WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

ATLANTIC FORESTS (SOUTHEAST) (BRAZIL)

Note: this evaluation is based on a revised nomination of the site as submitted by Brazil on 9 April 1999.

1. DOCUMENTATION

i) **IUCN/WCMC Data sheet** (4 References)

ii) **Additional literature consulted:** Bibby et al, 1992. **Putting Biodiversity on the Map. Priority Areas for Global Conservation**. Cambridge, UK. Biodiversity Support Program, Conservation International et al, 1995. **A Regional Analysis of Geographic Priorities for Biodiversity Conservation in Latin America and the Caribbean.** Washington, DC. Brown, KS, 1987. **In Biogeography and Quaternary History in Tropical America.** pp 175-96. Whitmore and Prance, eds. Oxford: Clarendon Press. Duellman, WE (ed), 1979. **The South American Herpetofauna: Its Origin, Evolution, and Dispersal.** Univ Kansas Museum Natural History Monogram 7. Fundacao SOS Mata Atlantica, 1892. **Dossie Mata Atlantica.** Sao Paulo: Fundacao SOS Mata Atlantica. Fundacao SOS Mata Atlantica and Instituto Nacional de Pesquisas Espacias, 1993. **Atlas da Evolucao dos remanescentes florestias e ecossistemas assaciados do Domino da Mata Atlantica no periodo 1985 - 1990.** IUCN Tropic Forest Program/Conservation Monitoring Centre, 1998. Brazil Atlantic Coastal Forests: Conservation of Biological Diversity and Forest Ecosystems. IUCN, 1996. **Centres of Plant Diversity and Endemism.** Chapter IV. Mata Atlantica. Lynch, JD. 1979. University Kansas Museum Natural History Monogram 7. pp189-215. Mori, SA. 1989. Eastern Extra-Amazonian Brazil, in **Floristic Inventory of Tropical Countries: The Status of Plant Systematics**. The New York Botanical Garden, New York. Padua, Maria Thereza Jorge, 1998. **The Atlantic Forest in Brazil.** Prance, 1987. **Biogeography of Neotropical Plants**. In Biogeography and Quaternary History in Tropical America. Whitmore and Prance, eds. pp 46-65. Oxford: Clarendon Press. Thomas, et al, 1998. Plant endemism in two forests in southern Bahia, Brazil. **Biodiversity and Conservation**, 7, p311-322. CIFOR/UNESCO. 1999. **The World Heritage Convention as a Mechanism for Conserving Tropical Forest Biodiversity.** 54p.

iii) **Consultations:** Local parks staff; staff of IBAMA Brazil; local NGOs; WCPA-Brazil; local and Parana State Government representatives and external reviewers.

iv) **Field visit:** Warren Nicholls, March 1999.

2. SUMMARY OF NATURAL VALUES

The Southeast Atlantic Forests (SAF) are located in the States of Parana and Sao Paolo in SE Brazil. The nomination consists of 468 193 ha of Atlantic forest and associated shrubs (restingas). Elevation range is from sea level to 1,100 metres. The nominated property consists of 25 areas and comprises the following 6 IUCN Category I protected areas: Jureia - Itatins Ecological Station (79,270 ha); Chauas Ecological Station (2,699 ha); Guaraquecaba Ecological Station (13,638 ha); Ilha do Mel

Ecological Station (2,241 ha); Xitue Ecological Station (3,095 ha); Guaraguacu Ecological Station (1,150 ha).

The other 19 units are IUCN Category II: Superagui National Park (37,000 ha); Pariquera - Abaixo State Park (2,360 ha); Jacupiranga State Park (part of) (119,000 ha); Ilha do Cardoso State Park (22,500 ha); Carlos Botelho State Park (37,644 ha); Pico do Marumbi State Park (2,342 ha); Intervales State Park (42,926 ha); Lauraceas State Park (27,524 ha); Alto Ribeira Touristic State Park (PETAR) (35,884 ha); Salto Morato Private Reserve (1,716 ha); Serras do Cordeiro, Paratiu, Itapua, e Itinga Wild Life Zone (5,000 ha); Serras do Arrepiado e Tombador Wild Life Zone (5,125 ha); Mangues Wild Life Zone (11,070 ha); Serra do Itapitangui (e Mandira) Wild Life Zone (3,437 ha); Ilhas oceanicas Wild Life Zone (93 ha); Roberto E Lange Turistical Preservation Zone & State Park (2,698 ha); Serra da Graciosa Turistical Preservation (1,189 ha); Zone & State Park Pau Oco Turistical Preservation Zone & State Park (905 ha); Ilha Comprida Wild Life Zone (7,687 ha).

Biogeographically, the Atlantic forests of Brazil are divided into two distinct areas: the Northeastern (Discovery Coast) and Southeastern regions (Bibby et al, 1992). This nomination is focussed on the Southeastern region. The nominated area lies entirely within a much larger buffer zone of 1,223,557 ha which is managed as a UNESCO Biosphere Reserve. The buffer zone is protected by Federal legislation and provides an important corridors function.

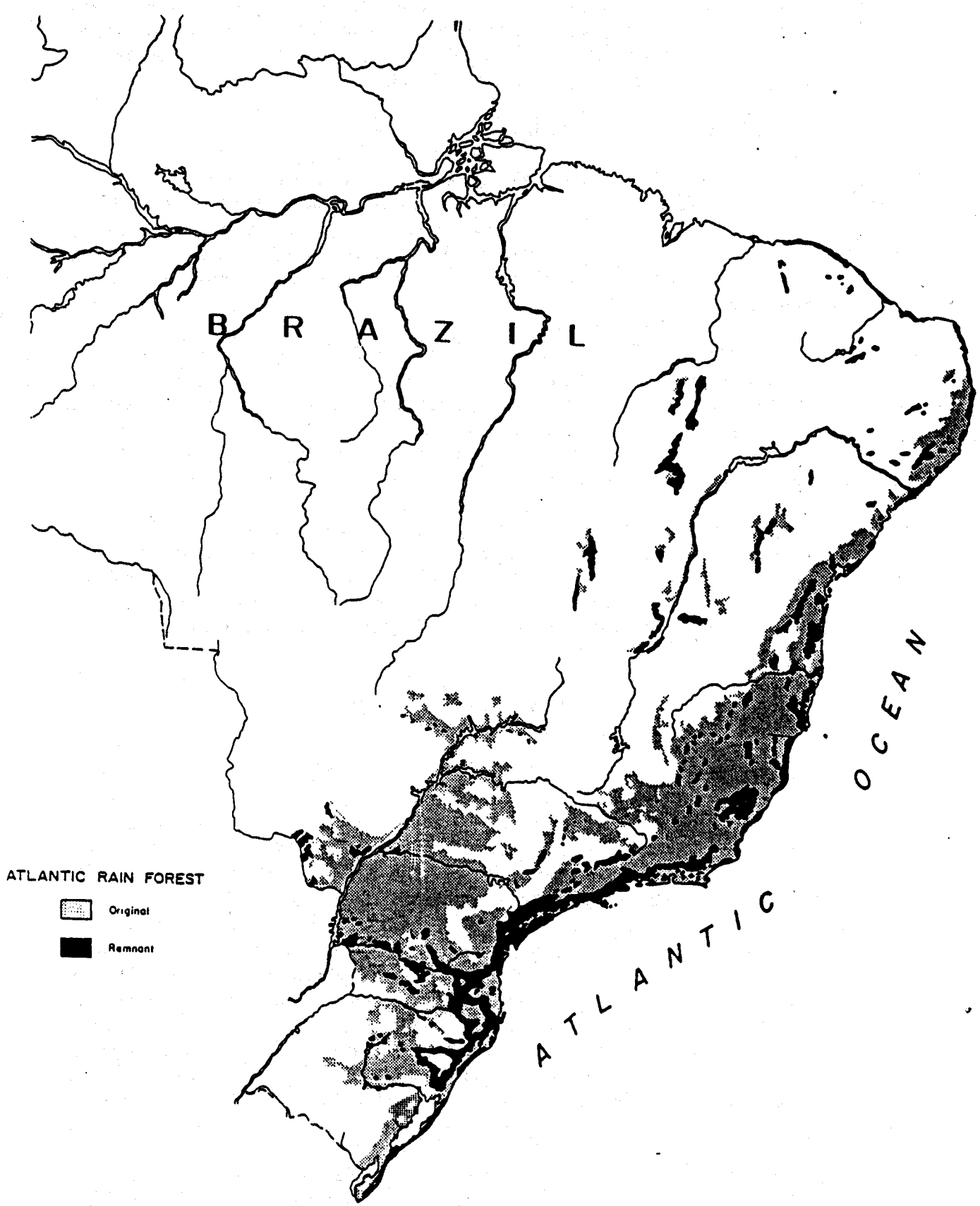
Atlantic forests are the world's richest rainforests in terms of biodiversity (along with the Choco forests of the Colombian Amazon basin and the Yanomono forests of Peru) and they are restricted to the Brazilian coastal region. Unfortunately, the Atlantic forests have suffered the impacts of colonialisation, farming, cattle grazing and urbanisation since the discovery of Brazil. Of the original Atlantic forest, which comprised over 1,250,000 square kilometres and occupied some 15% of Brazil, less than 8% (or 90,000 km^2) still remain (see map). Partially isolated since the Ice Age, the Atlantic forests have evolved into a complex ecosystem with exceptionally high endemism (70% of the tree species, 85% of the primates and 39% of the mammals) and are considered to be among the world's richest forests for tree species (almost 300) per hectare (especially for Myrtaceae species). It is also the region in Brazil with the greatest number of endangered and threatened species. Brazil's Atlantic forests are perhaps the most endangered forest ecosystem on earth (Mori, 1989) and have been given the highest priority for biodiversity conservation (Bibby et al 1992, Biodiversity Support Program 1995). It is one of the "Global 200" ecoregions and one of the "Focal 25" priorities of WWF. The exceptionally high biodiversity and level of endemism may be explained by high tropical humidity (due primarily to the oceanic influence and hillside condensation effects), and the range of altitude and geographical extension leading to the creation of a wide range of climatic and ecological conditions.

The SAF nomination comprises 25 discontinuous protected areas that contain Atlantic forest from the SE region and which are in an intact, or near intact, condition and with appropriate management arrangements in place. The nominated area is the largest continuous area of Atlantic forest with related littoral ecosystems in Brazil. From mountains covered by dense forests, down to wetlands, coastal islands with isolated mountains and dunes, the SAF comprises a natural environment of rich biodiversity and scenic beauty. Caves, waterfalls, rugged mountain ranges and sweeping coastal vistas contribute to the outstanding aesthetic values of the region.

Both the flora and fauna are extremely diverse, with over 55,000 species of plants (22% of the total found on Earth), of which some 18,000 are endemic. There are 524 species of mammals (131 endemic), 1,622 bird species (191 endemic), 517 species of amphibians (294 endemic), 468 species of reptiles (172 endemic), over 3,000 species of freshwater fish and between 10 and 15 million estimated species of insects..

BRAZILIAN ATLANTIC FORESTS DISTRIBUTION FROM 1500 – 1990

(Source: Monteiro, S. and Kaz, L. **Atlantic Rainforest**. Livroarte, 1992.)



The Atlantic Forest is also the place where about 80% of Brazilian mammal species are threatened with extinction. Among the rare and threatened species are the woolly spider monkey, Southern muriqui, Southern Brown Howling monkey, four species of tamarin, the ocelot, Jacutinga, Harpy eagle and the Brazilian red-tailed parrot. The SAF protects the majority of these threatened species. The site is one of 6 Atlantic forest clusters recommended as potential World Heritage forest sites at the 1999 CIFOR/UNESCO World Heritage Forest meeting in Indonesia.

3. COMPARISON WITH OTHER AREAS

Despite sharing some of its flora and fauna with the Amazonian forest (Brown, 1987; Mori, 1989), the Atlantic forests have long been considered a distinct neo-tropical forest type (Mori, 1989; Lynch, 1979) and are in a different biogeographical province (Serro do Mar). Despite 500 years of severe human impact, the Atlantic Forests of Brazil exceed other tropical rainforests in their high biodiversity and the very high level of endemism. The suite of species makes it difficult to compare it with other tropical rainforests.

The SAF nomination comprises 25 protected areas within the Southeast region of Atlantic forest. A separate nomination covers the Northeast region of Atlantic forest. Each nomination is complementary to the other and they reinforce each other. Each has a distinct suite of species and high levels of endemism. The Atlantic forests are not homogeneous and comprise separate centres of endemism with the SE and Discovery Coast (NE) regions each containing distinct species. They are also considered separately in light of differing deforestation history.

The physiognomy of the Atlantic forests is similar from north to south, with high trees (20 - 30 m), rich in epiphyte orchids and bromeliaeds and dense undergrowth. The vegetation, on the contrary, is highly endemic and species composition changes radically along the range. Hence the submission of two separate nominations, each having distinct species compositions. Each group of forests represents an important, but highly individual, aspect of the Serro do Mar Biogeographic Province.

There are few similarities between the SAF and the existing World Heritage site of Iguazu in southwestern Parana State. Iguazu is an inland subtropical forest focussed around spectacular waterfalls. It is also in a different biogeographical province.

4. INTEGRITY

As a serial nomination, the SAF has many issues in common with other serial nominations, particularly the “Central Eastern Rainforest Reserves” in Australia (CERRA) which contains eight clusters of protected areas spread over a 600 km distance with a total size of 108,450 ha. The SAF area consists of six clusters spread along a 180 km distance with a total size of 468,193 ha.

The main question on the integrity of each property is the small size of most of the protected areas that make up the nomination. Twelve of the 25 individual protected areas in the SAF are less than 5,000 ha. It is a general principle of the field of conservation biology that there is a minimum critical size if a reserve is to retain its biological diversity. It is known, however, that minimum size for long term maintenance of floral communities is much smaller than for that of faunal communities. Since the nomination areas’ values are focussed on floral values the question of small size becomes less of a concern. Moreover, seven of the sites are contiguous and found in clusters which effectively adds to their viability.

Related to the question of size is the distance between the isolated fragments on the complex ecological relationships of the total rainforest ecosystem. According to the theory of island biogeography, small separated protected areas isolated by modified habitats will behave like “islands” and will lose some of their original species until the new equilibrium is reached. All of the seven clusters have their separate units in reasonable proximity and are joined by corridors of semi-natural

habitats and buffers. In all cases, compensation for small size and scattered fragments will have to be made through intensive management. Though management plans for all sites are completed, implementation needs to be strengthened. It is particularly important to address the need for maintaining the corridors and effective buffer zones.

A second point relating to integrity is the coordination of management and planning for the property as a whole. In the case of SAF, there are several management authorities responsible, but all 25 sites fall under the umbrella of the Federal Program for the Preservation of the Atlantic Forests. The nominated property is also the core of the Mata Atlantica Biosphere Reserve which is intended to facilitate buffer zone management and regional integration.

Being a serial nomination, it is important to note that all elements of the nomination are included solely for their composition of Atlantic Forest and that they are all functionally linked and each one contributes to the overall unity. The different areas are core areas that all lie within a much larger area that is a UNESCO Biosphere Reserve. With so little Atlantic Forest left, it is considered important to include all those areas that add to the significance of the nominated area (and which have appropriate management arrangements in place), hence there are some areas of small size included because of their significance and the fact that they add to, and do not simply duplicate, the other areas.

The smallest of the nominated areas (93 ha) is an island and hence is not able to be enlarged in size while restricting the nomination to forested areas. The second smallest area (905 ha), along with the other 14 areas that are of less than 10 000 ha, all contain very significant and individually different examples of Atlantic Forest. The inclusion of each of the 25 sites is important to ensure as complete as possible representation of the full spectrum of examples of Atlantic Forest in the region.

A particularly significant area of Atlantic forest that is not included in the nomination is the Serra do Mar National Park. Unfortunately the Park is being impacted by human activities in the intensively populated corridor between Sao Paolo - Santos. This Park would make an appropriate and significant addition to the nomination when the management is able to cope with the adverse affects of the impacts.

In conclusion, as the Brazilian conservationist Ibsen de Gusmao Camara has written: “the immense Atlantic forests in all their glory are a thing of the past, and they can never be brought back. However, wisdom and common sense can still preserve significant samples of their former splendor and we can thus avoid the future label of irresponsible vandals.”

5. ADDITIONAL COMMENTS

The name of the property is in need of revision to be in conformity with other multi-unit sites. Brazil should be asked if they would agree to “Southeast Atlantic Forest Reserves”.

6. APPLICATION OF WORLD HERITAGE NATURAL CRITERIA

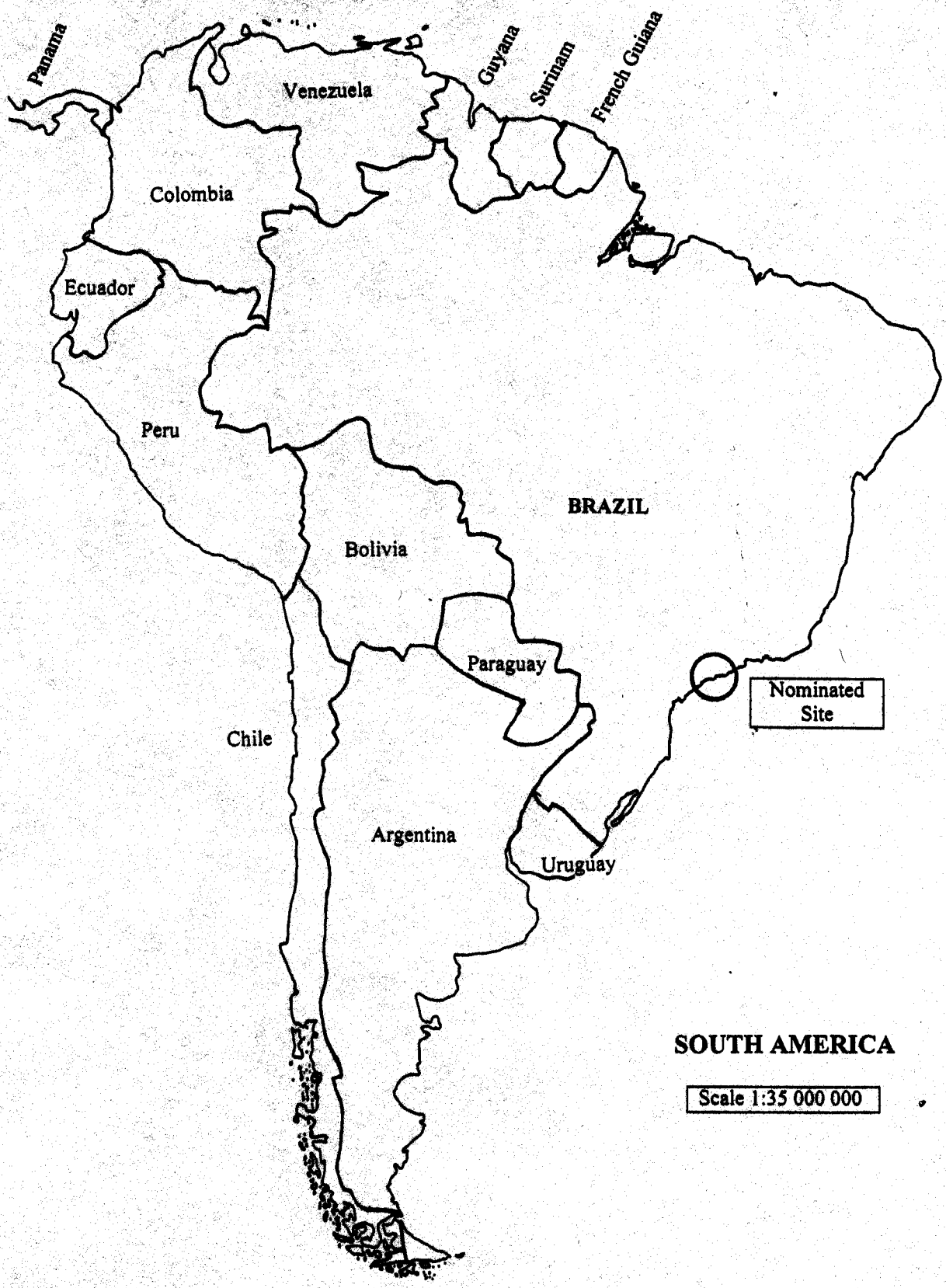
The nominated areas contain the best and largest remaining examples of Atlantic forest in the SE region of Brazil. The 25 protected areas that make up the site combine in a forest archipelago context, to reveal a pattern of evolution of great interest to science and importance for conservation. No one forest remnant would be adequate on its own. Rather, it is the collection of all clusters that adds up in a synergistic manner to display the biological richness and evolutionary history of the few remaining areas of Atlantic forest of southeast Brazil.

The property therefore, merits inscription under criterion (ii) for the evolutionary processes of this exceptionally diverse region as well as natural criterion (iv) for the high numbers of rare and endemic species that occur there. The fact that only these few scattered remnants of a once vast forest remain, make them an irreplaceable part of the world’s forest heritage. With its “mountains to the sea”

attitudinal gradient, its estuary, wild rivers, karst and numerous waterfalls, the SAF has exceptional scenic values and is also considered to meet natural criterion (iii). Although the geological history of the area is also interesting, these values are considered secondary to SAF's biological features and the case for criterion (i) is less convincing.

7. RECOMMENDATION

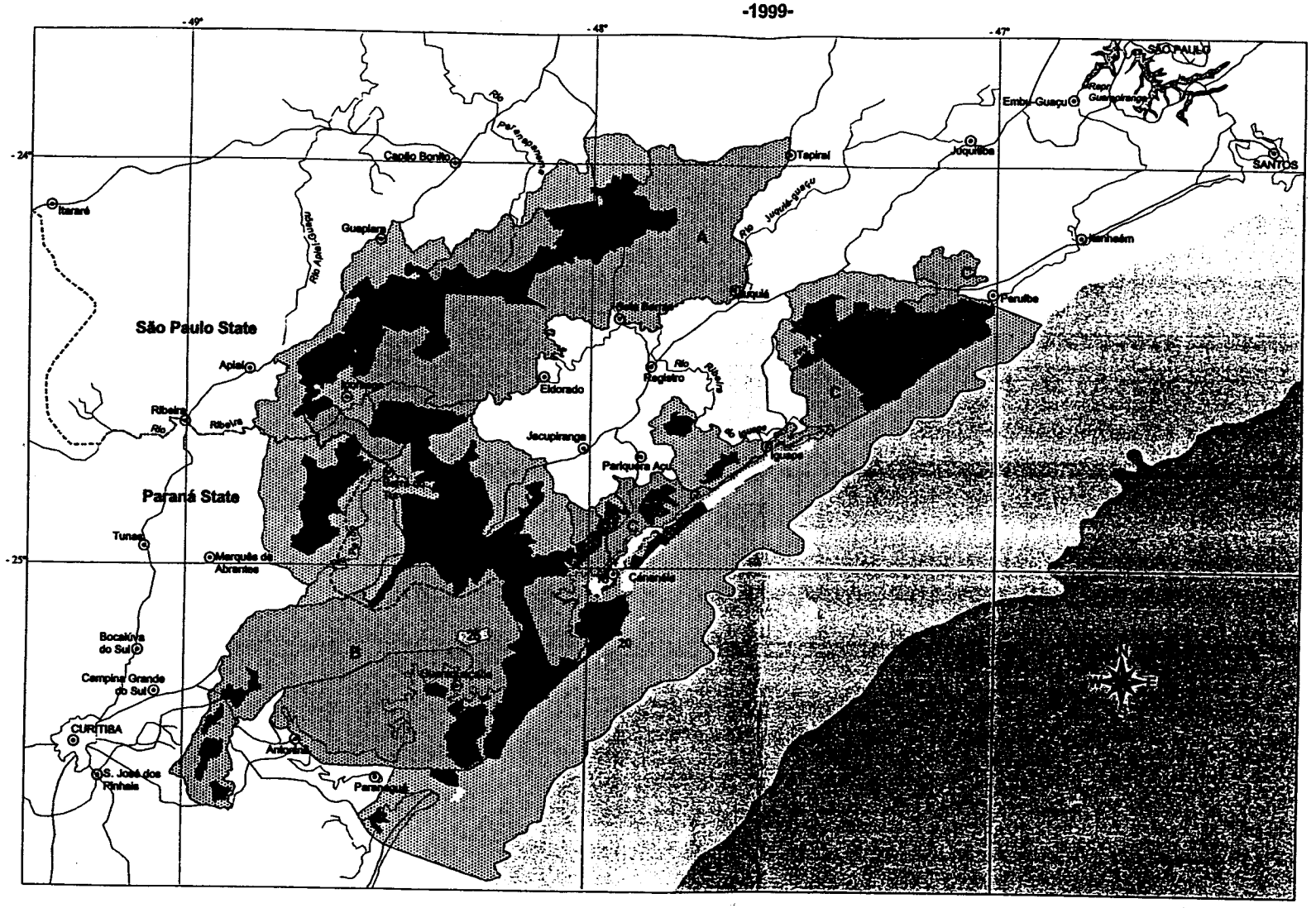
That the Bureau recommend to the World Heritage Committee that the "Southeast Atlantic Forest Reserves" be inscribed on the World Heritage List under natural criteria (ii), (iii) and (iv). The Bureau may also wish to encourage the Brazilian authorities to make efforts to restore natural conditions in the Serra do Mar State Park which could eventually be incorporated in the site.



Map 1. Location of Nominated Site

ATLANTIC FOREST S.E. BRAZIL

Natural property proposal to the WORLD HERITAGE LIST -1999-



- Hidrography
- State Limit
- Cities
- Roads
- National and State Parks
- Ecological Station
- Wildlife Zone
- Private Reserve
- Buffer Zone
- Buffer Zone (Environmental Protected Areas)

A - EPA Serra do Mar
B - EPA Guaraqueçaba
C - EPA Cananéia-Iguape-Peruíbe

Bathymetric Scale (meters)

- 0 - 10
- 10 - 20
- 20 - 50
- > 50

PROTECTED AREAS

1 - Carlos Botelho State Park
2 - Intervales State Park
3 - Xituê Ecological Station
4 - Alto Ribeira State Park
5 - Jureia-Itatins Ecological Station
6 - Chauás Ecological Station
7 - Pariquera Abaixo State Park
8 - Ilha do Cardoso State Park
9 - Jacupiranga State Park
10 - Lauráceas State Park
11 - Ilha do Mel Ecological Station
12 - Guaraguaçu Ecological Station
13 - Pico do Marumbi State Park
14 - Superagui National Park
15 - Guaraqueçaba Ecological Station
16 - Serras do Cordeiro Wildlife Zone
17 - Serras do Arrepiado Wildlife Zone
18 - Mangues Wildlife Zone
19 - Serra do Itapitangui Wildlife Zone
20 - Oceanic Islands Wildlife Zone
21 - Roberto E. Lange State Park
22 - Serra da Graciosa State Park
23 - Pau Oco State Park
24 - Ilha Comprida Wildlife Zone
25 - Salto Morato Private Reserve

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Map 2. Nominated Site