in November 2005 found the whole area, dominated by seasonally flooded savanna, had been burnt and the park facilities vandalized (F. Olmos in litt.). This was in stark contrast with areas just north, in Cantão State Park.

Ilha do Bananal includes part of the extensive floodplain system of the rio Araguaia, with navigable medium to high flow rivers, seasonal lagoons, marshes and numerous islands. Ilha do Bananal is the largest fluvial island in the world and harbors a diverse flora and fauna of the transition zone between the Amazon tropical forest and the Cerrado. The site is an extremely rich area for waterbirds, with a wide variety of resident breeding species (including Wood Stork, Jabiru Stork, Roseate Spoonbill and several ducks) and some Nearctic shorebirds (Spotted Sandpiper, Greater and Lesser Yellowlegs, Golden Plover, etc) occurring on migration. The huge sand beaches exposed during the dry season along the Araguaia and the rio Javaé host nesting colonies of Gull-billed Terns, Yellow-billed Terns, Black Skimmers and plovers.

Bananal Island actually does not include the best wetlands of the Araguaia system. Those are found to the southeast, along the Área de Proteção Ambiental (APA) Meandros do Araguaia, and to the north, in Cantão State Park and the lower rio Caiapó.

The APA includes the meanders and lakes of the Araguaia south of Bananal and its floodplain. This has been partially converted to huge commercial ricefields supporting enormous populations of wood-ducks, storks, herons and spoonbills. Cantão State Park (89,000) has 833 lakes formed from meanders of the rio Javaé-Cocos. Those provide an extremely rich feeding ground for wading birds and waterfowl, with gatherings of many hundreds of birds. The many beaches along the Javaés and the Araguaia are also an important nesting and foraging habitat.

Lagoa do Peixe: Rio Grande do Sul state. 34,400 ha; 31º14'S 050º57'W. Ramsar site no. 603. Also a Western Hemisphere Shorebird Reserve Network Site and National Park.

Lagoa do Peixe is a large brackish to saline lagoon, 240 km southeast of Porto Alegre, in Rio Grande do Sul State, southernmost Brazil. The park is located in the sandy belt between Lagoa dos Patos and the Atlantic Ocean. The shallow lagoon supports large concentrations of invertebrates and is an important wintering and staging area for migrant species. The density of *Litoridina* spp. (snail) and Polychaeta in the lagoon tend to increase from January onwards. This coincides with the arrival of migrant shorebirds. According to Lara Resende, during the peak period for migratory birds in the lagoon, the food availability is sufficiently high in the barra region and/or the beach to supply energy for the birds to recover, molt and gain extra fat reserves to continue migration. The whole area, with both freshwater and saline wetlands, is very important for a wide variety of waterfowl.

Lagoa do Peixe is visited by 19 neartic species during the austral spring and summer, 3 austral species during the winter and also by 5 local species. The area hosts several species of special concern, such as the Hudsonian Godwit, Red Knot, Buff-breasted Sandpiper and Rufous-chested Dotterel.

The Atlas of Neartic Shorebirds in the Coast of South America (Morrison & Ross 1989) lists Lagoa do Peixe as a potential WHSRN site. The 6,600 Sanderlings counted here represent 71% of the Atlantic coast total, and the 17,500 "peeps" account for 24% of the Atlantic coast total.

The 3,000 Hudsonian Godwits represent at least 10% of the Atlantic Coast population (counts do not take into account turnover). For the Red Knots, the 13,000 birds represent 10 - 21.6% of the American subspecies, *Calidris canutus rufa*. These figures do not take into account any

turnover, which certainly occurs in the area. Red Knots are present throughout the year in concentrations of up to 1,200 birds (Rodrigues & Lopes 2000).

Other birds present in the area are 15 species of ducks, 7 tern species (including large numbers of Common, Cayenne and Royal terns), skimmers, Peregrine Falcons and Chilean Flamingos. *Porzana spiloptera*, a globally Vulnerable species, has recently been found (and mist-netted) in the park but its status there is poorly known.

It is the only place in Brazil where Chilean Flamingos can be observed all year round. Its northern portion is heavily used by freshwater species such as Black-necked Swan *Cygnus melancoryphus* and Coscoroba Swan *Coscoroba coscoroba*, Fulvous Whistling Duck, *Dendrocygna bicolor*, White-faced Whistling–Duck, *Dendrocygna viduata,* Yellow-billed Pintail *Anas georgica*, Speckled Teal *Anas flavirostris*, Rosy-billed Pochard *Netta peposaca*, among others. Over 150 bird species have been recorded in the National Park list, with 16 Neartic shorebirds out of 26 listed species spending the boreal winter within its boundaries. From February on, the austral shorebirds start to arrive aiming to spend the winter there. Over 30% of the world's population of *Limosa haemastica* migrates through the area in both directions. Most of the migratory species stopping in the park use it as a stop-over area to refuel for their next migratory path. The park's suitable habitat and abundant foods provide the resources necessary to birds to undergo feather molt.

The national park faces several issues arising from its economic use (Leonardo Mohr in litt.). Lagoa do Peixe is linked to the sea by a channel that once opened depending on sea currents and water levels in the lagoon. The channel is now opened with the aid of machinery in order to allow the draining of nearby pastures and to shrimp larvae to gain access to the lagoon, and closed during the summer to stop the adult shrimp to migrate to the sea. The local shrimp fishery, carried with traps ("aviãozinho") that cover a good part of the lagoon is a source of controversy and disputes between the park and fishermen, as it is, according to the law, illegal, but allowed because of pressure from the local community and politicians.

Some 15-20 families still live in the park, but there are many houses used by people from other areas during weekends and the shrimp harvest (200 registered fishermen). One whole neighborhood (Talha Mar) was built after the park was decreed in 1986. The thorny political issue (no one seems to have the balls to uphold the law) has pushed proposals for the area losing national park status and be turned in an APA or "sustainable use" area. It must be pointed the disturbance caused by the fishermen and tourists, and the opening of channel severely disrupt shorebird behavior. Lagoa do Peixe has experienced severe droughts in the last few years and it was mostly dry in April 2002 (F. Olmos in litt.), a time when wader populations should be peaking. The opening of the channel during the winter (the rainy season) prevents water to accumulate and make the impact of the droughts worse.

Mamirauá. Amazonas state; 1,124,000 ha; 02º18'S 066º02'W. Ramsar site no. 623.

Most of Mamirauá is a Sustainable Development Reserve. "Várzea" forest with several lakes seasonally connected by natural drainage canals. The area has a high degree of endemism. Human activities include logging, subsistence agriculture, hunting, commercial fishing, and collection of aquarium fish.

Mamirauá includes a large number of lakes build by sediment deposition by the Solimões and its tributaries. Those harbor large fish populations during the low-water season, attracting huge numbers of waterbirds, especially Neotropic Cormorants, with flocks of thousands of birds. Wading birds such as storks and herons also gather in the drying lakes but there is no data on nesting colonies.

Sandbeaches are used by large colonies of Gull-billed Terns, Black-Skimmers and smaller numbers of Yellow-billed Terns. Eggs are harvested for consumption by local people in a scheme supposed to be sustainable (Haeder & Bernhard 2003), but there seems to be little discrimination about which species a given egg belongs. It would be worth if the "sustainability" of this scheme is proved, as there are concerns about the impacts on the less

common Yellow-billed Terns, a species that may be becoming scarcer over most of its range (Patricia de Jesus Faria, pers. com.).

Pantanal Matogrossense / Reserva Particular do Patrimônio Natural SESC Pantanal*;* Mato Grosso state; 135,000 ha and 87,871 ha; 17º39'S 057º25'W and 16º39'S 056º15'W. Ramsar sites n^{o} 602 and 1270.

The first includes Pantanal National Park near the Brazil-Bolivia border, by Lagoa Uberaba, while the second is a privately owned nature reserve. Both are part of the largest, permanent freshwater wetland in the Western Hemisphere.

The Pantanal de Mato Grosso is situated in a large depression functioning as an inland delta receiving several tributaries of the rio Paraguai, including the Taquari, Negro, Piquiri, Cuiabá/São Lourenço, Miranda and Aquidauana. Sited well inland, the Pantanal region is hot and frequently dry, with evapotranspiration far exceeding the local rains; if not for the inflow of waters draining into the basin the whole area would be a xeric, Chaco-like, thorn scrub.

The huge area covered by the basin implies in a complex and variable flood pattern, each river with its own flood peak. As the water enters the basin and flows southward, there is a trend for flood peaks occur later in the year as one goes south, to the point maximum water levels coincide with the height of the dry season in the southern edge of the Pantanal. The Pantanal is (or was) a vast mosaic of seasonally flooded savannas, patches of xerophytic scrub and deciduous forest. It has some of the largest and most spectacular concentrations of wildlife in the Neotropics (certainly the only ones in Brazil with real mass tourism potential) with huge resident breeding populations of a wide variety of species, especially all three Neotropical storks, spoonbills, ibises, egrets, herons, cormorants and darters. Nearctic shorebirds use the area for staging. The Pantanal probably harbors the largest populations of Jabiru Storks, Woodstorks, Roseate Spoonbills, Neotropic Cormorant and Snail Kites *Rosthramus sociabilis* in the world. Tubelis & Tomas (2003) provide an updated list of bird species and localities for the Brazilian Pantanal.

Nascimento *et al*. (in press) have mapped 42 nesting colonies all over the region, the best such study so far, but likely an underestimate of the true number of sites. The study shows most nest-building and clutches happen in May-August, when the water is still high, hatching in June-November and fledgling in September-December. Diving cormorants and darters are the first to nest, followed by storks and herons that need shallow waters to fish. Most colonies mapped in the study are located in the southern Pantanal, near the rios Capivari and Miranda.

As the Brazilian press has put it, Brazil is doing its best to wipe out the Pantanal until 2050. This is due to rampant deforestation in the upper Paraguai basin in Mato Grosso and Mato Grosso do Sul, among the largest producers of soybeans and beef. A study by Conservação Internacional (2005) shows 59 municipalities have cleared over half their areas. Twenty-two of them have lost over 80%, and 19 over 90% of their former cover. This loss happens exactly in the areas receiving the waters that feed the Pantanal, and is no wonder some rivers, especially the Taquari, have been filled with silt and can be crossed on foot, with dramatic changes in local flood patterns. The Taquari is widely known as an environmental catastrophe, as cattle ranches have been lost to the waters and once productive fisheries destroyed but its lessons have not been learnt.

The floodplain proper still has 83% of its native vegetation but this is being rapidly lost (2.3%/year) to make room for pastures, mainly in higher areas where forest patches grow. These cover a limited area but are important as a refuge for wildlife during the floods and are being rapidly cut, the trees being made into charcoal to feed steel plants elsewhere in Brazil. The CI study projects that in 45 years forest cover in the Pantanal will be completely lost.

Parque Estadual Marinho do Parcel Manoel Luís, including the Baixios do Mestre Álvaro and Tarol. Maranhão state; 34,556 ha; ca.00°30'S 044°45'W. RAMSAR site no. 1021.

It is a state marine park. Three coral banks off the northern coast of Maranhão, at the northern distribution limit of several fish species endemic to the Brazilian coast. The area is very important for fisheries and of extremely high scientific value. Numerous shipwrecks have been found in the area and await further study. Though the area is attractive to amateur and professional divers, tourism is limited, and because of difficult local currents and distance from the coast, only experienced divers are encouraged.

Threats include coral bleaching associated with climate change, the possibility of environmentally harmful shipwrecks where navigation is still hazardous, and pollution from hull washing by ships near São Marcos Bay. There is no information on the value of this area for seabirds.

5.2 – Other Sites

The inventory of Brazilian sites important to waterbirds made by Antas *et al.* (1989) still holds true, especially with regard to Amazonian wetlands. Please refer to that work for those areas. Bellow we add new information on some sites in order to complement the previous.

Some new sites have been added, especially seabird colonies in islands, which are described in greater detail. Regarding mainland sites, most new ones are splits from larger areas already described by Antas *et al*. (1989). The list below must not be seen as exhaustive, but a supplement to that work.

5.2.1 – Seabird Colonies

Recent information on location, population sizes and conservation issues of most seabird colonies in Brazil can be found in Branco (2004). Below is a summary of the main sites, selected on the basis of population sizes. This list does not include all seabird colonies recorded in Brazil, especially along the coast from Rio de Janeiro to Santa Catarina, where many islets, at one time or other, have nesting boobies, gulls and terns.

Atol das Rocas (03º45'S, 33º37'W) – The only atoll in the southern Atlantic, it has one of the largest seabird aggregations in the whole southern Atlantic. Numbers vary on a seasonal basis, but peaks of 115,000 Sooty Terns, 27,390 Black Noddies, 6,000 Masked Boobies, 200 Brown Boobies, 50 (non-breeding) Red-footed Boobies and 50 (non-breeding) Magnificent Frigatebirds have been reported. Shorebirds such as Turnstones also stop in the area in small numbers, and it is the source of the sole Brazilian record of Common Pratincole. Rocas is a biological reserve that has been successful in conserving the local bird populations.

Arquipélago de Fernando de Noronha (03º54'S, 32º25'W) – The main island and 20 satellite islets cover only 26 km^2. Noronha is the main Brazilian nesting station for Audubon Shearwater (in fact the main one in the southern Atlantic), Red-footed Booby (perhaps 4,000 birds), White-tailed Tropicbird (about 300 birds), Black Noddy (over 21,000 birds) and Fairy Tern (some 1,000 adults). Magnificent Frigatebird (some 100 nesting pairs), Red-billed Tropicbird (less than ten birds), Brown Noddy (about 2,000 birds), Sooty Tern (about 1,700 pairs) and Masked Booby (250-300 pairs) also nest in the islands. The local population of Red-footed Boobies seems the largest in the South Atlantic now the species ceased to breed in Trindade. Noronha is the only breeding station for the species in Brazil and it is considered as Near-threatened.

Fernando de Noronha is the sole (or one of the very few) Brazilian source of many Palearctic species such as Purple Heron, Squacco Heron, Grey Heron, Pintail, etc. Many shorebirds have also been recorded there. Fernando de Noronha is mostly in a national park but management is poor and introduced predators a serious issue. See the Audubon Shearwater and tropicbird accounts above.

Ilha da Trindade (20º30'S, 29º19'W) and **Arquipélago de Martin Vaz** (20º15'S, 28º55'W) – Part of a chain of seamounds running east from the Brazilian shelf, Trindade and Martin Vaz

are volcanic islands that raises abruptly from the sea. Trindade covers 8.2 km^2 and reaches 620 m. It was formerly clad in forests but is now mostly barren, eroding rock.

Trindade harbors most world population of Trindade Petrel, as well smaller numbers of Kermadec Petrels. Other nesting seabirds are the only Atlantic populations of Great and Lesser Frigatebirds (which may be specifically distinctive), Masked Boobies (about 600 birds), Fairy Terns, Brown Noddies and Sooty Terns (over 4,000 birds). Red-footed Boobies are extinct as a breeding species.

The small Martin Vaz is steep rocks with a flat top almost impossible to reach from the sea, although helicopter landings by the Navy happen from time to time. Martin Vaz is a known nesting site for Masked Boobies, Sooty Terns, Noodies and Fairy Terns and Trindade Petrel. It may also harbor nesting pairs of one or both Trindade frigates. For more information on Trindade see under Trindade Petrel.

Ilhas Itatiaia (20º21'30''S, 40º16'45''W), **Escalvada** (20º42''S, 40º24'24''W) and **Branca** (21º00'S, 40º47'W), – The seven islands of the Itatiaias, Ilha Escalvada and Ilha Branca, all off Espírito Santo, are the main breeding sites for Cayenne Terns in Brazil, with 10,000-13,000 birds swapping them as nesting sites every year. Nesting occurs from April to September, the terns changing colony location from time to time. The terns disperse widely over the coast, from Maranhão to northern Argentina. South American Terns also nest in the islands, with up to 490 nesting pairs. The Itatiaias are one of the very few nesting sites for Audubon Shearwaters in Brazil, with only five known nests.

The Itatiaias have been the focus of successful conservation efforts by the local ngo AVIDEPA that resulted in habitat restoration and increased numbers of nesting terns but still lack protected area status.

Arquipélago de Alcatrazes (21º06'10''S, 45º41'37''W) – The main island and seven islets harbor what may be the largest population of Magnificent Frigatebirds in the South Atlantic (a minimum of 6,000 birds), at least 3,000 Brown Boobies, 240 Dominican Gulls and irregular numbers of terns. Peaks of 850 South American and 124 Royal terns have nested in the several islets. The main island of Alcatrazes is home to several endemic plants, reptiles and frogs, and most boobies and frigates, but its northeast shore is used by the Brazilian Navy for target practice with dummy shells. This disturbs the birds and has caused fires that destroyed large areas, the last in 2005. Although some of the Alcatrazes islets are an Ecological Station, the main island remains under the jurisdiction of the Navy, which continues bombing it. Proposals to make Alcatrazes into a national park are shelved somewhere in the Environmental Ministry, but it must be pointed the Navy has succeeded in controlling access to the islands by potential vandals, and some birds (especially the frigates, which nest on the opposite side of the island) seem to have become habituated to the sound of the shots.

Laje de Santos (24º19'11''S, 46º10'52''W) – this mostly bare islet has long been known as an important nesting area for seabirds in São Paulo. Brown Boobies (c. 2,000 birds) are regular and the most abundant species. Dominican Gulls (some 30 birds) are also regular. Terns breed in most years, but numbers and composition vary. There are recorded maximums of 500 South American Terns, 284 Cayenne Terns and 374 Royal Terns (the threatened southeast Brazilian population) nesting in the islet. Laje de Santos is a state park and, currently, disturbance to seabirds comes only from the regular repairs demanded by an automatic lighthouse set in the islet.

Laje Conceição (24º14'13''S, 46º41'27''W) – this low, almost bare, rock is considered important because is one of the most regular nesting sites for Royal Terns in Brazil, with up to 240 recorded breeding birds that share the islet with some 50 Dominican Gulls. The number of Royal Terns can be larger in some years, with about 1,000 Royal and Cayenne terns gathering there (F. Olmos in litt.). The islet is popular among fishermen, who camp there causing serious disturbance. In some years that results in high nest predation by the gulls and abandonment of the colony.

Ilha do Castilho (25º16'23''S, 47º57'26''W) – The southernmost island in São Paulo, it has some 1,500 nesting frigates, 800 Brown Boobies, 200 Dominican Gulls and recorded peaks of 80 Cayenne and 60 South American terns. The latter may not breed in a given year. The island is subject to sporadical visits by fishermen but no serious threats have been reported.

Ilhas dos Currais (25º44'S, 48º22'W) – the three islands off Paraná are breeding sites for Magnificent Frigatebird (up to 6,000 birds), Brown Booby (up to 2,800 birds), South American Tern (up to 150 pairs; nesting is irregular and does not occur every year), Black-crowned Night-heron and Great Egret. There are great seasonal changes in the number of birds and the figures show the population peaks rather than actual total population sizes. Discards from shrimp trawlers are an important food source for nesting frigates and boobies.

Ilhas Moleques do Sul (27º51'S, 48º26'W) – the three coastal islands off Santa Catarina harbor breeding pairs of Magnificent Frigatebird (540-600 pairs every year), Brown Boobie (yearly mean of 640 birds), South American Tern (316), Cayenne Tern (221), Royal Tern, Dominican Gull (505). The terns are quite irregular and in some years up to 1,200 pairs may nest in the island. They frequently change nesting sites because of disturbance and predation by gulls, using other islands (Deserta, Itacolomis and Tamboretes) from time to time. A cavy (*Cavia intermedia*) is endemic to the islands.

The main threat comes from the disturbance caused by unauthorized fishermen and tourists landing on the islands, which are a state reserve.

5.2.2 – Estuaries and Coastal Wetlands

As mentioned before, the Brazilian coast is dotted by estuaries, mangroves and other wetlands used by waterbirds, including Nearctic shorebirds and locally breeding species. That makes a split between "breeding" and "non-breeding" unrealistic.

Two coastal wetland areas (Reentrâncias Maranhenses/Baixada Maranhense and Lagoa do Peixe) are RAMSAR sites described above. Some areas are huge, making a comprehensive description difficult. Other discreet areas are more manageable.

Northern Amapá Coast (02º30' to 4º24'S and 50º50' to 51º38'W) This huge area includes freshwater wetlands, mangroves and extensive mudflats associated to the rio Oiapoque and the estuaries of the rios Cassiporé, Uacá and Calçoene, south to the rio Araguari. Habitats range from freshwater to brackish mudflats, flooded palm savannas, flooded forests, forest-covered islands and lakes (Lago Maruani).

The coast of Amapá is well-known as a stop-over and wintering area for Nearctic migrants, specially Red Knots, Whimbrels, Willets, Laughing Gulls *Larus atricilla* and several terns. Many resident waterbirds are found in the region, with nesting colonies of Scarlet Ibises (one of the main concentrations in Brazil). There are also large numbers of Wood Storks, Jabiru Storks, Maguari Storks, Roseate Spoonbills, Yellow-crowned Night-Herons, Black-crowned Night-herons, Tricolored Heron, Little Blue Heron, Great Egret, Cocoi Heron. The only Brazilian population of Caribbean Flamingoes is found in this region, where they may still nest.

Part of the region is protected in Cabo Orange National Park, Maracá Ecological Station and Lago Piratuba Biological Reserve. This coast still harbors low human densities, but nesting colonies are a target for poachers and that accounts for flamingoes having deserted most of their former Brazilian range.

Maracá Island, Lago Piratuba and Maracoary Savanna (00º30'N to 02º30'N and 49º53' to 51ºW). This area includes two large, low-lying, mangrove-fringered coastal islands (Maracá and Tipioca) and some 300 km of the mainland. While the coastal areas of both the mainland and the islands are fringered by mangroves and huge mudflats, freshwater wetlands and flooded savannas are found inland, with occasional areas of forest on higher ground. In the

mainland, north of the rio Araguari, there is a system of several large lakes (Piratuba, Novo, Gansos and Bagres, each with thousands of ha.

The Araguari is known for nesting colonies of Scarlet Ibises, Woodstorks, several species of herons and egrets. The freshwater lakes and flooded savannas shelter large flocks of Whistling Ducks, cormorants and other waterfowl. Caribbean Flamingos seem regular in Maracá island, but breeding has yet to be proved. Maracá also has nesting colonies of Scarlet Ibises. The coastal mangroves and mudflats are an important stop-over and wintering area for Nearctic migrants.

Lago Piratuba is a biological reserve, while Maracá and Tipioca islands are in an ecological station.

Pará Coast and Amazonas Delta (00º10' to 1º50'S and 52º15' to 50º55' W). Another huge area including the mouth of the Amazon river and its islands (Marajó, Caviana, Mexiana, etc) and the southern coast of Pará to the mouth of the rio Gurupi.

Its southern border is continuous with the Reentrâncias Maranhenses and shares many of its features, including the large numbers of Nearctic shorebirds. Huge flocks of Semipalmated Sandpipers, Yellowlegs, Sanderlings, Whimbrels, Red-Knots, Short-billed Dowitchers, Turnstones, Willets, Laughing Gulls, Common Terns, Least Terns, etc are a common sight of this coast. Several resident species have large local populations, including Scarlet Ibises, Yellow-crowned Night-herons, Black-crowned Night-herons, Little Blue Herons, etc. Ilha Canelas is known for one of the largest Scarlet Ibis colonies in Brazil. Skimmers, River and Gull-billed terns coming from inland are also found along the coast.

The large islands of the Amazonas Delta have huge areas of seasonally flooded grasslands and savannas that support large numbers of wading birds, especially herons, egrets, South American Bittern, Woodstorks, Maguari Storks, and Whistling-ducks *Dendrocygna autumnalis*. There are also records of non-breeding Caribbean Flamingoes from the islands.

There is an on-going project conducting shorebird censuses along both the Pará and Maranhão coasts being carried by Antonio Augusto Rodrigues (Universidade Federal do Maranhão). This aims to pinpoint "hotspots" of bird abundance in the area.

The coast of Pará is pinpointed by villages and show higher human populations, and disturbance levels, compared to Amapá. Actually, 39,3% of the Pará Mangroves eco-region had already been lost by 2002 (Leandro Ferreira in litt.).

Parnaíba Delta (02º45'S, 41º45'W) – Forming one of the largest true deltas in South América, the lower Parnaíba forms an intricated network of channels and islands with a mosaic of very tall mangrove forests, palm forests, freshwater wetlands and mudflats stretching along the coasts of Maranhão and Piauí. The coastal areas are considered important for large numbers of Nearctic migrants and terns. Caju island is well-known for large nesting colonies of Scarlet Ibises, Tricolored Herons, Little Blue Herons and Yellow-crowned Night-herons.

Caju island is a privately-owned reserve devoted to eco-tourism. Most of the region is an "environmental protection area" but there are serious problems with expanding pastures, shrimp farms and over-exploitation of marine resources.

Lower rio Jaguaribe (04º15' to 05º30'S and 37º45'W to 38º30'W) – One of very few larger rivers emptying into a very dry coast, the Jaguaribe forms a system of several lagoons and mangrove swamps. The coastal areas of Ceará are known as a stop-over area for migrant terns, shorebirds and also Neotropical Grey-headed Gulls and Gull-billed Terns. Freshwater lagoons harbor flocks of Southern Pochards and White-faced Whistling-ducks.

Many of the mangroves in Ceará have been destroyed by shrimp farms, a still on-going process. The recent building of Castanhão dam in the upper Jaguaribe may affect freshwater inflow to the lower reaches, affecting the whole ecosystem.

Rio Grande do Norte Saltworks (04º55'S to 05º15'S and 36º10'W to 37º15'W) – A network of mangroves and saltworks are a conspicuous feature of the coast of northern Rio Grande Norte, especially around Grossos, Macau and Galinhos do Norte. The shallow tanks support large populations of brine shrimp that attract several waterbirds, while "islands" amid the pans provide nesting sites. Mangrove forests and mudflats along the coast provide feeding habitats to shorebirds, egrets and terns.

Azevedo *et al.* (2004) report nesting colonies of Gull-billed Terns (one of the few recent records in Brazil), Grey-headed Gulls and Yellow-billed Terns, as well nesting pairs of the enigmatic resident population of Wilson's Plover. Several migrant shorebirds also use the saltpans and nearby mangroves, making it an area of regional importance.

Mamanguape (06º45' to 06º50'S and 34º56' to 35ºW) - This relatively small area (about 10,000 ha) in the rio Mamanguape estuary. It includes mangrove forests, saltflats and mudflats. Araújo (2005) found 24 species of waterbirds, including Nearctic migrants such as Semipalmated Plover, Golden Plover, Grey Plover, Willets and Whimbrels. Numbers are lower compared to other sites to the north but this estuary does have regional importance as most of northeastern Brazil has been badly damaged by human activities.

Coroa do Avião (7º40'S, 34º50'W). A 2 ha sand islet with some herbaceous cover at the Pernambuco coast, Coroa do Avião has long been known as a stop-over site for migrant shorebirds that feed in nearby mudflats during the low tide. The area is used by aggregations of several hundreds each of Grey Plovers, Turnstones, Sanderlings, Semipalmated Plovers and Semipalmated sandpipers, with smaller numbers of Whimbrels, Red Knots, Common Terns and Cayenne Terns, among others. It is the source of a few records of *Charadrius melodus* (Azevedo-Júnior *et al.* 2001).

Rios Sergipe and Vaza-Barris (10º45'S to 11º55'S and 37º00'S to 37º38'W) – The lower reaches of the Sergipe and Vaza-Barris form a system of freshwater wetlands grading into mangrove swamps. Freshwater areas are used by large numbers of herons and egrets, while the mangroves shelter thousands of migrating shorebirds, especially Semipamated Sandpipers, Willets, Semipamated Plovers, Whimbrels and Sanderlings. The mangroves have nesting colonies of Little Blue Herons, Snowy Egrets and Yellow-crowned Night-herons.

The lower Sergipe benefits from sewage outflow from the city of Aracaju, what has caused dramatic changes in productivity in the last decade. Sewage has encourage the growth of mangrove trees and algae-covered mudflats that make prime feeding habitat for shorebirds and egrets (Marcelo C. Souza, pers. com.; F. Olmos in litt.)

Mangue Seco (11º27'S, 37º21'W) – This sandy point is located in the south side of the rio Real. At low tide extensive sandbars and mudflats lie west. Some 10,000 terns (mostly Common and Roseate, but also Cayenne, Least, Yellow-billed and Royal terns, roost on the bars, with the largest numbers seen during the night. The Common and Roseate terns depart in early morning to feed offshore (Hays *et al.* 1999, Pedro Lima in litt.).

Recôncavo and Itaparica Island (12.73º to 13.11ºS and 38.74º to 38.88ºW) – The rio Paraguaçu and smaller rivers dry into Todos os Santos Bay forming a complex of mangrove swamps, mudflats and sandbars known to be used by Nearctic shorebirds and many resident waterbirds. It is considered one of the main wintering areas for Grey Plovers, Whimbrels, Willets, Least Sandpipers and Semipalmated Sandpipers.

The southern shore of Itaparica island (Cacha-Prego) has sandbars used by thousands of migrating Common and Roseate terns, making the area one of the most important ones in Brazil for those species (Pedro Lima and Francisco Pedro Fonseca in litt).

Camamu Bay (14.13º to 13.80ºS and 39.04º to 39.87ºW) – One of the largest mangrove areas in Bahia, like the Recôncavo it is a wintering area for Whimbrels, Grey Plovers, Semipamated Plovers and other Nearctic shorebirds. It also has large numbers of resident Little Blue Herons, Great Egrets, Cocoi Herons, Snowy Egrets and Striated Herons.

A sandbar at the northern edge of the bay is a known roosting site for migrating Common and Roseate terns, with thousands of birds recorded at a time. Those feed offshore during daytime, coming back during the night (F. Olmos in litt.).

Caravelas (17º35' to 18º22'S and 39º08' to 39º55'W) – Another large estuary with extensive mangrove areas bordering inland freshwater wetlands. Species complement is similar to that observed at Camamu bay but more data are needed, especially regarding birds using the freshwater wetlands.

Rio de Janeiro Coastal Lagoons (22º50' - 23ºS and 42º to 43º25' W) – A chain of 11 coastal lagoons between the cities of Rio de Janeiro and Cabo Frio. The largest is Lagoa de Araruama. Some show high salt concentrations, what prompted their use for saltworks. The lagoons are associated to mangroves, saltmarshes, saltflats, mudflats and freshwater grasslands, including reedbeds. Sewage discharge is important in some, and dredging, urban expansion and man-made channels connecting the lagoons to the sea have changed the system in significant ways.

A large number and diversity of waterbirds is found in the lagoons. Grey-headed Gulls are known to nest, while large numbers of herons, egrets, night-herons, spoonbills, terns and rails can be seen in the lagoons. Mudflats and eutrophic areas attract large numbers of shorebirds, especially Grey Plovers, Semipalmated Plovers, Sanderlings, both Yellowlegs and White-rumped Sandpipers. Freshwater lagoons may harbor large flocks of Southern Pochards, Brazilian Teals and White-cheeked Pintails. Reedbeds in some lagoons are an uncommon habitat

Guanabara Bay (22º40’ to 22º55’S and 42º58’ to 43º16’W) – One of the largest estuaries in southeastern Brazil, the bay has been heavily modified by the expansion of Rio de Janeiro city and adjoining towns, industrial development, heavy pollution and building of port facilities. Nevertheless, significant mangrove areas, freshwater swamps and mudflats remain, especially in the inner areas of the bay.

It is known for nesting populations of South American and Cayenne Terns (which use the pillars of the Rio – Niterói bridge and some of the islets in the bay) and large numbers of Magnificent Frigatebirds, Brown Boobies, Neotropical Cormorants (up to 2,840 censused at a time). Little Blue Herons, Snowy Egrets, White-faced Whisthiling Ducks and other waterbirds. Cormorants, Great Egrets, Snowy Egrets and other herons nest in Tijucas islands, south of the entrance of the bay.

Also off the entrance of the bay, the Cagarras islands have nesting colonies with some 2,000 nests of Magnificent Frigatebirds and unspecified numbers of Brown Boobies. A wildlife refuge has been proposed for the islands.

Santos-Cubatão (23.93’S, 46.37’W) – A large bay and estuary complex rimmed with mangroves in its inner parts, this area is well-known by the impacts that pollution and dredging have had on waterbirds populations (Olmos & Silva e Silva 2002).

The area harbors several hundreds to low thousands of migrant shorebirds, especially both Yellowlegs, Semipalmated Plovers (found year-round) and Spotted Sandpipers. Gatherings of several hundreds of White-cheeked Pintails, Black Skimmer, Cayenne Terns, Dominican Gulls, Scarlet Ibises and Little Blue Herons can be seen in the area.

There are a few nesting colonies of Cocoi Heron, Little Blue Heron, Great Egret, Snowy Egret, Yellow-crowned Night-heron and Black-crowned Night-heron. Scarlet Ibises (the only population south of the Parnaíba Delta) bred there but now move south to Iguape to nest there.

A wildlife refuge has been proposed for the area.

Iguape-Cananéia Estuary (24º23' to 25º34'S and 47º1' to 48º22'W) – One of the largest estuaries in southeastern Brazil, it is a system of channels, islands and mudflats isolated from

the sea by Ilha Comprida and Ilha do Cardoso, and receiving the discharge of the rio Ribeira de Iguape. The lower Ribeira de Iguape has an extensive freshwater wetland with reedbeds supporting large numbers of Jacanas, Gallinules, rails, egrets and waterfowl.

The many large mudflats bathed by salt and brackish water support large numbers of egrets, herons, spoonbills and Nearctic shorebirds. During the summer thousands of Cayenne and South American terns gather in the area to take advantage of spawning anchovies.

There are a few nesting colonies of Little Blue Heron, Great Egret, Snowy Egret, Yellow-crowned Night-heron and Black-crowned Night-heron. Scarlet Ibises from Santos-Cubatão fly south to nest at the northern tip of Ilha Comprida, across the town of Iguape.

Ilha Comprida shelters the inner estuary from the open sea. Its long (70 km) beach is an important stop-over area for migrating shorebirds, especially White-rumped Sandpiper, Sanderling and Semipalmated Plover. The southern tip of the island is a known large roost of terns and skimmers. The whole site is an environmental protection area run by IBAMA.

Paranaguá and Laranjeiras Bays (25º15' to 25º35'S and 48º10' to 48º45'W) – Located right to the south of the previous area, maybe they could be considered a single unity. Paranaguá and Laranjeiras are fringered by large areas of mangroves, with many tidal channels and mudflats. The inner areas have freshwater swamps that grade into mangroves.

Superagui island, north of the entrance of Paranaguá bay, has a large sandy beach used by migrant shorebirds in the same way as Ilha Comprida to the north. The beach backed by freshwater wetlands in the depression between dunes covered by restingas.

The bay is used by large numbers of frigates and boobies from nearby islands that follow trawlers fishing for shrimp in the bay. The mudflats are feeding grounds for shorebirds such as Spotted Sandpipers and Semipalmated Plovers, night-herons, Roseated Spoonbills, herons and egrets.

Guaratuba Bay (25.88ºS, 48.67ºW) – This fairly deep bay is fringered by mangroves that grade into reedbeds and swamp forest in its inner areas, where freshwater dominates. One large freshwater swamp (Lagoa do Parado) holds most of the world population of Marsh Antbird *Stymphalornis acutirostris*, making it a priority IBA in Brazil, plus other marshbirds and many rails, jacanas, gallinules and waterfowl.

The mangroves support fairly large numbers of Yellow-crowned Night-herons, Little Blue Herons, Roseate Spoonbills, Great egrets and Snowy Egrets, among other wading birds. The site has an uncommon combination of mangrove and freshwater habitats that make it quite singular compared to other sites.

Lagoa do Sombrio (29º10'S, 49º40'W) – This large, brackish water lagoon, is fringered by reeds and open vegetation. It is a breeding site for several species of coots and gallinules, and shelters large numbers of migrant waterbirds coming from southern areas during the winter, including Rosy-billed Pochard, Black-necked Swan, Neotropic Cormorant, whistling ducks, herons and egrets.

Tramandaí Lagoons (29º22'S, 49º48'W to 30º23'S, 50º20'W) – This system of several lagoons and associated swamps spreads along 125 km of the coast of northern Rio Grande do Sul. There are both brackish and freshwater lagoons, and water levels suffer important seasonal changes.

The area is important for both locally breeding waterbirds like coots, bitterns, Southern Screamers, grebes and rails. Large numbers of ibises, Woodstorks, herons, egrets, spoonbills, Rosy-billed Pochards and other visitors use the lagoons, that receive migrants coming from wetlands in the lower Paraná basin, to the west.

A total of 13 Nearctic shorebird species use the area, as well as southern migrants such as *Chradrius falklandicus, C. modestus* and *Eudromias ruficollis*.

Lagoa dos Patos (29º55' to 32º00'S and 50º20'W to 52º15'W) – The largest freshwater lagoon in Brazil, this major water body affects not only its immediate surrounding but the whole coastal shelf because of its water (and nutrient) discharge. That makes the 220 km beach stretching from its mouth to the Brazil/Uruguay border a high-productivity area and one of the main wintering sites for Nearctic Common Terns and Sanderlings, and Cayenne and Royal terns coming from southern colonies.

Lagoa dos Patos has tens of satellite smaller lagoons and swamps used both as nesting and feeding sites. There are several mixed colonies of Neotropic Cormorants, Roseate Spoonbills, Snowy Egrets, Great Egrets, Black-crowned Night-herons, Whispering Ibises and White-faced Ibises. Coscoroba swans, Brown-hooded Gulls, Plumbeous Ibises, Southern Screamers, Snail Kites and a large diversity of waterfowl, rails and bitterns nest in the area.

The Lagoa dos Patos system is one of the most waterbird habitats in Brazil and, certainly, in South America.

Banhado Grande / Banhado dos Pachecos (UTM 868000/52000) – It is a system of freshwater wetlands isolated by rice plantations with two disjunct areas of 5,000 and 2,000 ha. It has the largest remaining bogs in the coastal plain of Rio Grande do Sul. Accordi *et al.* (2003) made the case for the área being considered a RAMSAR site. The area harbors 220 species of birds, including large numbers of herons, egrets, White-faced Ibises, Whispering Ibises, Black-necked and Coscoroba swans, Rosy-billed Pochards and several teal.

Additionally, it has populations of three globally threatened passerines (*Heteroxolmis dominicana, Xanthopsar flavus* and *Scytalopus iraiensis*), making it an important Brazilian IBA. The area is included in the Reserva Ecológica Banhado Grande, APA Banhado Grande and the Banhado dos Pachecos Wildlife Refuge.

Lagoa Mirim, Lagoa Mangueira and Banhado do Taim (32º10' to 33º40'S and 52º30'to 53º30'W) – Lagoa Mirim is a brackish water lagoon with little associated vegetation, while Lagoa Mangueira has freshwater. Some 120 small lagoons dot the region in a network of reedbeds, sand dunes, rice plantations, pastures and forest patches.

One of the richest South American wetland systems, waterbirds present are a veritable "who is who" of Brazilian species, with large numbers of both nesting and visiting species. It receives both Nearctic shorebirds and southern visitors, including Chilean Flamingo.

Seasonal droughts have put pressure on the area, as rice plantations monopolize the water and release little to flood the freshwater wetlands. Taim, although it is an ecological station, has suffered from this competition for water. Proposal to expand the reserve have been fought in court by local landowners and shelved by the government.

5.2.3 – Inland Wetlands

Pantanal do Guaporé (12º00' to 15º10'S and 64º50' to 59º30'W) – A large area of flooded grasslands dotted by palm swamps and forest patches along the rio Itenez/Guaporé, it spreads into Bolivia. The area closely resembles the Pantanal de Mato Grosso and, likewise, hosts large numbers of Woodstorks, Jabiru, herons, ibises, egrets, ibises and diverse waterfowl. Woodstorks and Roseate Spoonbills are known to nest. The Guaporé, in a way, forms a continuum with the northern Pantanal de Mato Grosso and it is likely that waterbirds move along both wetland systems.

Large sandbeaches form along the Guaporé during the dry season and attract nesting Gull-billed Terns, Yellow-billed Terns and Skimmers. The beaches, muddy areas and short-grass wetlands attract numerous shorebirds using the inland flyways, including Golden plover, Pectoral Sandpiper and Stilt Sandpiper.

The area is still poorly known, but there are on-going projects of aerial censuses of Marsh Deer, Jabirus and other wildlife. This has been prompted by the damage caused by introduced Water Buffalo to Guaporé Biological Reserve, which covers part of the area.

A large area of flooded savanna is found in Corumbiara State Park, south of the biological reserve, but it is still largely unknown. Its habitats closely resembles the ones in the Bolivian llanos de Mojos.

Lago de Sobradinho (09.7ºS, 41.54ºW) – The building of Sobradinho dam in the rio São Francisco has created a huge reservoir that flooded low-lying areas of former caatinga. The reservoir has become an important area for hundreds of Southern Pochards, Comb Ducks and several Whistling Ducks (Nascimento & Schulz-Neto 2000), and may be one of the main sites for those species in northeastern Brazil. Downriver, several natural, seasonal lagoons dot the São Francisco valley and are used by large numbers of egrets, herons, ducks, rails and shorebirds.

Ilha Grande National Park (27º45'S, 56º65'W) – The last free-flowing stretch of the rio Paraná in Brazil, the area is characterized by its broad floodplain and a large number of river islands. There is little published information on local waterbirds, but it is known to host Woodstorks, Jabiru Storks, several species of herons and ducks.

Rio de Janeiro Lagoons (21º25' to 22º10'S and 41º00' to 41º35'W) – The low-lying área of the lower Paraíba do Sul valley once supported a vast wetland akin to the Pantanal de Mato Grosso. This has been largely drained and dredged to make room for sugarcane plantations, eliminating many small lagoons. Nevertheless, the remaining lagoons and associated swamps, with many reedbeds, are an important habitat for the regionally threatened Comb Duck, Southern Pochard, White-faced, Fulvous and Black-bellied whistling-ducks, several teal, herons, egrets, Limpkin and bitterns.

Many shorebirds, including both Yellowlegs, Semipalmated Plover and Solitary Sandpiper, use the shallows with exposed mud. The region, although harboring significant numbers of waterbirds, is a shadow of what it was as recently as the 1950's, when "improvements" had a boost that lasted to the 1970's.

Lower Rio Ibicuí (28º40'S to 29º40'S and 56º05' to 56º55'W) – The lower rio Ibicuí and its tributaries forms a series of freshwater wetlands and lagoons along their floodplain before joining the rio Uruguai. The area has been largely occupied by rice plantations but both these and natural habitats are used by significant numbers of waterbirds. Like other areas along the rio Uruguai, this one is used by Nearctic migrants using inland routes such as Pectoral Sandpiper and Upland Sandpiper. A great diversity of teals and ducks is present, as many species migrate between areas to west, in the Paraná valley, to coastal wetlands in Rio Grande do Sul. There are also important numbers of Maguari Stork, Whispering Ibis, bitterns, egrets, coots and rails.

Black Skimmers and Yellow-billed Terns are known to nest in beaches along the Ibicuí.

6. Issues and Threats to Waterbirds and Their Habitats/Sites

Several issues affecting waterbird conservation in Brazil have been discussed under specific sites or species, including the problems caused by introduced predators in Abrolhos and Fernando de Noronha, the expanding rice plantations in the Araguaia valley and mangrove deforestation in Pará and Maranhão. A few additional comments are worth.

a. Hydropower plants x habitat specialists

About 80% of Brazilian electricity comes from hydropower plants. Widespread damming has drastically changed whole river basins, especially the Paraná, Uruguai, São Francisco and Tocantins, destroying wetlands and riverine forests and changing hydrological patterns.

One of the waterbird groups most affected by damming is beach-nesters or beach specialists such as Gull-billed Terns, Yellow-billed Terns, Black Skimmers and Orinoco Goose. These have lost their habitat along most of the rio Paraná, where the only free-flowing stretch runs from the Itaipú reservoir up to the Porto Primavera dam. All large east bank tributaries of the Paraná, especially the Paranapanema and Tietê, are now mostly a chain of lakes.

On-going projects shall turn the rio Tocantins in a similar chain of hydropower lakes. The Serra da Mesa, Peixe and Luis Eduardo Magalhães reservoirs are already flooded, and Estreito soon to come.

Other waterbirds such as Brazilian Merganser and Fasciated Tiger-heron are associated to fast-flowing, clean rivers, and are eliminated from hydropower reservoirs. Recent projects like Barra Grande have destroyed potential habitat for both species in the rio Pelotas (no proper study was carried to check for the species) and are planned for known merganser sites in the upper Tocantins basin. Whole strings of dams, funded both by the government and private money, are planned for both rivers.

b. Madeira hydropower plants and sedimentation

Two hydropower plants (Jirau and Santo Antonio) are planned for the rio Madeira, where they will be built on the rapids upriver from Porto Velho. The Madeira is extremely important for commercial fish (mostly large catfish) migrating up the Amazon into tributaries in Peru and Bolivia, and the dams will essentially kill those fisheries.

The Madeira is one of the Amazonian rivers carrying the largest sediment loads, what is important in bringing nutrients, creating sucessional habitats and in the dynamics of the many lakes and ox-bows found downriver. The trapping of sediments behind the dams will have impacts that will reverberate throughout the Amazon basin, not only in Brazil but also in Bolivia and Peru. Amazingly, none of those countries has asked to opinate on the project.

c. Pantanal deforestation and droughts

As pointed above, deforestation rates in the areas surrounding the Pantanal de Mato Grosso are very high and even forest areas in the flood basin are in targets for the ever-expanding Brazilian agribusiness, which is burning the country's natural assets to sell cheap soybeans, beef and chicken to the world.

Habitat destruction, siltation and pollution from agricultural run-off and the lack of sewage works in most cities around the Pantanal (including the Mao Grosso state capital Cuiabá) is compounded by multi-year drought cycles that devastate large areas of the Pantanal, as seen this year. Droughts, besides the damage they cause directly, including the failure of nesting colonies, result in widespread wildfires that cause havoc in the wildlife populations.

As pointed above, the Pantanal would be a semi-desert without the inflow from surrounding areas. It is known that much of rain falling in Central Brazil results from the evapotranspiration from the Amazon forest. When one considers the effects of Amazonian deforestation and global change on the rains feeding the Pantanal the future looks bleak.

d. Shrimp Farms

The growing markets coupled to the collapse of shrimp farms elsewhere resulted in a boom of pond-building for growing exotic shrimp in Brazil, especially in Ceará and Rio Grande do Norte. As happened elsewhere, and keeping the Brazilian tradition of mimicking other countries mistakes, all those were built in former mangroves, resulting in the widespread destruction of mangrove forests, salt flats and mudflats used by waterbirds.

Shrimp farming, besides fostering habitat destruction and coastal pollution similar to what has been recorded elsewhere, also fostered government corruption resulting in flawed environmental licensing, counter-information campaigns spreading false data on the rate of mangrove destruction and even a few deaths of law efforcers.

7. Ongoing Aquatic Bird Conservation Programs and Participants

Amongst the 126 globally threatened bird species in Brazil, considering the vagrant ones, 22 are considered waterbirds and 10 are near threatened. Even so, Brazil still has few conservation programs involving this group of birds. The Centro de Pesquisas para a Conservação das Aves Silvestres (CEMAVE – IBAMA) is the main organization involved with researches and conservation of waterbirds. Currently (until August 2006) the ongoing aquatic bird conservation programs are:

- Projeto de Conservação de Albatrozes e Petréis na Costa Brasileira (Conservation Project of Albatrosses and Petrels in the Brazilian Coast – ACAP) - 2006.
- Projeto de Monitoramento de Aves Migratórias na Costa Norte/Nordeste do Brasil (Monitoring Migratory Birds in the North/Northeast Brazilian Coast)
- Conservação da pardela-de-asa-larga (*Puffinus lherminieri*) (Conservation of Audubon's Shearwater *Puffinus lherminieri*)
- Monitoramento do Rio São Francisco com base nas Aves de Potencial Cinegético - Programa São Francisco – CEMAVE/CHESF (Monitoring of São Francisco River based on Gamebirds occurrence – São Francisco Program – CEMAVE/CHESF)
- Implantação da Base do CEMAVE e do Plano de Ação Emergencial para Controle do Perigo Aviário em Fernando de Noronha (CEMAVE headquarter implementation and urgent plan to control the Avian Flu at the Fernando de Noronha islands.

Conservação das Andorinhas-do-mar-do-bico-amarelo (*Sterna eurygnatha*) (Conservation of Sandwich Tern *Sterna eurygnatha*)

In June 2006, IBAMA launch, with BirdLife International support, a national action plan for the conservation of Albatrosses and Petrels (Plano de Ação Nacional para a Conservação de Albatrozes e Petréis - ACAP) to conserve the reproductive sites and implement actions to reduce the incidental capture of the seabirds by the longlines. The Projeto Albatroz, coordinated by Tatiana Neves, is the organization leading this initiative.

Another program is ready to be launched by IBAMA; the Action Plan for the Conservation of Brazilian Merganser *Mergus octosetaceus* (Plano de Acão para a Conservação do pato-mergulhão *Mergus octosetaceus*). This publication receive the participation of some collaborators, including Jaqueline Goerck (BirdLife International / SAVE Brasil) and it will be a very important tool for the conservation of this critically endangered species.

To join these programs there is the Neotropical Waterbird Census (NWC). It was started in 1990 in southern South America as a regional extension of the International Waterbird Census (IWC), globally coordinated by IWRB (now Wetlands International, WI). The NWC was initiated in Argentina, Chile and Uruguay, with an increasing coverage to the north of the region. In 1991 Brazil and Paraguay joined the program, followed by Colombia and Peru in 1992 and by Bolivia and Ecuador in 1995. At present, the NWC is covered by these nine countries of South America, where 355 wetlands sites were surveyed, with participation of more than 500 volunteers under national coordinators (João Menegheti and Gislaine Disconzi in Brazil). The NWC program was established to provide baseline information on the distribution and abundance of waterbirds and wetland habitats within the Neotropics. The program aims to contribute to waterbirds and wetlands conservation by:

- “Increasing the awareness of wetlands values;
- Providing the basis for estimates of waterbird populations;
- Monitoring changes in waterbird numbers;
- Improving knowledge of little-known waterbird species;
- Identifying and monitoring sites that qualify as wetlands of international importance.”

The NWC is a "site-based" counting scheme for monitoring waterbirds with volunteer participation. Most volunteers are members of enthusiastic networks and partner NGOs, with professional coordination in each country. Standardized waterbird counts are carried out at the same sites twice a year in February and July. Counts include grebes, pelicans, cormorants, herons, storks, flamingos, screamers, swans, geese, ducks, rails, shorebirds, gulls and terns. It has been conceived from the outset as a global waterbird conservation tool. In Brazil the NWC started in 1991 and stopped in 1995. Nine years late the NWC in Brazil was re-started and in 2004 and 2005 simultaneous censuses have taken place in isolated sites distributed in nine states in Brazil (Distrito Federal, Goiás, Minas Gerais, Mato Grosso do Sul, Paraná, Rio Grande do Norte, Rio Grande do Sul, São Paulo, Maranhão), which is a great success. The report documents the activities 2005-2006 will be produced and distributed in 2007 by the national coordinators of the NWC.

7.1 – IBAs and waterbirds

In March 2006 BirdLife International / SAVE Brasil launched the Important Bird Areas book from Brazil ("Áreas Importantes para a Conservação das Aves no Brasil"). This first publication considers the states inserted in the Atlantic forest limits and it includes important wetlands where we can find some threatened and congregatory waterbird species:

(IBA Code – Name)

PE01 – Arquipélago de Fernando de Noronha
(Pernambuco State)
- *Anous stolidus*: 10630 nests counted in 1987 (Antas, 1991)

ES08 – Trindade e Martim Vaz
(Espírito Santo State)
- *Pterodroma arminjoniana*: these islands harbor all known reproductive population.
- *Gygis alba*: possibly the second largest South Atlantic colony, with 800 individuals (Fonseca Neto, 2004)
- these are the only known reproductive sites for *Fregata minor* and *F. ariel* in the Atlantic Ocean

ES09 – Ilhas do Litoral Sul do Espírito Santo
(Espírito Santo State)
- *Thalasseus sandvicensis*: 10.000 – 13.000 birds reproduce in the islands every year (Efe et al., 2000) representing more than 1% of the global population for the *T. s. eurygnatha* subspecies.

SP09 – Arquipélago dos Alcatrazes
(São Paulo State)
- *Sula leucogaster*: 1500 reproductive pairs (Martuscelli et al., 2000)
- *Fregata magnificens*: 3000 reproductive pairs (Martuscelli et al., 2000)
- both species represent more than 1% of the global population.

SP12 – Ilhas Comprida e Cananéia
(São Paulo State)
- *Thalasseus sandvicensis*: till 3000 individuals of the *T. s. eurygnatha* subspecies (Barbieri et al., 2002; see Bencke et al., 2006).

PR13 – Ilha dos Currais
(Paraná State)

- *Fregata magnificens*: 2640 nests (Krul, 1997).
- represents more than 1% of the global population.

RS06 – Parque Nacional da Lagoa do Peixe (a Ramsar site too)
(Rio Grande do Sul State)
- *Phoenicoparrus andinus*: some birds visit the area during the winter (Belton, 1994)
- *Porzana spiloptera*: small resident population (BirdLife International, 2000)
- *Larus atlanticus*: some individuals registered recently (Barnett et al., 2004)
- *Phoenicopterus chilensis*: hundred of birds arrive in the winter (Belton, 1994)
- *Tryngites subruficollis*: one of the main wintering areas (Lanctot et al., 2002)
- *Calidris canutus*: more than 11000 birds use the area as a feeding site (Harrington et al., 1986)
- *Calidris alba*: more than 5000 birds use the area (Harrington et al., 1986)
- *Calidris fuscicillis*: more than 6000 birds use the area (Harrington et al., 1986)
- *Limosa haemastica*: more than 1000 use the area as a feeding site (Harrington et al., 1986)
- *Sterna hirundo*: 12000-14000 birds during the austral summer (Harrington et al., 1986)

RS09 – Estuário da Laguna dos Patos
(Rio Grande do Sul State)
- *Porzana spiloptera*: some birds were observed at "marismas" (Bencke et al., 2003)
- *Larus atlanticus*: 20-50 birds use the area every year (Bencke et al., 2003)
- *Phoenicopterus chilensis*: occur in few numbers (see Bencke et al., 2006)
- *Tryngites subruficollis*: 400-800 birds every year during the winter (Lanctot et al., 2002)

RS10 – Várzea do Canal São Gonçalo
(Rio Grande do Sul State)
- *Plegadis chihi*: the area probably harbor more than 1% of the global population (see Bencke et al., 2006)

RS11 – Banhado do Maçarico e Cordões Litorâneos Adjacentes
(Rio Grande do Sul State)
- *Tryngites subruficollis*: undefined status (see Bencke et al., 2006)

RS12 – Banhado do Taim
(Rio Grande do Sul State)
- *Phoenicopterus chilensis*: some solitary individuals registered (Belton, 1994)
-*Tryngites subruficollis*: hundreds during the austral summer (Lanctot et al., 2002)
- *Cygnus melancoryphus*: near 1270 birds in November/2000 (Dias & Fontana, 2002)
- *Coscoroba coscoroba*: near 1460 birds in November/2000 (Dias & Fontana, 2002)

8. Recommendations

Most recommendations have been made while discussing specific sites. Nevertheless, there are background factors affecting the conservation of waterbirds and, indeed, the conservation of the whole of Brazil's nature.

Brazilian economy relies strongly on the export of agricultural commodities, especially beef and soybeans, to keep a positive export balance. There is strong pressure for the expanding of pastures and plantations, what have caused ecological disasters. The heavy silting and degradation of the Taquari river basin in the Pantanal caused plantations upriver is one well-known example, but similar tales are occurring in other areas, including the Araguaia basin.

Foreign markets buying Brazilian soy and beef are the fuel of most recent destruction in Brazil, including the appalling levels of Amazonian deforestation recorded in the last three years. Most soybeans are exported to the EU and China. At least the former seems to be civilized enough to impose barriers to agricultural products sold cheap in foreign markets at

the cost of environmental destruction (not to mention slave labor – commonplace in areas being opened for pastures in the Amazon).

Potentially, foreign market pressure have an important hole in stopping further habitat destruction in Brazil, but this tool has yet to be used.

Hydropower reservoirs are another pervasive threat to all aquatic habitats and Brazil and are the greatest threat to Brazilian Merganser. Sources such as solar and wind power suffer from high costs and are not a realistic option in Brazil in the short term, unless production costs fall and there is a real governmental commitment to promote them. The close, and corruption-permeated, link between government officers and the hydropower sector make any such step unlikely.

The conservation community would help by taking a more realistic instance on nuclear power. Experience has shown nuclear plants to be far less damaging to biodiversity than hydropower and is the more viable option for Brazil, with a cost roughly twice of hydropower. That compares well to the 5 to 10 times figure of gas or oil-fed plants recently built in the country.

Brazil plans to boost its energy capacity by building several large dams in the Amazon, with plans going ahead for two in the Madeira river and one in the Xingu. Those will be disasters under any criteria, but the lack of economically feasible options, at least from the government side, means they will go ahead. The chronic opposition of the environmental sector (especially Greenpeace) to nuclear power just helps such damaging projects and should be reevaluated. A last-generation nuclear plant, such as the ones being built in Finland, France and Japan, would be a much better option than the dams now being licensed by the government.

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Table 1 – Waterbirds recorded in Brazil, their occurrence, IUCN status and national status according to the Brazilian threatened species list (Instrução Normativa MMA 03 de 27 de maio de 2003). Sequence and taxonomy follow Comitê Brasileiro de Registros Ornitológicos (http://www.cbro.org.br). [ ] – species reported but not documented.
Occurrence – R: resident breeder, most being intertropical migrants; A: austral visitor/migrant, including species from the Southern Cone, Subantarctic islands and the Antarctic. Some populations migrate to Brazil mingling with locally breeding birds and vice-versa; B: boreal visitor/migrant, mostly from North America; VA – vagrant; ( ): indicates suspected status for species with little information.

Local status shows information from Brazilian state red lists – RJ: Rio de Janeiro; SP: São Paulo, MG: Minas Gerais, PR: Paraná, RS: Rio Grande do Sul. Blanks in status columns = LC; PE = Probably Extinct; DD = Data Deficient

Taxa	National Common Names	Occurrence	IUCN Status	National Status	Local Status
Anseriformes Linnaeus, 1758					
Anhimidae Stejneger, 1885					
Anhima cornuta (Linnaeus, 1766)	anhuma	R			SP (CR), PR (EN)
Chauna torquata (Oken, 1816)	tachã	R			
Anatidae Leach, 1820					
Dendrocygninae Reichenbach, 1850					
Dendrocygna bicolor (Vieillot, 1816)	marreca-caneleira	R			RJ (VU)
Dendrocygna viduata (Linnaeus, 1766)	irerê	R, A			
Dendrocygna autumnalis (Linnaeus, 1758)	asa-branca	R			
Anserinae Vigors, 1825					
Cygnus melancoryphus (Molina, 1782)	cisne-de-pescoço-preto	R, A			
Coscoroba coscoroba (Molina, 1782)	capororoca	R, A			
Anatinae Leach, 1820					
Neochen jubata (Spix, 1825)	pato-corredor	R	NT	DD	SP (PE)
Cairina moschata (Linnaeus, 1758)	pato-do-mato	R			RJ (VU), RS (EN)
Sarkidiornis sylvicola Ihering & Ihering, 1907	pato-de-crista	R			RJ (EN), VU (RS)
Callonetta leucophrys (Vieillot, 1816)	marreca-de-coleira	R, A			
Amazonetta brasiliensis (Gmelin, 1789)	pé-vermelho	R, A			
Anas sibilatrix Poeppig, 1829	marreca-oveira	A			
Anas flavirostris Vieillot, 1816	marreca-pardinha	R			
[*Anas acuta* Linnaeus, 1758]					
Anas georgica Gmelin, 1789	marreca-parda	R, A			
Anas bahamensis Linnaeus, 1758	marreca-toicinho	R			SP (VU)
Anas versicolor Vieillot, 1816	marreca-cricri	R, A			
Anas discors Linnaeus, 1766	marreca-de-asa-azul	B			

Anas cyanoptera Vieillot, 1816	marreca-colorada	(A)			
Anas platalea Vieillot, 1816	marreca-colhereira	A			
Netta erythrophthalma (Wied, 1832)	paturi-preta	R			SP (VU)
Netta peposaca (Vieillot, 1816)	marrecão	R, A			
Mergus octosetaceus Vieillot, 1817	pato-mergulhão	R	CR	CR	SP (PE), MG (CR), PR (CR)
Heteronetta atricapilla (Merrem, 1841)	marreca-de-cabeça-preta	R, A			
Nomonyx dominica (Linnaeus, 1766)	marreca-de-bico-roxo	R, A			
Oxyura vittata (Philippi, 1860)	marreca-pé-na-bunda	A			
Taxa	**National Common Names**	**Occurrence**	**IUCN Status**	**National Status**	**Local Status**
Podicipediformes Fürbringer, 1888					
Podicipedidae Bonaparte, 1831					
Rollandia rolland (Quoy & Gaimard, 1824)	mergulhão-de-orelha-branca	R, A			
Tachybaptus dominicus (Linnaeus, 1766)	merguhão-pequeno	R			
Podilymbus podiceps (Linnaeus, 1758)	mergulhão-caçador	R			
Podicephorus major (Boddaert, 1783)	mergulhão-grande	R, A			
Podiceps occipitalis Garnot, 1826	mergulhão-de-orelha-amarela	(A)			
Sphenisciformes Sharpe, 1891					
Spheniscidae Bonaparte, 1831					
Aptenodytes patagonicus Miller, 1778	pingüim-rei	(A)			
Spheniscus magellanicus (Forster, 1781)	pingüim-de-magalhães	A	NT		
Eudyptes chrysolophus (Brandt, 1837)	pingüim-de-testa-amarela	(A)	VU		
Eudyptes chrysocome (Forster, 1781)	pingüim-de-penacho-amarelo	(A)	VU		
Procellariiformes Fürbringer, 1888					
Diomedeidae Gray, 1840					
Phoebetria fusca (Hilsenberg, 1822)	piau-preto	A	EN		
Phoebetria palpebrata (Forster, 1785)	piau-de-costas-claras	A	NT		
Thalassarche chlororhynchos (Gmelin, 1789)	albatroz-de-nariz-amarelo	A	EN	VU	PR (VU), RS (VU)
Thalassarche melanophris (Temminck, 1828)	albatroz-de-sobrancelha	A	EN	VU	PR (VU)
Thalassarche chrysostoma (Forster, 1785)	albatroz-de-cabeça-cinza	A	VU		
Thalassarche cauta (Gould, 1841)	albatroz-arisco	A			
Diomedea epomophora Lesson, 1825	albatroz-real	A	VU	VU	
Diomedea sanfordi Murphy, 1917	albatroz-real-do-norte	A	EN	EN	
Diomedea exulans Linnaeus, 1758	albatroz-gigante	A	VU	VU	PR (VU), RS (EN)
Diomedea dabbenena Mathews, 1929	albatroz-de-tristão	A	EN	EN	RS (VU)
Procellariidae Leach, 1820					
Macronectes giganteus (Gmelin, 1789)	petrel-gigante	A	VU		PR (VU), RS (VU)
Macronectes halli Mathews, 1912	petrel-gigante-do-norte	A	NT		
Fulmarus glacialoides (Smith, 1840)	pardelão-prateado	A			
Daption capense (Linnaeus, 1758)	pomba-do-cabo	A			
Lugensa brevirostris (Lesson, 1831)	grazina-de-bico-curto	(A)			

Pterodroma mollis (Gould, 1844)	grazina-mole	A			
[*Pterodroma hasitata* (Kuhl, 1820)]					
Pterodroma incerta (Schlegel, 1863)	grazina-de-barriga-branca	A	VU	VU	
Pterodroma lessonii (Garnot, 1826)	grazina-de-cabeça-branca	(A)			
Pterodroma neglecta (Schlegel, 1863)	petrel-de-kermadec	R			
Pterodroma macroptera (Smith, 1840)	fura-buxo-de-cara-cinza	A			
Pterodroma arminjoniana (Giglioli & Salvadori, 1869)	grazina-de-trindade	R	VU	VU	
Halobaena caerulea (Gmelin, 1789)	petrel-azul	A			
Pachyptila vittata (Forster, 1777)	faigão-de-bico-largo	A			
Pachyptila desolata (Gmelin, 1789)	faigão-rola	A			
Pachyptila belcheri (Mathews, 1912)	faigão-de-bico-fino	A			
[*Bulweria bulwerii* (Jardine & Selby, 1828)]					

Taxa	National Common Names	Occurrence	IUCN Status	National Status	Local Status
Procellaria cinerea Gmelin, 1789	pardela-cinza	A	NT		
Procellaria aequinoctialis Linnaeus, 1758	pardela-preta	A	VU	VU	PR (VU), RS (VU)
Procellaria conspicillata Gould, 1844	pardela-de-óculos	A	CR	EN	RS (EN)
Calonectris diomedea (Scopoli, 1769)	bobo-grande	B			
Calonectris edwardsii (Oustalet, 1883)	bobo-de-cabo-verde	B			
Puffinus griseus (Gmelin, 1789)	bobo-escuro	A	NT		
Puffinus gravis (O'Reilly, 1818)	bobo-grande-de-sobre-branco	A			
Puffinus puffinus (Brünnich, 1764)	bobo-pequeno	B			
[*Puffinus assimilis* Gould, 1838]					
Puffinus lherminieri Lesson, 1839	pardela-de-asa-larga	R		CR	
Hydrobatidae Mathews, 1912					
Fregetta grallaria (Vieillot, 1818)	painho-de-barriga-branca	A			
Fregetta tropica (Gould, 1844)	painho-de-barriga-preta	(A)			
Oceanites oceanicus (Kuhl, 1820)	alma-de-mestre	A			
Pelagodroma marina (Latham, 1790)	painho-de-ventre-branco	(A?)			
[*Oceanodroma castro* (Harcourt, 1851)]					
Oceanodroma leucorhoa (Vieillot, 1818)	painho-de-cauda-furcada	B			
Pelecanoididae Gray, 1871					
Pelecanoides magellani (Mathews, 1912)	petrel-mergulhador-de-magalhães	A			
Pelecaniformes Sharpe, 1891					
Phaethontidae Brandt, 1840					
Phaethon aethereus Linnaeus, 1758	rabo-de-palha-de-bico-vermelho	R		VU	
Phaethon rubricauda Boddaert, 1783	rabo-de-palha-de-cauda-vermelha	VA			
Phaethon lepturus Daudin, 1802	rabo-de-palha-de-bico-laranja	R		VU	
Pelecanidae Rafinesque, 1815					
Pelecanus occidentalis Linnaeus, 1766	pelicano-pardo	(B)			

Sulidae Reichenbach, 1849					
Morus capensis (Lichtenstein, 1823)	atobá-do-cabo	VA	VU		
Morus serrator Gray, 1843	atobá-australiano	VA			
Sula dactylatra Lesson, 1831	atobá-grande	R			
Sula sula (Linnaeus, 1766)	atobá-de-pé-vermelho	R		NT (S. s. sula)	
Sula leucogaster (Boddaert, 1783)	atobá-pardo	R			
Phalacrocoracidae Reichenbach, 1849					
Phalacrocorax brasilianus (Gmelin, 1789)	biguá	R			
[*Phalacrocorax bransfieldensis* Murphy, 1936]					
Anhingidae Reichenbach, 1849					
Anhinga anhinga (Linnaeus, 1766)	biguatinga	R			RJ (VU)
Fregatidae Degland & Gerbe, 1867					
Fregata magnificens Mathews, 1914	tesourão	R			
Fregata minor (Gmelin, 1789)	tesourão-grande	R		CR	
Fregata ariel (Gray, 1845)	tesourão-pequeno	R		CR	

Taxa	National Common Names	Occurrence	IUCN Status	National Status	Local Status
Ciconiiformes Bonaparte, 1854					
Ardeidae Leach, 1820					
Tigrisoma lineatum (Boddaert, 1783)	socó-boi	R			
Tigrisoma fasciatum (Such, 1825)	socó-boi-escuro	R		EN	MG (CR), RJ (PE), SP (CR), PR (EN)
Agamia agami (Gmelin, 1789)	garça-da-mata	R			
Cochlearius cochlearius (Linnaeus, 1766)	arapapá	R			SP (EN), PR (DD)
Zebrilus undulatus (Gmelin, 1789)	socoí-zigue-zague	R			
Botaurus pinnatus (Wagler, 1829)	socó-boi-baio	R			PR (DD)
Ixobrychus exilis (Gmelin, 1789)	socoí-vermelho	R			PR (DD)
Ixobrychus involucris (Vieillot, 1823)	socoí-amarelo	R			PR (DD)
Nycticorax nycticorax (Linnaeus, 1758)	savacu	R			
Nyctanassa violacea (Linnaeus, 1758)	savacu-de-coroa	R			PR (EN), RS (DD)
Butorides striata (Linnaeus, 1758)	socozinho	R			
Ardeola ralloides (Scopoli, 1769)	garça-caranguejeira	B			
Bubulcus ibis (Linnaeus, 1758)	garça-vaqueira	R			
Ardea cinerea Linnaeus, 1758	garça-real-européia	B			
[*Ardea herodias* Linnaeus, 1758]					
Ardea cocoi Linnaeus, 1766	garça-moura	R, A			
[*Ardea purpurea* Linnaeus, 1766]					
Ardea alba Linnaeus, 1758	garça-branca-grande	R,A			
Syrigma sibilatrix (Temminck, 1824)	maria-faceira	R			
Pilherodius pileatus (Boddaert, 1783)	garça-real	R			PR (NT)
Egretta tricolor (Statius Muller, 1776)	garça-tricolor	R			
[*Egretta gularis* (Bosc, 1792)]					

Egretta garzetta (Linnaeus, 1766)	garça-branca-pequena-européia				
Egretta thula (Molina, 1782)	garça-branca-pequena	R,A			
Egretta caerulea (Linnaeus, 1758)	garça-azul	R			
Threskiornithidae Poche, 1904					
Eudocimus ruber (Linnaeus, 1758)	guará	R			RJ (CR), SP (CR), PR (CR)
Plegadis chihi (Vieillot, 1817)	caraúna-de-cara-branca	R,A			PR (NT)
Cercibis oxycerca (Spix, 1825)	trombeteiro	R		DD	
Mesembrinibis cayennensis (Gmelin, 1789)	coró-coró	R			PR (NT), RS (EN)
Phimosus infuscatus (Lichtenstein, 1823)	tapicuru-de-cara-pelada	R,A			
Theristicus caerulescens (Vieillot, 1817)	maçarico-real	R			
Theristicus caudatus (Boddaert, 1783)	curicaca	R			
[*Platalea leucorodia* Linnaeus, 1758]					
Platalea ajaja Linnaeus, 1758	colhereiro	R,A			MG (VU)
Ciconiidae Sundevall, 1836					
Ciconia maguari (Gmelin, 1789)	maguari	R			RJ (VU), SP (VU)
Jabiru mycteria (Lichtenstein, 1819)	tuiuiú	R			MG (EN), SP (CR)
Mycteria americana Linnaeus, 1758	cabeça-seca	R			MG (VU)

Taxa	National Common Names	Occurrence	IUCN Status	National Status	Local Status
Phoenicopteriformes Fürbringer, 1888					
Phoenicopteridae Bonaparte, 1831					
Phoenicopterus ruber Linnaeus, 1758	flamingo	R		DD	
Phoenicopterus chilensis Molina, 1782	flamingo-chileno	A	NT		
Phoenicoparrus andinus (Philippi, 1854)	flamingo-grande-dos-andes	A	VU		
Phoenicoparrus jamesi (Sclater, 1886)	flamingo-da-puna		NT		
Gruiformes Bonaparte, 1854					
Aramidae Bonaparte, 1852					
Aramus guarauna (Linnaeus, 1766)	carão	R			
Rallidae Rafinesque, 1815					
Coturnicops notatus (Gould, 1841)	pinto-d'água-carijó	R		DD	SP (VU), RS (DD)
Micropygia schomburgkii (Schomburgk, 1848)	maxalalagá	R		DD	SP (VU)
Rallus longirostris Boddaert, 1783	saracura-matraca	R			PR (DD)
Aramides ypecaha (Vieillot, 1819)	saracuruçu	R			PR (DD)
Aramides mangle (Spix, 1825)	saracura-do-mangue	R		DD	SP (VU), PR (DD)
Aramides cajanea (Statius Muller, 1776)	saracura-três-potes	R			
Aramides calopterus Sclater & Salvin, 1878	saracura-de-asa-vermelha	R			
Aramides saracura (Spix, 1825)	saracura-do-mato	R			
Amaurolimnas concolor (Gosse, 1847)	saracura-lisa	R			PR (DD)

Anurolimnas castaneiceps (Sclater & Salvin, 1869)	sanã-de-cabeça-castanha	R?			
Laterallus viridis (Statius Muller, 1776)	sanã-castanha	R			
Laterallus fasciatus (Sclater & Salvin, 1868)	sanã-zebrada	R			
Laterallus melanophaius (Vieillot, 1819)	sanã-parda	R			
Laterallus exilis (Temminck, 1831)	sanã-do-capim	R			
Laterallus jamaicensis (Gmelin, 1789)	açanã-preta	VA	NT		
Laterallus leucopyrrhus (Vieillot, 1819)	sanã-vermelha	R			
Laterallus xenopterus Conover, 1934	sanã-de-cara-ruiva	R	VU		SP (CR)
Porzana flaviventer (Boddaert, 1783)	sanã-amarela	R			PR (DD), RS (DD)
Porzana spiloptera Durnford, 1877	sanã-cinza	R	VU	VU	RS (EN)
Porzana albicollis (Vieillot, 1819)	sanã-carijó	R			RS (DD)
Neocrex erythrops (Sclater, 1867)	turu-turu	R			PR (DD)
Pardirallus maculatus (Boddaert, 1783)	saracura-carijó	R			PR (DD)
Pardirallus nigricans (Vieillot, 1819)	saracura-sanã	R			
Pardirallus sanguinolentus (Swainson, 1837)	saracura-do-banhado	R			
Gallinula chloropus (Linnaeus, 1758)	frango-d'água-comum	R			
Gallinula angulata Sundevall, 1850	frango-d'água-menor				
Gallinula melanops (Vieillot, 1819)	frango-d'água-carijó	R			PR (DD)
Porphyrio martinica (Linnaeus, 1766)	frango-d'água-azul	R			
Porphyrio flavirostris (Gmelin, 1789)	frango-d'água-pequeno	R			SP (VU), PR (DD)
Fulica armillata Vieillot, 1817	carqueja-de-bico-manchado	R			SP (VU)
Fulica rufifrons Philippi & Landbeck, 1861	carqueja-de-escudo-vermelho	R			
Fulica leucoptera Vieillot, 1817	carqueja-de-bico-amarelo	R			

Taxa	National Common Names	Occurrence	IUCN Status	National Status	Local Status
Heliornithidae Gray, 1840					
Heliornis fulica (Boddaert, 1783)	picaparra	R			RJ (VU), SP (VU), PR (DD)
Eurypygidae Selby, 1840					
Eurypyga helias (Pallas, 1781)	pavãozinho-do-pará	R			
Charadriiformes Huxley, 1867					
Charadriidae Leach, 1820					
Vanellus cayanus (Latham, 1790)	batuíra-de-esporão	R			SP (VU), PR (DD)
Vanellus chilensis (Molina, 1782)	quero-quero	R			
Pluvialis dominica (Statius Muller, 1776)	batuiruçu	B			
Pluvialis squatarola (Linnaeus, 1758)	batuiruçu-de-axila-preta	B			
Charadrius semipalmatus Bonaparte, 1825	batuíra-de-bando	B			
Charadrius melodus Ord, 1824	batuíra-melodiosa	(B)			
Charadrius wilsonia Ord, 1814	batuíra-bicuda	R			
Charadrius collaris Vieillot, 1818	batuíra-de-coleira	R			
Charadrius falklandicus Latham, 1790	batuíra-de-coleira-dupla	R			

Charadrius modestus Lichtenstein, 1823	batuíra-de-peito-tijolo	A			
Oreopholus ruficollis (Wagler, 1829)	batuíra-de-papo-ferrugíneo	A			
Haematopodidae Bonaparte, 1838					
Haematopus palliatus Temminck, 1820	piru-piru	R			SP (VU)
Recurvirostridae Bonaparte, 1831					
Himantopus mexicanus (Statius Muller, 1776)	pernilongo-de-costas-negras	R			
Himantopus melanurus Vieillot, 1817	pernilongo-de-costas-brancas	R			
Burhinidae Mathews, 1912					
Burhinus bistriatus (Wagler, 1829)	téu-téu-da-savana	R			
Chionidae Lesson, 1828					
Chionis albus (Gmelin, 1789)	pomba-antártica	(A)			
Scolopacidae Rafinesque, 1815					
Gallinago paraguaiae (Vieillot, 1816)	narceja	R			
Gallinago undulata (Boddaert, 1783)	narcejão	R			PR (DD), RS (VU)
Limnodromus griseus (Gmelin, 1789)	maçarico-de-costas-brancas	B			
Limosa haemastica (Linnaeus, 1758)	maçarico-de-bico-virado	B			SP(VU), PR (DD)
[*Limosa lapponica* (Linnaeus, 1758)]					
Limosa fedoa (Linnaeus, 1758)	maçarico-marmóreo				
Numenius borealis (Forster, 1772)	maçarico-esquimó	B	CR	EX	SP (PE)
Numenius phaeopus (Linnaeus, 1758)	maçarico-galego	B			
Bartramia longicauda (Bechstein, 1812)	maçarico-do-campo	B			
[*Tringa totanus* (Linnaeus, 1758)]					
Tringa melanoleuca (Gmelin, 1789)	maçarico-grande-de-perna-amarela	B			
Tringa flavipes (Gmelin, 1789)	maçarico-de-perna-amarela	B			
Tringa solitaria Wilson, 1813	maçarico-solitário	B			
Catoptrophorus semipalmatus (Gmelin, 1789)	maçarico-de-asa-branca	B			
Actitis macularius (Linnaeus, 1766)	maçarico-pintado	B			

Taxa	National Common Names	Occurrence	IUCN Status	National Status	Local Status
Xenus cinereus (Guldenstadt, 1775)	maçarico-sovela				
Arenaria interpres (Linnaeus, 1758)	vira-pedras	B			
Calidris canutus (Linnaeus, 1758)	maçarico-de-papo-vermelho	B			
Calidris alba (Pallas, 1764)	maçarico-branco	B			
Calidris pusilla (Linnaeus, 1766)	maçarico-rasteirinho	B			
Calidris minutilla (Vieillot, 1819)	maçariquinho	B			
Calidris fuscicollis (Vieillot, 1819)	maçarico-de-sobre-branco	B			
Calidris bairdii (Coues, 1861)	maçarico-de-bico-fino	B			
Calidris melanotos (Vieillot, 1819)	maçarico-de-colete	B			
Calidris himantopus (Bonaparte, 1826)	maçarico-pernilongo	B			
Tryngites subruficollis (Vieillot, 1819)	maçarico-acanelado	B	NT	NT	PR (DD), RS (VU)
[*Philomachus pugnax* (Linnaeus, 1758)]					

Phalaropus tricolor (Vieillot, 1819)	pisa-n'água	B			
Phalaropus fulicarius (Linnaeus, 1758)	falaropo-de-bico-grosso	(B)			
[Thinocoridae Sundevall, 1836]					
[Thinocorus rumicivorus (Eschscholtz, 1829)]		VA			
Jacanidae Chenu & Des Murs, 1854					
Jacana jacana (Linnaeus, 1766)	jaçanã	R			
Rostratulidae Mathews, 1914					
Nycticryphes semicollaris (Vieillot, 1816)	narceja-de-bico-torto	R			SP (VU)
Glareolidae Brehm, 1831					
Glareola pratincola (Linnaeus, 1766)	perdiz-do-mar	(B)			
Stercorariidae Gray, 1870					
Stercorarius skua (Brünnich, 1764)	mandrião-grande	B			
Stercorarius chilensis Bonaparte, 1857	mandrião-chileno	A			
Stercorarius maccormicki Saunders, 1893	mandrião-do-sul	A			
Stercorarius antarcticus (Lesson, 1831)	mandrião-antártico	A			
Stercorarius pomarinus (Temminck, 1815)	mandrião-pomarino	B			
Stercorarius parasiticus (Linnaeus, 1758)	mandrião-parasítico	B			
Stercorarius longicaudus Vieillot, 1819	mandrião-de-cauda-comprida	B			
Laridae Rafinesque, 1815					
Larus atlanticus Olrog, 1958	gaivota-de-rabo-preto	A	VU	VU	RS (VU)
Larus delawarensis Ord, 1815	gaivota-de-bico-manchado	(B)			
Larus dominicanus Lichtenstein, 1823	gaivotão	R,A			
Larus fuscus Linnaeus, 1758	gaivota-da-asa-escura				
Larus atricilla Linnaeus, 1758	gaivota-alegre	B			
Larus pipixcan Wagler, 1831	gaivota-de-franklin	B			
Chroicocephalus cirrocephalus (Vieillot, 1818)	gaivota-de-cabeça-cinza	R			
Chroicocephalus maculipennis (Lichtenstein, 1823)	gaivota-maria-velha	R,A			RJ (PE)
Sternidae Vigors, 1825					
Anous stolidus (Linnaeus, 1758)	trinta-réis-escuro	R			
Anous minutus Boie, 1844	trinta-réis-preto	R			
Gygis alba (Sparmann, 1786)	grazina	R		NT (G. a. alba)	
Onychoprion fuscatus (Linnaeus, 1766)	trinta-réis-das-rocas	R			
Sternula antillarum Lesson, 1847	trinta-réis-miúdo	B			

Taxa	National Common Names	Occurrence	IUCN Status	National Status	Local Status
Sternula superciliaris (Vieillot, 1819)	trinta-réis-anão	R			
Phaetusa simplex (Gmelin, 1789)	trinta-réis-grande	R			RJ (PE)
Gelochelidon nilotica (Gmelin, 1789)	trinta-réis-de-bico-preto	R		DD (G.n. gronvoldi)	
Chlidonias niger (Linnaeus, 1758)	trinta-réis-negro	B			
Sterna hirundo Linnaeus, 1758	trinta-réis-boreal	B			
Sterna dougallii Montagu, 1813	trinta-réis-róseo	B		DD (S.d. dougalli)	

Sterna paradisaea Pontoppidan, 1763	trinta-réis-ártico	B			
Sterna hirundinacea Lesson, 1831	trinta-réis-de-bico-vermelho	R,A			SP (VU)
Sterna vittata Gmelin, 1789	trinta-réis-antártico	A			
Sterna trudeaui Audubon, 1838	trinta-réis-de-coroa-branca	R			
Thalasseus sandvicensis (Latham, 1787)	trinta-réis-de-bando	R,B,A		NT (T.s. eurygnathus)	
Thalasseus maximus (Boddaert, 1783)	trinta-réis-real	R,B,A		VU	SP (VU), PR (NT)
Rynchopidae Bonaparte, 1838					
Rynchops niger Linnaeus, 1758	talha-mar	R			

Appendix 1
Bird countings in Brazil

Code for Brazilian states: RS (Rio Grande do Sul), SC (Santa Catarina), PR (Paraná), SP (São Paulo), MG (Minas Gerais), RJ (Rio de Janeiro), ES (Espírito Santo), BA (Bahia), AL (alagoas), SE (Sergipe), PE (Pernambuco), PB (Paraíba), RN (Rio Grande do Norte), CE

(Ceará), PI (Piauí), MA (Maranhão), PA (Pará), AM (Amazonas), AP (Amapá), RO (Rondônia), RR (Roraima), AC (Acre), MT (Mato Grosso), TO (Tocantins), GO (Goiás), MS (Mato Grosso do Sul)

Continuous countings:

Amazonetta brasiliensis - 1994-2001: 1975 birds in RS (Nascimento et al, 2005)
Anas flavirostris - 1994-2001: 3557 birds in RS (Nascimento et al, 2005)
Calidris canutus - aug 2003-may 2004: 675 birds in MA (Ilha de Curupu) (Silva et al., 2004)
Mergus octosetaceus - 1996-2000: 39 individuals in MG (Serra da Canastra) (Silveira & Bartmann, 2001)
Netta peposaca - 1992-1993: 14000 in littoral area at RS (Antas et al., 1996)
Dendrocygna viduata - 1992-1993: 140000 in littoral area at RS (Antas et al., 1996)
Pterodroma arminjoniana - Trindade e Martim Vaz Islands, ES : 6500 individuals at the end of the last century (Fonseca Neto 2004); 2000-5000 individuals in the middle of the 90 decade (BirdLife International, 2000)
Sula leucogaster - 1989-2000: 1500 reproductive pairs in Arquipélago de Alcatrazes, SP (Martuscelli et al., 2000)
Fregata magnificens - 1989-2000: 3000 reproductive pairs in Arquipélago de Alcatrazes, SP (Martuscelli et al., 2000)

(Larrazábal et al., 2002)
04 expeditions done at Galinhos, Rio Grande do Norte State, during 98/99:
(Number of individuals counted)

Vanellus chilensis	5 (10-17 aug/99)
Pluvialis squatarola	18 (30 nov-08 dec/98 and 19-25 nov/99)
Charadrius semipalmatus	89 (19-25 nov/99)
Charadrius wilsonia	4 (12-19 mar/99 e 10-17 aug/99)
Charadrius collaris	11 (10-17 aug/99)
Haematopus palliatus	3 (12-19 mar/99)
Himantopus himantopus	52 (10-17 aug/99)
Limnodromus griseus	29 (30 nov-08 dec/98)
Numenius phaeopus	21 (30 nov-08 dec/98)
Tringa melanoleuca	315 (12-19 mar/99)
Tringa flavipes	407 (12-19 mar/99)
Tringa solitária	1 (30 nov-08 dec/98, 12-19 mar/99 and 19-25 nov/99)
Catoptrophorus semipalmatus	1 (30 nov-08 dec/98)
Actitis macularius	21 (19-25 nov/99)
Arenaria interpres	479 (19-25 nov/99)
Calidris canutus	13 (12-19 mar/99)
Calidris alba	25 (30 nov-08 dec/98)
Calidris pusilla	1455 (12-19 mar/99)
Calidris minutilla	18 (19-25 nov/99)
Calidris fuscicollis	172 (30 nov-08 dec/98)
Calidris himantopus	19 (12-19 mar/99)

Year countings:

1984

Pantanal
Ardea alba - 19960 individuals (August), at Poconé, MT (Yamashita & Valle, 1990)
Platalea ajaja - 2495 individuals (August), at Poconé, MT (Yamashita & Valle, 1990)
Mycteria americana - 27445 individuls (August), at Poconé, MT (Yamashita & Valle, 1990)

1986

According to Harrington et al. (1986), at Lagoa do Peixe National Park, Rio Grande do Sul State:
Limosa haemastica - more than 1000 use the area as a feeding site.
Calidris canutus - more than 11000 birds use the area as a feeding site.
Calidris alba - more than 5000 birds use the area.
Calidris fuscicollis - more than 6000 birds use the area.
Sterna hirundo - 12000-14000 birds during the austral summer.

1987

Sula sula - Fernando de Noronha Islands, PE: 2600 mature birds in July (Schulz Neto, 1995)
Anous minutus - Fernando de Noronha Islands, PE: 10630 nests in June (Antas, 1991)

1988

Sula dactylatra - Fernando de Noronha Islands, PE: 180 nests (Schulz Neto, 1995)

1990

Phoenicopterus chilensis - Lagoa do Peixe National Park, RS: this is the brazilian area where it can be registered during all the year (Antas, 1990)
Phoenicoparrus andinus - Lagoa do Peixe National Park, RS: the only known area in Brazil where it occurs (Antas, 1990)
[*Thinocorus rumicivorus*] - Lagoa do Peixe National Park, RS: first registered in April (Antas, 1990).
Thalasseus sandvicensis - Ilha Branca, ES: 10000 birds (Efe et al., 2000)

1991

Eudocimus ruber - Ilha do Cajual, MA: 2500 individuals in April (Rodrigues, 1995)

1992

Phaethon aethereus – Abrolhos, BA: 140 mature birds in June (Alves et al., 2000)

(Nascimento & Schulz-Neto, 2000)
During 23-27 July at Remanso – Lago de Sobradinho, Bahia State:
Dendrocygna viduata 1075

Dendrocygna autumnalis	7
Sarkidiornis sylvicola	66
Amazonetta brasiliensis	1
Phalacrocorax brasilianus	9
Anhinga anhinga	1
Butorides striata	2
Bubulcus ibis	9
Ardea alba	1
Egretta thula	15
Aramus guarauna	10
Vanellus chilensis	29
Jacana jacana	9

1993

Tachybaptus dominicus - 6 (November 16th at Campo Alegre de Lourdes, Lago de Sobradinho/BA)
Puffinus lherminieri – first record for the species in Brazil at Ilhas Itatiaia, ES. During August with 05 nests (Efe & Musso, 2001).

(Nascimento & Schulz-Neto, 2000)
During 28 feb - 11 mar at Lago de Sobradinho, Bahia State:

Dendrocygna viduata	2190
Dendrocygna autumnalis	70
Cairina moschata	63
Sarkidiornis sylvicola	21 and 185 (July 13th at Remanso-Lago de Sobradinho/BA)
Amazonetta brasiliensis	105
Anas bahamensis	11
Netta erythrophthalma	94
Phalacrocorax brasilianus	9170
Tigrisoma lineatum	4
Nycticorax nycticorax	5
Butorides striata	33
Bubulcus ibis	34
Ardea cocoi	4 and 1 (July 13th at Remanso-Lago de Sobradinho/BA)
Ardea alba	142
Egretta thula	33
Aramides cajanea	1
Gallinula chloropus	22
Vanellus cayanus	6
Vanellus chilensis	44
Himantopus himantopus	5
Tringa melanoleuca	6
Tringa solitária	7
Jacana jacana	132
Phaetusa simplex	1

1994

Pluvialis squatarola - average of 125-150 birds in November at Igarassu, PE (Telino-Júnior et al., 2003)
Charadrius semipalmatus – average of 500-550 birds in January at Igarassu, PE (Telino-Júnior et al., 2003)

Charadrius collaris – average of 100 birds in February at Igarassu, PE (Telino-Júnior et al., 2003)
Arenaria interpres - average of 150 birds in September at Igarassu, PE (Telino-Júnior et al., 2003)
Calidris alba - average of 325-350 birds in November at Igarassu, PE (Telino-Júnior et al., 2003)
Calidris pusilla – average of 450-500 birds in February at Igarassu, PE (Telino-Júnior et al., 2003)
Sula dactylatra – Abrolhos, BA: 800 mature birds in July (Alves et al., 2000)
Sula leucogaster - Abrolhos, BA: 400 mature birds in July (Alves et al., 2000)
Fregata magnificens - Abrolhos, BA: 166 nests in October (Alves et al., 2000)
Eudocimus ruber - Mangue Santos-Cubatão, SP: 385 individuals (Olmos & Silva e Silva, 2003); 3500 individuals at Ilha do Cajual, MA, in January (Hass et al., 1999).
Phoenicopterus chilensis - Lagoa do Peixe National Park, RS: according to Belton (1994) hundred of birds occur normally in the area. Banhado do Taim, RS: some solitary individuals registered (Belton 1994)
Thalasseus sandvicensis - Ilha Escalvada, ES: 10000 (Efe et al., 2000)

1995

Dendrocygna bicolor - RS: 21272 in October (Menegheti et al., 2001)
Dendrocygna viduata - RS: 98363 in October (Menegheti et al., 2001)
Netta peposaca - RS: 69405 in October (Menegheti et al., 2001)
Phaethon aethereus - Fernando de Noronha Islands, PE: 7 individuals observed till 1995 (see Schulz Neto, 1995)
Phaethon lepturus – Abrolhos, BA: 5 birds flying (Alves et al., 2000); Fernando de Noronha Islands, PE: the only known reproductive site for the species with a population of 100-300 birds (see Schulz Neto, 1995)
Sula leucogaster - Fernando de Noronha Islands, PE: 870 mature birds (see Schulz Neto, 1995)
Fregata magnificens - Fernando de Noronha Islands, PE: 500 birds (see Schulz Neto, 1995)
Pluvialis squatarola - Fernando de Noronha Islands, PE: few birds observed till 1995 (see Schulz Neto, 1995)
Limosa haemastica - Lagoa do Peixe National Park, RS: this place harbor 30% of the global population during October-April (Nascimento, 1995)
Arenaria interpres - Fernando de Noronha, data da publicação: É a espécie limícola mais comum no arquipélago, podendo-se observar dezenas de indivíduos. (Schulz Neto, 1995)
Calidris canutus - Fernando de Noronha Islands, PE: uncommon species at the islands (see Schulz Neto, 1995)
Calidris alba – Igarassu, PE: average of 425-450 birds in February (Telino-Júnior et al., 2003)

Larus dominicanus - Mangue Santos-Cubatão, SP: 120 individuals in September (Olmos & Silva e Silva, 2003)
Anous stolidus - Fernando de Noronha Islands, PE: 2000 birds (see Schulz Neto, 1995). Atol das Rocas, RN: the biggest reproductive colony in the South Atlantic with 18000 birds. (see Schulz Neto, 1995). Abrolhos, BA: 3000 birds in March (Alves et al., 2000)
Gygis alba - Fernando de Noronha Islands, PE: 1000 birds (see Schulz Neto, 1995)
Onychoprion fuscatus - Fernando de Noronha Islands, PE: 720 nests (see Schulz Neto, 1995). Atol das Rocas, RN: the biggest reproductive colony with 120000 mature birds (see Schulz Neto, 1995).

(Nascimento, 2001)
Neotropical Waterbird Census, **February**:

Anhima cornuta - 38 (Mamirauá/AM)
Chauna torquata - 63 (Pelotas/RS), 18 (Lagoa Mirim/RS)
Dendrocygna bicolor - 114 (São Lourenço do Sul/RS), 61 (Pelotas/RS), 3 (Lagoa Mirim/RS)
Dendrocygna viduata - 23 (Recife/PE), 180 (Camaçari/BA), 280 (Candeias/BA), 253 (Mucuri/BA), 75 (Morada Nova de Minas/MG), 36 (Aracruz/ES), 20 (Niterói/RJ), 62 (Presidente Epitácio/SP), 6 (Curitiba/PR), 3 (Rio Grande/RS), 126 (São Lourenço do Sul/RS), 43 (Pelotas/RS), 11 (Lagoa Mirim/RS)
Dendrocygna autumnalis - 4 (Recife/PE), 19 (João Pinheiro/MG), 64 (Morada Nova de Minas/MG)
Cygnus melancoryphus - 12 (Lagoa Mirim/RS)
Coscoroba coscoroba - 1 (Pelotas/RS), 30 (Lagoa Mirim/RS)
Cairina moschata - 19 (Mamirauá/AM), 18 (Recife/PE), 1 (Mucuri/BA), 4 (João Pinheiro/MG), 17 (Morada Nova de Minas/MG), (Conceição da Barra/ES), 1 (Lages/SC)
Amazonetta brasiliensis - 78 (Mucuri/BA), 41 (Morada Nova de Minas/MG), 4 (Aracruz/ES), 14 (Conceição da Barra/ES), 6 (Niterói/RJ), 51 (Curitiba/PR), 8 (Bituruna/PR), 2 (Gaspar/SC), 4 (Lages/SC), 4 (Pelotas/RS)
Anas flavirostris - 10 (Lages/SC), 4 (Lagoa Mirim/RS)
Anas georgica - 6 (Lages/SC), 6 (São Lourenço do Sul/RS), 2 (Pelotas/RS)
Anas bahamensis - 176 (Camaçari/BA), 37 (Niterói/RJ)
Netta erythrophthalma - 2 (Niterói/RJ)
Netta peposaca - 2 (Pelotas/RS), 3 (Lagoa Mirim/RS)
Rollandia rolland - 2 (Lagoa Mirim/RS)
Tachybaptus dominicus - 26 (Camaçari/BA), 28 (Candeias/BA)
Podilymbus podiceps - 42 (Candeias/BA), 93 (Mucuri/BA), 5 (Curitiba/PR), 1 (Lages/SC), 3 (Lagoa Mirim/RS)
Podicephorus major - 3 (Lagoa Mirim/RS)
Sula leucogaster - 5 (Paranaguá/PR)
Phalacrocorax brasilianus - 1219 (Mamirauá/AM), 4 (Mangue Seco/BA), 56 (Morada Nova de Minas/MG), 1 (Aracruz/ES), 147 (baía de Sepetiba/RJ), 66 (Niterói/RJ), 12 (Presidente Epitácio/SP), 290 (Curitiba/PR), 100 (Bituruna/PR), 89 (Pinhão/PR), 187 (Joinvile/SC), 8 (Rio Grande/RS), 4 (Pelotas/RS), 8 (Lagoa Mirim/RS)
Anhinga anhinga - 157 (Mamirauá/AM), 2 (Morada Nova de Minas/MG), 1 (Joinvile/SC), 18 (São Lourenço do Sul/RS)
Tigrisoma lineatum - 12 (Mamirauá/AM), 1 (Recife/PE), 2 (Camaçari/BA), 4 (Candeias/BA), 1 (Mucuri/BA), 2 (Presidente Epitácio/SP)
Tigrisoma fasciatum - 1 (Pelotas/RS)
Botaurus pinnatus - 1 (Mucuri/BA)
Ixobrychus exilis - 6 (Lagoa Mirim/RS)
Nycticorax nycticorax - 3 (Niterói/RJ), 30 (Curitiba/PR), 1 (Paranaguá/PR), 9 (Joinvile/SC)
Nyctanassa violacea - 1 (Joinvile/SC)
Butorides striata - 2 (Mamirauá/AM), 2 (Recife/PE), 4 (Camaçari/BA), 28 (Mangue Seco/BA), 3 (Conde/BA), 6 (Candeias/BA), 15 (Mucuri/BA), 3 (João Pinheiro/MG), 1 (Aracruz/ES), 3 (Conceição da Barra/ES), 2 (Niterói/RJ), 18 (Curitiba/PR), 24 (Bituruna/PR), 49 (Pinhão/PR), 1 (Gaspar/SC)
Bubulcus íbis - 17 (Presidente Epitácio/SP), 131 (Curitiba/PR), 9 (Pinhão/PR), 1 (Rio Grande/RS), 15 (Pelotas/RS), 15 (Lagoa Mirim/RS)
Ardea cocoi - 76 (Mamirauá/AM), 5 (Morada Nova de Minas/MG), 5 (baía de Sepetiba/RJ), 3 (Niterói/RJ), 34 (Presidente Epitácio/SP), 2 (Joinvile/SC), 2 (Lages/SC), 1 (Rio Grande/RS), 16 (São Lourenço do Sul/RS), 6 (Pelotas/RS), 2 (Lagoa Mirim/RS)
Ardea alba - 68 (Mamirauá/AM), 6 (Camaçari/BA), 17 (Mangue Seco/BA), 3 (Mucuri/BA), 7 (João Pinheiro/MG), 34 (Morada Nova de Minas/MG), 2 (Conceição da Barra/ES), 20 (baía de Sepetiba/RJ), 28 (Niterói/RJ), 103 (Presidente Epitácio/SP), 240 (Curitiba/PR), 3 (Paranaguá/PR), 10 (Joinvile/SC), 2 (Rio Grande/RS), 96 (Pelotas/RS)

Syrigma sibilatrix - 4 (João Pinheiro/MG), 5 (Morada Nova de Minas/MG), 9 (Curitiba/PR), 1 (Bituruna/PR), 2 (Paranaguá/PR), 5 (Gaspar/SC), 10 (Lages/SC), 1 (Pelotas/RS), 4 (Lagoa Mirim/RS)
Pilherodius pileatus - 1 (Conceição da Barra/ES)
Egretta thula - 8 (Camaçari/BA), 151 (Mangue Seco/BA), 1 (Candeias/BA), 1 (Mucuri/BA), 12 (João Pinheiro/MG), 16 (Morada Nova de Minas/MG), 2 (Conceição da Barra/ES), 37 (baía de Sepetiba/RJ), 54 (Niterói/RJ), 25 (Presidente Epitácio/SP), 24 (Curitiba/PR), 1 (Gaspar/SC), 53 (Joinvile/SC), 16 (Rio Grande/RS), 31 (São Lourenço do Sul/RS), 129 (Pelotas/RS), 16 (Lagoa Mirim/RS)
Egretta caerulea - 16 (Mangue Seco/BA), 3 (Mucuri/BA), 2 (baía de Sepetiba/RJ), 2 (Paranaguá/PR), 26 (Joinvile/SC)
Plegadis chihi - 182 (São Lourenço do Sul/RS), 632 (Pelotas/RS), 54 (Lagoa Mirim/RS)
Mesembrinibis cayennensis - 9 (Mamirauá/AM)
Phimosus infuscatus - 368 (Pelotas/RS), 60 (Lagoa Mirim/RS)
Theristicus caerulescens - 2 (Lagoa Mirim/RS)
Theristicus caudatus - 12 (João Pinheiro/MG), 2 (Gaspar/SC), 5 (Lages/SC)
Platalea ajaja - 6 (João Pinheiro/MG), 2 (Morada Nova de Minas/MG), 2 (baía de Sepetiba/RJ), 28 (São Lourenço do Sul/RS), 21 (Pelotas/RS), 21 (Lagoa Mirim/RS)
Ciconia maguari - 17 (São Lourenço do Sul/RS), 11 (Pelotas/RS)
Jabiru mycteria - 2 (João Pinheiro/MG), 1 (Morada Nova de Minas/MG), 4 (Presidente Epitácio/SP)
Mycteria americana - 1 (Lages/SC), 22 (Pelotas/RS)
Aramus guarauna - 2 (Mamirauá/AM), 7 (Conde/BA), 2 (Presidente Epitácio/SP), 4 (Lagoa Mirim/RS)
Aramides mangle - 2 (Joinvile/SC)
Aramides saracura - 2 (Presidente Epitácio/SP), 3 (Curitiba/PR), 2 (Bituruna/PR), 2 (Gaspar/SC), 4 (Pelotas/RS)
Laterallus viridis - 6 (Camaçari/BA)
Porzana albicollis - 1 (Mucuri/BA), 1 (Aracruz/ES), 1 (Conceição da Barra/ES), 4 (Paranaguá/PR)
Pardirallus nigricans - 3 (Aracruz/ES), 1 (Curitiba/PR)
Pardirallus sanguinolentus - 13 (Pelotas/RS)
Gallinula chloropus - 12 (Recife/PE), 342 (Camaçari/BA), 169 (Candeias/BA), 43 (Mucuri/BA), 4 (Aracruz/ES), 2 (Conceição da Barra/ES), 31 (Niterói/RJ), 165 (Curitiba/PR), 1 (Pelotas/RS)
Gallinula melanops - 3 (Lages/SC)
Porphyrio martinica - 20 (Recife/PE), 44 (Camaçari/BA), 42 (Candeias/BA), 11 (Aracruz/ES), 13 (Conceição da Barra/ES)
Fulica armillata - 43 (Pelotas/RS)
Fulica rufifrons - 68 (São Lourenço do Sul/RS)
Fulica leucoptera - 2 (Pelotas/RS)
Heliornis fulica - 1 (Mamirauá/AM)
Eurypyga helias - 1 (Mamirauá/AM)
Vanellus cayanus - 14 (João Pinheiro/MG)
Vanellus chilensis - 190 (Camaçari/BA), 38 (Mangue Seco/BA), 8 (Conde/BA), 15 (Mucuri/BA), 21 (João Pinheiro/MG), 14 (Morada Nova de Minas/MG), 3 (Conceição da Barra/ES), 3 (Niterói/RJ), 73 (Presidente Epitácio/SP), 598 (Curitiba/PR), 21 (Paranaguá/PR), 85 (Gaspar/SC), 20 (Lages/SC), 6 (São Lourenço do Sul/RS), 26 (Pelotas/RS), 20 (Lagoa Mirim/RS)
Pluvialis dominica - 17 (baía de Sepetiba/RJ), 15 (Lagoa Mirim/RS)
Pluvialis squatarola - 420 (Mangue Seco/BA), 20 (baía de Sepetiba/RJ)
Charadrius semipalmatus - 21 (São José do Ribamar/MA), 168 (Mangue Seco/BA), 556 (baía de Sepetiba/RJ)
Charadrius wilsonia - 156 (Mangue Seco/BA)

Charadrius collaris - 142 (São José do Ribamar/MA), 16 (Camaçari/BA), 120 (Mangue Seco/BA), 2 (Mucuri/BA), 2 (baía de Sepetiba/RJ), 2 (Paranaguá/PR), 23 (Rio Grande/RS), 2 (Pelotas/RS), 10 (Lagoa Mirim/RS)
Charadrius falklandicus - 8 (Rio Grande/RS)
Haematopus palliatus - 6 (Mangue Seco/BA), 4 (baía de Sepetiba/RJ), 112 (Rio Grande/RS), 16 (Lagoa Mirim/RS)
Himantopus himantopus - 42 (Camaçari/BA), 71 (Mucuri/BA), 11 (João Pinheiro/MG), 58 (Morada Nova de Minas/MG), 61 (Rio Grande/RS), 56 (Lagoa Mirim/RS)
Gallinago paraguaiae - 6 (Camaçari/BA), 6 (Mangue Seco/BA), 2 (Mucuri/BA), 11 (Paranaguá/PR), 3 (Gaspar/SC)
Limnodromus griseus - 632 (Mangue Seco/BA)
Limosa haemastica - 50 (Lagoa Mirim/RS)
Numenius phaeopus - 168 (Mangue Seco/BA), 37 (baía de Sepetiba/RJ)
Tringa melanoleuca - 8 (Camaçari/BA), 40 (Mangue Seco/BA), 19 (Mucuri/BA), 6 (baía de Sepetiba/RJ)
Tringa flavipes - 4 (Camaçari/BA), 24 (Mucuri/BA), 25 (Morada Nova de Minas/MG), 7 (baía de Sepetiba/RJ)
Tringa solitaria - 12 (Camaçari/BA), 7 (Mucuri/BA), 10 (João Pinheiro/MG), 11 (Curitiba/PR)
Actitis macularius - 84 (Mangue Seco/BA)
Arenaria interpres - 182 (Mangue Seco/BA), 95 (baía de Sepetiba/RJ)
Calidris canutus - 2 (São José do Ribamar/MA)
Calidris alba - 80 (São José do Ribamar/MA), 32 (Camaçari/BA), 630 (Mangue Seco/BA), 157 (baía de Sepetiba/RJ), 23 (Rio Grande/RS), 1 (Pelotas/RS)
Calidris pusilla - 135 (São José do Ribamar/MA), 360 (Mangue Seco/BA)
Calidris minutilla - 420 (Mangue Seco/BA)
Calidris fuscicollis - 140 (Rio Grande/RS), 120 (Lagoa Mirim/RS)
Tryngites subruficollis - 16 (Rio Grande/RS), 3 (Lagoa Mirim/RS)
Jacana jacana - 81 (Mamirauá/AM), 16 (Recife/PE), 84 (Camaçari/BA), 22 (Mangue Seco/BA), 7 (Conde/BA), 57 (Mucuri/BA), 7 (João Pinheiro/MG), 4 (Morada Nova de Minas/MG), 14 (Aracruz/ES), 14 (Conceição da Barra/ES), 27 (Niterói/RJ), 15 (Presidente Epitácio/SP), 209 (Curitiba/PR), 7 (Gaspar/SC), 37 (São Lourenço do Sul/RS), 8 (Pelotas/RS), 5 (Lagoa Mirim/RS)
Stercorarius parasiticus - 1 (Rio Grande/RS)
Larus dominicanus - 250 (baía de Sepetiba/RJ), 206 (Paranaguá/PR), 34 (Joinvile/SC), 37 (Rio Grande/RS), 35 (São Lourenço do Sul/RS), 52 (Lagoa Mirim/RS)
Chroicocephalus cirrocephalus - 2 (São José do Ribamar/MA), 4 (Pelotas/RS)
Chroicocephalus maculipennis - 172 (Rio Grande/RS), 45 (São Lourenço do Sul/RS), 816 (Pelotas/RS), 80 (Lagoa Mirim/RS)
Sternula superciliaris - 89 (Mangue Seco/BA), 32 (Joinvile/SC), 73 (Rio Grande/RS), 67 (São Lourenço do Sul/RS), 6 (Pelotas/RS), 16 (Lagoa Mirim/RS)
Phaetusa simplex - 101 (Mamirauá/AM), 5 (São José do Ribamar/MA), 619 (São Lourenço do Sul/RS), 60 (Lagoa Mirim/RS)
Sterna hirundo - 87 (Camaçari/BA), 4800 (Mangue Seco/BA), 31 (Rio Grande/RS), 1 (Pelotas/RS)
Sterna paradisaea - 482 (Mangue Seco/BA)
Sterna trudeaui - 112 (Rio Grande/RS), 6 (Lagoa Mirim/RS)
Thalasseus sandvicensis - 146 (Mangue Seco/BA), 21 (baía de Sepetiba/RJ), 4 (Paranaguá/PR), 704 (Joinvile/SC), 1 (Rio Grande/RS), 2 (Pelotas/RS)
Thalasseus maximus - 1 (São José do Ribamar/MA), 72 (baía de Sepetiba/RJ), 8 (Joinvile/SC), 16 (Rio Grande/RS)
Rynchops niger - 17 (Rio Grande/RS), 70 (Lagoa Mirim/RS)

(Nascimento, 2001)
Neotropical Waterbird Census, **July**:

Anhima cornuta - 60 (Mamirauá/AM)
Chauna torquata - 2 (Rio Grande/RS), 47 (Pelotas/RS)
Dendrocygna bicolor - 4 (Pelotas/RS), 114 (São Lourenço do Sul/RS)
Dendrocygna viduata - 510 (Conde/BA), 220 (Camaçari/BA), 118 (Mucuri/BA), 7 (Conceição da Barra/ES), 12 (Aracruz/ES), 750 (Presidente Epitácio/SP), 8 (Pelotas/RS), 89 (São Lourenço do Sul/RS)
Cygnus melancoryphus - 24 (Pelotas/RS)
Coscoroba coscoroba - 17 (Pelotas/RS)
Cairina moschata - 16 (Mamirauá/AM), 44 (Conceição da Barra/ES), 1 (Aracruz/ES)
Sarkidiornis sylvicola - 4 (Conde/BA)
Amazonetta brasiliensis - 6 (Camaçari/BA), 66 (Mucuri/BA), 25 (Conceição da Barra/ES), 9 (Aracruz/ES)
Anas georgica - 2 (Pelotas/RS)
Anas bahamensis - 490 (Camaçari/BA), 12 (Mucuri/BA)
Anas versicolor - 6 (Pelotas/RS)
Netta erythrophthalma - 2 (Mucuri/BA)
Netta peposaca - 3 (Pelotas/RS), 953 (São Lourenço do Sul/RS)
Tachybaptus dominicus - 3 (Conde/BA), 12 (Camaçari/BA), 3 (Mucuri/BA)
Podilymbus podiceps - 8 (Conde/BA), 18 (Camaçari/BA), 8 (Mucuri/BA), 4 (Conceição da Barra/ES)
Podicephorus major - 1 (Rio Grande/RS), 1 (São José do Norte/RS)
Phalacrocorax brasilianus - 132 (Mamirauá/AM), 7 (Maragogipe/BA), 59 (Vera Cruz/BA), 1 (Conde/BA), 1 (Aracruz/ES), 80 (Presidente Epitácio/SP), 5 (São José do Norte/RS)
Anhinga anhinga - 20 (Mamirauá/AM), 128 (São Lourenço do Sul/RS)
Tigrisoma lineatum - 13 (Mamirauá/AM), 1 (Maragogipe/BA), 2 (Vera Cruz/BA), 8 (Conde/BA), 6 (Camaçari/BA), 1 (Presidente Epitácio/SP)
Nyctanassa violacea - 3 (Maragogipe/BA), 4 (Vera Cruz/BA), 28 (Mangue Seco/BA)
Butorides striata - 179 (Mamirauá/AM), 1 (Maragogipe/BA), 39 (Vera Cruz/BA), 6 (Mangue Seco/BA), 27 (Conde/BA), 7 (Camaçari/BA), 8 (Mucuri/BA), 2 (Presidente Epitácio/SP)
Bubulcus ibis - 2 (Conde/BA), 2 (Camaçari/BA), 35 (Presidente Epitácio/SP), 1532 (Blumenau/SC), 3 (Pelotas/RS)
Ardea cocoi - 245 (Mamirauá/AM), 18 (Presidente Epitácio/SP), 4 (Rio Grande/RS), 2 (São José do Norte/RS), 1 (Pelotas/RS), 11 (São Lourenço do Sul/RS)
Ardea alba - 306 (Mamirauá/AM), 16 (São José do Ribamar/MA), 2 (Maragogipe/BA), 16 (Vera Cruz/BA), 32 (Mangue Seco/BA), 10 (Conde/BA), 2 (Camaçari/BA), 3 (Mucuri/BA), 10 (Conceição da Barra/ES), 26 (Presidente Epitácio/SP), 31 (Blumenau/SC), 5 (Rio Grande/RS), 19 (Pelotas/RS)
Syrigma sibilatrix - 2 (Blumenau/SC), 2 (Rio Grande/RS), 2 (Pelotas/RS)
Pilherodius pileatus - 8 (Mamirauá/AM)
Egretta thula - 34 (Mamirauá/AM), 15 (São José do Ribamar/MA), 69 (Maragogipe/BA), 64 (Vera Cruz/BA), 144 (Mangue Seco/BA), 8 (Conde/BA), 43 (Camaçari/BA), 60 (Mucuri/BA), 5 (Conceição da Barra/ES), 60 (Presidente Epitácio/SP), 55 (Blumenau/SC), 10 (Rio Grande/RS), 49 (São José do Norte/RS), 23 (Pelotas/RS), 20 (São Lourenço do Sul/RS)
Egretta caerulea - 1 (Maragogipe/BA), 168 (Vera Cruz/BA), 7 (Mangue Seco/BA)
Plegadis chihi - 8 (Rio Grande/RS), 147 (Pelotas/RS), 129 (São Lourenço do Sul/RS)
Mesembrinibis cayennensis - 2 (Mamirauá/AM)
Phimosus infuscatus - 56 (Pelotas/RS)
Platalea ajaja - 60 (Presidente Epitácio/SP), 10 (Rio Grande/RS), 4 (Pelotas/RS), 15 (São Lourenço do Sul/RS)
Ciconia maguari - 1 (Pelotas/RS)
Mycteria americana - 640 (Presidente Epitácio/SP)
Aramus guarauna - 13 (Mamirauá/AM), 32 (Conde/BA), 3 (Rio Grande/RS)
Aramides cajanea - 3 (Vera Cruz/BA), 3 (Camaçari/BA)
Aramides saracura - 3 (Presidente Epitácio/SP)
Laterallus viridis - 7 (Camaçari/BA)

Porzana flaviventer - 4 (Presidente Epitácio/SP)
Porzana albicollis - 2 (Mucuri/BA), 1 (Conceição da Barra/ES), 2 (Aracruz/ES)
Pardirallus nigricans - 2 (Mucuri/BA), 1 (Aracruz/ES)
Gallinula chloropus - 87 (Camaçari/BA), 92 (Mucuri/BA), 6 (Conceição da Barra/ES), 12 (Aracruz/ES)
Porphyrio martinica - 8 (Conde/BA), 5 (Camaçari/BA), 2 (Mucuri/BA), 19 (Conceição da Barra/ES), 19 (Aracruz/ES)
Fulica armillata - 176 (Pelotas/RS)
Fulica rufifrons - 170 (Pelotas/RS)
Fulica leucoptera - 155 (Pelotas/RS)
Heliornis fulica - 1 (Mamirauá/AM)
Vanellus chilensis - 3 (Maragogipe/BA), 17 (Mangue Seco/BA), 111 (Conde/BA), 83 (Camaçari/BA), 35 (Mucuri/BA), 39 (Conceição da Barra/ES), 2 (Aracruz/ES), 41 (Presidente Epitácio/SP), 82 (Blumenau/SC), (Rio Grande/RS), 2 (São José do Norte/RS), 15 (Pelotas/RS)
Pluvialis squatarola - 5 (Vera Cruz/BA), 7 (Mangue Seco/BA)
Charadrius semipalmatus - 210 (São José do Ribamar/MA), 12 (Mangue Seco/BA), 2 (Conde/BA)
Charadrius wilsonia - 4 (São José do Ribamar/MA), 83 (Mangue Seco/BA)
Charadrius collaris - 163 (São José do Ribamar/MA), 18 (Mangue Seco/BA), 16 (Camaçari/BA), 17 (Rio Grande/RS), 38 (São José do Norte/RS)
Charadrius falklandicus - 6 (Rio Grande/RS), 1 (São José do Norte/RS)
Haematopus palliatus - 8 (Mangue Seco/BA), 69 (Rio Grande/RS), 148 (São José do Norte/RS)
Himantopus himantopus - 7 (Conde/BA), 5 (Camaçari/BA), 33 (Mucuri/BA), 13 (Presidente Epitácio/SP), 10 (Rio Grande/RS), 8 (São José do Norte/RS)
Gallinago paraguaiae - 12 (Camaçari/BA)
Limnodromus griseus - 4 (São José do Ribamar/MA), 136 (Mangue Seco/BA)
Numenius phaeopus - 2 (São José do Ribamar/MA), 2 (Vera Cruz/BA), 12 (Mangue Seco/BA)
Tringa melanoleuca - 4 (Vera Cruz/BA), 5 (Mangue Seco/BA)
Tringa flavipes - 2 (Mangue Seco/BA), 2 (São José do Norte/RS)
Catoptrophorus semipalmatus - 11 (São José do Ribamar/MA)
Actitis macularius - 4 (Camaçari/BA)
Arenaria interpres - 54 (São José do Ribamar/MA), 18 (Mangue Seco/BA)
Calidris canutus - 82 (Rio Grande/RS), 133 (São José do Norte/RS)
Calidris alba - 9 (Mangue Seco/BA), 1 (São José do Norte/RS)
Calidris pusilla - 96 (São José do Ribamar/MA)
Jacana jacana - 88 (Mamirauá/AM), 12 (Mangue Seco/BA), 210 (Conde/BA), 34 (Camaçari/BA), 43 (Mucuri/BA), 21 (Conceição da Barra/ES), 11 (Aracruz/ES), 24 (Presidente Epitácio/SP), 36 (Blumenau/SC), 7 (Pelotas/RS), 12 (São Lourenço do Sul/RS)
Larus dominicanus - 218 (Rio Grande/RS), 422 (São José do Norte/RS),
Chroicocephalus maculipennis - 434 (Rio Grande/RS), 107 (São José do Norte/RS), 32 (Pelotas/RS), 62 (São Lourenço do Sul/RS)
Onychoprion fuscatus - 1 (Mangue Seco/BA)
Sternula superciliaris - 188 (Mangue Seco/BA), 42 (Rio Grande/RS), 8 (São José do Norte/RS), 35 (São Lourenço do Sul/RS)
Phaetusa simplex - 179 (Mamirauá/AM), 2 (Presidente Epitácio/SP), 1 (Rio Grande/RS), 43 (São Lourenço do Sul/RS)
Sterna hirundo - 245 (São José do Ribamar/MA), 30 (Maragogipe/BA), 19 (Vera Cruz/BA), 192 (Rio Grande/RS)
Sterna trudeaui - 30 (Rio Grande/RS), 42 (São José do Norte/RS)
Thalasseus sandvicensis - 127 (Mangue Seco/BA), 1 (Rio Grande/RS)
Thalasseus maximus - 72 (Rio Grande/RS), 12 (São José do Norte/RS)
Rynchops niger - 5 (Rio Grande/RS)

1996

Dendrocygna bicolor - RS: 20148 birds in sep-oct (Menegheti et al., 2001)
Dendrocygna viduata - RS: 90859 birds in sep-oct (Menegheti et al., 2001)
Anas bahamensis - Mangue Santos-Cubatão, SP: near 600 individuals in June (Olmos & Silva e Silva, 2003)
Netta peposaca – RS: 45082 birds in sep-oct (Menegheti et al., 2001)
Eudocimus ruber - Mangue Santos-Cubatão, SP: 505 birds in the year (Olmos & Silva e Silva, 2003)
Platalea ajaja - Mangue Santos-Cubatão, SP: near 100 birds in January (Olmos & Silva e Silva, 2003)
Charadrius semipalmatus - Mangue Santos-Cubatão, SP: 300-350 birds in October (Olmos & Silva e Silva, 2003); Igarassu, PE: average of 750-800 birds in October (Telino-Júnior et al., 2003)
Tringa melanoleuca - Mangue Santos-Cubatão, SP: near 100 birds in September (Olmos & Silva e Silva, 2003)
Tringa flavipes - Mangue Santos-Cubatão, SP: 550-600 birds in October (Olmos & Silva e Silva, 2003)
Thalasseus sandvicensis - Ilha Escalvada, ES: 13000 birds (Efe et al., 2000); Mangue Santos-Cubatão, SP: near 90 birds in June (Olmos & Silva e Silva, 2003)
Arenaria interpres – Igarassu, PE: average of 100-150 birds in October (Telino-Júnior et al., 2003)
Calidris alba – Igarassu, PE: average of 500-550 birds in October (Telino-Júnior et al., 2003)
Rynchops niger - Mangue Santos-Cubatão, SP: 400-450 birds in May (Olmos & Silva e Silva, 2003)
Fregata magnificens – Illha dos Currais, PR: 2640 nests (Krul, 1997)

1997

Dendrocygna bicolor - RS: 13727 birds is September (Menegheti et al., 2001)
Dendrocygna viduata - RS: 150611 birds is September (Menegheti et al., 2001)
Netta peposaca - RS: 37259 birds is September (Menegheti et al., 2001)
Eudocimus ruber - Mangue Santos-Cubatão, SP: 575 birds in the year (Olmos & Silva e Silva, 2003)
Pluvialis squartarola – Igarassu, PE: average of 150-200 birds in January (Telino-Júnior et al., 2003)
Charadrius semipalmatus – Igarassu, PE: average of 450-500 birds in January (Telino-Júnior et al., 2003)
Tringa solitaria – Abrolhos, BA: 1 bird in September (Alves et al., 2000)
Calidris alba – Igarassu, PE: average of 400-450 birds in February (Telino-Júnior et al., 2003)
Calidris pusilla – Igarassu, PE: average of 50-100 birds in January (Telino-Júnior et al., 2003)

1998

Dendrocygna bicolor - RS: 2234 birds in sep-oct (Menegheti et al., 2001)
Dendrocygna viduata - RS: 63760 birds in sep-oct (Menegheti et al., 2001)
Netta peposaca - RS: 8190 birds in sep-oct (Menegheti et al., 2001)

1999

Dendrocygna bicolor - RS: 6768 birds in sep-oct (Menegheti et al., 2001)
Dendrocygna viduata - RS: 111055 birds in sep-oct (Menegheti et al., 2001)
Netta peposaca - RS: 15708 birds in sep-oct (Menegheti et al., 2001)
Eudocimus ruber - Mangue Santos-Cubatão, SP: 550 individuals in the year (Olmos & Silva e Silva, 2003)

2000

Dendrocygna bicolor - RS: 21724 birds in sep-oct (Menegheti et al., 2001)
Dendrocygna viduata - RS: 109129 birds in sep-oct (Menegheti et al., 2001)
Cygnus melancoryphus - Banhado do Taim, RS: near 1270 birds in November (Dias & Fontana, 2002)
Coscoroba coscoroba - Banhado do Taim, RS: near 1460 birds in November (Dias & Fontana, 2002)
Netta peposaca - RS: 45396 birds in sep-oct (Menegheti et al., 2001)
Pluvialis squatarola – Abrolhos, BA: 3 registered birds (see Alves et al., 2000)
Numenius phaeopus – Abrolhos, BA: common (see Alves et al., 2000)
Arenaria interpres – Abrolhos, BA: 6 registered birds (see Alves et al., 2000)
Onychoprion fuscatus – Abrolhos, BA: population of 10 birds (see Alves et al., 2000)

2001

Dendrocygna bicolor - RS: 8114 birds in sep-oct (Menegheti & Dotto, 2002)
Dendrocygna viduata - RS: 124049 birds in sep-oct (Menegheti & Dotto, 2002)
Netta peposaca - RS: 3320 birds in sep-oct (Menegheti & Dotto, 2002)

2002

Dendrocygna bicolor - RS: 13240 birds in sep-oct (Menegheti & Dotto, 2003)
Dendrocygna viduata - RS: 98756 birds in sep-oct (Menegheti & Dotto, 2003)
Netta peposaca - RS: 33506 birds in sep-oct (Menegheti & Dotto, 2003)
Tryngites subruficollis - Lagoa do Peixe National Park, RS: one of the main wintering areas (Lanctot et al., 2002). Estuário da Laguna dos Patos, RS: 400-800 individuals every year during the winter. Banhado do Taim, RS: hundred of birds during the austral summer (Lanctot et al., 2002).
Larus atlanticus - Lagoa do Peixe national Park, RS: some individuals registered in November (Barnett et al., 2004)
Thalasseus sandvicensis – Ilhas Comprida e Cananéia: till 3000 birds (see Barbieri et al., 2002)

2003

Dendrocygna bicolor - RS: 11728 birds in sep-oct (Menegheti & Dotto, 2004)
Dendrocygna viduata - RS: 83774 birds in sep-oct (Menegheti & Dotto, 2004)
Netta peposaca - RS: 42172 birds in sep-oct (Menegheti & Dotto, 2004)
Eudocimus ruber - Mangue Santos-Cubatão, SP: 500 birds in the year (Olmos & Silva e Silva, 2003)
Porzana spiloptera - Estuário da Laguna dos Patos, RS: some birds were observed at "marismas" (Bencke et al., 2003)
Charadrius semipalmatus - Aracaju, SE: 2200 birds in October (Almeida & Barbieri, 2004)

Larus atlanticus - Estuário da Laguna dos Patos, RS: 20-50 birds use the area every year (Bencke et al., 2003)

2004

Dendrocygna bicolor - RS: 55905 birds in August, 60583 birds in sep-oct (Duarte, 2005)
Dendrocygna viduata - RS: 86168 birds in August, 104027 birds in sep-oct (Duarte, 2005)
Netta peposaca - RS: 42687 birds in August, 38861 birds in sep-oct (Duarte, 2005)
Gygis alba – Trindade e Martim Vaz islands, ES: 800 birds (Fonseca Neto, 2004; see Bencke et al., 2006)

(Menegheti, 2005)
Neotropical Waterbird Census, done at 61 sites in four brazilian states, **July**:

Chauna torquata	44
Dendrocygna bicolor	940
Dendrocygna viduata	9034
Dendrocygna autumnalis	295
Cygnus melancoryphus	116
Coscoroba coscoroba	233
Cairina moschata	5
Sarkidiornis sylvicola	78
Callonetta leucophrys	17
Amazonetta brasiliensis	253
Anas flavirostris	68
Anas georgica	33
Anas versicolor	48
Netta peposaca	51848
Rollandia rolland	42
Podilymbus podiceps	19
Podicephorus major	8
Phalacrocorax brasilianus	161
Anhinga anhinga	3
Tigrisoma lineatum	5
Nycticorax nycticorax	20
Nyctanassa violacea	12
Butorides striata	12
Bubulcus ibis	202
Ardea cocoi	20
Ardea alba	537
Syrigma sibilatrix	4
Egretta tricolor	34
Egretta thula	222
Egretta caerulea	117
Eudocimus rubber	8400
Plegadis chihi	1443
Phimosus infuscatus	110
Theristicus caudatus	14
Platalea ajaja	15
Ciconia maguari	39
Jabiru mycteria	7
Mycteria americana	5
Aramus guarauna	52
Aramides ypecaha	2

Pardirallus sanguinolentus	1
Gallinula chloropus	296
Gallinula melanops	6
Porphyrio martinica	21
Fulica leucoptera	438
Vanellus chilensis	12
Charadrius collaris	53
Himantopus melanurus	124
Numenius phaeopus	9
Tringa solitaria	4
Actitis macularius	12
Jacana jacana	150
Larus dominicanus	2
Chroicocephalus maculipennis	2
Sternula superciliaris	60
Rynchops niger	15

2005

Phoenicopterus ruber – Cabo Orange National Park, AP: 150 birds observed (Ross et al, 2005)
Thalasseus sandvicensis – According to Efe et al. (2005) the ES islands harbor 50-65% of the global population.

2006

Plegadis chihi - Várzea do Canal São Gonçalo, RS: the area probably harbor more than 1% of the global population (see Bencke et al., 2006)
Phoenicopterus chilensis - Estuário da Laguna dos Patos, RS: occur in few numbers (see Bencke et al., 2006)
Porzana spiloptera - Lagoa do Peixe National Park, RS: small resident population (BirdLife International, 2000, see Bencke et al., 2006)

Most relevant studies with waterbird banding in Brazil:

(Alves et al., 2000)

Abrolhos, BA (1990-1997)	*Sula dactylatra*	2456
5427 banded birds	*Sula leucogaster*	899
	Phaethon aethereus	799
	Fregata magnificens	357
	Anous stolidus	899
	Onychoprion fuscatus	14
	Phaethon lepturus	3

(Nascimento et al., 2005)

RS (1994-2001)	*Amazonetta brasiliensis*	280
1128 banded birds	*Anas flavirostris*	848

(Efe et al., 2000, 2004)		
ES (1988-1997)	*Thalasseus sandvicensis*	25733
(including 2985 young at Ilha Escalvada, 1993)		
(Nascimento et al., 2000)		
RS (1983-1992)	*Netta peposaca*	4394
(Nascimento & Antas, 1995)		
Brazil (1973-1994)	*Dendrocygna autumnalis*	956
	Dendrocygna viduata	13896
	Dendrocygna bicolor	8654
(Azevedo Jr. & Larrazábal, 1999)		
PE (north coast, 1987-1989)	*Calidris pusilla*	525