

# Information Sheet on Ramsar Wetlands (RIS) – 2009-2012 version

## RIO DOCE STATE PARK



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#### Name:

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Ramsar Site)

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Designation date

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Site Reference Number

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### 2. Date this sheet was completed/updated:

- July 2009

### 3. Country:

- Brazil – Br

### 4. Name of the Ramsar site:

- Rio Doce State Park (Parque Estadual do Rio Doce)

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**5. Designation of new Ramsar site or update of existing site:**

- Designation of a new Ramsar site

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**6. For RIS updates only, changes to the site since its designation or earlier update:**

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**7. Map of site:**

**a) A map of the site, with clearly delineated boundaries, is included as:**

- i) a hard copy;  (Annex I and II)
- ii) an electronic format;  (CD)
- iii) a GIS file providing geo-referenced site boundary vectors and attribute tables .  (CD)

**b) Describe briefly the type of boundary delineation applied:**

- The boundary is the same of the Rio Doce State Park limits. The limits of the Park is approved and described in the State Decree nº 1.119 (July 14<sup>th</sup>, 1944)

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**8. Geographical coordinates (Annex I and II)**

The geographical coordinates of the approximate centre of the site

- Latitude: 19°38'08."S
- Longitude: 42°31'36.73"O

This site is located between the meridians 42° 38W and 48° 28' and the parallels 19° 45'S and 19°30'S.

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**9. General location:**

- The Park is located in the southeastern region of Brazil in Minas Gerais State. It occupies part of the area known as Valley of Steel situated in Minas Gerais State and it is part of three different municipalities: Marliéria, Timóteo and Dionísio. The nearest large town is Ipatinga which is located where the Piracicaba River flows into the Rio Doce. Ipatinga is situated in eastern Minas Gerais State, far 217 km from Belo Horizonte, the state's capital. The main highways that connect these cities to the main destinations are named BR- 381 and BR – 458 (Annex III).

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**10. Elevation:**

- Maximum: 500 m
- Minimum: 200 m

The average altitude is 260 m above sea level.

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**11. Area:** 35,973 hectares (thirty five thousand nine hundred and seventy three hectares)

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**12. General overview of the site:**

- The Rio Doce State Park is the largest vegetation fragment of the Atlantic Rain Forest in Minas Gerais State, which is worldwide known because of its biodiversity. Besides, the Rio Doce lake system is considered the third biggest system of this kind in Brazil with nearly 150 lakes. This river can be divided in 3 different regions: high, middle and low. Several studies on freshwater

fishes indicate the Middle Rio Doce lakes as a priority region for biodiversity conservation of the Rain Forest Ecosystem (Latini, 2001). Though, the Rio Doce State Park, with its 42 natural lakes or 6,0 % of the protected area's surface (approximately 2,100 ha) have strategic conservation importance.

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**13. Ramsar Criteria: Due to the diversity and endemism of the site (named in the last paragraph of Section 20, "Wildlife"), we suggest to include Criterion 3, in addition to Criteria 1 and 2.**

1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9

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**14. Justification for the application of each Criterion listed in 13 above:**

**Criterion 1**

In the Atlantic Rain Forest biome the Bahia interior forest is one of the most altered ecoregion and less than 10% of the forest remains (Biodiversity Hotspot, 2007). There are few large remnants of forests (of more than 10 km<sup>2</sup>), and even these are currently under strong pressure from anthropogenic activities. Less than one percent of this ecoregion is officially protected as reserves or parks. The most representative protected area of this ecoregion is the Sweet Rives State Park (Parque do Rio Doce), which is 359 km<sup>2</sup> large.

**Criterion 2**

Several endangered species can be found in Rio Doce State Park, including one plant specie and 15 mammals and birds under the IUCN Red List (Anex VIII). Besides, under Federal and State lists of threatened species, there are at least, 7 plants and 28 mammals and birds (Anex V, VI, VII). Brazilian rosewood *Dalbergia nigra*, a Leguminosae endemic species, has a restricted distribution to the Brazilian Atlantic Forest. For its high timber value this species was intensively harvested resulting in its listing as a endangered species, including on CITES-Appendix I. According to the federal list of Threatened species, the avifauna encountered in the park corresponds to near 25% of the endangered Brazilian birds and near 27% of the endangered avifauna in the Atlantic Rain Forest.

A fewer number of animals are found in the Red List of IUCN: the large predators, Jaguar (*Panthera onca*), and the Harpy Eagle (*Harpia harpyja*), the biggest primate of South America, North Muriqui (*Brachyteles hypoxanthus*) which is an important seed disperser. The Red Billed Currawong (*Crax blumenbachii*) is another example. A list with several threatened species is attached to this document (Annex VIII).

**Criterion 3**

The Atlantic Rain Forest of tropical South America boasts 20,000 plant species, 40% of which are endemic. The number of birds is also significant as 325 species were counted within the Park. It corresponds to 82% of the birds found in Rio Doce Valley in Minas Gerais State; 47% of the birds found in the Atlantic Forest biome, 41% of the birds of Minas Gerais State and 19% of the Brazilian avifauna. There are at least 77 mammals species, among which 7 monkeys species and some important big carnivores. and among the amphibians, 38 species are found in the Park and a few of them are restrict to Minas Gerais State: *Sphaenorhynchus prasinus*, *S. argyreporatus*, *Aparasphenodon brunoi*, *Osteocephalus langsdorffii*, *Hyla albomarginata*, *H. anceps*, *Phyllomedusa robdei*, *Physalaemus obtectus*, *Chiasmocleis schubarti* e *Stereocyclops incassatus* ( Rio Doce State Park Management Plan, 2001)

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**15. Biogeography**

**a) Biogeographic Region:**

- Bahia interior forest (IBAMA, 2007) extends in a north-south direction in eastern Brazil, forming the transition between the savanna habitat of the cerrado (to the west) and the Atlantic coastal forests (to the east). This ecoregion is a mosaic of evergreen and gallery forests mixed with semi-deciduous forests, medium and tall grasslands, shrubby savanna, and arid montane scrub. These

habitats are spread out across a region of hills, tablelands, small mountains, and river valleys. Elevations range from 3,300 to 4,900 feet (1,000-1,500 m), with some peaks over 6,500 feet (2,000 m). The climate is strongly seasonal, with mild, rainy summers and dry winters. This area is known for its high floral diversity, with more than 4,000 species of plants recorded. (National Geography, 2007). **Annex IV**

#### **b) biogeographic regionalisation scheme**

- The chosen system is the ecoregion one adopted by WWF-USA. WWF defines an ecoregion as a "large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions". There are 238 Global Ecoregion based on these definition. One of them is the Atlantic Forest which is divided in 14 terrestrial ecoregion, including [Bahia interior forests](#). This classification was developed by World Wildlife Fund – WWF based in information provided by several experts and a compilation of data found in different papers. **Annex IV**

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### **16. Physical features of the site** (Tundisi and Saijo, 1997) (Garcia, F.C.; 2007)

#### Hydrology

The lakes cover 2,100 ha corresponding to 6,0% of the area of the Rio Doce State Park. The lakes, located at the interplateau lowlands of the Middle Rio Doce Valley, are not currently connected with the River as is the case in a floodplain system. Thus, the lakes in the Rio Doce Valley are very characteristic, with depths ranging from 30m to shallow swamps.

Once the lakes are closed, i.e. they do not communicate with the tributaries, hydrological cycle is regulated by direct rain, drainage from the main catchment area and from the groundwater layer as well as by evaporation process and transpiration from the macrophytes.

A few information about water quality is available for 4 lakes: Dom Helvécio, Carioca, Gambazinho and Jacaré. The highest measures of water temperature where record to Carioca lake (33,4 °C) and Jacaré (33,1 °C). These lakes registered the smallest values as well, Carioca (21 °C) and Jacaré (22 °C). Tests with dissolved oxygen registered 14 mg.L<sup>-1</sup> as the highest values found at the superficies of three different lakes: Dom Helvécio, Carioca and Gambazinho. The lowest value was measured in Carioca Lake (21 °C).

All the lakes present pH values slightly acidic during almost all the year. Although, pH values slightly alkaline and extremely acid are found in specific conditions. The highest values for electric conduction where record to Dom Helvécio Lake (244 µS.cm<sup>-1</sup>) at the depth of 32m. An analyze of total dissolved oxygen presented values between 220 mg.L<sup>-1</sup> (Dom Helvécio Lake) and 10mg.L<sup>-1</sup> (Gambazinho and Carioca Lakes).

#### Climate

The yearly mean temperature is 21.8°C, and the mean yearly precipitation is 1,517 mm. The rainy season lasts from October to April, following a very dry period of approximately six months. The climate is tropical humid, AW accordingly to the Köppen classification.

#### Geomorphology

The Park is located in the Interplatalic Depression of the Rio Doce Valley, important physiographic characteristic of the Brazilian southeast, which comprehends an extensive depression of 200 km long and 50 km wide, oriented to a general direction NNE-SSW (Mello, 1997). The Depression is strongly controlled by the main structures of the precambrian foundation, with its formation most likely associated to tectonic fracture mechanisms of the Cenozoic Era. In the Interplatalic Depression of the Rio Doce Valley, a strip of approximately 20 km wide and 80 km long stands out. Following the course of the Rio

Doce, it is characterized by the presence of valleys full of sediments where the lacustrine bodies, which compose the system of isolated closed lakes of the middle valley of Rio Doce, are located. These lakes present assorted dimensions, registering maximum measures of nearly 5 km and areas measuring up to 4 km<sup>2</sup> (Meis & Tundisi, 1986). Its shapes, mainly dendritic-shaped, prove its origin connected to ancient drowned drills. The lakes of the Rio Doce Valley (around 150) originated from the cutoff of the Rio Doce tributaries, caused by the alluvial deposits during the Quaternary Period. The Doce and Piracicaba Rivers carried heavy volumes of clastic rocks. The thicker particles were retained in discontinued compartments, thus forming sandy parcels that reached up to 35 meters in thickness. Some tributaries were able to follow the ascent through sedimentation, gradually filling their own banks. The less important rivers, with smaller collection areas, did not contain sufficient solid cargo to elevate the levels of its banks to the brim, consequently suffering a drowning process, cutting off in its entry doors by the quick deposit of detriments of the Doce and Piracicaba Rivers. Thus, originating the dense network of lagoons, distributed along the middle Rio Doce basin, middle course and lower course (estuary) of the intersection with Piracicaba River.

The distribution of altitudes of the hillslopes characterizes, in the hilly lowlands, a widespread development of a low erosional surface, which was dated tentatively to the end of the Tertiary, and to the Lower and Middle Pleistocen. Relief amplitudes are seldom larger than 100m.

### Soils

A brief account of the geographic distribution of the major soil classes and a description of its morphological and physical attributes based on field data, and previous photoanalysis using airphotos in scale 1:50.000

From the point of view of soil grouping, to the level of suborder the occurrence is as follows:

Soils with latossolic B horizon	9.191,36 ha	25,54%
Soils with textural B horizon	22.376,65 ha	62,16%
Hydromorphic soils	795,13 ha	2,21%
Not developed soils	106,17 ha	0,29%

In the area of study the predominant soils are clayey. In relation to the textural types, the following groupings were made:

Clay texture	30.804,55 ha	85,55%
Medium texture	1.480,07 ha	4,11%
Organic	79,51 ha	0,22%
Undefined texture	106,17 ha	0,29%

Topographically the region has the following distribution of relief:

Plateau	7.605,94 ha	21,12%
Ondulated	524,55 ha	1,46%
Ondulated and strongly/ ondulated	12.065, 28 ha	33,52%
Strogly/ondulated and mountainous	12.274,53 ha	34,10%

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### **17. Physical features of the catchment area** (Tundisi and Saijo, 1997)

“The Lake System, located in the interplanaltic depression of the Middle Rio Doce, is subjected, all year long, to the action of winds from east and northeast originating in the centre of subtropical high pressure, that is, from the anticyclone of the Southern Atlantic (Nimer, 1989). This air mass has a high temperature due to the intense solar radiation and high humidity as a result of large-scale evaporation from oceanic waters.

The cold front with its origin in the southern part of Brazil also contributes to the interplay of those air masses. Those cold air masses originate from the polar anticyclone with low air temperature and less humidity.

Thus during the winter there is low precipitation. The cold air masses predominate at least for 3 months while, for the rest of the year, the warm air masses are a dominant feature. On the other hand, the cold air masses arrive in the Middle Rio Doce region in a state of weakness, rendering few cold months, and with no precipitation. The summer, according to Nimer (1989), extends in fact from October to March, a period of high precipitation and high air temperatures.

The consequences of this climate for the functioning of the lake system are reflected in the vertical circulation which is much more dependent on precipitation during the summer and less dependent on wind during the winter. There is a slow process of mixing, starting in May that corrodes the thermo cline. The cold air masses during the winter are responsible for surface cooling that produces a homogeneous vertical system in July.

The region has a rainfall system with a typical tropical rhythm. Due to the depression in the Rio Doce, the average rainfall is 1,500 mm with some areas with less than 1,000 mm. Maximum precipitation occurs in December (summer) and minimum in July (winter). The smaller precipitation is due to two factors: the lesser frequency of fronts between the cold air masses and warm air masses in the interior of the southeast region; and the orographic factors that produce isolation. In this respect, the Middle Rio Doce Lake District is isolated by the elevations ("Mares de morros"- according to Ab'Saber, 1997) that are the predominating feature in this area.

In the climatic differentiation of the southeast region, the Middle Rio Doce Valleys defined as having a tropical climate, semi-humid, with 4 to 5 months of dryness and with a mesothermic characteristic (Nimer, 1989)

The Rio Doce system shows a very special feature of the coevolution of lakes and forest, in which the morphometry was driven by geomorphological events, and the limnological conditions are a response to this pressure. According to Pflug (1969) the major outline of the Rio Doce depression results from a process of pediplanation under a semi-humid climate in the Quaternary. Later, the rivers started to incise their valleys, and a tributary system of low gradient dendritic valleys was formed. In consequence, the former pediplain was dissected into irregular small hills, which now rise about 50-70 m above the present river bed."

## 18. Hydrological values

There is no data available on the hydrological values of the site.

## 19. Wetland Types

### a) presence:

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

Inland: L • M • N • O • P • Q • R • Sp • Ss • Tp • Ts • U • Va •  
Vt • W • Xl • Xp • Y • Zg • Zk(b)

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

### b) dominance: First – O, Second – M, Third - N

- O - From the 42 lakes of Rio Doce State Park the most well known are Dom Helvécio, Jacaré and Amarela. There are some data available for these three lakes on their morphometry (table). The lake system represents 6% of the park surface. (Tundisi and Saijo, 1997)

PARAMETER	LAKES		
	D. Helvécio	Jacaré	Carioca
Surface (ha)	687.23	103.09	13.33
Volume (m <sup>3</sup> x 10 <sup>4</sup> )	831,495	375,8	71.35
Maximum Depth (m)	32.5	9.8	11.8
Average Depth (m)	12.1	3.65	5.35

Shoreline (m)	45	11,25	1,676
Shoreline Development	5.45	3.13	1.29

- M – The main rivers are Sweet (Rio Doce) and Piracicaba, which delimits part of the Park. There are some important smaller rivers, locally known as “ribeirão”, denominated: Turvo, Mumbaça, Belém, Óculos, Sacramento.
- N - There is a temporary connection between several lakes and rives during the raining season. These net allow a flux of fish between different hydrological systems.

## 20. General ecological features:

### Lakes (Tundisi and Saijo, 1997)

“The limnology of the lakes in the Rio Doce is closely related to the geomorphological processes to which their origin is attributed. The lakes were formed by a dam from sediment deposits after incision of the Rio Doce and a dissection of its tributaries during the arid climate of the Pleistocene era. Consequently, in a great majority of cases, the lakes has assumed a V shape with steeply inclined slopes and are located in valles. The action of wind on mixing waters is very reduced because the lakes are surrounded down to the shoreline by a high secondary growth of the Tropical Atlantic Forest Even in winter, when the lakes present an isothermic profile, the mixing process is not through enough to reach deep zones, such as those in Lake Dom Helvecio. In shallow lakes like Lake Carioca, mixing is more effective so that the nutrients are distributed throughout the water column. A striking characteristic of the lakes during summer is their high stability”.

### The vegetation of the Rio Doce State Park (Tundisi and Saijo, 1997)

“The vegetation cover of the Rio Doce State Park is a forest mosaic in several stages of succession. Lakes are surrounded by this forest, constituting this an unique feature. There is a strong interaction between the lakes with the forest, namely the contribution of the litter to the increase of particulate organic matter in the lake waters. Considering the physiognomy, structure and life forms, 10 typologies of the vegetation were defined for the area:

- **Tall primary forest with epiphytes** – Primary forest well developed, stratified with a representative number of trees of large size (higher than 30 meters) and a great variety of species. This type covers only 8,35% of the total area of the Park.
- **Tall forest** – Well developed and stratified vegetation with trees of large size. It differs from the former type by the reduced number of epiphytes, by a smaller number of very large trees and lower height. The canopy is found between 18 and 25 m. It covers about 30% of the Park
- **Medium to tall forest with bamboos and graminoids** – This type is an intermediate between the high forest and the secondary forest with medium size, bambusoids and graminoids. The herbaceous stratum is characterized by the presence of grasses and the *Cyperacea Rhynchospora sp.* The size of the arboreal individuals is always higher than 12 m. The stage of development is advanced but it does not present the characteristics of a primary forest. This can be observed by the undefined stratification and by the presence of a close understory. It covers about 30% of the Park area and is one of the most abundant type.
- **Medium secondary forest with bamboos and graminoids** – This is typically a secondary forest developed as a result of recovery from the fires of 1964 and 1967. The understory is closed with abundant presence of bamboos, graminoids and lianas. The mosaic characterizing this type of vegetation is composed of areas of old field, secondary forest of medium size and tallfern field. The medium size secondary forest presents a height stratum of 8 to 15 m and an intermediate stratum of 8 to 10 m with young trees both small and of average size. It covers 17,2% of the Park area.

- **Low secondary forest** – Forest in recovery with canopy less than 8 m with low variety of species, high frequency of small bamboos, and several gaps with exposed soil. Occupies 0,1% of the area of the Park.
- **Low woodland** – Vegetation of low height, with a maximum of 10 m, irregular with an arboreal stratum closed or open. It represents a gradient between the areas with abundance of *Typha sp.* (Taboa) and the forest. It covers about 1.1% of the Park.
- **Low tree and scrub tallgrass savanna (campo sujo)** – This is a graminoid herbaceous closed stratum and a sparse arboreal stratum with small trees and bushes. This vegetation occurs in places where recent anthropogenic activities were developed. It covers 2.7% of the area of the park.
- **Tallfern fiel (smambaial)** – Herbaceous vegetation, dominated by a pteridophyte *Pteridium sp.* It is common in degraded areas and is considered as an indicator of poor and acidic soils. It covers 0.1% of the Park.
- **Evergreen tallgrass field with *Typha sp.* (cattail field-taboal)** – the herbaceous stratum is homogeneous and has a graminoid format. It is composed of thyphaceae, Cyperaceae and Poaceae. The superior stratum with bushes or trees is absent. The abundance of *Typha domingensis* Pers. (taboa) is characteristic. It covers 3% of the Park area, and occurs in permanent wetlands or near the lakes.
- **Partially submerged shorterb field (hydrophyte vegetation)** – This is a macrophyte formation showing the frequent presence of *Ekeicgarus sp.*, *Nymphaea spp.*, *Salvinia spp.*, *Eichornia crassipes* Solms. It covers a small area in shallow lakes or near the margin of deeper lakes.”

#### Diversity of the Flora in Subtropical Freshwaters (Espindola *et al.* 1998)

In the lakes of Rio Doce Valley a total of 91 taxa were identified, distributed among Zygnemphyceae (38.56%), Cyanophyceae (31.87%), Chlorophyceae (120.07%), Bacillariophyceae (11.0%), Oedogonophyceae (3.30%), Dinophyceae (2.1%) and Euglenophyceae (1.1%), with the highest number of species among th Zygnemaphyceae (36) and Cyanophyceae (29).

#### 21. Noteworthy flora: (Annexes V and VIII)

The checklist of plant species presented by quotes at least for arboreal species that are on the verge of extinction, in the list of threatened species of Minas Gerais (Minas Gerais, 2008) *Dalbergia nigra* (vell.) Fr. All. *Melanoxylon brauna*, Schott. and *Ocotea odorifera* (Nees) Mez, *Euterpe edulis*. There are also species with economic value such as *Cariniana estrellensis*, *Cariniana legalis*, *Lecythis pisonis*, *Platymenia foliolosa*, *Paratecoma peroba*, *Genipa Americana*, *Euterpe edulis*, as well as species used in popular medicine such as: *Carpotroche brasiliensis*, *Cephaelis ipecacuanha*, *Virola gardneri*, *Copaijfera langsdorffii* among others.

The potential of the vegetation of the Park as a genetic bank of tropical arboreal species has been registered by Almeida Filho *et al.* (1989) who selected 11 species of economic interest. They have identified, for seed collection, 53 healthy and productive matrices.

#### 22. Noteworthy fauna: (Annexes VI, VII and VIII)

##### Fish communities (Tundisi and Saijo, 1997)

In 1987 an inventory held in the area counted a total of 27 species of fish of 11 families in the lakes of Rio Doce State Park. The local extinction or serious decrease in the number of native fish such as *Cuimatus elegans* and *Oligasarcus cf. macrolepis* were observed after the introduction of exotic fishes, specially tucunaré (*Cicha cf. ocellaris*) and Piranha (*Pygocentrus nattereri*). These are present at Dom Helvécio and Jacaré Lakes. Other exotic fish species identified in the area were: African catfish (*Clarias gariepinus*), Tamoatá (*Hoplosternum litoralle*), Oscar (*Astronotus ocellatus*), Tilapia (*Oreochromis niloticus niloticus*), Tambaqui



(*Colossoma macropomum*). These changes in the fish community seem to be due to the predation effect of the exotic species (FNMA/UFV, 2001).

### Terrestrial vertebrates

Up to 30% of the total Atlantic Forest mammals are found in the Rio Doce State Park: 77 mammals species of nine Orders. Seven species of primates are present, corresponding to 40% of the existing primates in the Atlantic Forest. Large carnivores are also present in the area.

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#### **23. Social and cultural values:** (Rio Doce State Park Management Plan, 2001)

**a)** Every year in July inhabitants from local communities ride their horses on a procession following the image of Virgin Mary - Nossa Senhora da Saúde - from the municipality of Marliéria to the Dom Helvécio Lake inside the Park. This traditional event started in the years 20 when local people used a little church near the Lake to pray. It is now considered as religious and ecological event as the Saint is the patron of this nature reserve.

b) No

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#### **24. Land tenure/ownership:**

**a) within the Ramsar site:** According to the Brazilian Law (Brazil, 2000 and Brasil 2002) which establishes the National System of Conservation Unit, any Park, either national, state or municipal, should be created over public land or otherwise have its land purchased by the government afterwards. A significant 90% of the area of Rio Doce State Park is owned by the government of Minas Gerais State and the other 10% is on an advanced process of acquisition. All lakes are of public domain, though, which facilitates the management and enforcement processes.

**b) in the surrounding area:** The areas around the Park are private land, mostly of which owned by reforestation companies using eucalyptus (*Eucalyptus globulus*), an exotic plant, for paper and coal. There are also a few farmers dedicated to agricultural and cattle grazing for dairy products.

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#### **25. Current land (including water) use:**

##### **a) within the Ramsar site:**

State Parks in Brazil belong to the group of fully protected areas qualified for education, research and tourism. Due to a cultural event held for several years in these areas before the establishment of Sweet River State Park, in a specific period of the year, the community is allowed to celebrate a religious event which are not an usual activity. No kind of direct use of natural resources is allowed within its boundary thus hunting and fishing activities are forbidden. One exception is the control of exotic species using fishing methods.

##### **b) in the surroundings/catchment:**

Any development activity to be settled at the buffer zone of any Park in the country should hear the Protected Area administration and follow the recommendations of the Park Management Plan. A significant 82% of the buffer zone of the Rio Doce State Park is under intensive exploitation, mainly for wood extraction, but also for agriculture, cattle breeding or for human occupation of both kinds: urban, near Impatiating city, and rural settlements spread around the park.

Timóteo, Marliéria e Dionísio are the three municipalities that cover the area of the Park. The first one has 76,092 inhabitants and it occupies a total area of 145 Km<sup>2</sup>. The second one, Dionísio keeps a total population of 10,234 people and an area of 343km<sup>2</sup>. The last, Marliéria has 3,743 inhabitants and occupies an area of 546Km<sup>2</sup> (IBGE – www.ibge.gov.br). Regarding the cattle fields, these are well degraded due to

its intensive use provoking an advanced stage of erosion. All these activities may contribute to the pollution of some water bodies found at the buffer zone of the State Park. **Annex II**

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**26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:**

**a) within the Ramsar site:** (Rio Doce State Park Management Plan, 2001)

- Illegal hunting and fishing are rare but occurs in a few spots of the park.
- The presence of a highway inside the park provokes animal death by road accident.
- The introduction of exotic fish species such as *Cychna ocellaris* (Tucunaré) and *Pygocentrus sp.* (Piranha) have some negative impacts over the food chain (fishing of exotic species is allowed only in the Dom Helvécio Lake as an eradication measure). The local extinction or serious decrease in the number of native fish such as *Cuimatus elegans* and *Oligasarcus cf. macrolepis* were observed after the introduction of exotic fishes, specially tucunaré (*Cychna cf. ocellaris*) and Piranha (*Pygocentrus nattereri*). These are present at Dom Helvécio and Jacaré Lakes. Other exotic fish species identified in the area were: African catfish (*Clarias gariepinus*), Tamoatá (*Hoplosternum littorale*), Oscar (*Astronotus ocellatus*), Tilapia (*Oreochromis niloticus niloticus*), Tambaqui (*Colossoma macropomum*). These changes in the fish community seem to be due to the predation effect of the exotic species (FNMA/UFV, 2001).
- Until the year 1993 the area has gone through various forest fires damaging a significant portion of the Park. In the 60s 9,000 hectares were badly damaged. From 1994 a prevention and fighting integrated plan was established involving local private companies, public organizations, NGOs and municipalities, each participating within its competencies/possibilities. The integrated effort has been producing a positive result and since 2005 no significant fire was registered in the Park area.

**b) in the surrounding area:** (Tundisi and Saijo, 1997)

“Demand for exploitation of the natural resources in this region began to gain momentum on a large scale in the fifties. It was during this period that the main deforestation around the lakes took place. The Tropical Atlantic Forest was gradually replaced by a species of *Eucalyptus sp.*, a fast growing well-adapted Australian plant first introduced to Brazil in 1905. The fast growth of *Eucalyptus* in this region has another consequence: every 8 years the artificial forest around the lakes is cut and a new plantation starts. This has produced changes in the slopes and lake sediments. Thus, similar to other regions in Brazil, small-scale plantations considerably changed the landscape and the terrestrial ecosystem and then the lakes. The human activities in this region can be summarized as follows:

- Harvesting of Atlantic Forest wood species down to the shore of the lakes, and plantation of non-native forest (*Eucalyptus sp.*);
- Road construction, altering hill slopes configuration near the lakes;
- Rice plantations in the wetlands, after removal of *Typha domingensis*.
- Introduction of exotic fish species in the lakes: *Cychna ocellaris* (Tucunaré) and *Pygocentrus sp.* (Piranha).
- Introduction of aquatic exotic plants and zooplankton (along with fish).
- Erosion due to intensive use of cattle fields
- Pollution of water bodies due to wood extraction, agriculture, cattle breeding and human occupation.

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**27. Conservation measures taken:**

**a)** The Site's limits are the same as the Rio Doce State Park. This was the first State Park to be created in the State of Minas Gerais, in 1944 through the Decree/Law nº. 1,119. The Park is a protected area under

the group of “full protection” where no direct use of natural resources is allowed according the Law nº 9,985/2000 which establishes the National System of Conservation Unit (SNUC). Under the SNUC parks are areas destined for research, public visitation and environmental education. The site is one of the core areas of the Atlantic Forest Biosphere Reserve recognized by UNESCO in 1993.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the

Ia ; Ib ; II ; III ; IV ; V ; VI

The appropriate category is number **II – National Park**. According to The Brazilian National System of Conservation Units – SNUC, parks can be created by 3 governmental levels: National, Federal, Municipal. The Rio Doce State Park was created by the Minas Gerais State Government and is nominated as a **State Park**.

c) Does an officially approved management plan exist; and is it being implemented?:

The Park Management Plan was approved by the government in the year 2002 and the majority of actions foreseen in this document were completed. The Rio Doce State Park has one of the best infrastructures of all parks in the State of Minas Gerais. Within the intensive use area (according to the Park zoning), there are some laboratories and suitable accommodation for researchers. Nowadays, 81 projects have been developed and they count with the support of the park manager. For the public use, the Park has a specific plan to improve tourist attractions. It includes six interpretative trails already implanted and a visitor center. A consultative council, composed by representations from the civil society, government and private sector, has been established in order to promote the integration between the local population and the park management authorities. The council meets periodically and discuss any important or emerging issues related to the Park management.

The Public Relation and Education Sub-Program have been developed using the structure of the park to give lectures about the importance of preserve the Atlantic Rain Forest, visiting communities around the park and guiding children on tracks into the park, where they learn about conservation and biodiversity. The Environmental Management Program is developed by the cooperation between the park administration and the police to control hunting and fishing into these area.

d) Describe any other current management practices:

- The Park has a Fire Fight Plan with critic areas mapped. The Park has all equipment and staff necessary to accomplish with what is foreseen in the Plan, such as helicopter, airplanes and professional firefighters.

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## 28. Conservation measures proposed but not yet implemented: (Rio Doce State Park Management Plan, 2001)

The Park Management Plan is divided into programs and each program into sub-programs with its own planned activities. As management plans are officially approved by the state government its programs are consequently considered as official conservation measures to be followed:

### **Knowledge Program**

- Research Sub-Program (activities: establishment of agreement with universities, analyze of the influence of exotic species in the park, raise information about the native forest fragments in the park’s buffer zone, analyze of *Oligosarkus solitarius* (lambari- bocarra) population viability, built an information site about research in the unit)
- Environment Monitoring Sub-Program (activities in this topic are related with fishing)

### **Park Integration with its buffer zone Program**

- Environmental Control Sub-Program (analysis and regulation of land use around the park, incentive for the creation of private nature reserves).
- Sustainable Development Alternative Program (valorization of handicrafts and homemade sweets, human impacted areas restoration)

### **Operation Program**

- Land Sub-Program (land legal issues inside the park)
  - Administration Sub-Program (employees social care, yearly strategy plan, establishment of daily activities)
  - Institutional Cooperative Sub-Program (information sharing with local government (mayors) to establish cooperative terms with local companies)
- 

### **29. Current scientific research and facilities:**

The Rio Doce State Park has a high quality infra-structure to receive researchers and tourists: parking area, camping area, lodging, restrooms, theater, visitor center, research center. The site is the most intensively used by researches in Minas Gerais State with more than 500 papers already published.

Currently there are two important research programs being developed in the area: The Brazilian Long Term Ecological Research Program (LTER) and Tropical Ecology Assessment and Monitoring Network (TEAM)

- **The Brazilian Long Term Ecological Research Program**, a cooperative effort amongst scientists, students and funding agencies, at this time represented by the Ministry of Science and Technology (MCT/CNPq), has as an overall goal the development of long-term ecological studies following a central research theme and is guaranteed by a specific line of federal funding. On the international front, this program is a member of the International Long Term Ecological Research Program – ILTER, an international network that has 21 partners with active participation and exchange of experiences, another 10 currently have programs for developing their national network, along with 14 other countries that have expressed interest in integrating in this network.

Brazil is an active member of this network since 1998, including effective participation in its coordinating committee.

The basic expectation of this initiative is to permit the growth of ecological research and the training of human resources in an integrated method which is guaranteed by a specific federal budgetary item which permits concentration of activities in a central objective composed of five thematic lines of research (LTER, 2007).

- **The TEAM Network** has the objective of quantify and forecast changes in biodiversity in tropical forests at local, regional and global scales, and to understand the intrinsic dynamics of biodiversity and its responses to anthropogenic drivers of change (e.g., climate change, habitat conversion, habitat degradation, overexploitation of species). TEAM is concerned with biodiversity at multiple levels of organization, from species, to communities and ecosystems, including the abundance of species, biomass, species diversity (both richness and evenness components), the extent and condition of habitats, as well as the rate and delivery of benefits (ecosystem services) to people. The TEAM Network is committed to making TEAM Network data globally accessible to the scientific and conservation communities and to the general public. Achieving this goal requires the coordination of an integrated and systematic sampling program at multiple spatial and temporal scales. Rapid dissemination of TEAM data to the global scientific and conservation communities is crucial to maximize the utility of TEAM data for

change detection and for informing the development of sound conservation strategies (TEAM, 2007).

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### **30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:**

Within its limits, the Rio Doce State Park has a Visitor Center with an auditorium prepared to house 100 people. A video with the main characteristics of the site was produced to be used as outreach material for the visitors. As well, some folders on the ecological features of the park were elaborated. Additionally, there are some trails at the “intensive use” area of the Park used by small accompanied groups guided by park staff who provides them with some information on the area.

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### **31. Current recreation and tourism:** (Rio Doce State Park Management Plan, 2001)

The Park has a great potencial to become one of the main tourist attractions in the Steel Valley region, contributing for the local economy.

The Rio Doce State Park is opened to public visitation and receives an average 25.000 people per year, mostly of them from the region itself, but also some are from the State capitals of Belo Horizonte, São Paulo and Rio de Janeiro. The allowed activities for tourists are trekking, bathing on the lake, boat riding. The peak season is during the holidays and the main attraction of the park is the Dom Helvécio Lake which has a recreation purpose area (swimming and fishing of exotic species). This is the only Lake opened to the public, among the 42 existing within the limits of the Park.

Park rangers, apart from their duties, do also guide visitors on trails. Some are interpretative though and no guidance is needed.

As a way to promote local involvement and employment, commonly rangers are hired among local people.

Some other activities such as restaurant and boat renting are offered by sub-contractors of the Park administration.

The Park has been opened to public visitation since 1967, although it was kept closed from 1987 to 1993 for infra-structure building and repair.

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### **32. Jurisdiction:**

The site is within the jurisdiction of Minas Gerais State Government and The Forest Institute of Minas Gerais is responsible for its administration.

#### **Forest State Institute – IEF:**

General Director: Humberto Candeias Cavalcanti

#### **Protect Area Directorate**

Director – Nádia Aparecida Silva Araújo

Rua Espírito Santo, 495

Centro- Belo Horizonte -MG

CEP-30.160-030

Phone: +55 (31) 3219.5000

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### **33. Management authority:**

#### **Rio Doce State Park**

Instituto Estadual de Florestas

Park Manager – Marcos Vinícius de Freitas

Santa Rita – Mariléia – Minas Gerais

CEP. 35.185-000

Phone: +55 (31) 3844-2200

e-mail:periodoce@meioambiente.mg.gov.br

**Protect Area Directorate**

Instituto Estadual de Florestas  
Director – Aline Tristão Bernardes  
Rua Espírito Santo, 495  
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Phone: +55 (31) 3219.5000

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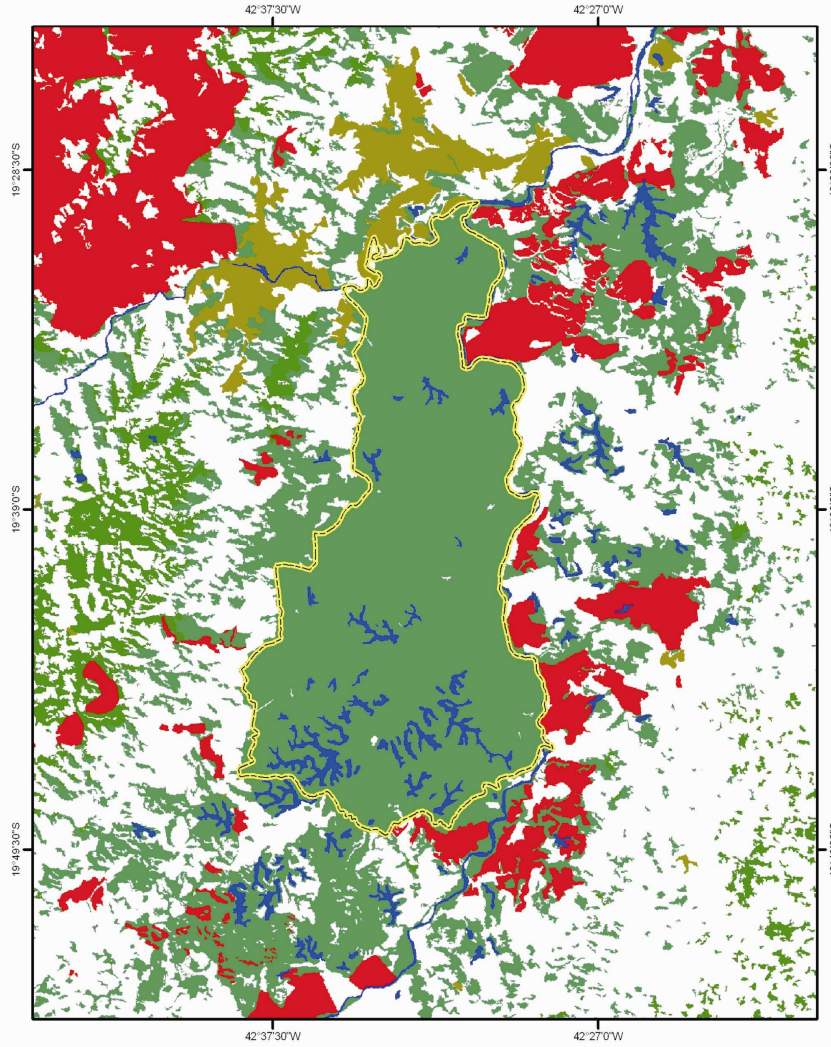
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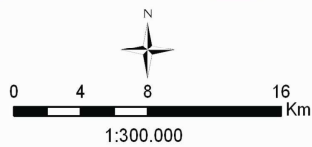
ANNEX II

**Ramsar Site Rio Doce State Park  
Land Use and Vegetation Cover**



**Legend**

- |   |                       |   |            |   |            |   |   |
|---|-----------------------|---|------------|---|------------|---|---|
|  | Semidecidual Forest A |  | Eucalyptus |  | urban area |  | Ramsar Site and Rio Doce State Park limit |
|  | Semidecidual Forest B |  | water      |  | Land Use   |   |   |



**ANNEX III**

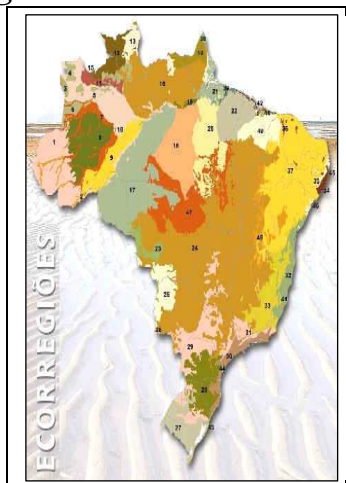


Picture: aerial view of the Rio Doce State Park lakes (Maria Carolina Hazin)



Picture: aerial view of the Rio Doce State Park lakes (Maria Carolina Hazin)

**ANNEX IV  
(Ecoregions in Brazil – IBAMA 2007)**



1. Sudoeste da Amazônia	2. Várzeas de Iquitos
3. Florestas do Caqueta	4. Campinaranas de Alto Rio Negro
5. Interflúvio do Japurá/Solimões-Negro	6. Interflúvio do Solimões/Japurá
7. Várzeas do Purus	8. Interflúvio do Juruá/Purus
9. Interflúvio do Purus/Madeira	10. Várzeas de Monte Alegre
11. Interflúvio do Negro/Branco	12. Florestas de Altitude das Guianas
13. Savanas das Guianas	14. Florestas das Guianas
15. Tepuis	16. Interflúvio do Uamatá/Trombetas
17. Interflúvio do Madeira/Tapajós	18. Interflúvio do Tapajós/Xingu
19. Várzeas do Gurupá	20. Interflúvio do Xingu/Tocantins-Araguaia
21. Várzeas do Marajó	22. Interflúvio do Tocantins-Araguaia/Maranhão
23. Florestas Secas de Chiquitano	24. Cerrado
25. Pantanal	26. Chaco Úmido
27. Campos Sulinos	28. Florestas de Araucária
29. Florestas do Interior do Paraná/Paranaíba	30. Florestas Costeiras da Serra do Mar
31. Campos Ruprestes	32. Florestas Costeiras da Bahia
33. Florestas do Interior da Bahia	34. Florestas Costeiras de Pernambuco
35. Florestas do Interior de Pernambuco	36. Brejos Nordestinos
37. Caatinga	38. Manguezais do Amapá
39. Manguezais do Pará	40. Restingas Costeiras do Nordeste
41. Manguezais da Bahia	42. Manguezais do Maranhão
43. Restingas da Costa Atlântica	44. Manguezais da Ilha Grande
45. Manguezais do Rio Piranhas	46. Manguezais do Rio São Francisco

ANNEX V

LIST OF THREATENED SPECIES - PLANTS			
SCIENTIFIC NAMES	IUCN RED LIST	BRAZILIAN LIST	MINAS GERAIS LIST Category **
<i>Cattleya labiata warneri</i>		X	EN
<i>Dalbergia nigra</i>	X	X	VU
<i>Dorstenia arifolia</i>		X	
<i>Euterpe edulis</i>		X	VU
<i>Melanoxylon brauna</i>		X	VU
<i>Ocotea odorifera</i>		X	VU
<i>Psychotria ipecacuanha</i>			CR

## ANNEX VI

LIST OF THREATENED SPECIES – BIRDS			
SCIENTIFIC NAME	IUCN RED LIST Category *	BRAZILIAN LIST Category *	MINAS GERAIS LIST Category **
<b>Tinamidae</b>			
<i>Tymnus solitarius</i>			EN
<i>Crypturellus variegatus</i>			EN
<i>Crypturellus noctivagus</i>		VU	
<b>Falconiformes</b>			
<i>Leucopternis polionota</i>			CR
<i>Leucopternis lacernulata</i>	VU	VU	CR
<i>Harpia harpyja</i>			CR
<b>Cracidae</b>			
<i>Penelope obscura</i>			
<i>Pipile jacutinga</i>	EN	EN	
<i>Crax blumenbachii</i>	EN	EN	CR
<b>Phasianidae</b>			
<i>Odontophorus capueira</i>		EN	EN
<b>Columbiformes</b>			
<i>Geotrygon violacea</i>			VU
<b>Psittaciformes</b>			
<i>Pyrrhura cruentata</i>	VU	VU	CR
<i>Pyrrhura leucotis</i>		VU	CR
<i>Amazona rhodocorytha</i>	EN	EN	EN
<b>Cuculiformes</b>			
<i>Neomorphus geoffroyi</i>		CR	CR
<b>Thamnophilidae</b>			
<i>Dysithamnus plumbeus</i>			VU
<b>Contigidae</b>			
<i>Cotinga maculata</i>	EN	EN	CR
<b>Emberizidae</b>			
<i>Curaeus forbesi</i>	EN	VU	CR

\*Livro Vermelho da fauna brasileira ameaçada de extinção – Fundação Biodiversitas – 2008.

\*\* Resolução COPAM 367 de 15 de dezembro de 2008

ANNEX VII

<b>LIST OF THREATENED SPECIES - MAMMALS</b>			
<b>NOME CIENTÍFICO</b>	<b>IUCN RED LIST Category *</b>	<b>BRAZILIAN LIST Category *</b>	<b>MINAS GERAIS LIST Category **</b>
<b>Phyllostomidae</b>			
<i>Platyrrhinus recifinus</i>	VU	VU	
<b>Callitrichidae</b>			
<i>Callithrix aurita</i>	EN	VU	EN
<b>Cebidae</b>			
<i>Alouatta guariba</i>	CR	CR	CR
<i>Brachyteles hypoxanthus</i>	CR	CR	EN
<i>Callicebus personatus</i>	VU	VU	EN
<b>Felidae</b>			
<i>Leopardus pardalis</i>		VU	VU
<i>Panthera Onca</i>	NT	VU	CR
<i>Puma concolor</i>		VU	VU
<b>Tayassuidae</b>			
<i>Tayassu pecari</i>	NT		CR
<b>Muridae</b>			

\*Livro Vermelho da fauna brasileira ameaçada de extinção – Fundação Biodiversitas – 2008.

\*\* Resolução COPAM 367 de 15 de dezembro de 2008.

ANNEX VIII

RED LIST OF THREATENED SPECIES – IUCN		
SCIENTIFIC NAMES	COMMON NAME	IUCN CATEGORY
<b>PLANTS</b>		
<i>Dalbergia nigra</i>	BRAZILIAN ROSEWOOD	VU
<b>BIRDS</b>		
<i>Harpia harpyja</i>	HARPY EAGLE	CR
<i>Pipile jacutinga</i>	BLACK-FRONTED PIPING-GUAN	EN
<i>Crax blumenbachii</i>	RED-BILLED CURASSOW	EN
<i>Pyrrhura cruentata</i>	BLACK-TAILED PARAKEET	VU
<i>Amazona rhodocorytha</i>	RED-BROWED AMAZON	EN
<i>Dysithamnus plumbeus</i>	PLUMBEOUS ANTVIREO	VU
<i>Cotinga maculata</i>	BANDED COTINGA	EN
<i>Curaeus forbesi</i>	FORBES'S BLACKBIRD	EN
<b>MAMMALS</b>		
<i>Platyrrhinus recifinus</i>	RECIFE BROAD-NOSED BAT	VU
<i>Callithrix aurita</i>	WHITE-EARED MARMOSET	EN
<i>Alouatta guariba</i>	BROWN HOWLER MONKEY	CR
<i>Brachyteles hypoxanthus</i>	NORTHERN MURIQUI	CR
<i>Callicebus personatus</i>	NORTHERN MASKED TITI	VU
<i>Panthera Onca</i>	JAGUAR	NT
<i>Tayassu pecari</i>	WHITE-LIPPED PECCARY	NT